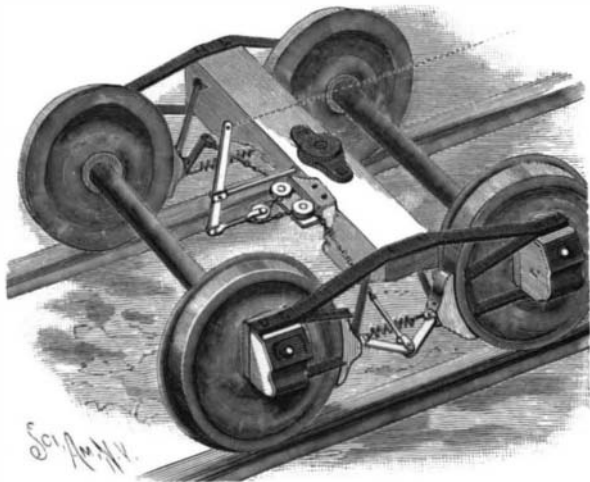


**A NEW CAR BRAKE.**

The illustration represents an improved car brake, in which the brake shoes are moved into contact with the wheels by the straightening of toggle arms located between the shoes operating against adjacent wheels. The improvement has been patented by Ferdinand Gabler, Topeka, Kansas. The shoes are suspended by hangers and have a loose jointed connection with the toggle arms, and the latter are jointed by a bolt or

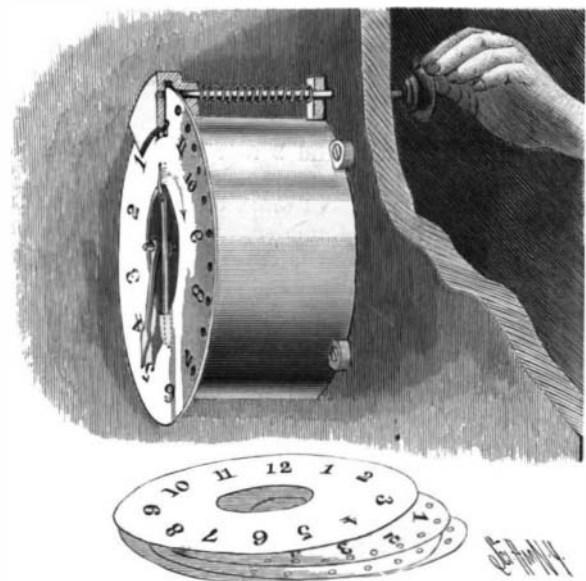


GABLER'S CAR BRAKE.

pintle pin to a stem extending transversely to the middle of the car. The inner ends of the two stems on opposite sides of the car are connected to a chain which passes around two pulleys on a stationary axis and around an intermediate pulley carried by a clevis on the lower end of a brake lever, connected at its other end to the brake chain through which the brakes are applied. Pulling on the brake chain tends to straighten the toggle arms, thrusting the brake shoes against the wheels, from which they are removed, when the tension is released, by a spiral spring connecting the shoes of each pair.

**A WATCHMAN'S TIME RECORDER.**

A simple and inexpensive watchman's time recorder, especially adapted for use in factories and other buildings, for making a record of the times at which the watchman makes his rounds, is shown in the accompanying illustration, and has been patented by Charles L. Reis, of Richmond Hill, L. I., N. Y. On the hour hand of an ordinary clock secured to the inside of a door or wall is fastened a ring shaped dial, preferably of paper and with markings similar to those of a clock face, this dial being set on shoulders formed in the hour hand. This hand extends across the dial, and a spring holds the paper dial in contact with the hour hand, causing it to travel around with it. On the upper part of the clock casing is secured a guideway through which the upper part of the paper dial passes as it revolves, and in this guideway is arranged to slide a pin adapted to puncture the paper dial when pressed by the watchman, the pin being withdrawn by a coiled



REIS' WATCHMAN'S TIME RECORDER.

spring. The paper dial is simply made, as shown in the small view, and may be readily slipped on the hour hand and held in position thereon by the spring, it being understood that the paper dial is attached to the hour hand to correspond with the indicated time. The punctures made in this dial, when it is removed each morning, indicate the times of the watchman's visits.

