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Progress

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EDITORIAL COMMENT.

The Iron Industry.

ELSEWHERE we prove that there is reason for supposing there are phenomenally large deposits of iron ore at Parapara. The reason lies in the fact that in one out of five blocks of country, all iron bearing, 22 millions of tons are in sight. With this wealth in view on the surface, the riches hidden below must be very great.

The late Sir A. Cadman secured a lease with the late Mr. E. M. Smith at Parapara, and, after many attempts to float a company for working it (which necessitated repeated visits to London on their part) they died, as the project came apparently within reach of success. Work had been done on the property, according to the conditions of the lease, and after their deaths the project was underwritten on condition of substantial subscription within the Dominion. This condition was satisfied during the session of 1907, but for some reason the underwriting was not followed by the desired result. Had it been so followed, the underwriting syndicate would have made very large profits, and loaded the industry proportionally. It is a bad system for the industry, though good for the underwriting syndicates.

In our opinion it would be better for the State to develope the industry. The State has accepted the responsibility of giving aid, for there are some attractive bonuses under offer with Parliamentary sanction. The State has also accepted the extension to the iron industry of the principle of State ownership already in force in the railways, the telegraphs, the insurance department—fire, life, and accident—and in coal mining.

It has further done so by a provision, in the lease of the Parapara property, for the purchase by the Government, on certain specified terms, at the end of ten years: a term extended substantially in 1906. This is eminently right, because the State can get the necessary money cheaper, and for longer terms, than any private firm, and does not have to pay profits to underwriters. Moreover the State, as the greatest user of iron in the Dominion, stands in the front rank of possible exploiters. State ownership and working would, therefore, be decidedly better for the industry, and for the interest of the public which owns the property; and the State has the additional advantage of the indirect advantages. The State, moreover, has demonstrated its capacity for carrying on large businesses economically and safely.

Lastly, in the event of more capital being required at any time—a thing very likely in the iron industry—the State will not have in getting it, the difficulty that blocks private enterprise. On the whole then, if the State were to determine to set aside half a million for the great work of establishing the pig-iron industry at Parapara, that would be the best way out.

Time presses for decision. The American President has warned the world that its known resources are near their end, and the announcement has been made by cable that the biggest trust ever formed—"The International Steel Trust"—has been floated, with a capital of 150 millions sterling, to "corner" the whole. The Dominion must protect, by State working, the property that may make New Zealand the richest country on earth.

Here and There.

RIGHT-HANDEDNESS AND LEFT-HANDEDNESS.

[BY DR. GEORGE M. GOULD).

There is no reason to suspect even the most vague or far-away beginnings of preference for right or left paws in animals. So long as the four feet are used for locomotion there can be no lateral differentiation of function. I have watched for it in squirrels that use their front paws to hold nuts, cats that strike at insects in the air or play with wounded mice, and in many other animals, but am sure that to neither paw is preference assigned There is thus probably no dominance of either eye in animals. Even in the monkeys and gorillas, who of all animals most use the forepaws as hands, one catches no suggestion of preferential use or superior expertness in the dextral or sinistral side.

But in the lowest human savages all over the world, choice or greater expertness of one hand is as clearly present as in civilised cases No savages, however, are so near animal conditions as to exhibit its differentiating origins. Fixed in all our military and social customs and living at the base of language itself are two facts which solve the riddle and make clear whence and how right-handedness arose. In all tribes and countries since man used implements of offence and defence, the sinistral or cardiac side was protected by the shield, and the sinistral hand was called the shield hand, as the dextral was called the spear hand.

Next to fighting and synchronous with it was the need of barter, and the fundamental condition of bartering was counting with the low numbers, one to ten. The fingers of the free or dextral hand were, of course, first used and all fingers are to-day called digits, as are the figures themselves, and the basis of our numberings is the decimal or ten-fingered system. The tally-stick, notched or numbered, is the record of the digits held in the air. Every drill and action of the soldier, is dextral in every detail. The dominancy of the right eye is shown in firing from the right shoulder and sighting with the left eye. I have two patients left-handed in every respect, who have been taught to fire their guns from the right shoulder, but of course they are left eyed, and they depress the right eye below the level of the gun and sight with the dominant left eye.

Right-footedness, less differentiated of course, must follow right-handedness, so that all soldiers must step off with the left foot first, *i.e.*, the spring must be made with the right. The loss of the right hand, or right eye, mutilations, etc., very common in barbaric times, would help to account for the preservation of the present four per cent. of left handed people.

THE ORIGIN OF THE KINEMATOGRAPH.

The faculty possessed by Edison, in common with other great inventors, of taking up a scientific discovery and turning it to practical account, is clearly displayed in the kinematograph. The illusive effect of moving pictures was well-known at the beginning of the century, as the following story shows:—

Sir John Herschell, after dinner in 1826, asked his friend Charles Babbage how he could show both sides of a shilling at once. Babbage replied by taking a shilling from his pocket and holding it in front of a mirror.

This did not satisfy Sir John, who set the shilling spinning upon the table, at the same time pointing out that if the eye is placed on a level with the rotating coin both sides can be seen at once. Babbage was so struck with the experiment that the next day he described it to a friend, Dr. Fitton, who immediately made a working model. On one side of a disc was drawn a bird, on the other side an empty birdcage. When the card was revolved on a silk thread the bird appeared to be in the cage. This card showed the persistence of vision upon which all moving pictures depend for their effect. The eye retains the image of the object seen for a fraction of a second after the object has been removed. This model was called the thaumatrope.

Next came the zoetrope, or wheel of life. A cylinder was perforated with a series of hand drawings of dancing men. On the apparatus being slowly rotated the figures seen through the slots appeared to be in motion. The first systematic photographs taken at regular intervals of men and animals were made by Muybridge in 1877.

Later on some ingenious person thought of the idea of taking a succession of photographs of moving figures at different movements, each picture, of course, illustrating the exact position of the figures at the precise moment the picture was taken. The whole series of pictures was bound together upon one edge, so that by twirling the leaves, one phase in the movement of the figures came into view immediately after the other and with such rapidity that the impression left upon the eye by one picture was not effaced before the succeeding picture had dawned upon it. By this means the effect of continuous movement was produced.

The Industrial Miracles of the World, and their Workers :

The House of Singer and the Sewing Machine.

This is an industry unique in the history of the world's work. In its universality it has one competitor in the oil business controlled by Rockefeller. In everything else it stands alone. It dates from the year 1852, the date of its first patent. That was secured just about a year after the discovery of gold at Bathurst by Hargreaves; a discovery, the forerunner of an industry which has sent some three hundred millions of Australasian gold round the world, and into every corner of the habitable globe. The Singer industry has not sent as many millions round perhaps, but wherever the gold goes, there the Singer goes also. The reason is easily assigned. It is, that the hunger for gold is not greater than the desire for the famous sewing machine. That is why gold and the Singers are inseparable fellow travellers.

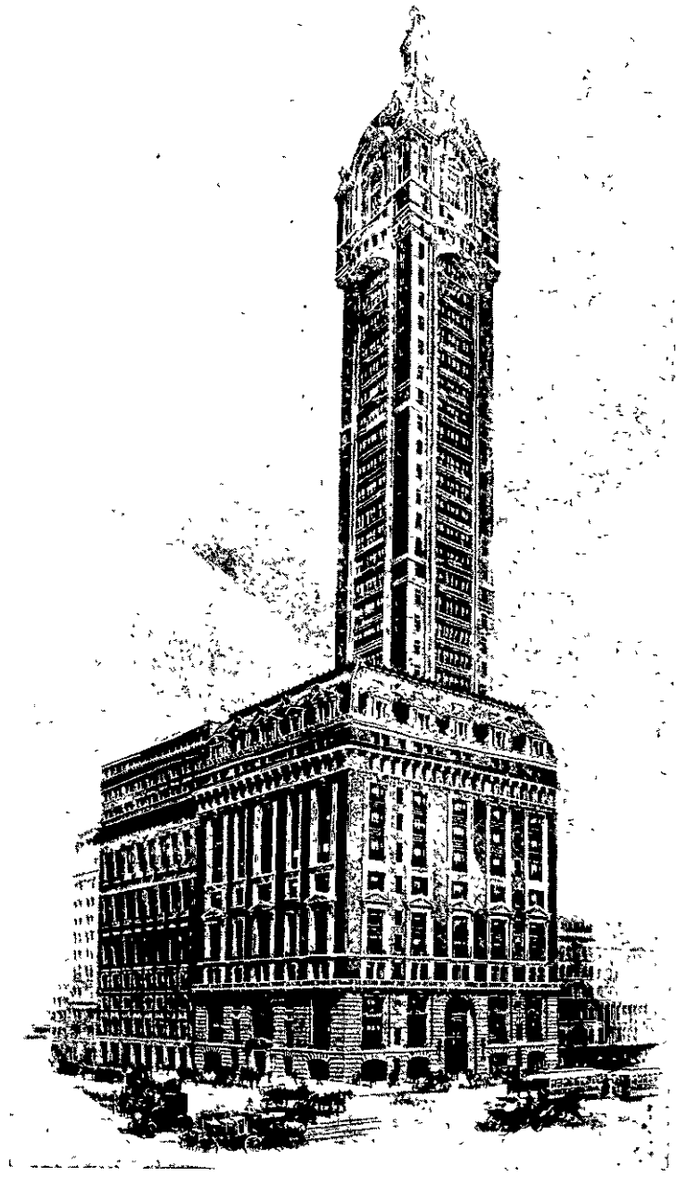
The great house stands out prominent in another respect. It began with thoroughness, reliability, and inventive genius beyond the average, of the highest order, indeed, and it has maintained that tradition from the first day to the present time. That is attested by the unanimous opinion of the world of work. Many others have maintained the tradition of good business capacity, as every one knows who remembers the histories of the great houses of Vanderbilt, Astor, Rothschild, and Baring, each of which has remained in the forefront of good business methods for something over a century. But the Singer industry is the only one that has maintained from the beginning unimpaired the tradition of brilliancy of opportune invention. So much the ordinary practice of this institution proves comprehensively. There is at the head office a staff of experts whose duty it is to look after all that pertains to the mechanical department, not only watching the working of the many hundreds of machine-types on their list, but adding to that list as the occasion requires. When a new kind of work, with which the Company is quite unfamiliar, is brought in, the pattern of the new work required is turned over to the experts and these are set to work to invent a machine which will turn out that new work as well and truly, as simply and cheaply, as all the other outputs of the factories. There is we believe, no instance of failure to meet such demands, and all record of undue delay is conspicuous by its absence. This point is the one on which this firm is not only pre-eminent, but unquestioned.

The Singer Company has another unique record. It has no middleman in any of the many countries to which its machines are regularly taken. The Company has established its own shops all over the world, and runs then all. The number of these retail places of business runs into many thousands, the list of which fills a catalogue of nearly 200 pages. From this it will be readily seen that the undertaking is huge and difficult, necessitating familiarity with different languages, and the requirements, usages, and habits, of a great variety of people. Nevertheless the local customer is safe from the profit that in other businesses belongs to the middleman, pays no toll, in other words, for the benefits of the Company's work; and on the other hand is in touch with the principals as closely as if they lived in his own town.

Such a record as this is unprecedented. It helps to explain the cheap rate, quality considered, at which the truly wonderful examples of the company's output are placed in the home.

The history of the invention is brief in words, and comprehensive in its experience. There were other sewing machine men before the man whose name is now the household word of the sewing world. Just before Isaac Merrick Singer was born in 1811, the idea of abolishing the terrible hardships of the sewing trade by giving the business of sewing a new and mechanical sphere, had attracted many minds, and there were some patents by the time that young Singer came to man's estate. He was a born inventor. To him an engineering drawing was of the deepest attraction, while mechanical problems inspired him with a positive passion. He soon saw that the inventors of the sewing machine had (with one exception, as will be shown presently) failed, and he set to work to find perfection where they had found failure. He was poor, and his business aptitude was in inverse ratio to his mechanical genius. Fortunately he fell into the hands of a good lawyer who piloted him through all the difficulties of the patent stage; past the rocks of company promoting; and into the harbour of steady achievement. By that time the best business brains of the world had become associated with the best inventor of his day.

Once in the harbour of steady achievement, developments proved easy. It is only another way of saying that the merits of the perfected machine (we use the word in comparison between the abortive preceding patents and the Singer first success) were irresistible. As an example of the class of work turned out in the early days, attention was invited, at the recent exhibition in Christchurch, to a machine sold to a Victorian lady in the year 1859. Year in and year out this machine has done good work for that lady for 40 years, with a stitch unimpaired by time or the ravages of use. At the exhibition in question it produced as good a stitch as ever, as good indeed as many of the



THE SINGER TOWER AT NEW YORK. HEADQUARTERS FOR THE WORLD.

Singer Tower ..	612ft.	City Investment Company's Building, N Y	400ft.
City Hall, Philadelphia, U.S.A.	557ft	Park Row Building, N.Y...	382ft.
Washington Monument	555ft.	St. Isaac's, St Petersburg .	365ft.
Cologne Cathedral ..	516ft.	The Giralda, Seville .	350ft.
Rouen Cathedral ..	490ft	The Campanile, Venice ..	325ft.
Great Pyramid, Egypt	485ft.	Madison Square Gardens, N Y.	305ft.
St. Stephen's, Vienna..	450ft.	G P.O Tower, Sydney .	236ft
St. Peter's, Rome ..	400ft.	St Sophia, Constantinople	200ft.
Salisbury Cathedral ..	400ft.	Christchurch Cathedral, N.Z.	200ft

most modern of its successors. It is known in the trade as "The Singer Letter A" machine. This proves very strikingly how practical were the views of the inventor, who directed his whole attention at the outset to the perfection of the stitch, which after all is the main thing in the sewing machine. It was the perfection of the stitch which sent the Singer away through the world, as the fellow-traveller of the gold for which men sell their souls. The stitch disposed of, the inventor and his successors had the way clear to the other points of the machine, and the support of the world of sewers while they followed it.

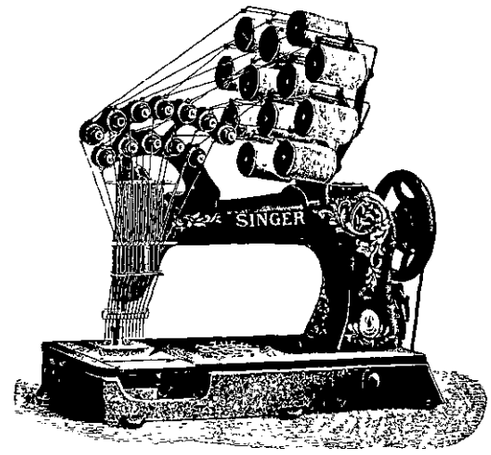
Here it will be well to refer to the exception to the general rule that all sewing machines had failed before Singer succeded. Allan B. Wilson had patented a machine in 1851 (August 8th) having a rotary hook and bobbin, and four-motion feed. This proved the foundation of the sewing machine connection known in the history of this trade, as the "Wheeler and Wilson." That combination proved a formidable and aggressive competitor. This firm had a good career, but the superiority of the Singer methods, and the unique character of its wide circle of work, proving irresistible, the rival combination was duly absorbed, and the field went entirely into the possession of the Singers. The latter now push the "Wheeler and Wilson" with the same "vim" as they do the Singers.

To-day the Singer interests turn out, from various factories, fully two million machines a year. This immense output is, as before observed, distributed all over the world, not through dealers, but by means of the Companys' own shops, of which there are some 6,000 all told, in nearly 5,000 towns. New York and Brooklyn have 90, Chicago 40, Philadelphia more than 60, London 24, Great Britain 619, France 220, Germany 644, Australasia 194 : the organisation also covering Canada, Mexico, Europe, India, South Africa, Turkey, and many other lands. It has been well said that "each Singer shop, wherever found, is controlled absolutely by the Company, and is a centre for sewing machine supplies, and sewing machine troubles of every sort. No matter who the woman is or what language she speaks, or what make of sewing machine she owns, the nearest Singer shop is the place for her to apply to for help, and women all over the world know this."

The improvements effected since the output of the first machine are divided into the following groups:—

(1.) Simpler mechanism and manipulation.
(2.) Speed and lightness of running.
(3.) Silence in action.
(4.) Greater range and working capacity.

As to what they do, the catalogue of performances is exceedingly varied. Those familiar with the wonderful old "Song of the Shirt" once had an idea that they saw in the fabrics special to that field of work, the limit of the usefulness of the sewing machine. It was not long, however, before the sewing machine had sprung out over every class of clothing, and great factories arose for the wholesale manufacture of garments, while the family use of the machine was spreading through town and country all over the civilised world. Canvas carpets and saddlery soon acknowledged the power of the American wizard of industry, and when the boot trade did the same, the astonishment of mankind was prodigious, and still is every time one of the uninitiated strolls into a boot factory. Of these there are many all over Australasia, as over the rest of the world, provided in every instance with the famous machines



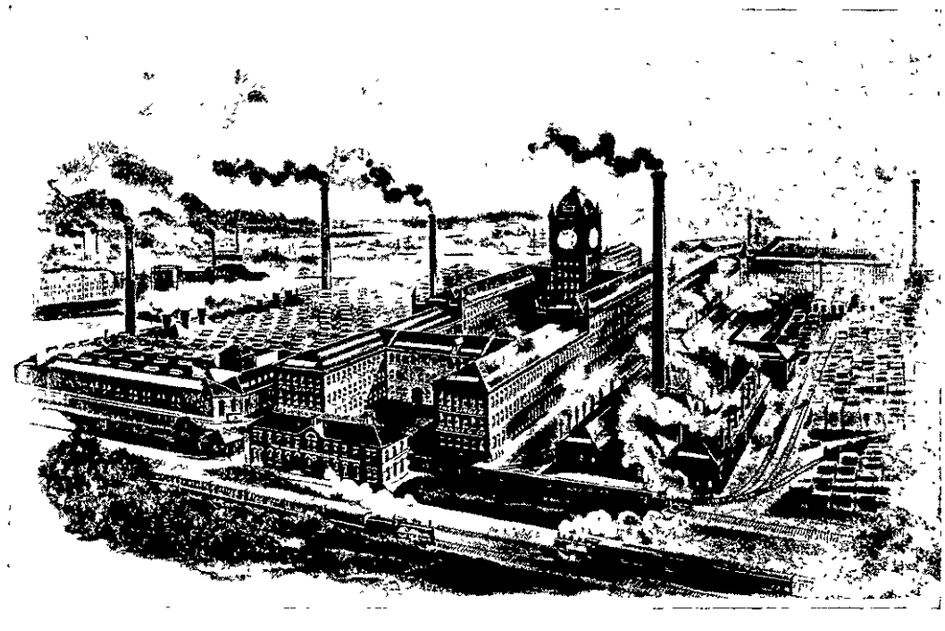
MACHINE 41—12

Works from two to twelve needles at a time, making two or more parallel rows of fine lock stitching Extensively used for corsets, cloaks, skirts, etc , effecting a marvellous economy of labour.

from the Company's factories. In these "King" Singer sews the lightest leather with the most delicate thread, and has no difficulty with the toughest boot, neither does he delay appreciably with anything before him whether great or small. The plainest shapes are to him no easier than the most complicated ; his stitches run round all curves and angles, and hold as well at the end ; and when adjustments are required to varying thicknesses of leather, the adjustment is automatic and certain, as well as prompt ; the work going on without stoppage of any kind at any point. Above all things the simplicity of the movements surprises the average onlooker. The versatility of the machine did not stop at boots. It rose to the regions of art, giving us tapestry of many kinds, pictures of artistic effect, lace curtains, drapes, tea-cloths, work that emulates the feather work of the islands of the south seas, rivals the beautiful delicacy of Moorish arabesques, and makes use with equal facility of all the colours in the range of the manufacturer.

