

AN AUTOMATIC PUMP GOVERNOR AND RECEIVER.

In the steam-heating system of a building an automatic device should be provided, which receives the water of condensation from the radiator coils and pipes, controls the pumps, obviates the objectionable "hammering" of the pipes, and returns the water of condensation to the boiler while still hot. A device of this nature is made by the Creamer Steam Specialties Company, Jansen Hasbrouck, proprietor, of 126 Liberty Street, Manhattan, New York city.

The apparatus, as our sectional view indicates, comprises a receptacle (into which all water from coils, etc., drains) containing an open metal bucket, *B*, and a weight, *W*, twenty times heavier than the bucket, both hung from the ends of a lever fulcrumed at its middle. A second lever is fulcrumed at the weight end of the first lever and is connected with the vertical stem of the steam valve. As the water of condensation flows into the receptacle and into the bucket through the return pipes, the weight descends, pulling down the corresponding end of the lever, thereby opening the steam valve and automatically starting the pump. When the water within the receptacle has been pumped out, the distribution of weight is reversed, the filled bucket now being twenty times heavier than the weight; hence, the weight is raised, the steam valve closed, and the pump stopped. As the water again accumulates in the receptacle the bucket is buoyed up, and the operation begins anew.

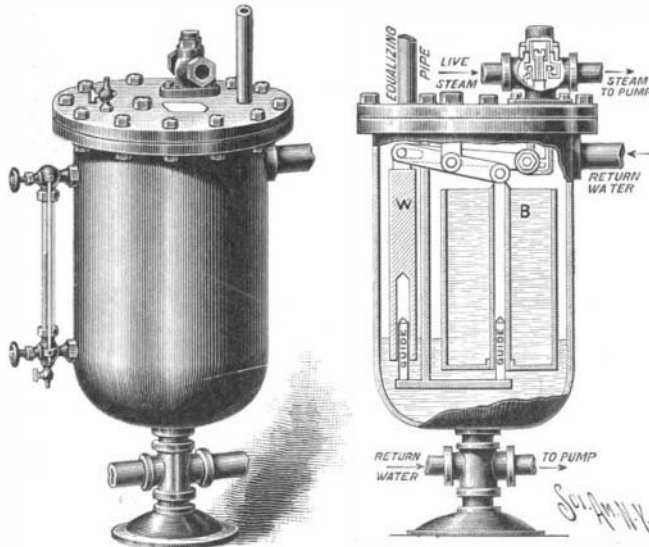
The apparatus is now in use in many large office buildings and institutions, in connection with pumps of all kinds. In old and new buildings it will completely obviate all those objectionable noises in steam pipes which are occasioned by the collection of the water of condensation. The returning of this water of condensation in its heated condition to the boiler is another of the advantages incident to the use of the device.

QUICKSILVER FOUNTAIN AT EARL'S COURT, LONDON.

Mr. Charles Bright, F.R.S.E., the well-known English electrical engineer, has recently devised a complete novelty in fountains for the Queensland government's show at the Earl's Court Exhibition, in which it now forms the main center of attraction. Its *raison d'être* comes about owing to Queensland being anxious to attract attention to mercury as an important product of that country, and here Mr. Bright, judging from the crowd which daily gathers round the fountain, seems to have given them an apparatus more likely than any to produce this effect. When it is remembered that mercury has a weight nearly fourteen times that of water, it will be seen that the problem was no

easy one. In order to describe this invention in anything like detail we must first refer our readers to the accompanying drawing.

The mercury falls from an upper bowl about 4 feet in diameter to one some 7 feet below, and about $7\frac{1}{2}$ feet in diameter. This entire device is coated with black paint to show off the silver. The price of mercury runs at about $\frac{2}{6}$ per pound as often as not—and, as we know, a pound of mercury does not go very far in bulk; thus one of the main considerations in view was to employ as small a quantity as possible, and any-

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thing like an imposing Niagara Falls of the liquid metal was soon ruled out of court. Thus, the upper basin is filled up with cement by way of converting it into a flat table with some sixty-four grooved channels at 2-inch intervals round the lip to conduct the quicksilver in modest quantities over the edge.

Similarly things are so regulated that there is just enough mercury in the lower bowl to float a number of household flatirons and chunks of rock; and it is here that the man in the street is impressed with the fact that it is mercury and not water that is sent through the fountain.

