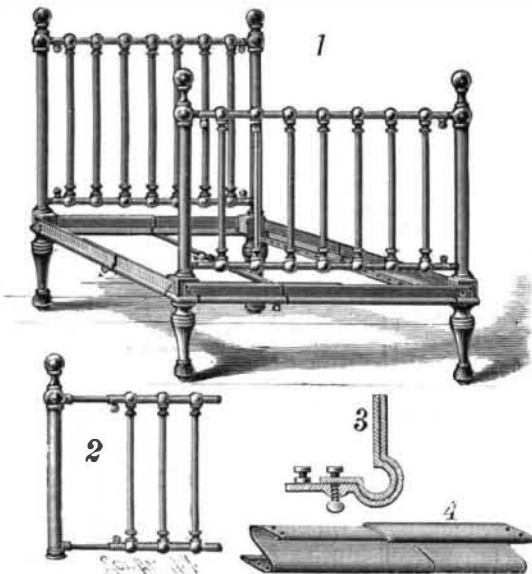


Cross Lighting.

Some traditions die hard, being accepted without examination by nine persons out of ten and by all who are in or under authority and, like officials generally, opposed to, or suspicious of, innovation. Among these is the belief in the hurtfulness of cross lighting. This method of lighting would seem only to be held injurious in schools, for in our own houses we are only too pleased if we can have windows on two or more sides of a room. Even in Germany, where statistics and experimental investigation pervade every department of administration, and where in each detail the executive is guided by an order in council somewhat inappropriately called an "Erlass," we find cross or double lighting still expressly condemned. Yet Cohn and Förster, Javal and Ferrand, Rumbold and a Royal Commission on School Construction have urged the groundless nature of the prejudice. Provided always that the eyes are not dazzled and that no shadow falls on the reading or writing, it is impossible to have too much diffused daylight or its artificial equivalent. The loss of intensity with increasing obliquity of the rays of light is acutely felt in wide rooms, especially when not high in proportion, on the side opposite the windows; whereas if there be windows or lights on each side, the intensity of illumination is equalized and its total amount doubled. It is only necessary that that coming from the right should be naturally or artificially the weaker, as by having the windows north and south or by filling those on the right with clouded glass. Windows in front are always objectionable, but light from behind, if not so strong as to cast a shadow, can but serve to increase the illumination derived from the proper quarter. As Cohn and Förster long since pointed out, reading or other work demanding clear but effortless vision is in the open air when the sky is overcast a real luxury. Under these circumstances the light is ample but shadowless; it comes from everywhere, but from no one quarter more than from another. The most perfect artificial illumination conceivable is that obtained by Hrabowski's arrangement of hemispherical milk glass reflectors with prisms and mirrors by which the light of an electric lamp is diffused equally throughout the building, though the source is hidden from view. The light is photometrically equal to that of a clear summer day and as free from color; it is almost shadowless and is, in fact, superior to daylight in not being liable to fluctuations, although its intensity can be regulated at will.—London Lancet.

A NEW EXTENSION BED.

An extension bed has been patented by Alfred W. Furnival and Henry Martin, of Second Avenue, Astoria, N. Y., which may be adjusted in length and width to meet various requirements. With this object in view, the side and end rails are made in two parts adapted to slide one upon the other. As indicated in the cross section in Fig. 3, these rails are constructed of plates so bent as to form vertical and horizontal flanges which are united by a bulb. The rail sections may slide longitudinally, but are prevented from being laterally displaced by the peculiar construction of the bulb. By means of a screw, the two parts of each rail may be held in any desired position. To the rails corner-blocks are secured and provided with legs. Corner-posts are carried by the blocks and have adjustable connection with the head and foot pieces. As shown in Fig. 2, the head and foot pieces are composed of hor-



