

special machinery may or may not be necessary;

6. New principles coupled with the mode of carrying the same into effect.

A short examination of each of these heads and a few examples will make these matters clear.

A new machine or contrivance may be for an entirely new purpose or it may be for use in connection with an old purpose. The first is an extremely rare class of invention, while the second is most common. As an example of the first, take the subject of the transmission of speech over long distances by electricity. Here was a new purpose, and the telephone, with its vibrating plates, transmitter and receiver, formed the new apparatus for this new purpose. Therefore the telephone was a patentable invention of the first order; namely, a new apparatus for a new purpose.

As an example of a new machine for use in connection with an old purpose, the original sewing machine might be instanced. Sewing is among the oldest of arts, but the first sewing machine was an absolutely new contrivance for this old purpose, and therefore forms good subject matter, though not so high class as the telephones, seeing that the purpose to which it is applied is old. Improvements in existing machinery, which is also included in the first class, probably form the bulk of the patented inventions. As an example of this kind, I may instance the hundreds of patented improvements on the original sewing machine. In all classes of machinery of which large quantities are used, an improvement that may appear to an outsider to constitute a very slight advance is often the source of a fortune to its inventor, and is, of course, patentable subject matter.

With regard to the second class, namely, new and useful combinations of mechanical parts and of materials, it must be said at the outset, that a combination to warrant a patent must, of course, show invention, obvious combinations not being good subject matter. Therefore, in every case it is necessary to take the merits into consideration to decide whether or not the combination shows invention. All engineers have at their disposal a certain number of well-known mechanical parts and motions which form the stock-in-trade of the mechanical arts. In building a machine for a certain purpose an engineer may make use of these and by combining them, produce an apparatus fit to perform a certain function. So long as he merely exercises judicious selection and puts the different parts to their obvious uses, he does not necessarily exercise invention, but only the skill of an ordinary workman, and in that case the machine, although perhaps the first of its kind, is not necessarily a patentable invention. As an example of the simplest form of combination, we may take the case of the first sausage-making machine, which was the mere combining of a well-known mincing machine and an equally well-known machine for filling skins. The question of invention in this case, which was brought before the Court of Appeal was decided against the patent. Still, even this simplest type of combination might be patentable if the method and means used to connect them called for invention. For example, merely to place a folding machine in line with a printing machine, so as to print and fold continuously, instead of

separately as before, would not be invention if nothing more were done. But if the continuous printing and folding involved some necessary transmitting mechanism, requiring design and the exercise of invention to pass each printed sheet separately to the folders, then the combination would be patentable subject matter.

It is impossible to patent the combination of a concrete thing with an abstract property; as Baron Pollock, in deciding a case of this nature, once said: "You cannot have a valid claim for the combination of 2½d. with a pound of butter."

Neither is it possible to patent a combination of two things, between which no real combination exists.

In dealing with a claim in which a particular chain adjusting gear for a cycle was claimed in combination with a step for mounting such cycle, the judge remarked that the patentee might as well have said: "I claim that gear in combination with a hat on a man's head."

Referring now to class three. Improvements in existing manufactures, processes or parts of processes, we might take, for example, the manufacture of pile fabrics. Instead of adopting the usual plan of weaving the pile in loops and cutting these loops by an after operation, an inventor might produce a new method of weaving pile fabrics, face to face, in a double web and cut the pile by an after operation of separating one fabric from the other, thus saving both time in the weaving and in the pile cutting. This would be a patentable improvement in that particular manufacture.

In dealing with the next class, namely, novel and useful results and products of manufactures and processes, it might be mentioned that doubt appears to exist as to whether a new product, apart from the means used to produce it, is good subject matter for a patent. The most reliable writers on patent law lean rather against the proposition.

(To be continued.)

Railway Carriages.

For this same service a number of specially roomy day and night coaches were constructed, and in their appointments these carriages reach the high-water mark of railway carriage construction which has been going on in New Zealand for a number of years, both in the Government workshops and in the Wellington works of the late Wellington and Manawatu Railway Company.

The width of the Main Trunk carriage is 9ft. 3in., one foot wider than all other carriages in use on the railways, and the length over all is 50ft. The sleeping cars have accommodation for twenty persons to sleep. There are six compartments in each car, four of which hold four passengers each, and two have two bunks each. The bunks are arranged across the car, what a seaman would call athwart-ships, and a corridor runs the length of the carriage, with lavatories at each end. The day coaches and dining-cars are of the same roomy type, the second class being unusually comfortable.

The whole of a North Main Trunk train is New Zealand built, from pilot to tail-lights, and while the critical mind can find faults in some points, such would be the

case in any railway equipment. It is, on the whole, a very well appointed train, and the only pity is that the fine engines which haul it are not given better opportunities of showing their pace. The timetable is too slow.

Substitution of Cement for Lumber.

Two years ago there was an overproduction of 100 per cent. staring cement manufacturers in the face, as the estimated capacity of the plants at that time was 100,000,000 barrels per year and the consumption only 50,000,000. Present conditions indicate a consumption of 75,000,000 barrels this year. This increased demand, coupled with the fact that large Eastern manufacturers for two years have sold large quantities South and West at unprofitable figures, has caused the advance. The increase, we believe, is largely due to the sale of Portland cement to farmers and other small consumers and the general prosperity of the South and West. Western dealers report sales of 16 barrels of cement per 1000 feet of lumber, against one barrel per 1000 feet five years ago.—From the *Manufacturers' Record*.

Machine Labour in Gas Making.

At no time in the history of gas manufacture (says "Engineering") has there been such activity in the replacement of hand labour by machinery as at the present time. The chief area for the exercise of such machines is that of which the retort-house is the centre, embracing the coal-store and the coko-store. Whilst vertical retorts are in some works being installed, as the more or less natural development of the inclined system, yet in many others the horizontal retort is being retained, with the application thereto of mechanical operation. The mode of transmission of the motive power to these various machines has something to do with determining the collateral features in the coal stores and the coke stores. Whilst wire rope, compressed air, hydraulic, and electrical transmission have all their representatives in this field, yet in the combined schemes of taking in coal, stoking, and delivering coke, the electrical appears to have advantages worthy of careful consideration. Of the several types of electrically-driven stoking machines, the Fiddes-Aldridge occupies a unique position, inasmuch as it is the only one charging and discharging simultaneously a 20ft. to 22ft. length of horizontal retort. To this distinction is added another—namely, of taking automatically a supply from the overhead hoppers into the machine as desired. The result is that one machine attendant performs what is often three distinct operations in other systems. The only conceivable drawback to the system of simultaneous discharge and charge is that the retort is not ordinarily inspected at each operation and to its general condition and soundness. But if such inspection is desired, it may be arranged by the operator not taking in coal until the retort has been discharged. In practice, however, this hypothetical objection has not been found a serious one, and as the economy of operating is unquestioned, the machine is meeting with very much favour.