FRIENDS of the Lick Observatory will be glad to know that, owing to the open winter, considerable progress has already been made in mounting the 3 foot reflector presented to it by Edward Crossley, Esq., lately M. P. for Halifax, England. In another month it is likely that both dome and telescope will be erected.

**Purification of Drinking Water by Means of Filtration.**

The importance of pure water in determining the health of a community has long been recognized and cannot be overestimated.

At the present time it is impossible for many cities and large towns to obtain the required amount of water from a naturally pure source, and in the future, with the enormous increase in population and the number of manufacturing towns established along the banks of the small streams and rivers, this difficulty will be manifestly greater. Therefore the possibility of purifying, by artificial means, water which has been polluted by sewage and which contains both organic matter and bacteria, has become a question of great importance in many communities.

In considering any method for accomplishing this object, two things must be borne in mind, viz., its efficiency and its cost. The objections which have been urged against filtration are:

First, that while a filter might remove the coarse material in suspension, it would allow all the organic matter in solution and the bacteria to pass through unchanged.

Second, that even if a filter were efficient for a short time, it soon becomes clogged and saturated, and then the condition of water which passes through is worse than when it entered.

Third, that the cost and maintenance of a properly constructed filter is so great that it cannot be universally adopted as a means of purifying water.

The report of the Massachusetts State Board of Health for the year 1894 contains some very interesting and important facts upon all these points.

For the past seven years the board has maintained an experimental station at Lawrence for the sole and express purpose of testing the efficacy of filtration of water to purify it and render it fit for household purposes. The water tested was that of the Merrimac River, which is lined from source to mouth with manufacturing towns and which may be taken as a fair sample of river water contaminated with a considerable amount of organic matter.

The filters were of all sizes and thicknesses, from those a few feet square and ten inches in depth to the large filter covering two and one-half acres, through which the water supplied to the city of Lawrence has been filtered since 1893.

Chemical and bacteriological examinations were made weekly, and sometimes daily, of the water of ingress and egress. Sand of different sizes was used, and the filters were run both intermittently and continuously. The results of this careful and painstaking investigation, extending over a number of years, and every source of error being eliminated, are both astonishing and gratifying.

From a bacteriological standpoint they prove that a properly constructed and properly managed filter will remove from 98 to 99.84 per cent of the ordinary bacteria in water, and that if such bacteria as the bacillus prodigiosus, which is very similar to the typhoid bacillus, be added to the water in varying proportions, the filter will remove from 99 to 99.993 per cent. The organic matter in solution is greatly diminished and the water is chemically purified.

Moreover, the efficiency of the filter, instead of diminishing, increases with age and use, owing to the formation of a gelatinous coating about each grain of sand, which serves to entangle the bacteria in their progress.

The rate of filtration may reach five million gallons daily per acre of filter without impairing the efficiency. If the surface clogging is properly removed, there will be no appreciable difference in the quality of the filtered water during or after the process of removal.

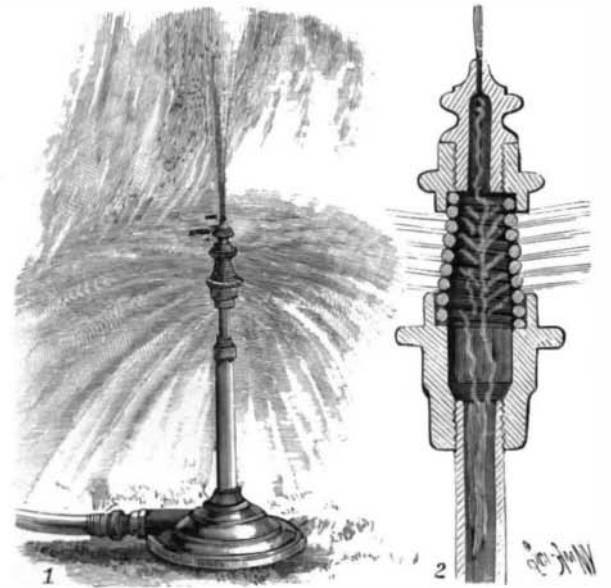
Finally, the cost of construction and maintenance of such filters is not so great as was supposed, and is not to be compared with the benefits derived from their use. The one which has been in successful use in the city of Lawrence proves that the plan is practicable in supplying cities with potable water. It seems to us that the knowledge derived from these experiments should be spread abroad and the attention of municipal authorities called to them.