There are exhibitions in every country of many kinds, industrial, pastoral, and mechanical every year, where the Singer is always strongly in evidence. He is shown in battalions, working at high speed on tables arranged for the convenience of the power supply. In this display there is often a skeleton machine with parts so cut away that the beautiful, simple, and perfectly balanced mechanism which operates the needle at lightning speed can easily be watched and understood. Then to show how the thread brought down by every descent of the eye-pointed needle is engaged and looped by the shuttle below so that every stich is securely locked or knitted, and thereby cannot rip or give way, a mirror is pivoted on cross braces between the uprights midway between the pediments and the base of the machine. On its polished surface every motion of the vibrating shuttle is clearly reflected, and by watching the displayed movements in the opened arm of the machine and those of the base reflected in the mirror, any intelligent person is able to understand literally at a glance why the Singer is such a favourite in the world of work.

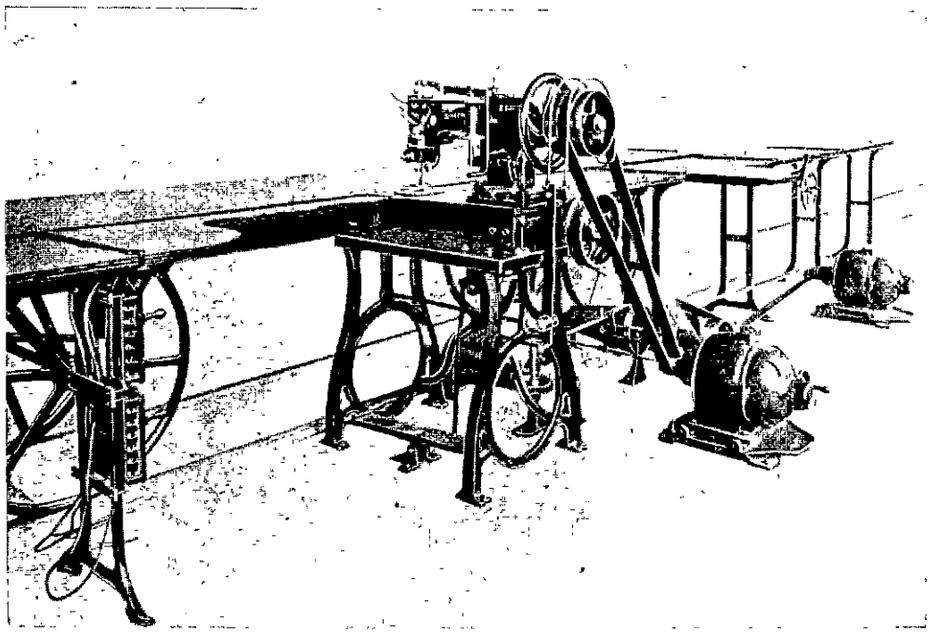
Such is the nature of the invading power which has annexed so many countries. The invasion is carried merrily on upon the satisfactory principle—beneficent in industrial war, malicious in all other rivalries—of making war support war. The material is prepared in nine factories. Of these, three only are in the country of the inventor, namely at Elizabethport, N.Y., South Bend, Ind., and Cairo, Ill., a proof that protective tariffs have been over-leaped by the Singer genius without any undue difficulty. Instead of lying down before the tariff wall and howling complaint, Singer and Co. simply jumped at it and landed all right. Thus we see factories of theirs in St. John's, Quebec, Canada ; Wittenberge, in the ancient kingdom of Prussia ; at Florisdorf, in the centre of the Austrian Empire ; and Poldosk, in much backward Russia. On the other hand free-trade presents as little difficulty to the advance of Singer and Company, the largest factory of all (established early in their victorious career) is Kilbowie, near the great city of Glasgow, employing over 20,000 hands ; from this factory New Zealand draws its supplies. About this factory system it is to be specially noted that every part of every machine manufactured in any factory is interchangeable. Thus anyone travelling with a machine can get a duplicate part, in case of breakdown, anywhere he may be without having to send to the head factory. It is the finishing touch of as splendid a service as has been devised by the wit of man.



THE SINGER FACTORY AT KILBOWIE, NEAR GLASGOW.
Employs 20,000 hands, and makes all the machines supplied to British countries.

The leading feature of the work of these factories from the profit point of view, is that they cannot keep pace with the demand for their output. Every year the plant of each factory is added to, and every year the demand out-tops the addition. When the manager draws up an advertisement his assistants come to him with a despairing request either to leave off advertising, or to show them some new way of getting more work out of the factories. Advertising has always been thoroughly well understood by the management of this warily enterprising firm, as many know who are familiar with its enormous output in the shape of "business talks" as they were called, which used to fill the newspapers and magazines of the world some quarter of a century ago. Those who are not aware of that episode, still are aware of the Napoleonic character of the advertising policy of this company, for they are always hearing of the great Singer Building in New York, with its tower 41 stories above ground, and its imposing height of 612 feet. They are never allowed to forget that this tower is the highest building in the world, dwarfing even the biggest things in the United States. For Dominion readers there is an easy method of realising the stupendous height of this structure. We have nearly all seen the spire of Christchurch cathedral, which rises 200 feet in the air. Place three Christchurch steeples on the top of one another, the three together will fall short of the Singer Building by sixteen feet. No one can ever imagine that the firm that put up the highest building in the universe for advertising purposes does not understand the value of advertisement.

A ROOM FULL OF SINGERS'. (*Kaiapoi Woollen Factory*)



NO. 6–K–6 MACHINE

For sewing sails, tarpaulins, and other heavy gear The work is carried by a travelling table past the machine, which stands on a fixed platform of its own. The machine in the picture is working in the factory of the Union Steamship Company, at Dunedin.

Still it occurs to the critical to wonder why the practice of going slow in advertising which followed the era of the "business talks" is now being departed from, seeing that the reason is still in force that was given for the shorter method of merely stating names and addresses. This has been explained by the business manager in New York, who contends that there are imitations against which he must warn his clients, things unreliable and not to be trusted by the prudent. The day will come, he hopes, when the working power of the factories will overtake the demand and then, if the fort has not been well held by enterprising advertising in the meantime, it will have been stormed by the unworthy. Advertising then, is almost on the borders of a philanthropic project with the Singer people.

At all events if the policy is selfish, it is a selfishness enlightened enough to know that the advantage aimed at is as much for the client as for the purveyor. However, be that as it may, the Singer Company's industry is a splendid example to a young country like the Dominion of New Zealand, of everything that a good, up-to-date, manufacturing project ought to be. As a combination of inventive genius, organising power, cheap distribution, commercial aptitude, diplomatic skill, and unfailing soundness of simple constructive work, there could be nothing better. If the workers of the Dominion will manage to take a leaf out of that magnificent book, it will be a good day for their industries.

The Singer Car.

The following cable is just to hand from the Singer Company at Coventry:—"Result of 2000 miles Reliability Trials: Singer Car first in its class."

Tonga Bay Granite.

A New Zealand granite obtained from Tonga Bay, about 30 miles from Nelson, is being used in the construction of the new Public Trust buildings at the corner of Lambton quay and Stout street.

As this building is the first in which this stone has been extensively used, special interest is taken in it, and it is satisfactory to note that the stone is a first class building stone, being entirely free from flaws. The stone can be obtained in blocks of any size, a number of stones in the Public Trust building weighing upwards of five tons, and some even reaching eight tons in weight. The difficulties and obstacles invariably met with in opening a new quarry have all now been got over, and J. and A. Wilson, Limited, who found it necessary to purchase the quarries and plant from the Tonga Bay Granite Company, are now in a position to supply granite in any quantity.

An interesting article on the stone will appear in our next number, with illustrations of the building, and also some views of the quarry.

Tonga Bay granite is a stone easily worked and looks well in any finish such as rock faced, fine axed, and can also be polished. It is also a first class stone for carving and it no doubt will be largely used for monumental work.

There are at present 30 masons engaged at the Public Trust Buildings.

In a recent issue of the *Revue Scientifique* Dr. C. Fery gives an illustrated account of the new methods of determining high temperatures in industrial operations. For temperatures up to 700 deg. C. he recommends a thermo-electric couple of iron-constantan, from that to 1300 deg. C. one of platinum and its alloys, in each case in combination with a self-registering arrangement Where the thermo-couple would be injured if brought into direct contact with the source of heat, he advocates the use of his own pyrometer, in which the radiation from the source is concentrated by a concave mirror on to the thermo junction. For sources of small dimensions at temperatures above 900 deg. C., optical pyrometers, *e.g.*, Wanner's, are the most useful.

OUR INDUSTRIES.

No. XXV.

QUARTZ MINING.

(Continued.)

If we could find similar employment for all of these boys, what a paradise of mining the Dominion would be. As it is, we must put up with the handicap of diversion of a percentage of our best to other lands for lack of the career denied to them in their own. Still, the schools are good for the mining interest, and that interest must grow and become more absorbent.

Then there is the question of sanitation, and that is the cause of much expense and of corresponidng benefit. In the same connection there is a vast body of mining law which guards against accident and fixes the responsibility of the owners and managers and workmen with a nicety beyond praise. This is part of the complicated body of law which arranges the whole question of the working goldfields, of which more by and by.

Lastly, this mining in quartz reefs is expensive in the matter of machinery. Metallurgy placed on the right basis, the mechanical difficulty came next to the surface. Vaguely the public imagines of the same. Precisely the number of machines of all kinds has been returned as follows:—In the Auckland quartz districts there are 38 rock breakers, 1221 stamps, 3 ore crushers, 262 berdans, 32 pans, 22 settlers, 204 mortars, 122 retorts, 62 melting furnaces, 33 assaying furnaces, 22 cyanide patents, and 12 concentrating plants.

On the West Coast of the South Island there are 6 rock breakers, 299 stamps, 37 berdans, 4 settlers, 18 mortars, 29 retorts, 9 mining furnaces, 4 assaying furnaces, 10 cyanide plants, 1 chlorination plant, and 3 concentration plants.

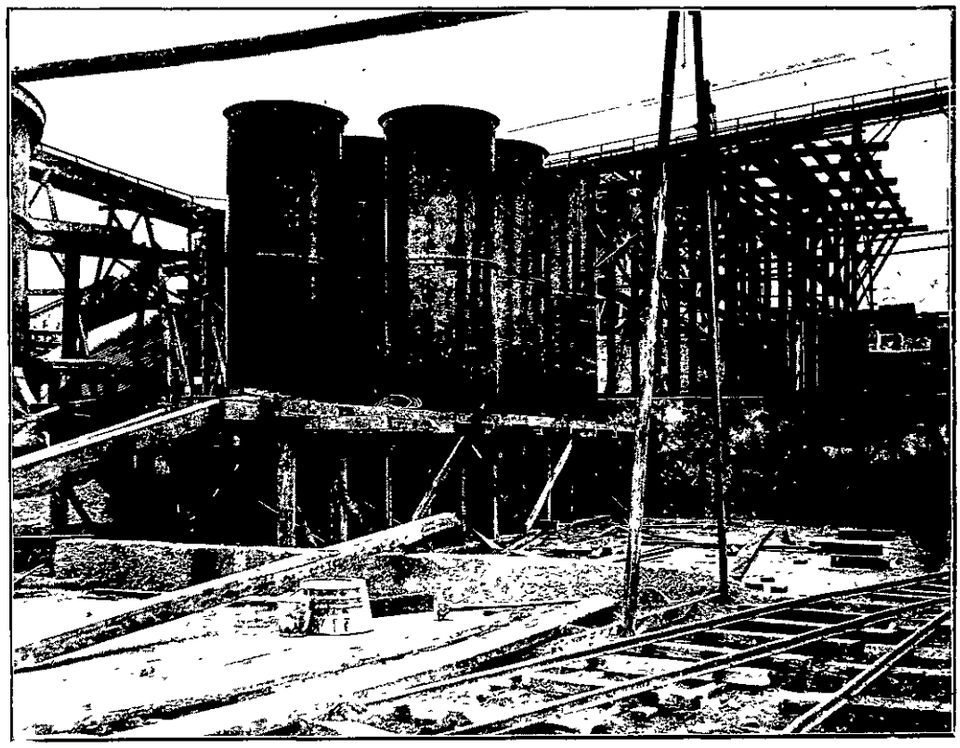
In Otago the numbers are:—9 rock breakers, 343 stamps, 3 ore crushers, 39 berdans, 4 pans, 2 settlers, 15 mortars, 14 retorts, 12 smelting furnaces, 8 assay furnaces, 7 cyanide plants, and 8 concentration plants.

The value of this machinery is, with the exception of Auckland, not given separately, in the return, which sets the whole of the mining plants of the Dominion collectively down at £1,756,629. The Auckland quartz machinery is set down at £478,000, and the others may be estimated—Nelson at £150,000 and Otago at £50,000, which brings the value for the whole of the quartz industry up to about £628,000.

Of the 62 mining companies registered in the north it is reported that their subscribed capital is £819,181 and that they have paid up £257,973 of this amount. No figures are given separately of the quartz companies in other parts of the Dominion, but it is evident, judging by the proportion the industry in the North bears to the industry in other places, that there is not a great deal to add to the amount.

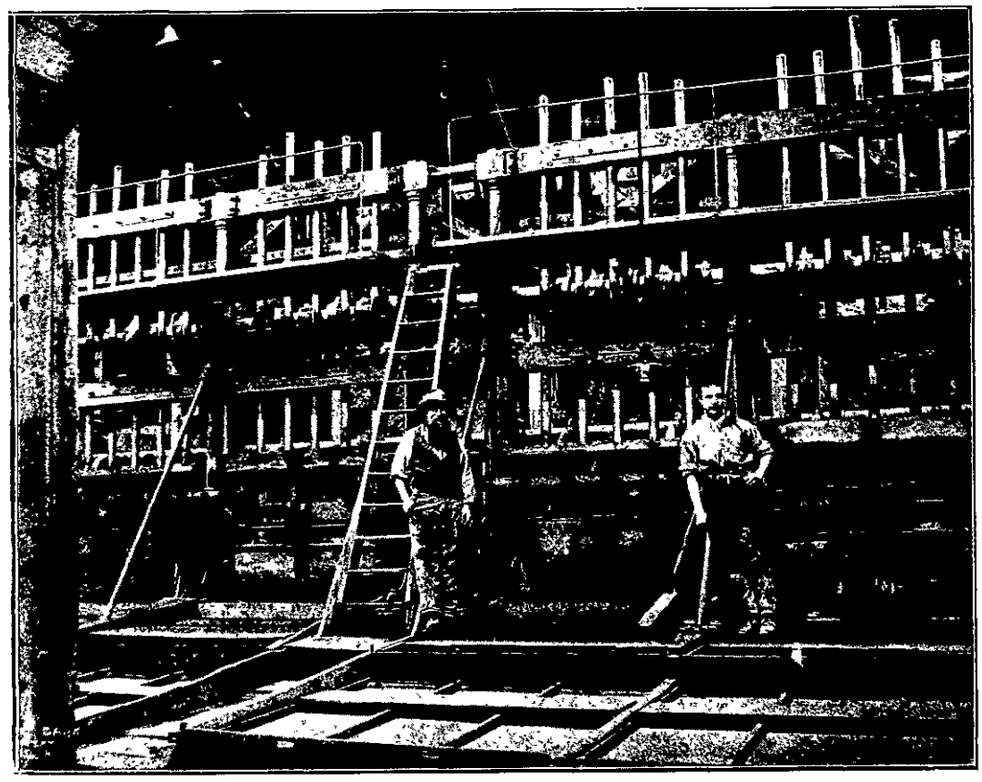
It will be seen that the quartz mining industry is valuable, complicated, and hopeful; that it uses much machinery depends heavily on science, and employs much capital, as well as many men. It remains to add that there is a body of law by which it is regulated, which it behoves every man connected with it to understand.

The Mining Acts contain all the most up-to-date provisions for effective regulation of the rights of mining property, for the protection of life, and for comfort in mines. They deal with the division of the colony into districts, and the classification of the lands therein; they define the mining privileges and water concessions, and prescribe the conditions on which they can be held; they order the working of mines and control their regulation, including the examination of mine managers, battery superintendents, and engine drivers, and the issue of the necessary certificates; in a word, they take cognisance of all matters pertaining to the industry, such as partnerships, the registration of appliances and processes, the reports of mining yields, the compensation for injuries, and the administration of justice.



CONCENTRATES TREATMENT PLANT, WAIKINO BATTERY.

The Mining Companies and Companies Acts require little reference. It is worth noting that the latter body of legislation has been brought up to the latest London standard by the amending Act of 1900, in the matter of promoters' shares. Promoters' shares (which do not, by the way, include paid-up shares given as part-payment for a mining property) must now (so far as the Companies Acts are concerned) be set forth in all prospectuses; without a list of them no joint-stock company can be registered; they are unsaleable for two years after the formation of a company, unless a year's dividend has been paid during that period; and, in the case of winding up during the period, they entitle their holders to no share in the assets of liquidation.



KEEP-IT-DARK BATTERY, REEFTON

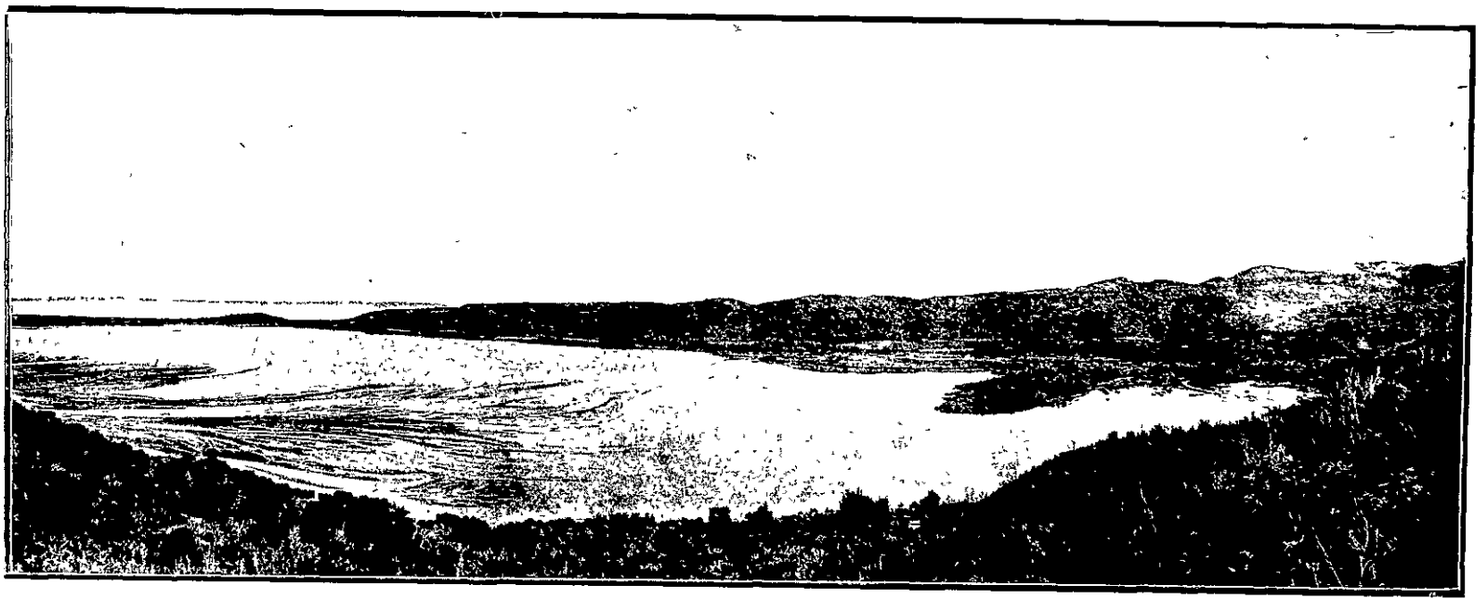
COMING INDUSTRIES.