The lower basin is drained off by a drain pipe 80 feet in length and $1\frac{1}{2}$ inches in diameter, which conveys the

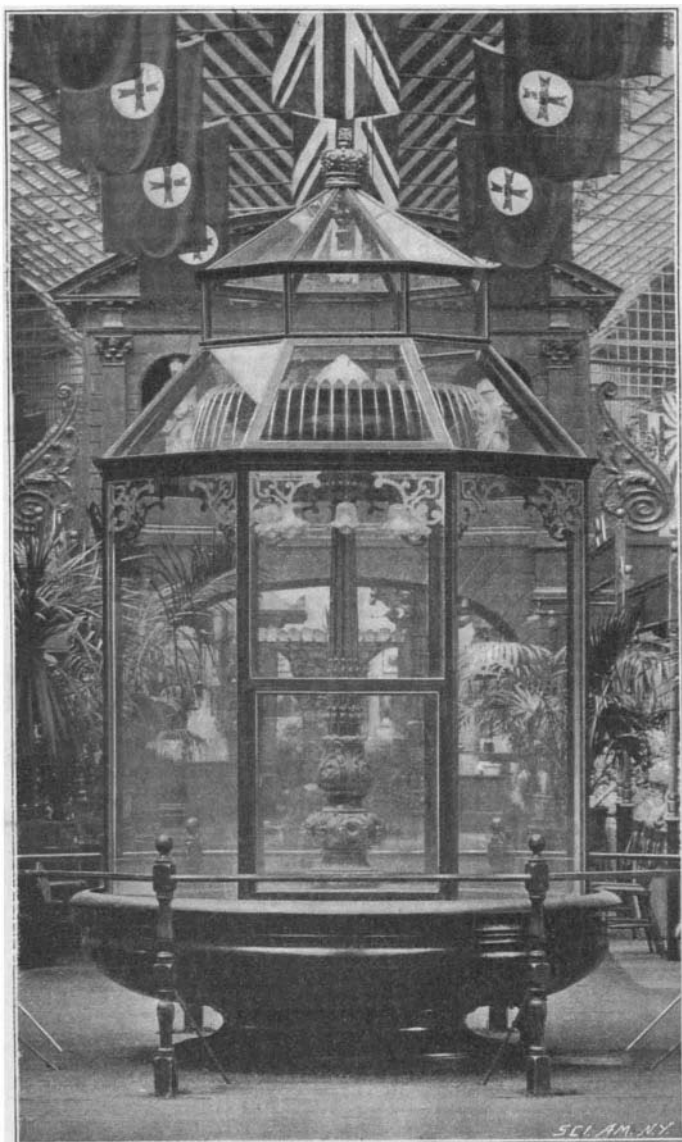
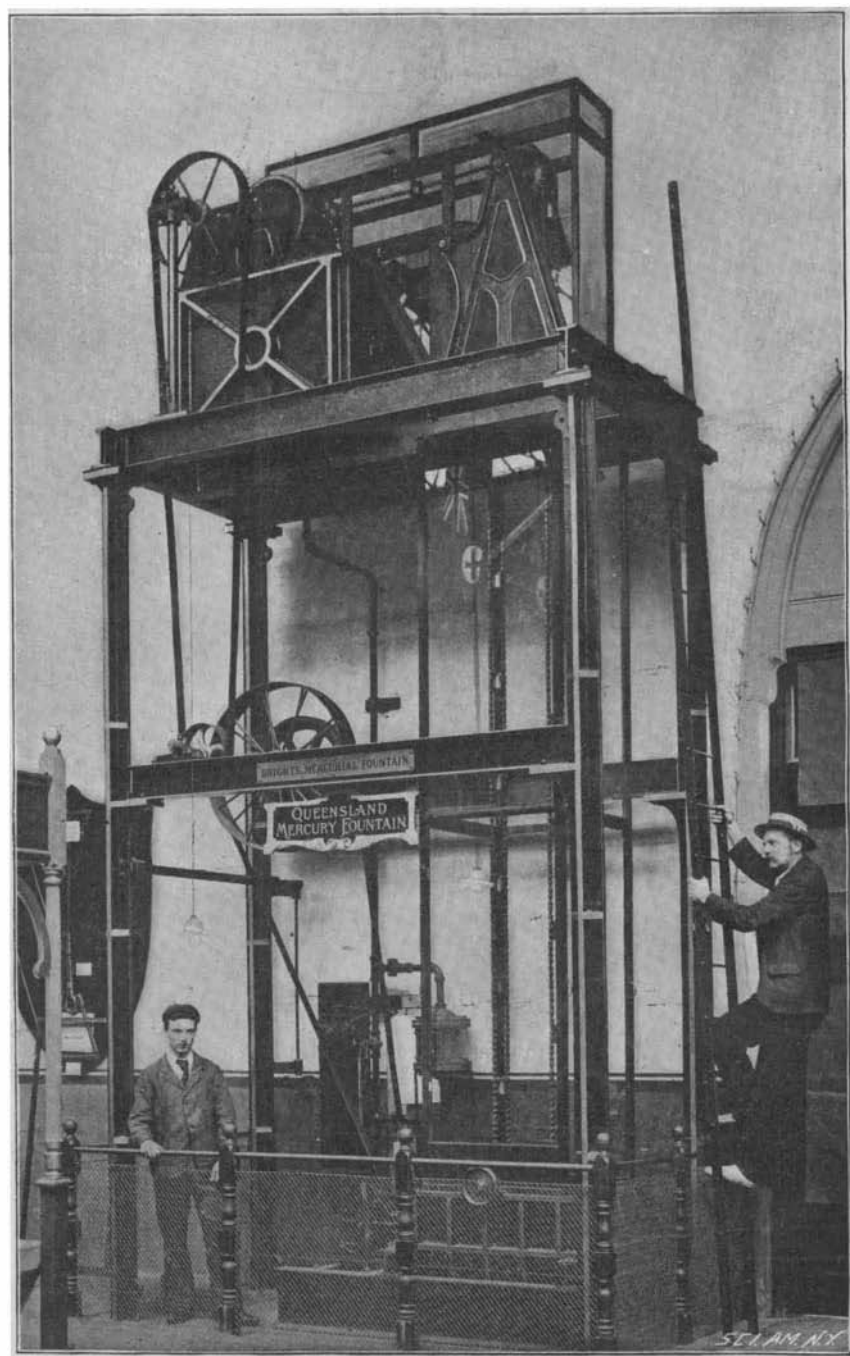
quicksilver to a tank conveniently placed, and, of course, at a slightly lower level. This tank acts as the means of supply to an elevator for furnishing the required head of the liquid mercury. The elevator is constituted by a number of small, stoutly built steel cups ($3\frac{1}{2}$ by $2\frac{1}{4}$), attached at intervals to an endless bicycle chain which is kept running through the store tank. As each freely suspended cup approaches the lower tank a tilting system enables it to pick up its cup full of mercury. The loaded cups are from here led up to a reservoir tank at a height of 14 feet above the other, where each in turn empties its contents. From this reservoir the quicksilver is carried through a pipe some 100 feet in length and 1 inch in diameter back to the upper bowl of the fountain. On its way, however, the mercury is run through a fine wire gauze filter which frees the running mercury from the impurities which superficially collect from the atmosphere.