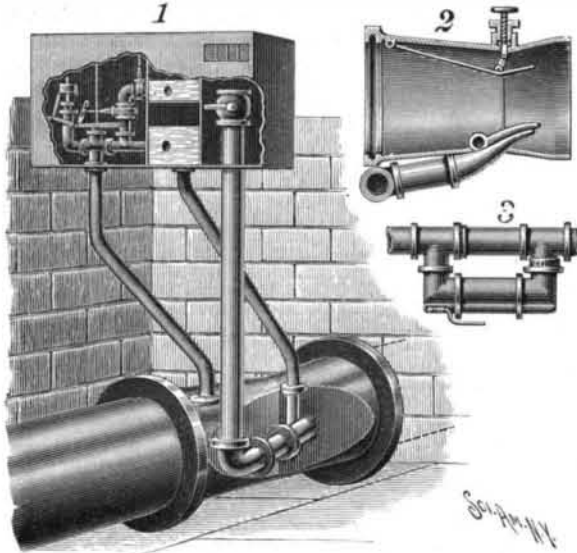
A NEW EXTENSION BED.

izontal tubes and vertical connecting rods. The horizontal tubes slide over rods fixed to the corner posts and are held in any desired position by means of screws. The springs for this bed are shown in perspective in Fig. 4. These consist of reversely curved plates adjustable longitudinally and rolled over or beaded to prevent lateral displacement. The springs are held within the bed by means of holes engaging pins on the side rails, and are supported at their central portions

by means of a rod made of telescoping sections and extending between the end rails. Among the many advantages claimed for this bed are its structural firmness and its ready adjustability to conform with the accommodations afforded by various rooms. The construction of the springs is noteworthy for the novel means employed to prevent sagging of the central portions.

AN APPARATUS FOR PURIFYING WATER.

The methods usually employed in purifying water require costly pumping and filtering stations and



McElroy's APPARATUS FOR PURIFYING WATER.

special machinery. It is the purpose of an invention patented by the designing engineer of the Brooklyn Water Works, Mr. Samuel McElroy, 170 Broadway, New York, to supersede these expensive appliances by providing an apparatus in which the force of gravity becomes the agent of applying air or antiseptic solutions to the water running in a conduit.

In the line of the conduit the inventor places the induction valve shown in Fig. 2, the casing of which is contracted between its ends, so as to produce an increased velocity of water in the throat thus formed. This valve is further provided with inlets for the entrance of air and of antiseptic gases or solutions, and with a deflecting plate adjusted by a screw rod to promote the increased velocity of the water. A casing, as shown in Fig. 1, is placed near the induction valve and is provided with an air chamber properly connected with an inlet to the induction valve and with a check or stop valve to guard against reactions. The casing is furthermore provided with a solution chamber and with a mixing chamber also connected with the induction valve and guarded by proper check and stop valves. The solution and mixing chambers supply the antiseptic gases as they are required. A coil pipe is applied to the conduit as shown in Fig. 3, for the purpose of collecting the organic matter with which the water may be impregnated.

In operation the water flowing through the conduit will produce a draft which draws through their respective pipes the air from the air chamber in the casing and the antiseptic solutions stored in the solution chamber. The impurities of the water coming into contact with these corrective agents will be destroyed or neutralized.

Among the advantages claimed for this apparatus are its automatic action and its cheapness.

The Slime on Fishes.

A fish just taken from the water, if handled, says The New York Sun, is found to be slippery and coated with slime. All fishes, the meanest and the noblest, killi-fish and shark, shad, salmon, and trout, wear this slime. They could not exist without it.

The slime is secreted usually in a continuous series of ducts with numerous openings, arranged in a line extending along the side of the fish. Some fishes have one line on a side, some have five or six. The lines may be plainly visible, and in some cases appear to be a marking on the fish. More often they are not observable at all. Some fishes store this secretion in pores distributed over the whole surface of the body, the larger number, however, in pores in lateral lines. There are also pores for the secretion of mucus or slime in a fish's head.

The slime is exuded through the divisions between the scales to the outer part of the body, over which it spreads, forming a sort of outer skin or covering, transparent, and having elasticity and tenacity, and often considerable body. It would not be remarkable for a fair sized fish, say a fish of two pounds weight, to have a coating of slime a thirty-second of an inch in thickness. Fishes vary greatly in the amount of slime which they secrete; the eel will suggest itself as one that is very slimy.

The fish's slimy coating reduces its friction when in motion and helps to increase its speed. It aids in pro-

tecting the scales from injury, being of sufficient substance to serve in some measure as a cushion. The slimy covering makes the fish hard to hold, and so enables it the more readily to escape from its enemies. It is sometimes repugnant to other fishes, which are repelled by its odor. It is the slime from the fishes handled that makes the angler "smell fishy" as the expression goes.