No. I.

Ironfields of the Dominion.

(Blocks from Government Bulletin, No. 3.)

There are enormous deposits of iron ore of very excellent quality in the Dominion. Of these, most is known of the deposits at Parapara, in the Karamea district of Nelson, not far from Collingwood. A vigorous attempt has been made to start the iron industry there, and it has been assisted by substantial encouragement by Government and Parliament. Apparently the attempt has not succeeded: but the deposits are still to the fore, and public opinion is very eager about seeing the industry established.



PARAPARA INLET, FROM NORTH-WESTERN SIDE.

Of course the only question for the practical man is, will the industry pay when it is established? Naturally his first question is as to the consumption of the Dominion. In the year 1906 the Dominion used iron, of all kinds — pig and manufactured iron, in all shapes —some 131,060 tons, for which it paid the import value of £1,330,500. That does not mean that the industry, when established, can hope to handle the whole of that million and a third of sterling value. There is, indeed, an opinion to the effect that we should confine ourselves to the production of pig iron. Well, the import of pig iron in the year named was 10,624 tons, of the import value of £43,673. In view of that figure, it becomes necessary to consider what other openings there may be in the long list of the importations into the Dominion. Bars, bolts, and angle iron, total up to the respectable figure of nearly £190,000; pipes and fittings loom substantially at £153,000; rails, with the necessary accompaniments, come up to no less than £250,000, sheet and plate, galvanised, plain, and corrugated, reach the high figure of nearly £400,000 Other manufactures there are, but the whole weight of everything in tons (without the pig iron) comes no higher than some 120,000 tons. There is something for industry to hope for, but it is limited by the total weight, and by the fact that the difficulties in the way of establishing the iron industry outside of the limits of the production of the raw material of manufacture, namely the pig iron of commerce, are somewhat large. It is clearly a case for the assistance of the State through the bonus system—a fact the State has practically admitted for many years past, and is admitting to-day, with the same practical earnestness.

IRON ORE, WASHBOURN BLOCK. THE HILL IS COVERED WITH BLOCKS OF ORE

At this stage of the discussion, one is reminded of the statement of an importer's agent, that the smallest blast furnace conceivable would turn out all the iron required by the Dominion in a few weeks, and then fail economically by running down — a thing fatal to the economic production of merchantable iron, as every one knows who has ever had anything to do with the same

Shall we be discouraged? No: for here looms up the recent statement of the President of the United States, warning his people that the end of the magnificent resources of their territory is in sight, and that the iron supply, in particular, is on the borders of extinction, and must be conserved in some scientific drastic way. This gives a new shape to the fact that the world's consumption is great and is increasing by leaps and

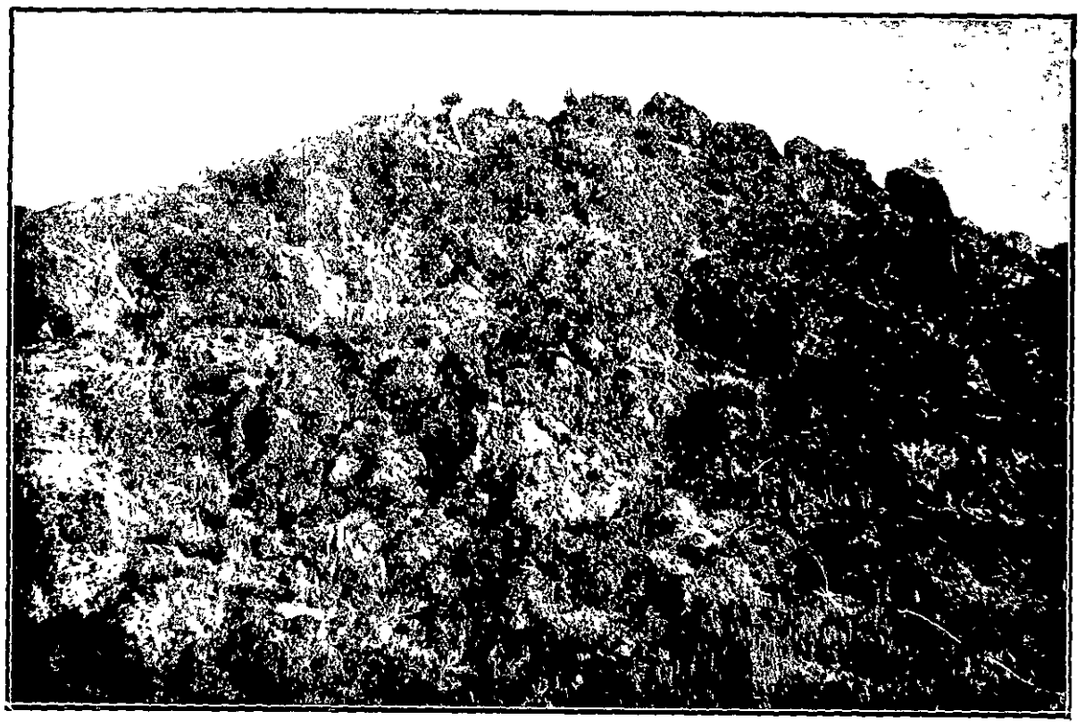
bounds. In the last century (it has been computed) the world consumed 3,300 million tons of iron: but at the rate of the present consumption, the century now current will require to be supplied with fifteen thousand million tons, and the general cry is where will it come from?

The world's output of pig iron in 1903 was a little over forty-six million tons. To this aggregate, the principal contributing countries were as follows:

U.S.	18,009,252
Germany	10,085,634
Great Britain	8,811,204
France	2,827,668
Belgium	1,216,500
Canada	265,418
Russia	2,453,953

These countries contributed a little over 43½ millions of the total of 46 millions and over. The percentages of the different supply countries were: United States 38·84, Great Britain 19·27, Germany and Luxembourg 21·75, France 6·13, Belgium 2·63, Austria-Hungary 3.08, Russia and Finland 5·29, Sweden 1·09, Spain 0·65, Italy 0·16, Canada 0·57, other countries 0·54.

Now, President Roosevelt, in his astonishing message to Congress the other day, stated that the end of the world's supply at the present rate of use would come in about fifty years. The figures we have quoted of the consumption of the two centuries, the last and the current (estimated, the latter of course) go some way towards bearing him out. Mr. Carnegie, who knows what he is talking about whenever he has to do with iron, has stated that the high class Cleveland ironstone will be practically exhausted in twenty-five years, and the high grade supplies of iron ore in the United States by the middle of the present century, or about twenty years later. Mr. Hadfield, the English authority, estimates that by the year 2000 the United Kingdom alone will require a supply of 450 million tons of iron ore per annum. The American autherity, Dr. Atkinson (the statistician of Boston) declares "should two-thirds



OUTCROP OF IRON ORE, WASHBOURN BLOCK. THE ORE IS THICK, AND GIVES THE EFFECT OF SHEEP FEEDING IN FLOCKS.

IRON ORE, ONAKAKA BLOCK, NEAR HIDDEN TREASURE TRACK.

SIDE OF GORGE CUT THROUGH IRON DEPOSIT, WASHBOURN CREEK.

IRON ORE IN WASHBOURN CREEK BED THE THICKLY SCATTERED ORE READY FOR THE FURNACE.

of the present population of the globe ever consume as much iron per head as the inhabitants of the United Kingdom and America, namely about 560 lbs. per head, the demand would have to be met by a world supply of about 300 million tons per year." This seems to take off a big discount from the British conclusion, but both men unite in asking where the supplies are to come from.

We read, moreover, in the Karamea Parapara *Bulletin* of Mr. Bell, that "The world's supply of high grade iron ores is rapidly decreasing, owing to the enormous annual production of iron necessitated by modern methods of construction," adding that "it has been estimated by very good authorities that, at the present rate of iron consumption, within fifty years the world's visible supply of ores now considered sufficiently high-grade to be employed for manufacture will be exhausted" From all of which it will be readily realised that the American President has ample ground for the sensational statements he made to Congress about the approaching exhaustion of the world's iron ores of merchantable quality. It is, moreover, well established that the rate of the use of iron by the world is increasing far faster than the world's population

It follows, therefore, that any country possessing a valuable asset of iron ore may find it difficult to go wrong in any attempt it may make to turn the same into money, and as soon as it likes to try. This note was in Mr. Bell's mind when he was stating the conclusions of the experts. "In view," said he, "of these considerations, the value of the immense deposits of iron ore at Parapara cannot be doubted, and the day does not seem far distant when this great store of material wealth will be utilised." In plain English, there is a market, and a growing market, for every ton of ore that can be converted at Parapara. The world's markets are fairly stretching out their hands to the Dominion of New Zealand, eager to take all we can give.

Quantity and Quality of the Parapara Ore.

It becomes the main question, what is there at Parapara in the shape of iron ore? The Karamea district is according to the Geological Bulletin (No. 3, of the new series) 243 square miles in extent, and over the whole of it there is iron ore more or less. Of that ore, the best in quality, and the most in quantity is to be found in three outcrops, viz: the Washburn block, the Tukurua block, and the Onakaka block. The ore of all three, says the Bulletin, is apparently the result of oxidation of ferrous carbonate, the general quality being high, the deposits in the Washbourn block showing, however, ore of higher grade than the others. Mineralogically considered, the ore is mainly limonite, though partly gothite, and possibly turgite. The quantity of ore in the three blocks is "enormous, though it is impossible to estimate the exact amount of ore in any of the blocks, since no operations beneath the the surface have as yet been conducted. A rough estimate"—we may remark, an estimate that bears the stamp of the most careful, conscientious calculation and computation—"of the amount of ore showing on the surface of Washbourn block, gave 22,691,762 tons. The amount of ore in this one block may be much greater, and it is not likely to be less." The quantities of ore in the other two blocks are such as to satisfy "the most exacting iron-seekers."

The area of the Washbourn block is about one mile square, and the Tukurua is about the same, the Onakaka being two miles long by a mile and a half broad. In these areas the deposits are extraordinary, as may be seen from our illustrations. The ore occurs in the creek beds, it lies scattered over the hill sides, it is disclosed by great rents in the mountains, it stands obtrusive in huge cliffs. A great deal of it is covered with timber of the dense character special to the Dominion, its quality proclaims itself to the eye of even the tyro, it lies for the most part in ridges, standing between streams. The great fact is that no search is required. The miner has but to scoop the ore in.

What of the quality? Firstly, for the impurities of which there is a small percentage, they never occur in the Parapara division in quantities sufficient to prove refractory in the manufacture of pig iron.

Then as to the percentage of iron. Standards of value are—turgite, containing 66·2 per cent. of metallic iron; gothite, 62·9; limonite, 59·8 per cent. Now, it is on record, that from a sample of ore taken to Melbourne, so far back as 1870, pig iron was made experimentally containing 97·62½ per cent. of metallic iron. Referring to this experiment the Bulletin of the department above quoted, says, that none of the extraneous elements "occur in such proportions as to render the metallurgical treatment difficult, or the commercial products inferior to those turned out by many of the leading iron-producing mines of the world."

The detail analysis is of course more important. There is one for each of the blocks. From the Washbourn block, 34 samples were taken, with care to keep as near the average of the localities as possible, and the iron contents ranged from 58·18 per cent. to 40·71 with an average of 51·79 per cent. The remark of the Bulletin is "In order that the exact chemical nature of the ore body might be known, complete representative sampling was made of every available part

IRON ORE, WASHBOURN BLOCK, NEAR PAINT MILL.

of the ore deposit in Washbourn block, and the analyses made therefrom have shown the splendid quality of the ore in a very striking manner. Hydrous iron-oxides with over 50 per cent. of metallic iron may be considered of high grade; with 40 to 50 per cent., of medium grade; and with less than 40 per cent., of low grade. Twenty-nine of the 34 showed over 50 per cent. in the iron content, and hence the ores were high grade limonites, while the remaining five—between 40 and 50 per cent. —represented medium grade ores. "From the Tukurua block, seven samples were taken, ranging from 59·35 to 43·79, with an average of 50·4. From the Onakaka block forty samples were taken, ranging from 52·44 to 24·99, with an average of 45·17. Out of the 40 samples, four were of high grade, 34 were medium, and only four of low grade—a fact which compensates much for the great variety of observed quality within short distances.

There is a fourth block, the Pariwhakaoho, but it is not extensive, and the quality of a sample did not show more than 47·03. In addition, there are minor occurrences of ore all over the district, but they are valuable chiefly as showing possibilites for the future, after search, than for present developments. The supply of iron in the big blocks then is immense—extraordinarily so—and the quality is of high average.

Cost of Production.

There is very little to go upon in the way of details of workings on the spot. It is remarked, however, in the Bulletin, that in the Masabi section of the Lake Superior region in the United States, where somewhat similar conditions prevail, the actual cost of mining is estimated at 80 cents, or 3s 4d the ton. In New Zealand, it is added, the average should not greatly exceed this amount, and mining operations might be conducted even more economically. In fact the ores, being exposed on the surface, ought to possess every facility for cheap and easy mining.

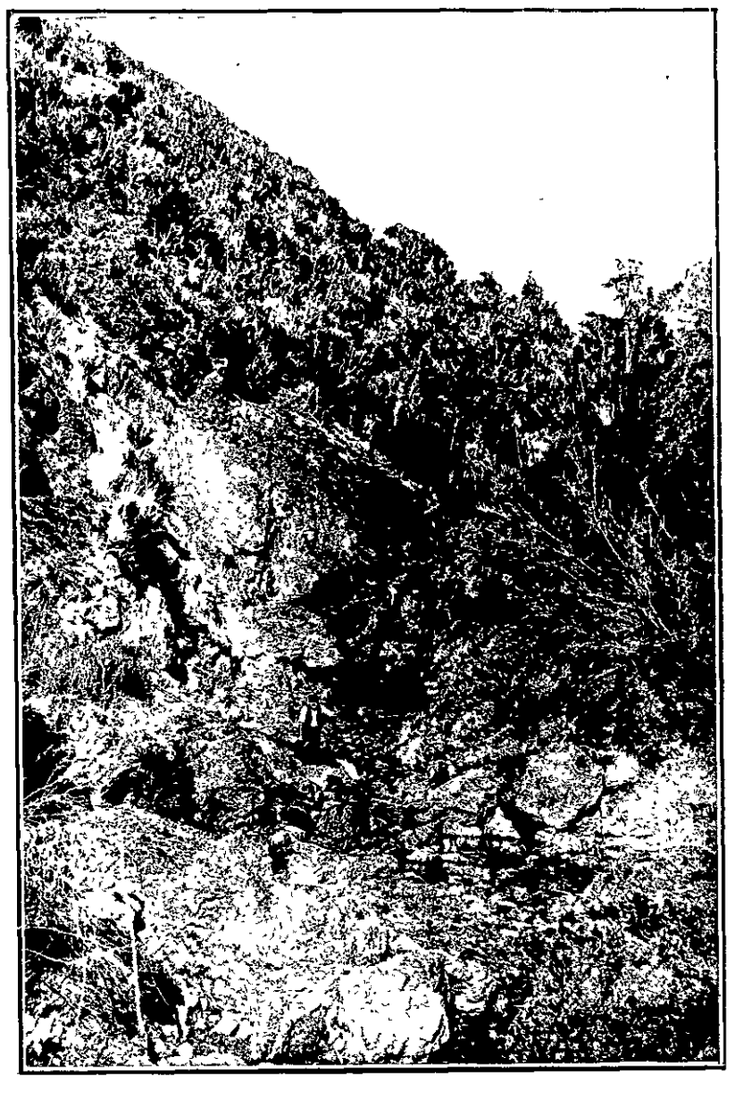
Secondly, there are many suitable spots for blast furnaces which would command the ore from the three big blocks. There are two especially suitable, one on the Parapara inlet, the other on the banks of the Onakaka stream in a very extensive flat. Both have the easiest communication with the sea, and there is a certainty of fairly calm water, owing to the proximity of the sheltering Farewell spit, and the gradually shelving bottom is just fit for a wharf, which at low water could accommodate ships drawing thirty feet. Such a wharf is projected.

Thirdly, "The necessary limestone flux for effecting the removal of the silica in the reduction of the ore, lies conveniently at hand. Some of the crystaline complex carbonates with which the ore bodies are generally associated, would certainly be suitable for this purpose, though doubtless a still better flux is to be found in the limestones of the Oamaru series occuring on the Parapara inlet the Lower Parapara, and elsewhere."

Fourthly, the coal question is not so pleasing as once seemed likely. There is coal at Puponga, very well reported on half a century ago by Hochstetter in his facinating book on New Zealand, but it has been tried and found not to yield a hard enough coke for smelting. At Pakawau, eight miles off on the Parapara inlet, there is a coal which gives a fairly hard coke, but it contains too much sulphur for metallurgical purposes, and so far as has been ascertained at present, this coal is not in quantity sufficient. The Bulletin disposes of the question, however, by pointing to the Westport coal measures, distant 145 miles by sea. "The abundance of high class coal available in the Westport district affords a coke eminently adapted for the requirements of the smelter, and no good reason appears to exist why it should not be landed at Parapara, at a cost consistent with extensive and profitable metallurgical operations."

Summarising, we have here at Parapara enormous quantities of high-class ore in position most accessible, close to the sea, with no difficulties of embarkation. Abundances of fluxes are on the spot, and the coal for the smelting presents no difficulty. The mine-field is marked, quoted, and signed by nature, for the establishment of a valuable iron industry; it is now countersigned by opportunity; and the opportunity is growing with rushing rapidity.

QUARTZ AND LIMONITE ROCK AFTER FERRATION AND SILICATION.



IRON ORE IN WASHBOURN CREEK.

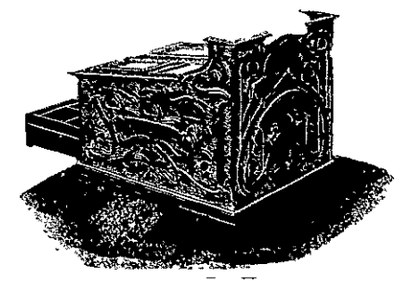
MACHINE varnishes or glazes are commonly employed for painting agricultural machines and are obtainable in a variety of colours, such as green, red, blue, etc. They must possess brilliant lustre and adhere to the iron almost as firmly as enamel. They may be produced, of excellent quality, according to the following recipe. In 120 parts of 95 per cent. alcohol dissolve 80 parts of soft Manila copal, 40 parts of resin, and when the solution is complete add 30 parts of castor oil. This varnish is rubbed down, in the proportion of 4 to 7, with any desired bright colour.

F. H. TREVELLIAN, the Inventor and Patentee.

The Imperial Cash Register:

A Growing Industry.

Due entirely to Dominion brains and enterprise.



THE MACHINE.