The $2\frac{1}{2}$ tons of mercury employed for this striking apparatus represents alone some \$2,970 in value.

Each of the tanks has about 2 cubic feet of mercury in it. The number of elevator buckets is twenty-eight, placed at 20-inch intervals along the chain; and as each holds ~~some~~ 10 cubic inches (5 pounds), the supply of mercury is worked at a rate of over 7 tons per hour. Both the delivery and return pipes are lined with glass (mainly to reduce friction to a minimum), and the head of mercury in the reservoir tank is equivalent to 6 feet above the height of the top basin. The elevator is most satisfactorily worked by a 2 horse power electric motor of the new Langdon-Davies (alternating current) pattern.

Both the fountain itself and the machinery to work it are lighted by electricity, and the effect at night of the spray of mercury falling, with the light glistening between, is truly entrancing. The only gold medal of this show has been awarded to Mr. Bright for this highly ingenious and novel invention.

PAPER may be rendered fireproof for making flashlight reflectors or for other purposes by moistening with the following solution: Ammonium sulphate, 8 parts; boric acid, 3 parts; borax, 2 parts; water, 100 parts; sodium tungstate can also be used, and a solution of common alum is often efficacious, but it tends to loosen and disintegrate the paper.

**QUICKSILVER FOUNTAIN AT EARL'S COURT, LONDON.****ELEVATOR AND TANKS FOR OPERATING QUICKSILVER FOUNTAIN.**