

PROGRESS IN ILLUMINATION.

WELSBACH FACTORY IN NEW ZEALAND.

Written for PROGRESS.

A new industry has sprung into existence in New Zealand. Born of the importance of our colony as a consuming centre, it has become necessary to establish a factory for the manufacture of Welsbach mantles and sundries in Wellington. Before describing the departments of this new branch it will be interesting to examine the progression of events in the career of the wonderful illuminant which to-day is everywhere familiarly known as the "Welsbach Incandescent."

The history of incandescent gas lighting is the history of the success of Dr. Carl Auer Von Welsbach's splendid chemical discoveries in the application of the rare earth's thorium and cerium in the preparation of his perfect incandescent mantle. But it is not only a story of glowing success of science successfully solving great problems and bringing new light to the world. Success has crowned the Welsbach Company's campaign throughout the world—a success that has only been secured by persistent effort.

When Dr. Welsbach invented his mantle, the patent specifications read that "a cotton filament was to be immersed and treated with a solution of thorium and cerium, the resultants being a 60 to 70 candle-power illuminant." That stands good to-day, and imitators must not infringe this formula in countries where the Welsbach patents exist. Imitators must utilise a greater percentage of cerium, and the public thereby lose, as the mantle has only 32 candle-power instead of 70.



HEAD OFFICE, WELLINGTON.

It is not a very far cry back to the time when electricity as an illuminant threatened to completely supplant gas, and relegate it from the drawing-room to the kitchen, there to perform the menial work of grilling the succulent chop, and boiling the water for washing up. Now gas not only can challenge the most powerful arc and incandescent electric lamp for power and softness of illumination, but the mantle has also reduced its cost to such an extent as to gladden the heart of the thrifty householder.

In 1893, the Welsbach Company started operations in a street off Wynyard Square, Sydney. So recently as December, 1904, a new general manager arrived from England to take up his important duties in the head office. Within a week of this gentleman's operations, he determined on the abolition of sole agencies, and started six branches. The result has been striking—an increase of 300 per cent. in the output, and the employment of double the number of hands.

Many use the Welsbach mantle without knowing the delicacy of manipulation necessary in the processes of its manufacture, which are generally illustrated on these pages.

Here, in New Zealand the girls employed by the Company are going daily through the same delicate operations as at the works at Wandsworth, in England, where they turn out about thirty millions of mantles per annum. In the first instance, one enters a spacious compartment where interest is immediately aroused by a half-dozen girls diligently mangling babies' hose without feet, with miniature mangles. Of course, it is not quite this,

but something much more important—the immersion in a solution of rare earths, and their subsequent wringing of innumerable short lengths of strips of tubular cotton hose, which are the mantles in embryo destined to light our homes. To give some idea of the magnitude of operations, these girls can treat something like 12,000 mantles in a day. From figures like these the visitor flees to another floor, where more girls are fitting the impregnated bases on to moulds, which are put into drying cupboards. After the drying process come more girls who take and pass the myriads of mantles on to folders whose duty it is to straighten out and

off in a furnace, until each mantle has gone through the hands of a dozen girls, and singly placed in boxes to go to the consumer.

One of the greatest triumphs of the Welsbach system is the manner in which it has been made possible to adopt practically nearly all the advantages claimed for electric lighting. Until the Welsbach system came into force, electric light was preferred by many for the ease in which it could be turned on or off with innumerable switches, and the decorative effects that could be obtained through the manner in which the incandescent lamps could be suspended. But the Welsbach fittings and their pilot lights en-



IMPREGNATING AND SEWING THE MANTLES.

fold flat in readiness for fixing in another department. The fixing operation refers to the top of the mantle. If you take up a Welsbach mantle, you will notice a pink ring round it, that is the fixing, to which this part of the mantle is subjected before the top is gathered, and the asbestos string, by which it is suspended, is passed through it. One by one the flat, limp fabrics are picked up, and the tops are just passed between two little rollers—the operative parts of the machine—and out they come with about three-quarters of an inch of their length impregnated by the pink fluid, and the fixing process is completed. Then there come more girls, and the toughening and other bewildering processes, such as burning

able the light to be turned on instantaneously any time of the day or night, and can be arranged quite as conveniently as any electric light switches. As far as suspended or inverted, lights are concerned, which for so long were the feature of electric lighting, and the great want in all gas fittings, these have been matched by the new fittings of the Welsbach Company. It must not be forgotten, too, that in the case of electric light switches and fittings, these were, and indeed are, always of an expensive nature. To put on a switch to turn out an electric light will cost anywhere from 20/- to 30/-, and the drop fittings run into any amount. The Welsbach lights with pilot light, or bye-pass,



BURNING-OFF AND SHAPING THE MANTLES