This machine is a cash register. It is more · it registers everything possible to be registered in connection with the business of a retail store. The remarkable thing, or rather one of the remarkable things about it, is that it was invented in the Dominion, and made in it. The whole thing, lock, stock, and barrel, is the product of Dominion brains and hands.

Look at it! Its metal case is finished with great taste, every working part is sound, easy, strong, compact. It would be absolutely impossible for any factory in any other country to turn out a more shapely, more handy, more reasonably priced article.

IN THE PACKING ROOM.

IN THE FACTORY.

This is a thing to dwell on. This is "Local Industry Week" in the Dominion, or rather our date of issue is the first of the month after that very successful array of the products of local talent and local enterprise. Time was when the mention of the origin of a thing manufactured was enough either to make its fortune or to damn its chances. If the thing was foreign everybody was eager to see it, to gloat over it, to buy it, and to swear for evermore that the local people are altogether hopeless. Then followed the reasons, all of which went down with the sapient people who made public opinion in those days. The unhappy colonial had not any ideas, he was impertinent if he supposed he could ever have any. He had no capital to speak of, and the competition that gives vigour to invention was altogether wanting. Old methods, moreover, which had grown from generation to generation, being perfected by innumerable turns of invention suggested by experience, were not likely to be competed with by rash colonists who had really no right to come in off the fields. It was for them to recognise that the primary works of agriculture and the pastoral industries were all the Colony could hope to devote itself to for centuries. In short, everything being against the colonial manufacturer, there ought not to be any colonial manufacturer at all.

But the colonial manufacturer being a person of grit, one of the pioneers of this Dominion, in fact; one that is to say of a sturdy race; absolutely declined to allow any person, no matter how superior, to think for him. He went on manufacturing, therefore. It must be admitted, and it will be admitted by many who are old enough to remember the struggle between the imported article and the local, that the local was often inferior. Never was it inferior in material—it was, indeed, always superior. But its workmanship was often unable to submit to comparison with the better finished British or foreign product. When, for example, the local foundry turned out a pulley wheel, it was heavy, unsightly, lumbering, by the side of the wheels from over the water. If it was possible to be inelegant the colonial article achieved inelegance with the quickest promptitude and the most dolorous certainty. A colonial tweed we can recollect which had but one good point, namely its sound quality, and a thousand bad ones, all of which might have been summed up in a regret that the wretched thing would never wear out. In like manner, the first ploughs and harrows of the local makers were fearful and wonderful things.

But these early disabilities have now passed out of sight. The generation in possession knows them not, the generation that has a memory looks back with minds chastened by sympathy for the courage which undertook to face comparison with the best, and the persevering skill and improving quality which eventually reached the highest level, and occasionally surpassed it. Take for instance the flax trade, which was started and kept going entirely by machinery of local invention and make.

This truth was first borne in on the people of the Dominion at the Christchurch International Exhibition of 1883, run by Messrs. Joubert and Twopenny. There the imported article was displayed in great quantity beside the local, and judicious persons not swayed by prejudice admitted the equality of much. In the year 1885, at Wellington, there was a display of local manufactures, and the products of the soil, the forest, and the mine, which undoubtedly astonished many by the excellence of the manufactures. Candles, soap, iron work, brass work, timber work, furniture, woollens of all kinds, especially rugs, tweeds, blankets, boots, leathers, and phormium, rope and twine, proclaimed equality with anything in the world. An industrial exhibition at Christchurch told the same tale later on, and more exhibitions told it in the most convincing manner. A whole series of these in all parts of the Dominion corroborated the story, all of which paid handsomely The climax was reached in the great Exposition at Christchurch the other day, where the level of the manufacturing industry of the Dominion was acknowledged by common consent of the many travelled people of the country to be equal to all and surpassed by none. It is a verdict acquiesced in by all the experts who saw and were astonished by that great show. That fact alone justified its great cost, and made that cost a comparative bagatelle.

These are the things that are recalled by the sight of this locally made register. Therefore do we linger on them here. If you wish to understand the secret of the success of local manufacture, look at the register. There is nothing better, more solid, more beautifully finished, more durable and handy anywhere.

This machine is the invention of Mr. F. H. Trevellian, and is the product of a close study of the requirements of the merchant shop-keeper.

Three years ago the inventor produced his first model, and since then he has been busily engaged with the manufacturing details of the register.

Being in close touch with the register business for many years, and an enthusiastic believer in the advantages of cash registers, the patentee recognised the need for something that would do more than register the amounts of cash and credit sales. He saw how much more necessary it was to record the actual goods sold; thereby providing the shop-keeper with that information so absolutely essential to a correct statement of his daily transactions with his customers. With that end in view the subject of this article was evolved.

GETTING READY TO TRAVEL.

IN THE SHOP.

This machine is entirely manufactured in the Dominion, the only imported thing being the paper in bulk used in the manufacture of the register supplies.

It is a distinct advance on cash registers hitherto used, inasmuch as it shows not only the cash and credit sales to the firm, but also *all* the transactions in detail, in the day's work of the store. It gives a "sale note" to the customer, and retains under lock and key a copy for the proprietor (where a book-keeper is employed it will also issue a "duplicate" for the book-keeper, retaining a "triplicate" thereby providing a double check over the assistant and book-keeper). It registers cash payments for the whole amount of the sale note. It delivers bills, and "books up" credit sales, issues receipts, and records any accounts paid by customers, and keeps a correct tally of amounts and the details of cash paid out by the firm.

When a sale is made the assistant makes the necessary entry upon the sale note. The machine then does the rest—on the turning of a handle the sale note is ejected from the register (a unique device automatically ensures the correct length of sale note), a copy comes into view beneath a glass indicator, the previous copy disappearing, the cash drawer is unlocked and thrown forward, a bell is rung announcing the opening of the drawer, a summarised detail strip is brought forward beneath a glass plate where it remains visible, and the whole mechanism is then automatically locked until the cash drawer is closed, when the operation can be again repeated.

When cash is paid out the register takes a receipt from the payee and files it away in a compartment designed for that purpose. If cheques, notes, etc., are cashed for customers it records the particulars and tells the proprietor which assistant gave the change.

IN THE STORE

Where "cash coupons" are given away by the storekeeper a coupon attachment is provided, which is supplied with the register.

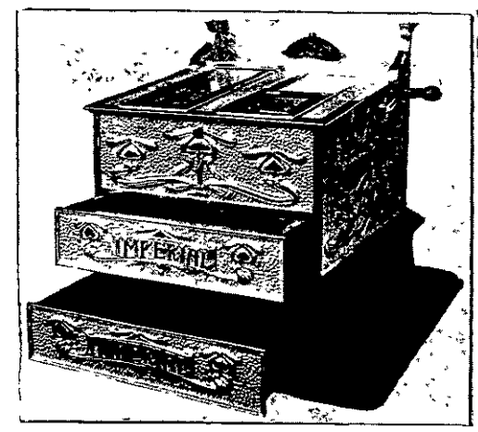
At the end of the day there is a complete daybook record of the day's transactions, while the summarised detail strip shows the amount of cash that should be in the cash drawer. Should a customer dispute an account, and have lost the sale note, the copies are at hand for immediate reference. Clerical errors are rectified with automatic effect, and with absolute certainty. It is a system at once simple and effective.

The feeding and supply rollers and rolls are ingeniously constructed, and the recording rolls work with perfect truth and are wound as tight as drums.

For dissecting the various records from the recording rolls, there is supplied a cutting machine which can cut off 500 records in two and a half minutes, a performance as astonishing as it is unerring.

In appearance and design the machine is as finished a piece of work as is turned out in any part of the world, and in this respect much credit is due to the factory manager, Mr. C. Bristow, and his efficient and well-trained staff of mechanics.

One of the most important features of the business is the manufacture of the record rolls. These rolls are printed to suit customers' requirements. Therefore each time an order for rolls is received, a complete change of programme is necessary. These rolls are cut, printed, and rewound by a machine designed by the patentee in conjunction with the factory staff, and constructed in the Christchurch factory. This machine is capable of turning out 50,000 printed dockets daily. To obtain this result many months of experimenting were required, as such a machine was not procurable in the world's markets. This "Record Roll" Making machine is working to its full capacity each day, and the company now find it necessary to work the machine two "shifts" per day to keep pace with the demand.



MODEL C—2 DRAWER.

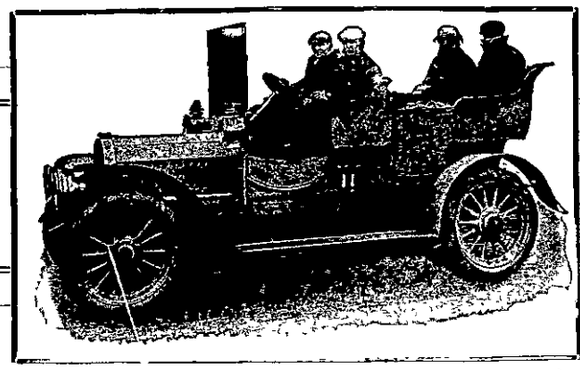
Several models, including multiple drawer machines, are being manufactured for various trades.

The Imperial Cash Register and Sales Recorder is a most creditable product of New Zealand brains and enterprise, and promises to revolutionise business ways in the direction of accuracy, dispatch, and simplicity, especially in the matter of book keeping.

We understand a company is about to be formed to take over the New Zealand patent rights, and to push the sale of the machine in the Dominion.

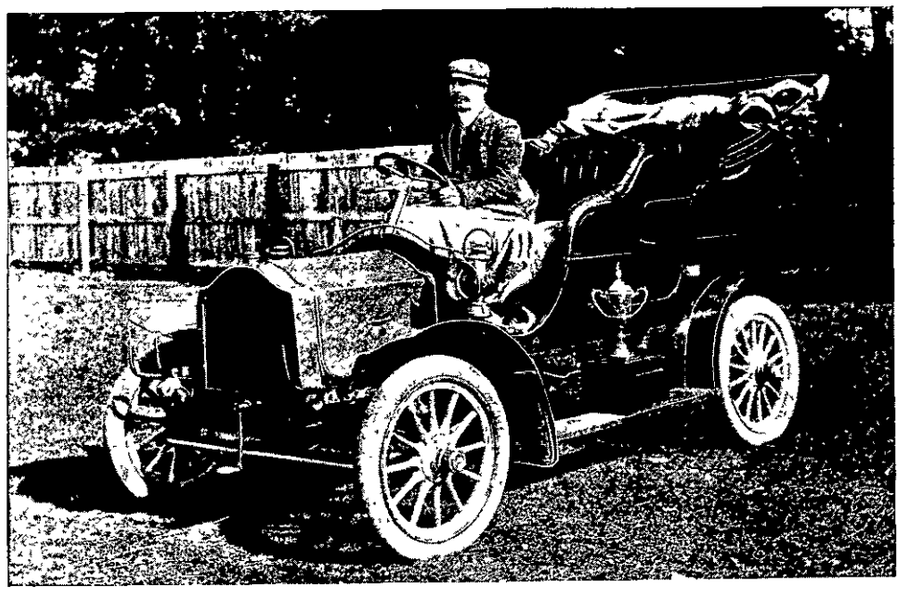
The head office of the company is in Grey street, Wellington, and they have show rooms in Auckland (Queen street), Wellington (Panama street), Christchurch (Hereford street), and Dunedin (Crawford street). The factory is located in Mr. William Wiggins' establishment, Christchurch.

Motors. Motoring.



Municipal Motors.

At Glasgow the Corporation recently appointed a special committee to frame regulations with a view of drawing up a scheme by which the total cost of each car should be charged proportionately to the department of the Corporation according to the number of miles which it has run in that particular service. They have now completed their labours, and in future the words "Corporation of Glasgow" are to be printed in letters of the same size and distinctness as the existing identification mark. All cars attached to various departments are, in future, to be kept at the depot of the Tramways Department and put at the call of any of the Corporation officers, irrespective of their particular work in the past. To each vehicle a speedometer and milometer is to be affixed, so that at the end of the year the total mileage can be ascertained. The total cost of the running will be taken, and the proportion of expenses charged to each department on the basis already mentioned. These regulations seem well framed to secure their end, and should also prevent the use of municipal motor vehicles for private enjoyment.



INVERCARGILL MOTOR RACES. 1ST PRIZE (SILVER CUP), MR. E. M MCKAY. [*See next page*].

Victoria Petrol Engine.

This engine starts instantly, is at no expense when not working, and requires no lamp or hot tube. Any labouring man can start and run them—an advantage quite invaluable in the country, wherever power is required. The following special features are embodied in the construction of these petrol engines. The cylinder, water jacket, and combustion chamber are cast in one piece, with no joints to leak and give trouble, and is securely bolted to the crank case. The fly wheels are so fitted that they can easily be taken off; the whole of the gear wheels, cams, etc., are enclosed in the crank case and run in oil. The petrol flows direct from the tank to the vapouriser, there being no pump or pipes with the usual leaky joints and unions. The inlet and exhaust valves are operated by cams, therefore they cannot stick and do not hammer. Either valve can be taken out for cleaning.

Bradford Corporation means to extend its already somewhat considerable motor plant.

Dust.

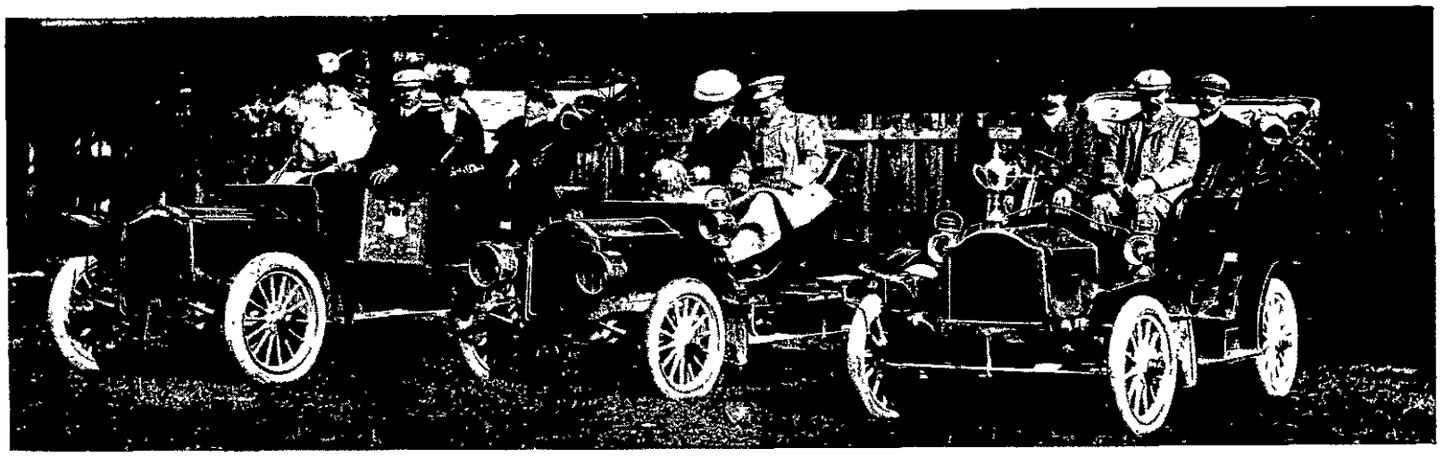
Experiments show that the larger the area of resistance of a fast moving car, the greater the air displacement, or partial vacuum which seems to be created behind the car, and so it follows, more dust is raised. And in so far as a large folded buggy hood goes to increase this resistance, it must increase the dust raised. It all depends on whether the hood when folded back adds to the area of the car's resistance as seen from the front, or not.

Accidents.

MOTORS COMPARE WELL.

The Automobile Club du Rhone has issued a return of the accidents which have occurred in the Departments of Rhone and Ain between 1st January and 20th March last. Railway accidents were 36 in number, causing the deaths of 9 persons and injury to 19 others; 69 tramway accidents resulted in 4 deaths and 48 injured; horse-drawn vehicle mishaps brought about the death of 8 persons and injury to 110 others. Finally, the number of automobile accidents in which 13 persons were injured, was 24; no deaths, however, occurred.

A Renard road train with 75 h.p. tractor was recently tested in Dublin, Ireland, and those interested in the problems of transportation in Ireland, apart from the railway companies, regard it as having great possibilities for the development of the country districts of the island



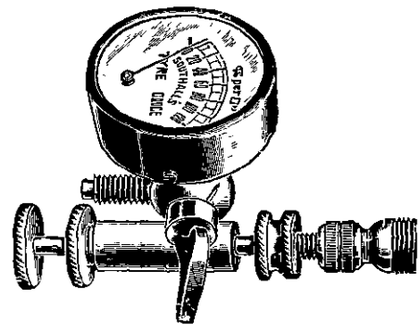
INVERCARGILL MOTOR RACE. GROUP OF RUSSELL WINNERS [*See next page*].

Some New Motor Accessories.

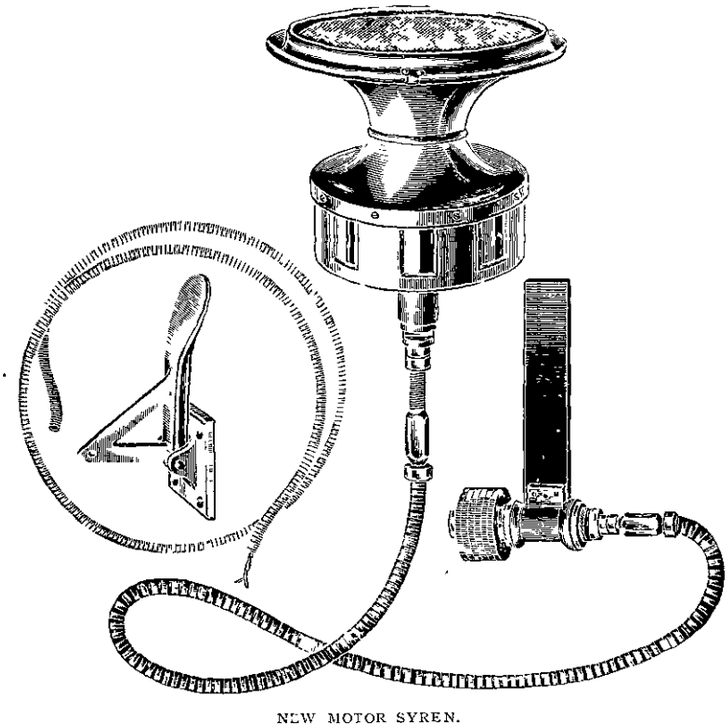
The Southall Tyre Gauge.

An apparatus for accurately ascertaining the pressures inside pneumatic tyres during the process of inflation.

It is no exaggeration to state that fifty per cent. of pneumatic tyres at the present time are being run very much under inflated, thus ruining the fabric. The pressure gauge attached to the pump is far from satisfactory, as the delicate mechanism of the gauge is strained to its maximum at every stroke of the pump, which soon causes it to become inaccurate. When gauge is in perfect order it only registers the pressure going through pump tube to tyre, which is often considerably more than is actually in the tyre. It is very often out of order owing to being fixed on the pump and put along with other heavy tools in the car.



SOUTHALL TYRE GAUGE.



NEW MOTOR SYREN.

Speed Indicator and Watch Combined.

The new speed indicator can be supplied in any of the usual types, together with a high-class lever watch specially constructed to withstand vibration.

A chart which is an ingenious contrivance driven by the clock, is marked off in hours and miles per hour; an arm, to which is attached a pencil, traces the speed at which the car is travelling at any time during a 12 hours run.

New Motor Syren.

One of the best syrens on the market. Has a very loud tone.