A most important function of the fish's slimy coating is to protect it from the attacks of fungus, a form of plant life found in all waters, salt and fresh, including the purest. The slime covers the entire exterior surface of the fish, including the fins. Fungus does not attach to the slime; but if the fish were to be injured so that there was upon it some spot uncovered by the slime, upon that spot some minute fragment of fungus, so small as to be scarcely more than visible, would be likely to lodge. Once lodged, the fungus is reproduced very fast.

Fish sometimes recover from attacks of fungus, but much more often they do not. The fungus displaces the skin, inflammation is set up, and the place attacked becomes practically a sore. With its continued growth the fungus may cover the side of the fish and extend over the gills and finally kill it.

THE "SENTINEL" BICYCLE-LOCK.

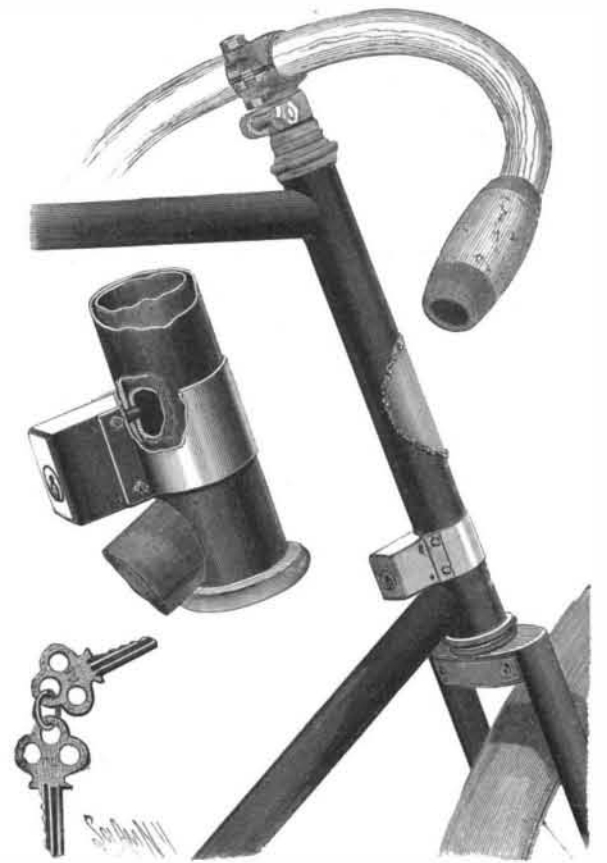
An ingenious bicycle-lock, which will no doubt find very general favor with wheelmen, is now being introduced by the Yale & Towne Manufacturing Company, of No. 9 Murray Street, New York.

The lock, as shown in the illustration, is intended to be permanently fastened to the steering-head of a bicycle, and is designed to hold the front wheel at an angle to the frame, thus rendering it impossible for the bicycle either to be led or ridden away.

The locking mechanism is that of the well known Yale pin-tumbler type, which makes the number of key changes practically limitless, thus absolutely precluding the possibility of other keys being in existence which may fit the lock.

We learn from the manufacturers that, during the past summer, a number of these locks have been in use by riders, and that it is their unanimous testimony that they are of the greatest service.

The lock is of neat design and finish, and, to quote one rider, "no better insurance can be put on a wheel."



THE "SENTINEL" BICYCLE-LOCK.

It is thought that it will be extensively placed on bicycles by manufacturers, as a special feature for the coming season; but it may be easily applied to any wheel. While shown in the present cut attached to the head with a separate band, it may also be used directly behind the name plate; the latter being employed as a band to secure it to the wheel.

We hear that one of the largest bicycle manufacturers in the country, having an extensive export trade, has undertaken to introduce the lock throughout Europe.

A VELOCITY of 8.3 or 10.6 kilometers per second is obtained for the wave front of the Indian earthquake of June 12, 1897, the two values being obtained by means of the two times recorded for the start of the earthquake at Calcutta. The velocity of the propagation of the maximum inclination of the earth's surface to the vertical comes out 2.61 or 2.76 kilometers per second.—G. Agamennone, in Science Abstracts.