In the immediate vicinity of New York the water of the Passaic River has been for a long time very bad and is constantly growing worse as regards its contamination with sewage and the waste of manufacturing plants on its banks. Several large cities and towns obtain their water supply from this source, and if there is a practical and economical means of rendering this water pure and wholesome, it certainly ought to be adopted.

While our own Croton is considered a very good quality of water, yet it is liable to contamination, and we have recently had abundant proof that it may become disagreeable to sight and taste. A proper system of filtering would no doubt improve the quality greatly, and the matter should be brought to the attention of the proper authority.—Medical Record.

**A NEW LAWN SPRINKLER.**

A sprinkler designed to throw a gentle yet effective spray, and which is of simple and inexpensive construction, is shown in the accompanying illustration, and has been patented by Charles A. Ashton, of Piqua, Ohio. Fig. 1 represents the sprinkler in operation, Fig. 2 being a vertical section. A reduced stand pipe supports a spreading head, whose lower end has an enlarged bore and receives the lower end of a closely coiled spring, made fast to the base of the spraying head. To the top of the spring is secured a cap in which screws a plug having a large central bore, with a reduced bore at the top, to make a fine vertical thread of spray when the water is turned on. In operation the water is also forced out horizontally



ASHTON'S LAWN SPRINKLER.

through the interstices of the spring, in a manner quite resembling a miniature fountain. The plug is readily removable from the cap, facilitating the cleansing of the sprinkler from any obstruction.

**IMPROVED HORIZONTAL TAPPING MACHINE.**

It is in the minor operations in the manufactory or machine shop, no less than in the larger work, that time and money are saved, and profits increased.

Making screws and nuts and tapping parts for receiving screws are among the smaller but important operations carried on in the shop. A great deal of attention has been given to machines for doing this work rapidly and with uniformity.

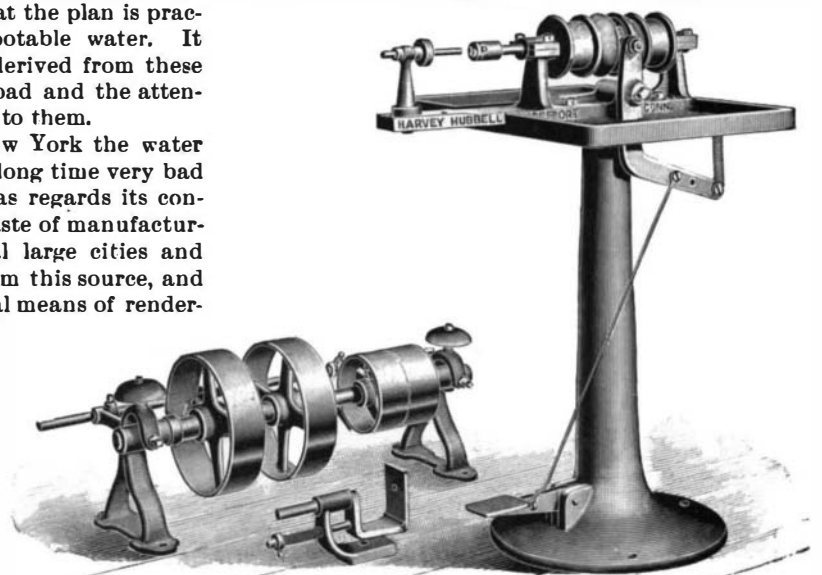
We give an engraving of a machine designed for light, rapid tapping. The spindle is driven by two 1 1/4 inch belts, running in reverse directions, giving a speed of 1,200 to 1,500 revolutions per minute. The reversing of the tap is accomplished by releasing the foot pressure from the treadle, which, through the medium of a lever, actuates a friction cone.

The machine is fitted with a flat sliding plate for holding work, also a revolving spindle which is especially useful for tapping small pieces. To this spindle may be fitted a work holder, which is wholly under the operator's control, so that, if the tap becomes caught from any cause, it may be instantly released and allowed to revolve, with the work attached, without danger of breaking the tap.

The machine is provided with a substantial counter-shaft and chuck.

Harvey Hubbell, 875 State Street, Bridgeport, Conn., is the manufacturer of this machine.

It is reported from France that the fresh juice of the poppy plant applied to recent bee stings gives immediate relief and prevents inflammation.



HORIZONTAL TAPPING MACHINE.