We are indebted to the Scott Motor and Cycle Co., for the accompanying illustrations.

NOTES.

All motorists will need to take warning from an accident which recently befell the chauffeur in the employ of Mr. John Duthie, of Wellington, who somehow endeavoured to fill his petrol tank by the light of an ordinary oil car-lamp. After having placed the lamp within about six inches of the petrol tank opening, he proceeded to fill up, and when the task had been almost completed the fumes arose, and the whole tank immediatly ignited. The chauffeur was instantly overcome by the fumes, and remained unconscious for two hours; while the car, which was a 14-16 h.p., continued to burn merrily for some time. After recourse had been had to liberal applications of water, brought in buckets and other suitable vessels at hand, the owner of the car contemplated with mixed feelings the entire destruction of the body, wiring, and cape-cart hood, which will involve him in a repair bill of over £100.

* * * * * *

An English automobile company (Daimler) has established a scholarship system at its works. The scholarships are to be awarded to successful candidates at an examination that is to be held in July of next year. A two years' course of instruction at the Coventry works is to be provided for the holders of the scholarships, and this privilege will be accompanied by maintenance grants of £100 in one case and £20 in four other cases. There is also a clause entitling the company to retain the services of the recipients of the grants for a subsequent period of two years at a salary of not less than £150 a year. The examiners will be Professor Sylvanus Thompson and Dr. Hele-Shaw.

The new British patents and designs acts became operative on 1st January, 1908. This act makes compulsory the "working" to an "adequate extent" in the United Kingdom of patents having the benefit of the protection of the British patent laws, and will force, it is claimed, the manufacture in the United Kingdom of many articles now made in the United States for export to the United Kingdom. The motor trade is consequently expectant.

* * * * * *

In Germany automobiles used for commercial purposes are exempt from the heavy taxation imposed on pleasure vehicles, but it seems that the tax collectors are not always easily convinced that a car is used mainly for commercial work. It is reported that a butcher in Wiesbaden, who owns a convertible goods and passenger vehicle, has had the collector fasten the delivery body to the frame with a seal, so as to quiet all suspicions of the tax department.

The Paris "Breakdown" Contest.

On 15th December took place the Concours des Pannes, or "Breakdown" Contest of the Parisian publication *l'Auto*. The idea of this contest was that some derangement was effected in the mechanism of all competing cars and the drivers were required to locate the trouble, the one doing so in the shortest time being declared the winner. The time limit was 25 minutes. Great interest was shown in the event, and there were nearly a hundred contestants. The entries were divided into five different groups.

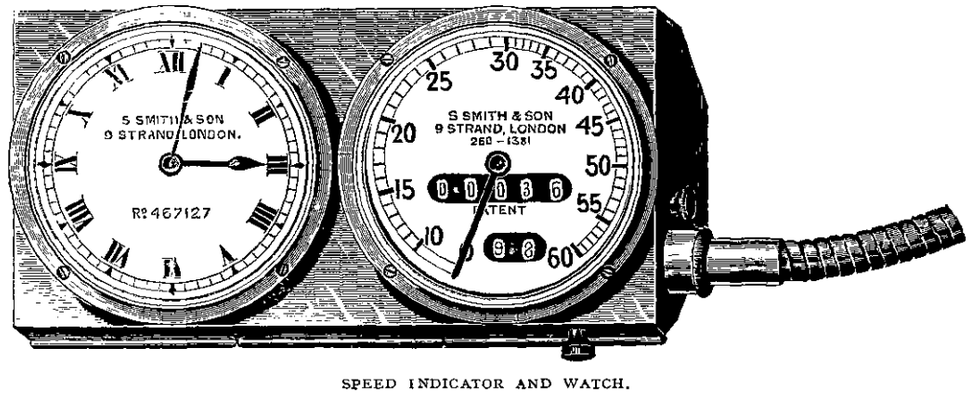
In the first trial the magneto was short circuited by means of tinfoil. The time required for remedying the trouble varied from one minute 28 seconds to 25 minutes. In the second test the inlet pipe was stopped up. Only a single one of the competitors succeeded in removing the obstruction within the time limit. It was amusing to see the drivers hunt and try for the difficulty. In the third trial the carburettor was choked by a piece of paper. The time required for eliminating this trouble varied between the limits of 4 minutes 45 seconds and 7 minutes 6 seconds. In the fourth trial the gasoline tank was shut off and the ignition connections were interchanged. About one-half of the nine contestants succeeded in overcoming these defects, their time ranging from 1 minute 23 seconds to 7 minutes 6 seconds. The final test, consisting in the location of an open contact on the interrupter, was only successfully passed by a single competitor.

In connection with these hunts for derangements in the mechanism there was a competition in interchanging tires, which were supposed to have been punctured. The best time for renewing all four inner tubes was 9 minutes 46 seconds, and it is of interest to note that both of the prize-winners followed the practice of removing the outer cover and the inner tube together after having first fully unscrewed the security bolts.

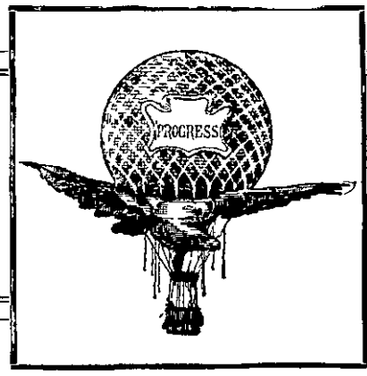
Invercargill Motor Race.

On page 306 we give illustrations of this event. The first picture shows the winner of the first prize (silver cup)—Mr. E. B. McKay (16 h.p. Russell Touring Car). This car has already covered 8,000 miles, first set of tyres lasted between five and six thousand miles. The petrol consumption equalled 27 miles per gallon. Mr. McKay was the first motorist to go to Lakes Te Anau and Manapouri and back without accident.

The other illustration gives a group of Russell Car Winners, with their respective passengers. From right to left—First Prize, Mr. E. B. McKay (16 h.p. Russell); Second Prize, Miss A. Johnstone (16 h.p. Russell); Third Prize and Fastest Time, Mr. W. A. Printz (25 h.p. Russell), Mrs. W. A. Printz at the wheel—this lady drives her car on the Orepuki roads, which are about the worst in New Zealand.



SPEED INDICATOR AND WATCH.



The Mastery of the Air.

A Record of the Achievements of Science in the Realm of Aerial Navigation.

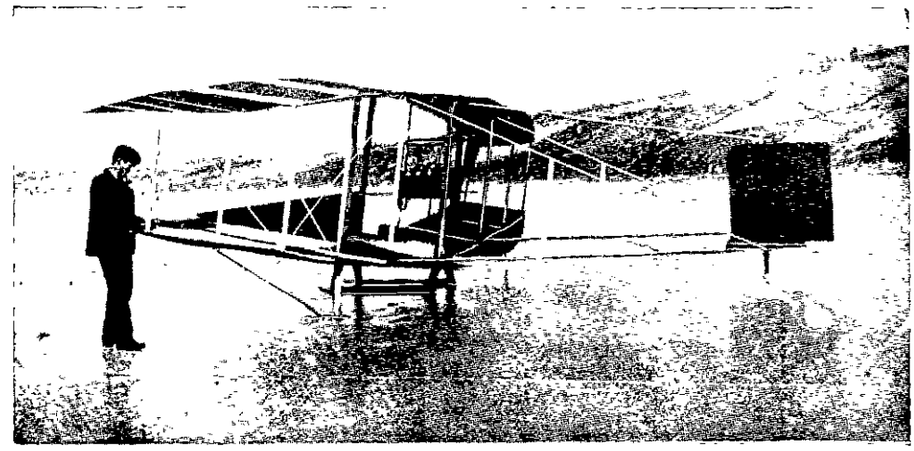
What the Wright Machine is Like.

In this column we present an illustration of a machine built on the lines of the machines now building for the Wright brothers, and for Mr. Herring, two of the contractors who have, as shown in our last issue, undertaken to supply flying machines to the United States Government. The machine illustrated was built by the Aerial Experiment Association of Canada, which has been lately formed by Dr. Alexander Bell of telephone fame, who has been prominent in aviation for many years past. It was Dr. Bell, indeed, who gave the first description of Langley's model of the Aerodrome, a description which concluded with the emphatic statement that the model was perfect, and that it only remained for practical men to make a working machine. One can easily understand how so indefatigable a spirit as Bell should be the founder of an experimental association for the study and practice of flight. The machine constructed by this association under the direction of its enterprising founder is described in the newspapers as "along the general lines of those now being built for the U. S. government by Mr. Herring and the Wright brothers." On that acconut therefore it has a special interest, for it is on these lines that the contractors have undertaken to fly for an hour with two men aboard and to cover a a distance of thirty miles. We therefore give the full particulars as published in a late issue of the *Scientific American*, as follows:—"The machine consists of two superposed surfaces having a spread of 43 feet from tip to tip and a width of 6½ feet from front to back at the centre, which width gradually diminishes to 4 feet at the ends proper of the planes. The front edge of the upper plane extends out 4 feet beyond the last vertical connecting posts at each end, and the silk surface tapers back from this edge to the rear edge of the plane, and has several light ribs attached to it to give it stiffness. Thus the planes are 4 x 35 feet in size, which corresponds to a supporting surface of 280 square feet, while the flexible rear edges, etc., bring this up to a total 385 square feet, which is also the weight of the machine fully equipped. Of this 185 pounds represents the weight of the machine alone, and also that of the engine and propeller, filled fuel and oil tanks, etc. Mr. F. W. Baldwin, M.E., who operated the aeroplane in its initial test, weighed 185 pounds, so that the total weight was 570 pounds, or 115 pounds for each square foot of supporting surface of a loading that was sufficiently light to make it possible for the aeroplane to rise at a speed of about 25 miles an hour and lift over 20 pounds per horse-power. In constructing this machine for the purpose of experiment, every effort was made to reduce the head resistance as much as possible, and it was with this idea in view that the planes were curved and brought nearer together at their ends (the spacing apart is 6½ ft. at the centre and but 4 ft. at the ends), so that the connecting posts could be shortened. These posts are somewhat oval in cross-section, their greatest width being from one-fourth to one-third of the distance back from the front edge. The large centre posts are 4 inches from front to back and one inch thick; the next posts on either side are slightly smaller; and so on to the end ones, which are 1½ inches from front to back and have a maximum thickness of ½ inch.

"The surfaces themselves are made of silk and contain pockets, in which are placed the curved, laminated strips extending from the front to the rear edge, and giving the surfaces their curved form. Above each pair of posts a T-shaped wood strip extends from front to back, and helps to strengthen the structure. The spacing of the vertical posts also decreases from the centre outward. The two centre posts at the front and rear edges are about 22 inches apart. The first post on either side of these two is 6½ feet away, while the spacing between this and the next post is 5½ feet, and from here to the outer post about 5. The planes are connected together with diagonal guys of the finest piano wire procurable. They are trussed in both a vertical and horizontal direction.

"The horizontal rudder, which is 8 feet long by 2 feet wide, is located at the front end of a suitable framework, which projects out 5 feet from the forward centre posts. This framework is covered with silk in order to lessen the head resistance. The rudder is steadied at each end by rods, which run back to the planes. It is pivoted on a horizontal axis, and is operated by a vertical lever extending an equal distance above and below it and located at its centre. A wire runs runs from one end of this lever around a pulley in the body framework, and back to the other end of the lever. Attached to the pulley is a small operating lever for turning the same, and thus manœuvering the horizontal rudder. This rudder is worked by the left hand of the aviator, while the vertical rudder is operated in a similar manner by a lever convenient to the aviator's right hand. The tail of the aeroplane consisted of but a single horizontal surface located 12 feet back of the rear edges of the planes. The dimensions of this tail were 14 feet 10 inches long by 3 feet wide, *i.e.*, in a fore and aft direction. It was carried upon two long bamboo poles, which ran back horizontally from the lower plane, and which were well braced by other bamboo poles extending to the upper planes, and connected to the lower poles by spruce posts. This horizontal tail was also trussed on its under side to a vertical post, upon which was placed the vertical rudder. Despite this trussing, the pressure upward against the tail was so great as to cause it to buckle on one side, while the aeroplane was in the air, the result being that the machine veered sharply to the same side and landed, sliding sidewise on the ice and breaking one of the outer runners and its supporting post. The motor employed was an 8-cylinder Curtis air cooled engine of 40 horse power. This engine was mounted on horizontal wood beams connecting the front and rear large centre posts. It carried a light bicycle wheel on its front end as a fly-wheel, while the 6-feet propeller was mounted directly on the rear end of the crank-shaft. The pitch of this propeller was 4 feet, and the number of revolutions per minute that it made while the aeroplane was in flight was probably in the neighborhood of 1,200. With the aeroplane held stationary and the motor running, a thrust of 130 pounds was obtained at about 1,000. The lower plane was notched at its rear edge in the centre, to allow of the propeller revolving.

"The 40-horse-power motor used had a bore and stroke of 3⅝ and 3¼ inches respectively. This engine develops its full power at about 1,800, while at the speed at which it ran during the flight (viz. 1,200 r. p. m.) it developed only about 25 horse-power. The weight of this engine complete, without accessories, is but 145 pounds, while with a separate carbureter of 14 ounces



MACHINE MADE ON THE LINES OF THE MACHINES NOW BUILDING FOR WRIGHT BROTHERS UNDER CONTRACT WITH U.S. GOVERNMENT.

weight upon each cylinder, and with the combined gasoline and oil tank shown as well as including the propeller, the total weight was but 200 lbs. The engine had been thoroughly tested, driving a propeller and running a motor ice-boat.

"The idea of mounting the aeroplane upon runners and testing it upon the ice seems to be an excellent one, and to offer several advantages. Besides the two main runners of substantial construction, the next to the last vertical post at the rear of the surfaces was prolonged downward, and fitted with a runner also, for the purpose of steadying the machine, and keeping it on an level keel. A runner was also fitted to the vertical rudder post, but was subsequently removed."

Test of the Machine.

In the only test made the machine rose off the ice, and flew a short distance, the first time of asking. That was a marked success; much inferior of course to the flights of Farman and Delagrange. These it might have equalled but for an accident. It was, however, an accident of a crucial character, throwing a flood of light on the uncertainties of the new mode of aviation. The cause was the buckling of the horizontal tail, due, as above described, to the upward pressure. This had been provided for, but it is clear that the data were not sufficient for calculation; the moral is, that more information must be accumulated by practical experiment. The machine flew 318 feet, at a height of 15 feet; then the tail buckled, and the machine came down like a winged bird. The following is a brief account of the trial that began so brilliantly and ended in disaster. "Owing to the warm weather and the melting of the ice on Lake Keuka, near Hammondsport, N. Y., where the test was held, it was feared that it would be impossible to try the machine. Fortunately, however, a slight cold snap gave the experimenters a chance to make the trial, and on the 12th instant, upon its first test, the aeroplane flew a distance of 318 feet 11 inches, and apparently showed good stability. After running 200 feet the machine rose to a height of 15 feet, and the trial could have been continued and made much longer had the horizontal tail not been damaged. The chief point to be noted is, that no difficulty was experienced in getting up in the air with this machine, and in all probability in the near future it will be possible to make much more extended flights."

The inference has been drawn that much may be expected in the near future, from this active experimenting association which has flown a machine at the first time of asking; and it is a very fair inference indeed. Comparison with the experience of Sir Hiram Maxim in 1895, and of Santos Dumont 11 years later, and of others during the interval, in which there was no getting off the ground, shows that the association has made a very good start.

New Record in Aviation.

There is news of capital importance in the science of aviation. A considerable step in advance has been made. On April 12th at Issy les Molineaux, which is becoming the Champs de Mars of the victories of the modern aeroplane, M. Delagrange, the sculptor, beat all up-to-date records of flight in an apparatus heavier than air, by making at least 10 kilometers without a hitch. When he alighted after going round the marked circuit seven times, it was not because of an accident but because he was absolutely exhausted. "The working of my balancer and of my rudder", he said, "is excessively fatiguing, and I shall have to get up my biceps before dreaming of accomplishing 20 or 30 kilometers." When it is said the flight was made without a hitch it should, nevertheless be observed, that after some two minutes, at about 12ft. above the soil, M. Delagrange slightly touched the ground with the left wheel of his machine as he was rounding one of the posts. A similar thing happened on the third round. Strictly speaking, the flight ought perhaps, therefore, to be divided into three separate parts. The second part would however, even on this basis suffice to give M. Delagrange the record. M. Farman made 2,004 meters in 8min. 31sec., and his rival covered 3,925 meters in 6min. 30sec. These figures, moreover, are measured only from post to post, and do not include the curves in making the turning. The total flight lasted 9min. 15sec. These figures were officially checked by the representatives of the French Aero Club. M. Delagrange's machine is provided with the same kind of motor as M. Farman employed, a 40-horse power light cylinder Antoinette.

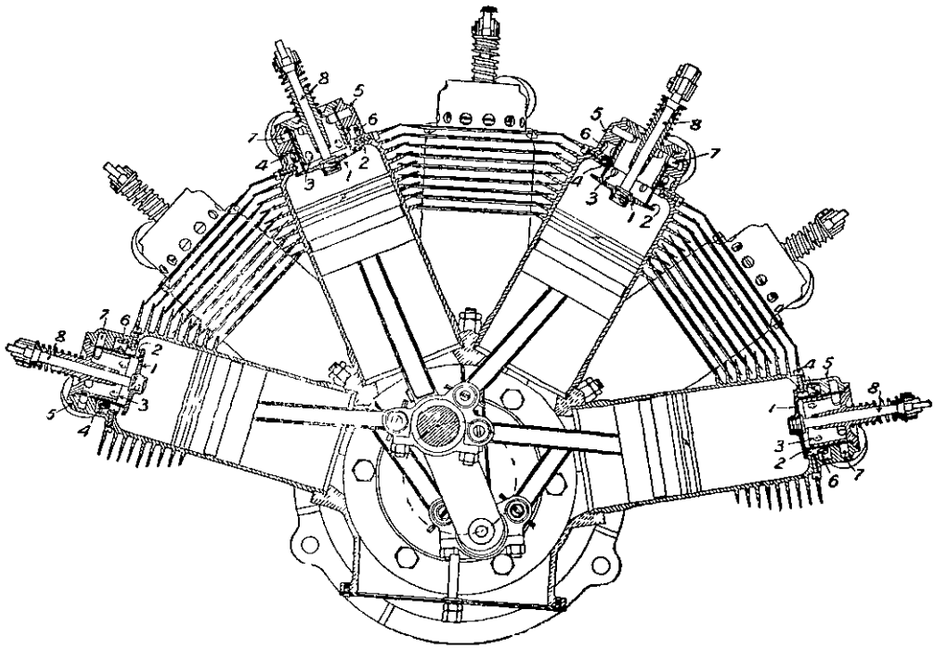
Later.

Another feat by the same aeronaut was chronicled by cable on May 31 from Paris: M. Delagrange, in the presence of members of the aeronautical societies of France and Italy, ten times circled the Place d'Armes, Paris, in his airship at a height of from 13 feet to 25 feet, in fifteen minutes twenty-six seconds, covering 12,750 yards, and securing a prize of £1600. This is 7 1-3rd miles, at 30 miles an hour.

Later Still.

M. Delagrange flew 9.14 miles at Milan in 16½ minutes—about 27 miles an hour. Count Zeppelin has brought out a new airship, 450 ft. long, for Germany.

Under date June 10th, the cable records a thrilling experience of two lady parachutists at Lonton, Staffordshire. They got entangled in the cordage of their balloon, one got her parachute clear at a height of 11,000 feet, the other jumped for that parachute, and both came down to earth none the worse.



THE R.E.P. MOTOR, THE NEWEST DESIGN FOR AEROPLANES.

The Pelterie Air-cooled Motor, known as the R.E.P.

This motor is regarded in Paris as the first in lightness, power, and ingenuity of construction. Its inventor, M. Esnault-Pelterie is one of the Paris aeronauts who has had considerable success of late. For his new aeroplane, he designed a motor which has some striking features, and finding it to be well adapted for this kind of work, he has now gone into the manufacture of such motors at his establishment near the city. What he desired was to secure solidity, a good distribution of the forces, and constant torque. For this latter purpose the explosions must come very near together, and the impulses be transmitted to a single crankshaft. Such an idea can be realised by disposing the cylinders in star fashion around a central crank case. It is of the greatest interest to suppress the flywheel, but to do this, the explosions must be exactly distributed. Moreover, in two revolutions, all the cylinders should be fired, but in the second revolution the same set of cylinders must not be used as in the first. Thus it is necessary to have an uneven number of cylinders, which is the only means of satisfying the above conditions In practice, all the cylinders should be above the horizontal plane passing through the axis of the motor, so that the oil will not run into the lower cylinders. To do this the second set of cylinders must be in a second vertical plane parallel to that of the first set, which secures the form of motor illustrated herewith.

According to the description which M. Esnault-Pelterie kindly furnished to the public, the crankshaft has two cranks placed at the 180 degrees apart. The arrangement of the cylinders in fan shape allows of shortening up the length of the crank case, and thus the crank is much shorter and much stronger. The crank has been designed according to the best formulæ, and weighs but 5½ pounds for 30 horse-power. Nowhere does it bear a strain of more than 15 kilos per square millimeter (21,334 lbs. per square inch) when running. The bearings are of very liberal dimensions, especially the propeller bearing. An interesting feature of the 7-cylinder motor is the arrangement of three connecting rods on one crank, and four on the other. As can be seen from the cross-sectional drawing, one connecting rod is integral with the crank-pin box, which has suitable sockets for the pivot pins of the other connecting rods.

Engineering: Sea and Land

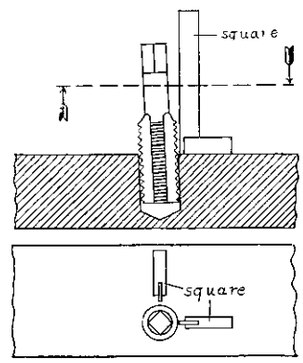
The Use of Tools: Screwing Tackle.

From the *Commercial Motor.*

When purchasing screwing tools, it is advisable to pay a fair price for them, in order that a good set may be obtained; the best dies on the market are incapable of cutting threads equal to those which are produced on the lathe, but a bad set does not even attempt to cut; it simply squeezes out the metal in a very unsatisfactory manner. A good set of dies and taps, in the hands of a capable man, will last for many years; in careless hands, the life of these screw cutting devices is very short. Taps are more abused than dies, and many are broken by careless handling. If one half of a tap is left in the hole one has been working on, it will in all probability be an awkward job to remove it.

Before screwing a bolt, the rough, outer skin should be rubbed off with an old file as far down as the thread is required. As this outer skin is very hard, and is injurious to the dies, care should be taken that the size of the bolt is not reduced too much, or the tops of the threads will not hold up; the blank, however, should be made slightly under the size required, as the threads rise a little in screwing. Before commencing to screw a bolt, the size of dies to suit that particular bolt must be put in, and they must be opened out sufficiently to enable them to be placed over the end of the bolt, which should be about level with the top of the dies; it should then be screwed up fairly tight, and some oil should be dropped on the end of the bolt. The stocks should be pulled round in the same direction as one would screw on a nut, i.e., "clockwise"; if the dies are tight enough, a portion of the thread should be cut on the bolt, and the first cut should be deep enough to guide the dies when they are run back—if the cut is not deep enough, the threads will probably get "crossed." The dies should be run back until the end of the bolt is slightly below the top face of the dies, and the dies may then be tightened up again and run down a second time. The process should be repeated until the thread is deep enough. It is during the first few cuts down that threads are spoilt, owing to the fact that the dies have not sufficient guidance. If, when running, the dies back for the first time, they are not inclined to follow the partly cut thread, they should be tightened up a little when at the bottom of the bolt, previous to running them back. In running the dies down, after every two or three revolutions in the direction of cutting, they should be turned back about half a revolution, in order to enable the cuttings to clear themselves, instead of getting between the dies and the partly cut thread, and thus stripping off the latter. If, by any means, a cutting has got between the dies and the threads, the dies must be taken off and all the cuttings must be carefully wiped off both the dies and the bolt and great care should be exercised in replacing the dies, in putting them fairly in the thread again, or another thread will be started on the top of the previous one. The bolt should be oiled each time the dies are run down, and the dies should be tightened at the top of the bolt, repeating the operation until a good full thread is shown. The nut should be tried on the bolt (after previously passing the tap through it) to make sure it is a standard size, and that the threads have not been damaged.

In tapping a hole, if it passes right through the work, the taper tap can be run right through, but, in the event of having a blind hole the taper is run in until the point reaches the bottom; the "second" tap is then run in and clears away some of the metal left by the taper, so cutting the thread further down; after this the "plug" tap is run in to cut a full thread down to the bottom of the hole. Great care must be exercised in tapping holes in order that the tap should not be unduly forced, and, directly it is found that the tap is tight, it should be run back a turn or two and a little oil put on it and tried again, as, if any extra pressure is put on the wrench, the tap will probably break in the hole. If on a second trial, it is still too tight, the "second" tap should be tried, in order to ease off the upper threads before trying the taper tap again. Do not snatch the wrench during the turning · a good indication when the tap is too tight



is that the wrench may be felt springing back as soon as the pressure of the hands is relieved it is dangerous to proceed further than this point.

Another point of great importance in tapping holes is that the tap should go in quite square although the hole may have been drilled square, it does not follow that the taps will enter squarely, unless certain precautions are taken. These precautions must be taken before the operation proceeds very far, and consists of the following: The tap should be tried with a small square by sighting along the edge of the blade and the plane turned part of the tap; the tap should be tried in both positions Supposing it is found that the tap is entering as shown in the illustration, it can be drawn over by exerting a slight downward pressure on one side and a corresponding upward pressure on the opposite side of a double-ended tap wrench. In the case of a single-ended one, the pressure must be downwards. One should not attempt to draw it all at over once or the tap will get broken; it may require two or three turns before the tap stands square. This unbalanced pressure must only be exerted when the wrench is in the position shown, or the tap will be brought out of the square in another direction. This pressure is only kept on the tap during a quarter of a revolution in the direction of cutting. Neglect of these precautions will often cause a lot of trouble, especially in the case of studs; unless the latter are all standing quite square, they may necessitate a lot of filing of the holes of a cover, in order to allow them to go over the studs. Taps, like dies, must be occasionally turned back a part of a revolution, in order to clear the cuttings from the hole, especially in wrought iron or steel, otherwise the cuttings may get between the tap and thread and strip it or break the tap.

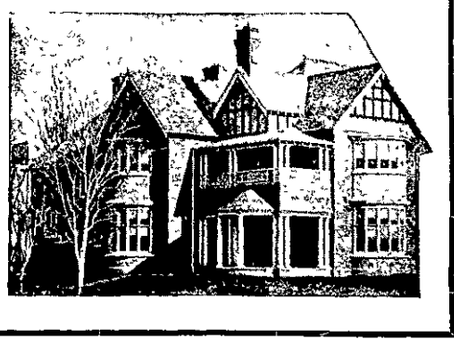
After the cutting edges of taps become worn, instead of cutting they have a tendency to bind and breakage is sure to follow. This can be remedied to a certain extent by backing the threads off on a grindstone, but, unless a man has had some experience at this kind of work, it is not advisable to attempt it, because, if the taps are backed off too much, fracture of the thread or tap will follow. If, on the other hand, any metal is taken off the point, or cutting edge, the tap is rendered useless.

Broken taps should always be kept, as they very often come in for odd jobs. By backing off the first few threads, they can often be used as second taps, or, ground still further back, they may be used for special taper taps. Should a tap get broken in the work, it is an awkward job to get it out: if any of the tap is left above the hole it can often be turned out with a pair of grips, if, however, it is broken below the top of the hole, it must be broken out with a round nose chisel, or, failing that, it will have to be softened by heating and then drilled out.

Tapping is a matter for the sense of touch, and the difference between cutting and "squeezing" is easily distinguished after a little experience. These tools should be kept in a case, usually supplied with the better class tools, and should not be left lying about on the bench, or they will soon become damaged or "lost."

According to the *American Machinist*, a plan of shop apprenticeship that is in operation in one large sheet-metal workers' establishment in Philadelphia provides for a bonus to be paid to the apprentice on completion of his term of indenture. The apprentice is started at a wage of $5 a week, which is increased $1 at the end of each six months during a period of four years. In addition to this, his employer deposits in a fund $1 each week during the entire period, making a bonus of $208 with accrued interest. It is understood that this $1 a week bonus is not in any sense part of the boy's wages, but is offered as an inducement for him to serve his term faithfully. The agreement is made with the boy's parents and provision is made that the amount deposited will be forfeited upon failure of the apprentice to observe the agreement.

It is only one hundred years since the first gas company was formed (says an exchange), and a great many persons now living can well remember the time when it was quite common for the smaller shops to be lighted with oil lamps Improvements in gas burners and lamps, and the invention of the gas mantle, have brought the gas up to the level of the incandescent electric light.



Architecture and Building.

Failures of Ferro-Concrete.

THEY ARE MANY AND FORMIDABLE.

Mr. G. A. Lewis has written an emphatic warning on the above subject. We re-publish with pleasure.—Just now we are hearing and reading about the above material for building construction. In almost every building, and technical journal that one may take hold of its praises are being sung, so I thought a few words on some of its failures, that our friends on the other side of the Altantic have experienced might be read by some of our readers with interest, especially by those who do not know that some of these glowing reports do not quite represent the facts of the matter.

Reinforced concrete has only lately been adopted for the construction of some of our public buildings in this country, and we have not had much time to witness its shortcomings. We must, therefore, go for experience to a country where it has been very much in use. Since the San Francisco earthquake and fire, there has been no subject of greater importance to all interested in the construction of buildings than the comparitive merits of brick and concrete. That catastrophe created new problems, and presented new conditions. Certain interests have taken advantage of the changed aspect to set forth theories and statements, neither fair, honest, nor truthful, selfishly attacking brick as a building material. The truth hurts no sound reliable article. Brick and terra-cotta stand out as far and away the best building material as regards durability, substantiality, and fireproof qualities. Herein lies the truth. The cement interests have been active in filling the magazines and the daily press, with technical papers by their own engineers and writers, exalting their own product, and belittling brick and other material I hope now to correct any misapprehension in the minds of the building public, by a few illustrations of buildings that have collapsed.* Actual photographs tell the truth and I hope they will be conclusive enough to establish the reliability and superior character of brick as a building material, against its rival concrete. I simply ask that the truth be known. Referring to the concrete craze, people often ask why it has aroused such an interest, particularly among the younger and less experienced structural engineers. Well, as anyone knows, anything in an experimental stage is bound to be attractive to young engineers and architects. I admit the whole subject of reinforced concrete is a most fascinating one about which to theorise. The greatest difficulty with it generally is to apply those theories in actual construction, and there, of course, is the scene of its failures. Anything that makes a great noise, and is being much talked about, is bound to obtain some popularity. To my mind, however, the principal reason for this, at least temporary, popularity, is the extreme activity of the exploiters of its hundred or more different systems. The technical journals are over-loaded with scientific discussions as to its modules of elasticity, and the manufacturers and patentees of the various systems keep all the technical schools and engineering colleges loaded up with tests, reports, and what not concerning their varied products. Naturally enough the colleges turn their attention to the subject, learned professors do some experimenting on their own account on a small scale, and proclaim to the world, that

GERMAN INTERIORS.

Hall of villa, Englehorn, Mannheim [*Architect, Tillmsen, Mannheim*]

Hall and Staircase, villa of Herr Israel, Bundlestrasse, Berlin. [*Architects, Hart and Lesser, Berlin.*]

* We have seen the pictures, which show a very complete ruin. Unfortunately their lack of definiteness prevents their reproduction.—[ED. "P."]

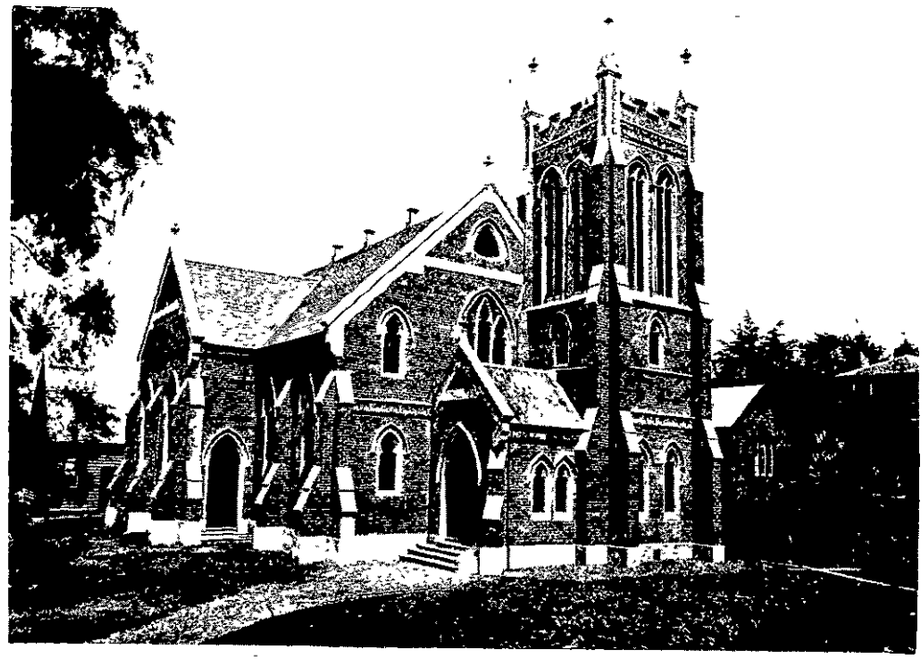
this is so, and must remain so under every circumstance, and I am sorry to see that we in this country are swallowing their misrepresentations.

Now, in connection with a comparison of costs as regards the different materials, it is often said that reinforced concrete is cheap; and when concrete is cheap, it has to be "cheap" in every sense of the word. Inferior cement, the least possible quantity of that, and cheap unskilled labour, are the constituent elements of its cheapness, and with these factors, what can be expected of the concrete? But still in this country it might be given more than its required quota of cement, and also extra supervision, even if its promoters lose money over it, just to firmly launch it on the unsuspecting building public. That done they could gradually relax the extra precaution that it needed to give it a good send off. Reinforced concrete is said to be fire-proof, but everyone connected with the building industry knows that it is not, for where it has come in contact with fire it has been an utter failure. When a heat of 600 degrees and upwards reaches it, it loses its water of crystalisation until the water is finally driven off; the cement or concrete will lose most of its strength; in fact will be ruined.

As an illustration, a fire occurred at the Monadnock building, San Francisco, and after it was extinguished, a pile of empty sacks, and also loose timber that was lying about, had sustained little or no damage, while the reinforced concrete beams and floor were a total wreck, though they showed they had been subjected to very little heat. Not only had this building been constructed by the best formula, with Johnson bars turned up at the ends, which is supposed to resist severe strains, but it also showed that concrete and steel do not expand and contract together. This is only one instance; I might quote others, but I must consider space.

Now it has been said that the concrete adheres to the steel bars that are used as reinforcements. Well, in the case of buildings that have collapsed in course of construction, the steel bars have failed to show it, as they have come out perfectly clean, as if they had never been in close proximity to cement. These are facts. The Hotel Bixby, Long Beach, Cal., is a warning to those who have only looked on one side of the construction. This building collapsed on Friday morning, November 9, 1906, without a word of warning, and killed ten men outright, while as many more were seriously injured. This building was constructed by the most up-to-date method known in reinforced concrete, chiefly of the Kahn bars, recognised among reinforced concrete engineers as being the best and highest priced reinforcements on the market, though Ransome twisted bars and square and round bars were used in columns, and in some parts of the building. A provision had also been made in part of the exterior columns for any settlement that might take place on any one pier, by connecting the piers together at about the surface line, with a reintorced girder, assuming that this would act as a cantilever, and prevent any one pier or piers from settling. Yet, in spite of all these precautions, this building collapsed with fatal results.

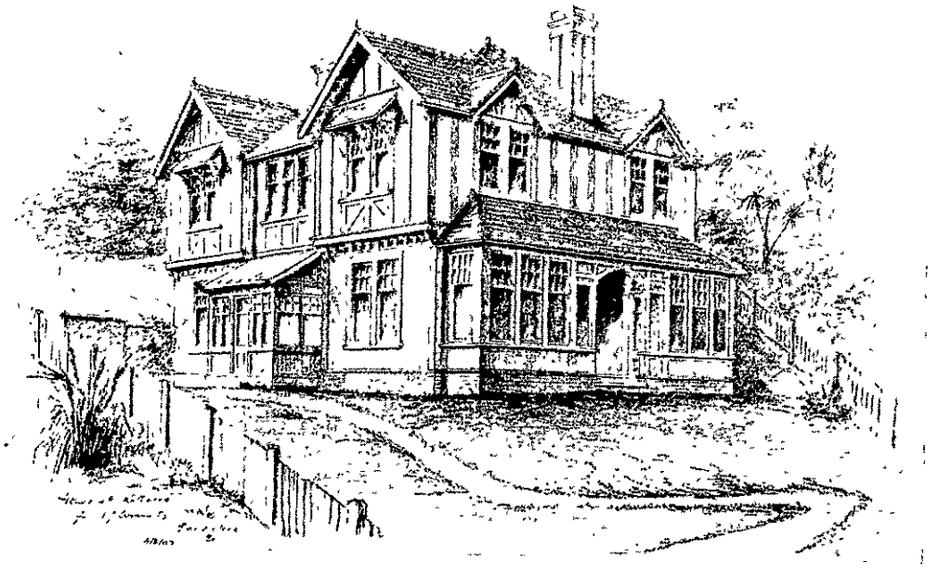
Here are the names of a few of the towns where concrete buildings have recently collapsed.—Elyria, Ohio; Minsola, L.I., Rochester, N.S., Marshall, I.U.; La Crosse, Wis.; Dubeth, Min.; Trenton, N.J., Newcastle, P.A; Milwaukee, Wis, Dayton, Ohio, Pittsburg, P.A., Greenpoint, N.S; Binghamson, N.Y.; Corning, N.Y., Boston, Mass., Philadelphia, Bridgeman Bros building, Peoria, Ill., a 200 ft. concrete chimney Berne, Switzerland; Paris, France. These are only a few among the many disasters that have occurred recently. Now, I hope I have said enough to convince anyone interested in ferro, or reinforced, concrete, that it is not all that its promoters make it out to be.



KAIKORAI CHURCH [*Architect, J. S. Salmond*]

Mr. Wynne's Residence, Kelburne.

One of our illustrations is a reproduction of a drawing by the architect of a house in Grove road, Kelburne, which has lately been built for Mr. H. J. Wynne, from designs by F. de J. Clere, F.R.I.B.A. Mr. Clere has not very materially departed from the half timber style which he introduced into Wellington some years ago when he built Dr. Fell's and Dr Wallace McKenzie's (now Dr. Gilmer's) and other picturesque houses, and which were the forerunners of a host of copies which dot the hills of Wellington in all directions. He has, however, brought the plan of the building quite up-to-date, and by the judicious use of tiles and Flemish glass the place is quite abreast with modern work. The house contains ten good rooms, and more than the ordinary number of conveniences. It is lighted throughout by electricity, and provided with gas for cooking purposes, and though on a much exposed site the construction is so good that the fiercest winds produce no effect on it.



VILLA RESIDENCE, GROVE ROAD KELBURNE. [*Architect, F. le J. Clere.*]

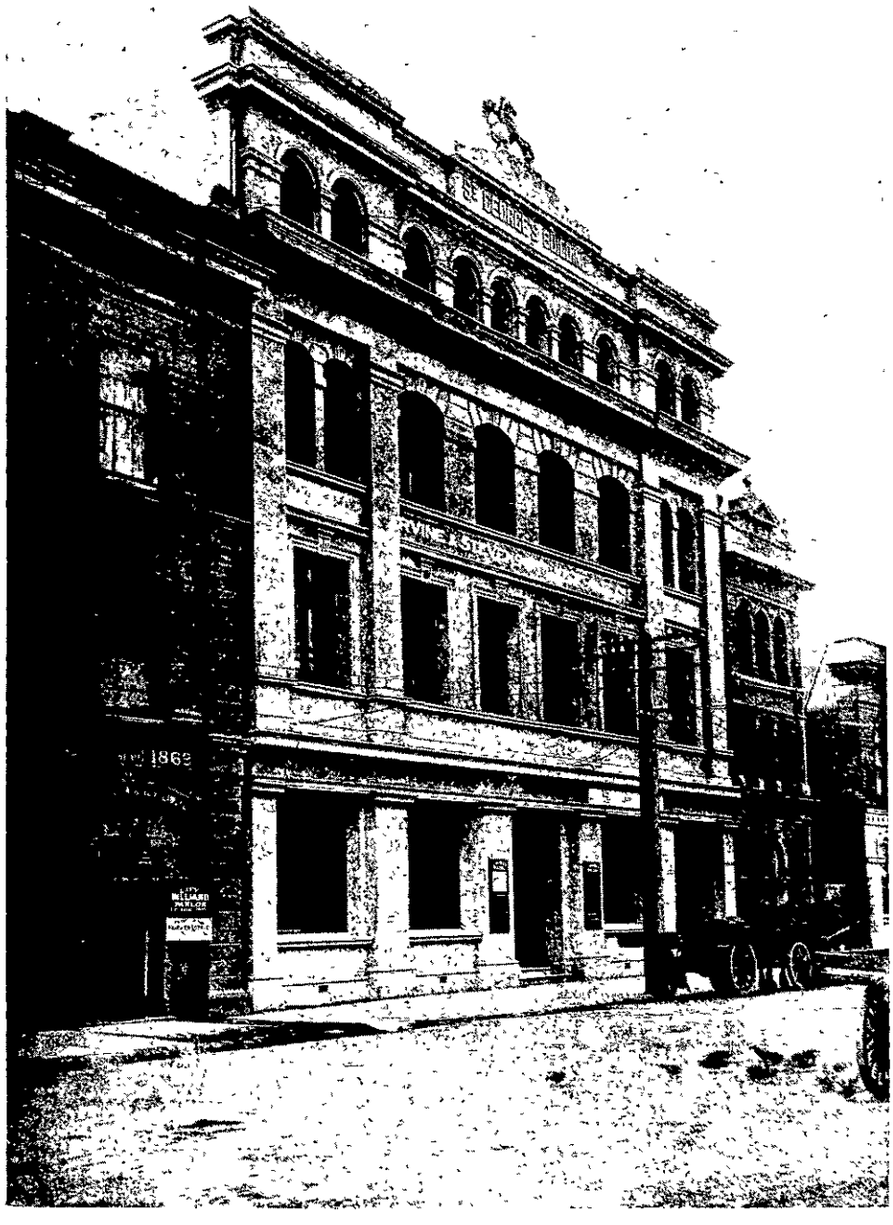
Kaikorai Presbyterian Church.

Above is a photograph of the newly-erected Presbyterian Church at Kaikorai, Dunedin, designed by Mr J. L. Salmond. The church is built of brick relieved on the outside with cement, mouldings, etc. The windows glazed with leadlights, glass of several tints The stair to the gallery is placed in the tower. The inside walls are finished with rough tinted plaster, and all interior wood-work is of selected red pine The ceiling follows the line of the hammer beam principals, and is finished in deep cove with fibrous plaster work, broken up into neat moulded panelling. The church is seated for 450 adults.

A tender has been accepted for the erection of Roman Catholic Memorial Schools, at Feilding, by Mrs Walter Johnson. The site is situated in Derby street, between the church and the convent. The building will have a frontage of 76ft, and will contain four class rooms with accommodation for 160 scholars, and a spacious corridor. The contract provides for a brick building relieved with cement facings, gables and enrichments, and a tile roof The work is expected to be finished at the end of the year, and will cost about £3,000. Architect, E. W. G. Coleridge.

St. George's Buildings, Brandon Street, Wellington.

These buildings are in a site 60 ft x 80 ft, and are four stories high, the respective heights from ground floor upwards being 13 ft., 12 ft., 11 ft., and 10 ft., The ground and first floor offices are subdivided into numerous offices, and the two upper floors undivided. The staircase is wide, and of easy grade, and in addition there is a combined goods and passenger electric elevator, which was installed by the Standard Elevator Co., of Sydney. A wide cart dock has been provided at one side of the building at the floor of lift. The whole of the rooms are well lighted, three light wells being provided at sides and back for this purpose, Three sanitary appliances are all grouped at the back on each floor, and are thoroughly up-to-date. Two large strong rooms fitted with Chubb's fireproof doors are provided, one on ground floor and one on first floor The buildings are lighted throughout with gas and electric light The structure is built of brickwork, substantially bound with iron bands, and the foundations are carried on concrete piles. The upper floors are carried on steel girders and stanchions, which in turn are carried on concrete piles. The various rooms are lathed and plastered with pulp plaster finished with lime putty. The whole of the joiners' work is of figured red pine varnished. The front is treated in a simple style of Italian Renaissance executed in cement stucco, and the central pediment is surmounted with a full size modelled statue of St. George and the Dragon. Architects, Crichton and McKay, F.F.R.I.B.A.; contractor, W. G. Emeny. For ground floor plan see page 315.



ST. GEORGE'S BUILDINGS, BRANDON STREET, WELLINGTON. [*Architects, Crichton and Mackay*]

A Remarkable Hotel.

The distinction of the new Piccadilly Hotel, which was opened in May last, lies in its fine architecture. But from the point of view of mere size it is a remarkable building. There are over 700 bedrooms, and the following figures give some idea of the magnitude of the work of construction: 6,500,000 bricks have been used; 60,000 cubic yards of earth were excavated for the foundations, which are 40ft. deep. There were also used 104,000 cubic feet of Portland stone, 4,200 tons of Portland cement, 11,000 yards of wall tiling, 7,000 tons of iron and steel work, 8,700 yards of asphalte flooring, seventy miles of electric bell wire, 200 miles of piping for lighting and heating, ninety miles of electric light and power cables, 160,000 floor joists, 16,000 electric lamps. The architect is Norman Shaw: his building is said to be the stateliest modern building in London; and he has received applause from every school of taste in the modern Babylon. It is a success rare among architects; if you doubt, walk down Lambton Quay and hear the people talk.

The Palmerston North Technical School Board are about to erect new buildings at the corner of Duke and King streets. Architect, F. de J. Clere, F.R.I.B.A., Wellington.

NOTES.

Additions are in course of erection to a house in Glandovey road, Christchurch. Architects, Clarkson and Ballantyne; contractors, Rastrick Bros.

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A residence is in course of erection in Matson avenue, Christchurch. Architects, Clarkson and Ballantyne; contractor, J. H Beanland.

Mr. J. M Dawson has removed to offices in Norwich Chambers, Custom House Quay.

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A tender has been accepted, and the work is now in progress, for the erection of a private school in Hill street, Wellington, for Miss Somerville. The building will contain four large class rooms with accommodation for 80 pupils, all conveniences, fire escapes, etc., and will cost £900. Architect, E. W. G. Coleridge; contractor, Jas. Craig.

Moore Bros.' tender has been accepted for the erection of new premises for the D.I.C., Christchurch, in place of those destroyed by the late big fire. Architects, England Bros.

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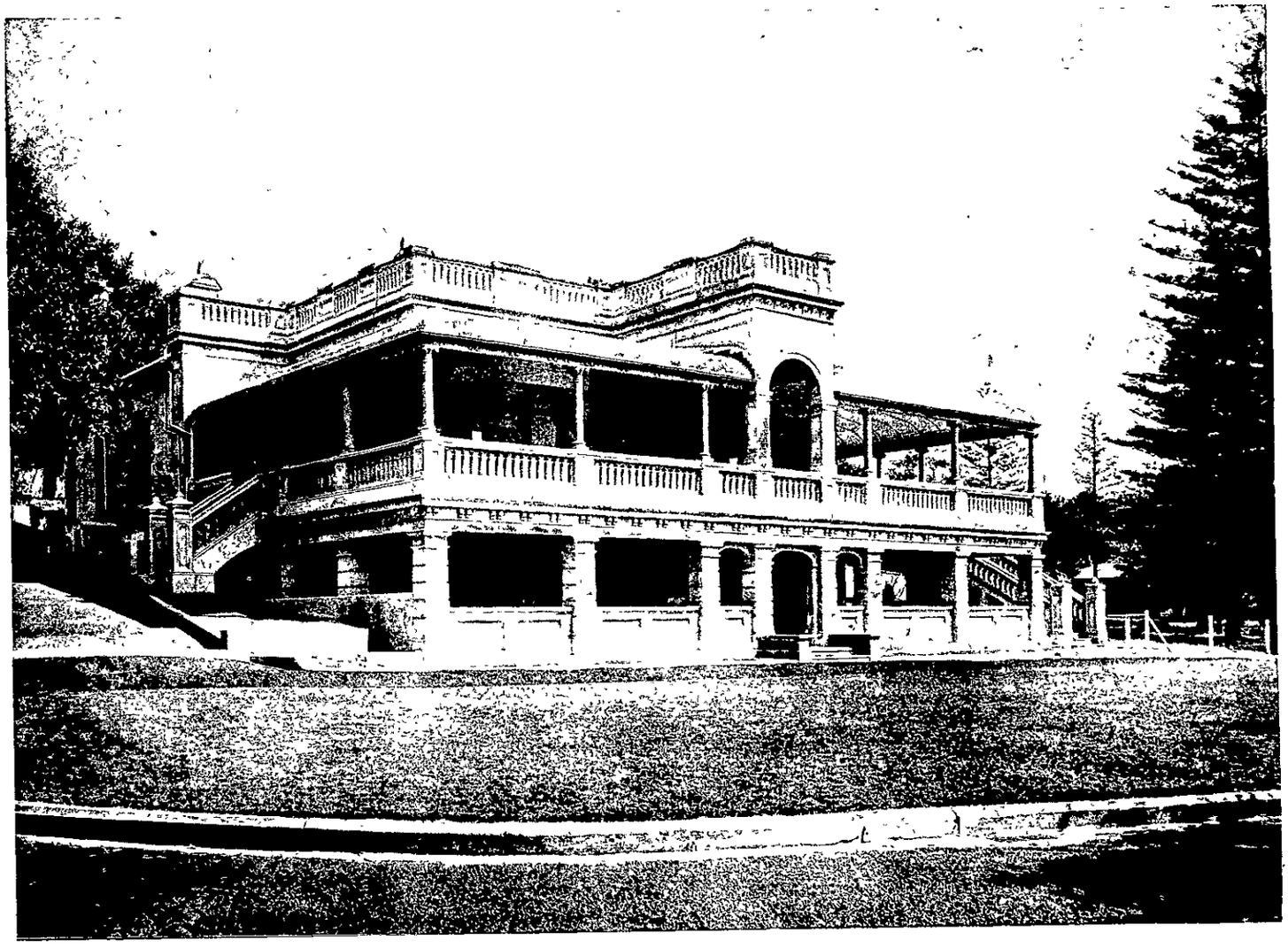
A tender has been accepted for the erection of a residence in Britomart street, Wellington. Contract price £1,860. Architect, John S Swan; contractors, Hunt and Macdonald.



AUSTRALIAN HOMES' CLIFFBROOK, RESIDENCE OF MR. N. R. MILLER, COOGEE.

Tenders are in course of preparation for the erection of a bungalow at Island Bay for Mr W H Coy Architect, C F. B. Livesay

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Plans and specifications for the Y.M C A Christ Church will be finished shortly, when tenders will be called Architects, Clarkson and Ballantyne

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A tender has been accepted for the erection of a bungalow residence in Rougotai terrace, Miramar, for Mr. W H Fordham. Architect, W. Gray Young; contractors, Eade Bros.

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A contract has been let for additions and alterations to Hall's Bellevue boarding house, Gloucester street, Christchurch. Architects, Clarkson and Ballantyne; contractor, Charles Calvert.

* * * * * *

A contract has been signed for the erection of a new high altar, for a Roman Catholic church at Hokitika. Contract price £57 10s. Architect, John S. Swan; contractor, John Moffat..

* * * * * *

Tenders have been called for the erection of a residence at Marton, which will contain ten rooms, and a verandah nine feet wide on each side of the house. The roof is to be finished with slates, the chimneys with rough cast, and vertical weather boards will be used on the walls The walls and ceiling of the hall, and the walls of the principal rooms will be panelled, that on the walls being up to the top of the doors. All the internal woodwork, with the exception of the back premises, will be fumed. Architect, E. Coleridge,

Messrs Hunt and Macdonald are the successful tenderers for the erection of tramway shelters for the Miramar Borough Council. Architect, C F. B Livesay.

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A contract has been let to Wakelin and Son for the erection of offices for the Norwich Fire Insurance Co Featherston street The building will have a pleasing elevation of four stories, and be finished off in pressed brick and stucco, upon stone base The offices are provided with electric radiators etc., also an elevator to each floor The same firm have completed plans for a store, brick factory and shops for the National Hat Mills, at Newtown, and are also preparing plans for a church in brick at Brooklyn

* * * * * *

John S. Swan, architect, has let the following contracts:—Sundry buildings at Home of Compassion, Wellington; additions and alterations to a residence, Hill street, Wellington; contractors, Meyer and Illingworth. The making of seats for church of Mt. Saint Gerard, contract price £113, contractors, Campbell and Burke. A memorial mural tablet, to be erected in the Basilica, Hill street, by Hickmott and Sons. The slab will be of Sicilian marble, and the balance is Oamaru stone, contract price £40.

Aids to Architectural Taste.

Our contempory, the *Carpenter and Builder*, is much exercised about the apathy with which even the triumphs of architecture are regarded by the general public, and proposes a remedy: 1. "The teaching of architecture in secondary schools, and evening continuation schools, not from the architectural student's point of view, but as a matter of general culture. 2. The publication in the general press of brightly written and well-informed articles on architecture. 3. The signing of their buildings, as pictures are signed, by the architects, so that the public may become familiar with the names and styles of the leading practitioners of the art." To which we say, "Amen," with pleasure.

Plans and specifications are being prepared for the erection of two residences at Khandallah. Architect, E. W. G. Coleridge.

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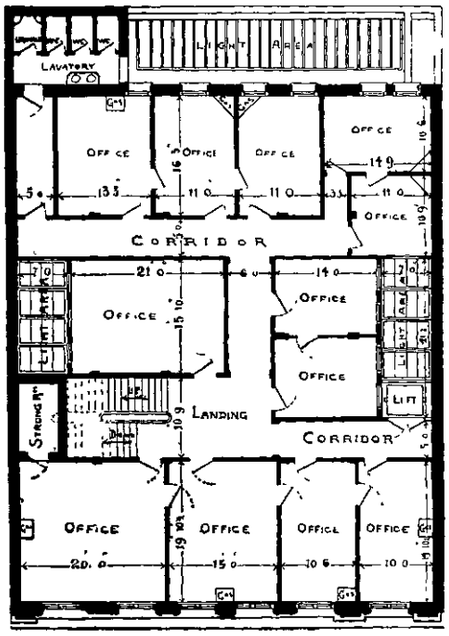
Decorations and renovations have just been completed to the Commercial Travellers' Club premises in Victoria street, Wellington. Architect, W. Charlesworth; painter and decorator, W. Jennings.



GROUND FLOOR PLAN, ST. GEORGE'S BUILDINGS, WELLINGTON (see page 311).

Tenders are invited for supplying extensive shop fittings for Mr. J. L. Murray's new shop in Queen street, Masterton. Architect, J. Charlesworth.

* * * * * *

A tender has been accepted at £437 10s, for the erection of a cottage at Island Bay. Architect, John S. Swan.

* * * * * *

Tenders will shortly be called for erecting the Te Aro Post and Telegraph Offices at the corner of Ghuznee and Leeds streets, Wellington, by the Public Works Department. Architect, J. Charlesworth.

* * * * * *

The old Maori church at Otaki has for some time been causing anxiety as to its stability. The architect has made an examination of the church, and finds that many of the plates and other timber that are touching the ground are considerably decayed, and that the roof sarking, which is of white pine, is much worm eaten. In the main the building is in excellent preservation, and it is hoped that with a new foundation, if it escapes the ravages of fire, this wonderful memento of Maori art may last for an indefinite period. Architect, F. d J. Clere, F R.I.B.A., Wellington.

THE ancient seal of the town of Winchelsea, which was struck in 1280, has just been restored to the corporation, after being out of its possession for more than a century.

* * * * * *

THE British Museum contains the oldest specimen of pure glass which bears any date. This is a little lion's head, having on it the name of an Egyptian king of the eleventh dynasty.

Workmen's Compensation.

The suspension of the Laing works of which the cables were so full a few weeks ago, has given rise to some curious questions affecting the position of workmen having claims for compensation. This arises from the fact that there are sundry claims to be shortly tried in the Sunderland County Court. It is pointed out that the insurance companies when they have to answer the claims against the employer direct, on the employer's insolvency, can contest the claims from the beginning, and such defence as was open to the employer is open to the insurance company. If the amount of the policy is less than the workman's claim, the workman must fall back for the balance on the employer's estate as an ordinary creditor, but to the extent of £100 he has preferenee over all creditors by the law of England. Should an insurance company become insolvent, the workmen's claim reverts to the employer just as if he had not insured at all. It is evident that there are some pretty problems awaiting development out of this rather tremendous bankruptcy. The chief point of interest seems to be centred in the fact that hitherto in ordinary cases employers relying on their insurance never contested cases leaving the companies to pay; while the companies, in order to popularise business of accident insurance, never looked too closely at things. The fact that there is resistance in this bankruptcy case is of interest wherever the practice of insurance has been supposed to have solved the problem of the workman's claims.

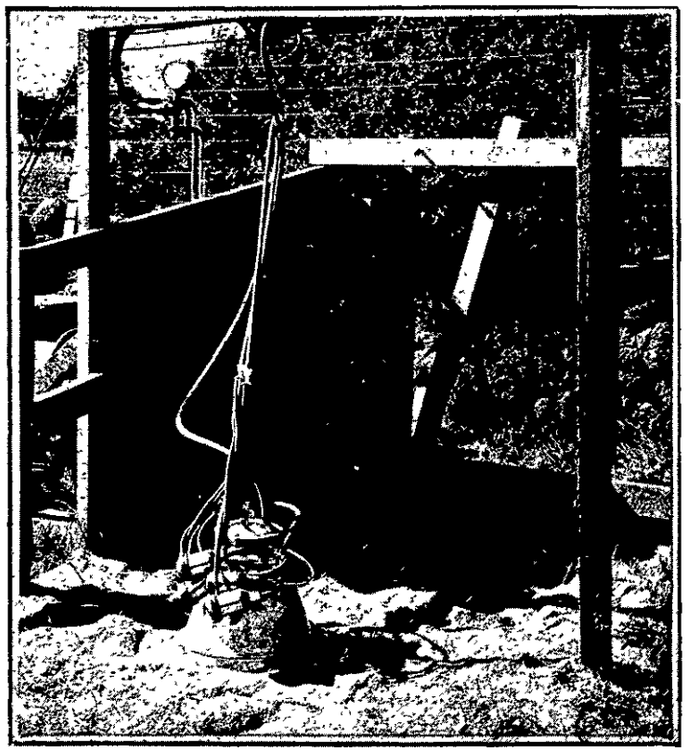
The largest percentage of organised workers is found in Denmark. Half of the population is unionised. Sweden is a close second, with Germany next.

A RECENT INVENTION.

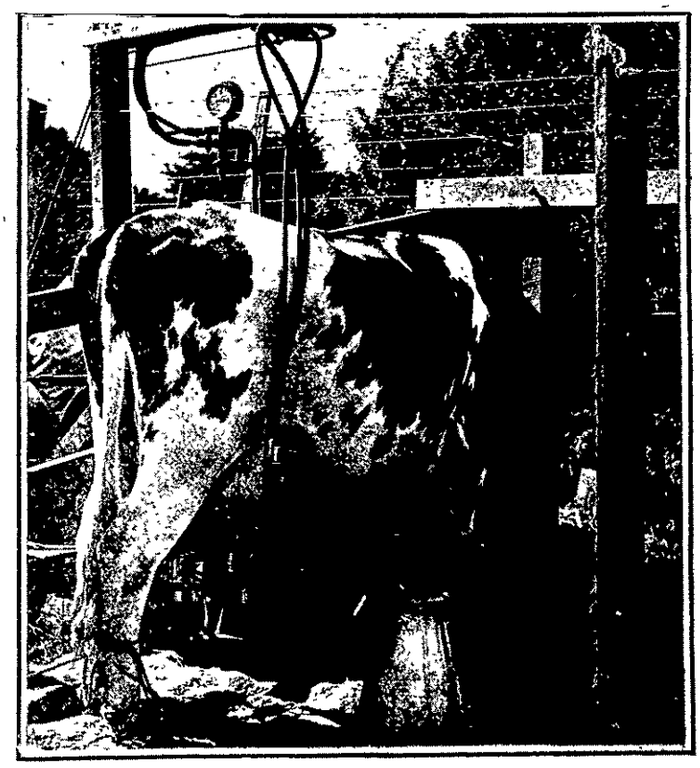
The Dominion Pressure Milking Machine.

Hitherto the unwieldiness of pouches, aggravated by the multitude of the levers used for working them, has been the bane of many types of milking machines. Now the indispensable requirements of pouches are readiness of rapid attachment and detachment, steadiness of pressure, and facility for frequent washing. These have, after much thought and many experiments, been attained in the Dominion Pressure Milking Machine, by altering the shape of the pouches from square to circular, and by applying a vacuum pressure of 7½ lbs. directly without the usual hangers and belts. A vacuum pump working in connection with the pressure pump exhausts the air pressure exerted on the rubber, thereby creating and insuring a complete collapse of the two pressure pouches.

The pouches are inflated and deflated sixty times every minute. The control of the pouches is governed by a controller fitted in each bail, the controllers are actuated by



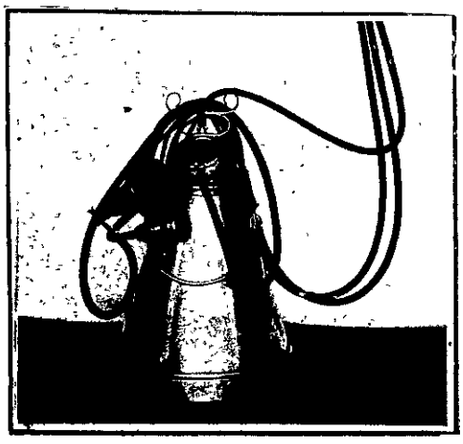
WAITING FOR THE COW.



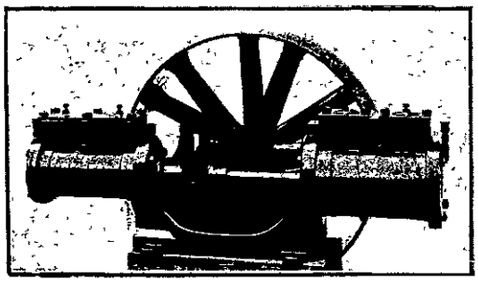
IN THE BAIL

means of a small crank which causes the reciprocating motion which cuts off the pressure and vacuum alternately, thereby causing the inflation and collapse of the pouches.

The pressure and vacuum pumps used in conjunction with these machines are constructed and designed with the pressure and vacuum cylinders facing each other as shown in the illustration, and the piston rods of each are connected to a link, in which a case-hardened crosshead is fitted, and into the crosshead a crankpin also case-hardened is inserted. The reciprocating motion is carried out by means of pulleys (fast and loose) driven from either a Mellor or Stover vertical oil engine. As will be seen from the illustration the machine is of most complete and compact design. The valves and seats used in the pressure and vacuum pumps are made from gun metal, and can be readily taken out by a farmer, in fact any valve can be taken out and replaced while running. The pumps are of the double acting type, and are of ample size and capacity to deal with the work required of them



VACUUM MILK RECEIVER AND TEAT CUPS.



AIR PRESSURE AND VACUUM PUMP.

Attached to the pressure and vacuum pumps are two receivers, one for a pressure of 15 lbs. per square inch, and the other for a vacuum of 15″, and one pipe reduced to 7½″ by means of a vacuum valve. The pressures and vacuums are carried along the shed by means of pipes, and at each bail the pipes are connected to the controller.

The controller is a tube with three connectors fitted to it, two for pressure and one for vacuum. The first compartment is for a pressure of 15 lbs. per square inch, and in the second it is reduced by a reducing valve to 7½ lbs. per square inch.

The pressure is conveyed from the one rubber tube to the four pouches by means of a claw which can readily be cleaned by means of a brush.

The pouches are of unique design, and have been pronounced by experts to be the simplest and most economical yet designed, besides imitating to a very large extent the action of the hand, in fact we are certain that the imitation is as near as it is possible to get to the action of the hand on a cow's teat. The construction of the pouch is as follows: The outside is cased with a metal sleeve which is the former for the pouch; at the top of this metal sleeve a small circumferential bay is secured made from rubberised leather, which is tested to a pressure of 30 lbs. without leaks, this being 15 lbs. in excess of what is required. The bag is secured in the brass sleeve and valve fitted to conduct the pressure to this bag. For the second pressure a rubber sleeve is passed right through the metal sleeve and turned over each end and secured, a valve is fitted, thereby allowing the second pressure of 7½ lbs. to enter between the rubber and the metal sleeve. The top, or udder ends, of the rubber sleeves are reinforced by means of metal cups which also hold a rubber ring passing on either side of the metal ring, ensuring only rubber coming in contact with the teat. The bottom portion of the rubber is held in position by a bell-shaped metal contrivance which conveys the milk to a four way connection which is connected to the bucket by a single hose of pure rubber.

The buckets are so constructed that the lids may be readily removed and the milk poured into any receiving vat. The top, or lid of the bucket is so constructed that the milk can be seen running into the can so that where a cow has ceased to give any more milk it can be seen at a glance.

We feel sure that this machine has come to stop, and that it will be a great commercial success, and a general favourite with all who decide to adopt this type of machine.

Great credit is due to Messrs. Wiggins and Co. for the amount of time and expense which has been expended on perfecting this machine, and we feel confident that they will meet with the support which they richly deserve.

City Pleasure Resorts.

Island Bay, Day's Bay, Miramar, St. Clair. New Brighton, Sumner, North Shore, and a legion of spots, together with islands innumerable—these are the names of a few of the resorts where the citzens of the four centres take their pleasure. In some, the natural attractions, the ozone, the tumbling salt water, the breezes, the sands, are left to do all the attracting, with what aid may be squeezed out of a tea-room. In others there are water-chutes, swings, merry-go-rounds, playgrounds for football, cricket, hockey, and here and there golf-links.

The impression produced on the stranger is, that in our pleasures, we of the Dominion are either too primitive or too exclusive. They remark that in other countries they cater very much more for the general average: which is quite true. Without giving any list of the multitude of establishments devoted to the purpose of recognising the duty of the public entertainer to both the "world and his wife," we will quote the latest building project which has seen the light at Brighton. It is for a palace of pleasure, on which a quarter of a million is to be expended.

"This palace is to occupy the middle of a three acre site, and there will be spacious tennis, croquet, and bowling lawns on either side, open to the view of the front. A model yacht pond will be included. A marble restaurant, to seat 1,400 people, will run out on the sea-side, with a semi-circular end overlooking an open-air swimming sea bath for ladies and gentlemen. The central part of the palace will be the winter garden and palm house, to accommodate about 3,000 people, and there will be an assembly hall for dances, for 1,500 people. At Hastings a further £60,000 is to be spent in a similar fashion.

Applications for Patents.

THE following list of applications for Patents, filed in New Zealand during the month ending 14th May, has been specially prepared for PROGRESS :—

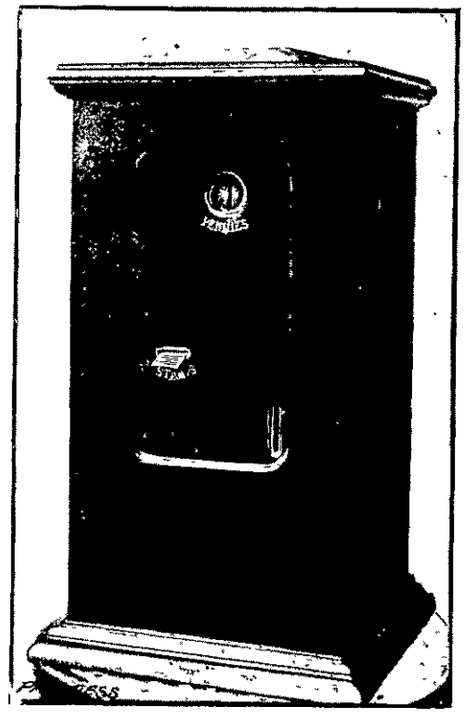
24197—J. Stevens, Riversdale: Mouse and rat trap.
24198—J. T. Hunter, Wellington: Typographical composing machine.
24199—J. T. Hunter, Wellington: Incandescent mantle manufacture.
24200—E. S. Baldwin and H. H. Rayward, Wellington: Vessel closure.
24201—O. C. C. Chapman, Dunedin: Water tap
24202—H. G. Hibberd, Waihi: Mineral slimes lifting.
24203—Yarrow and Co (Bolton), Limited, Bolton, Eng.: Pipe joint.
24204—D. Morgan, Launceston, Tas.: Collapsible mold.
24205—S. K. McIver, Ballarat, Vic.: Furnace and copper.
24206—T. Bottrell, Amosfield, N.S.W.: Branding and castrating apparatus.
24207—G. P. Innes and T. C. Allen, Sydney, N.S.W: Reversible and variable speed gear.
24208—A. G. R. Williams, Cambridge: Gas manufacture.
24209—A. J. Stieber, Bulltown: Folding swing chair.
24210—J. L. Muller, Sannois, France, and J. Rousset, Vincennes, France: Kinematograph plate.
24211—P. F. Acott, Ballarat East, Vic.: Street-sweeping machine.
24212—A. E. S. Foster and E. Berg, Picton: Tobacco pipe.
24213—J. H. O'Callaghan, Christchurch: Bicycle pump.
24214—M. G. Newbould, Napier: Electrical conductor cut off.
24215—H. Frith, Birkenhead: Window opener and fastener.
24216—A. R. Hardy, Dunedin: Roller blind
24217—A. M. Bell and C. E. Russ, Denver, U.S.A.: Ironing machine.
24218—F. G. Cottrell, Ph.D., Berkeley, U.S.A.: Separating suspended particles from gaseous bodies.
24219—A. H. Schmidt, Auckland: Wire fabric for spring beds.
24220—A. Ellis, Dunedin: Spring wire mattress.
24221—T. S. Philpott, Newtown: Gas burner.
24222—G. J. Richardson, Auckland: Window-dressing apparatus.
24223—Thompson Type Machine Company, Chicago, U.S.A.; Type casting machine
24224—C. Suttie, Waharoa, and M. H. Wynyard, Auckland: Flax treatment.
24225—W. W. Pearce, Christchurch; Necktie holder.
24226—W. W. Pearce, Christchurch: Writing case etc.
24227—J. A. Wilson, Kumeroa, Spring attachment for traces.
24228—C. S. Burgon, Auckland: Ship's course indicator.
24229—A. H. Borgstrom, Hango, Finland: Butter making apparatus.
24230—W. H. Fletcher, Eikenhof, Transvaal: Ore crusher.
24231—H. E. White, Christchurch: Skylight bar.
24232—J. R. Kent, Christchurch: Shoe or slipper.
24233—E. J. Butterworth, Manurewa: Distance measuring instrument.
24234—W. D. Ramsay and E. J. Shotton, Christchurch: Flooring substance.
24235—T. and J. J. Fleming, Sydney, N.S.W, and M. K and N. H. Mackenzie, Ultimo, N.S.W.: Ironing appliance
24236—A. H. Wright, Dunedin: Envelope delivery machine.
24237—A. H. Wright, Dunedin: Coin freed weighing machine.
24238—C. J. Wattson, Dunedin: Letter cards
24239—W. J. W. Pascoe and R. Walker, Dunedin: Milk delivery apparatus.
24240—T. Aitken, Cupar, Scotland: Liquid distributor for roads.
24241—G. Robson, St. Kilda, Vic.: Gaslight controller
24242—W. P. Rough, Wellington: Air carburetter.
24243—R. Spoendlin, Zurich, Switz.: Pump and motor.
24244—J. S. Douglas, Dunedin: Trolley pole controller.
24245—J. R. Preston, Lancaster, Eng: Hot water supply.
24246—G. J. E Sundbery, Stockholm, Sweden, and C J. J Hagg, Husby, Sweden: Milking machine.
24247—L T Reichel and E. F. Reichel, Wellington: Temperature recorder.
24248—L T Reichel and E. F. Reichel, Wellington: Temperature recorder.
24249—L. T. Reichel and E. F. Reichel, Wellington: Fire alarm.
24250—P. A. Bulmer and G N. Bulmer, Mangatoki: Milking machine teat cup.
24251—H. W. Yeoman, New Plymouth: Bicycle crank.
24252—J. Christophersen, Mangaroa: Cork screw.
24253—W. H. Smith, Aramoho: Siphon.
24254—C. Dahl, Palmerston North: Vacuum milking machine.
24255—C. Birley, Auckland: Shears, scissors, etc.
24256—C. Meuli, Eltham: Animal cover fastening.
24257—M. G. Newbould, Napier: Electric tramway.
24258—E C. Austin, Wanganui: Spirit level.
24259—M Saunders, Timaru: Tide motor.
24260—A. J. Park, Dunedin: Picture mount cutter
24261—A. J. Park, Dunedin: Plan, picture mount, etc., marker.
24262—A. C. Anderson, Stirling Point: Weight indicator.
24263—H. Rolland (*alias* Zadoni) and H. Stewart, Hawera: Starch.
24264—G. Westmoreland, Waipiroi Bay: Spouting bracket.
24265—R. A. O. Walter, Wade: Envelope

Full particulars and copies of the drawings and specifications in connection with the above applications, which have been completed and accepted, can be obtained from Baldwin and Rayward Patent Attorneys, Wellington, Auckland, Christchurch, Dunedin, etc.

The New Dickie-Brown Stamp Seller.

In our issue of May 1907, we described the Dickie - Brown automatic stampseller, and remarked incidentally that from the various accounts received, a great future awaited this ingenious device. As most of our readers are aware, the inventors are two young Wellingtonians who have been so successful in their exploitation of the stamp-seller that at the present time we learn of a company registered in London with a capital of £70,000, co-temporary with the formation of a corporation, having offices in the Metropolitan Life Buildings, in New York, with a capital of $500,000. At the present moment the machine is on trial at the New York Post Office, and it has also undergone a severe test at the General Post Office, Melbourne, where many thousands of stamps were recently issued to the public during the course of six days.

THE OLD MACHINE.



THE NEW MACHINE.

The chief improvement in the new machine over the one previously described in these columns, lies in the adoption of a handleless system of releasing the stamp—the mere insertion of a penny in the slot automatically causing delivery of the stamp. Other improvements are demonstrated in the extreme delicacy of the mechanism, which enables it to reject, not only coins dissimilar to those intended for use, but even the right coins which through wear, are unsuitable for the purposes of the stamp-seller. There being no handle to lift, as in the old design, simplicity in the working of the machine is brought to the highest pitch, and the danger of mistakes, or its being tampered with is practically removed.

The New York *Tribune* in a recent issue states "that three of the machines were to be placed in the corridor on the ground floor of the General Post Office, in order that they might undergo a thirty days' test. One of these machines contains a one cent stamp, another a two-cent stamp, and the third, one of the five-cent denomination. The new stamp-seller, which was selected from thirty-five submitted at Washington, is 14 x11 x 11. To extract the stamp from the one-cent machine the coins must be inserted in the slot and likewise the nickel is the only coin that will enter the machine containing the slot of the five-cent stamp. To obtain the two-cent stamp it will be necessary to insert two cents one at a time, first releasing the lever; but no stamp will protrude from the aperture designed for that purpose until the weight of the second cent is added. The stamps are handed out from rollers, and the machines are designed to contain rolls of 2,500 stamps. The perforations between the stamps are relied on to prevent the purchaser getting more stamps, or getting them oftener than he should." The *Tribune* concludes its article by references to the low cost of manufacture, and the excellence of the invention as a whole. Messrs Salter, the famous scale makers of Birmingham, are the sole manufacturers of the Dickie-Brown stamp-seller in the United Kingdom.

Since the above was written, Mr. Dickie has received cable advice to the effect that the three machines in the lobby of the New York Post Office have most successfully passed through the Government test, and that a recommendation has been forwarded to the Senate, urging their immediate use in suburban and congested post offices.

Have you any friends—at home or abroad—to whom you would like us to send a specimen copy of "PROGRESS"? If so, send their names and addresses to the Manager, 256 Lambton Quay, Wellington. He will, on receipt, forward a copy or copies of this issue, Post Free.

The first attempt to utilise the automobile on the battlefield is about to be made in Morocco in a newly-invented automobile mitrailleuse. This has a 30 h.p Panhard chassis, unarmoured, on which a gun is mounted on a pivot in the centre. The officer and chauffeur are placed in front and two artillerymen in the rear The gun can be trained in any direction. The new automobile is under the command of Captain Genty, head of the military automobile park at Vincennes It has arrived at Oran already and has left for the front.