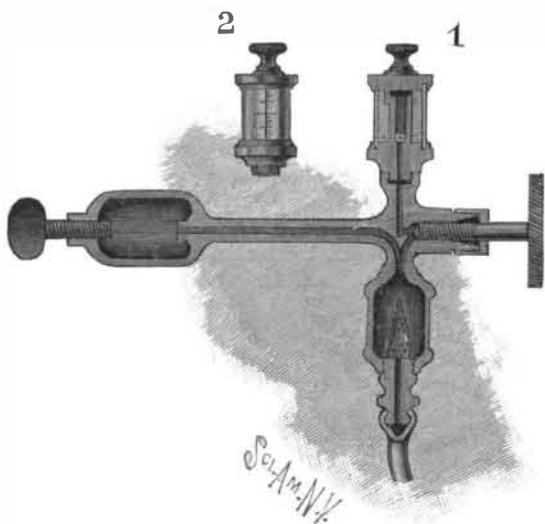


MIXING AND VAPORIZING DEVICE FOR INHALERS.

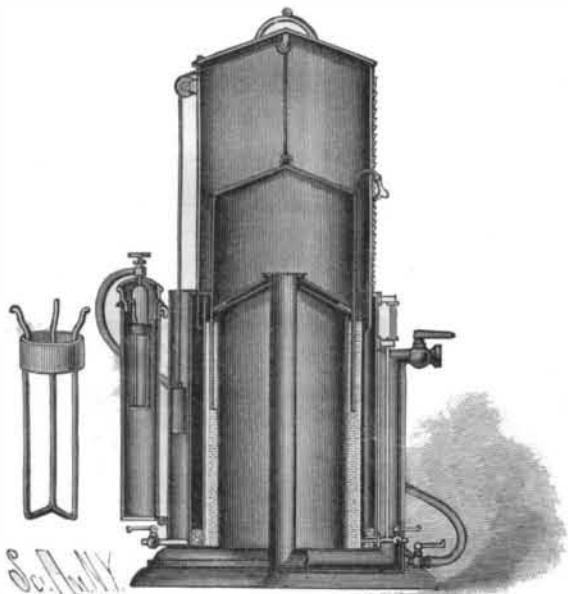
This device—the invention of Mr. G. E. Johnson, of Albion, Ind.—is designed for thoroughly mixing anæsthetics, such as nitrous oxide and laughing gas and ether, at the time they are being used. The neck of a cylinder containing nitrous oxide is held in a yoke formed at one end of the tube in such a way that the gas can pass into the bore of the tube. The inner end of the bore is curved downward, and leads into a chamber the lower end of which is connected by a tube with a gaso-

**MIXING AND VAPORIZING DEVICE FOR INHALERS.**

meter. Projecting upward from the bottom of the chamber is a wire gauze cone, which insures the perfect mixing of the gases as they pass through it. On top of the main tube is held a glass vessel having a screw cover and a gauge, as shown in Fig. 2. From this vessel the bore extends down to a bore in a neck on the end of the tube; a passage also leads to the chamber. In the neck is a screw valve. The anæsthetic liquid is contained in the glass vessel. By properly turning the screw valve, a small quantity of the liquid is permitted to flow into the chamber, where it is thoroughly mixed with the gas; it then passes through the tube into the gasometer.

GASOMETER.
The gasometer, or device, with illustrated, is to be used by dentists and others to produce nitrous oxide. Secured to the side of the outer shell by hooks is a case containing a tripod frame—shown in the small view—for holding the nitrous oxide cylinder, which is connected by a hose with a cock on the inlet and outlet pipe; when the tripod is removed, a larger cylinder can be passed into the case. The valve of the cylinder containing the liquefied gas being opened, the gas passes through the hose and pipe into the bell, which is raised and locked in place by a catch engaging with teeth of racks formed on the outer shell, which is provided for the purpose of covering the bell when the latter is raised.

As the bell ascends, the weight attached to its top by a cord leading over suitable pulleys descends. The

**JOHNSON'S GASOMETER.**

sides of the bell enter the water in a well formed by two cylindrical casings united at the bottom and secured to a base. Between the edges of the double conical top of the inner casing is held a rubber packing which rests against the inner surface of the bell. When the desired quantity of gas is in the bell, the oxide cylinder is closed and the hose uncoupled. To administer the gas, a flexible tube provided with a mouthpiece is coupled on the end of the outlet pipe, and the latch is raised to permit the bell to descend to exert pressure on the gas. Scales are provided, which show how much gas is in the bell and how much has been removed; a glass

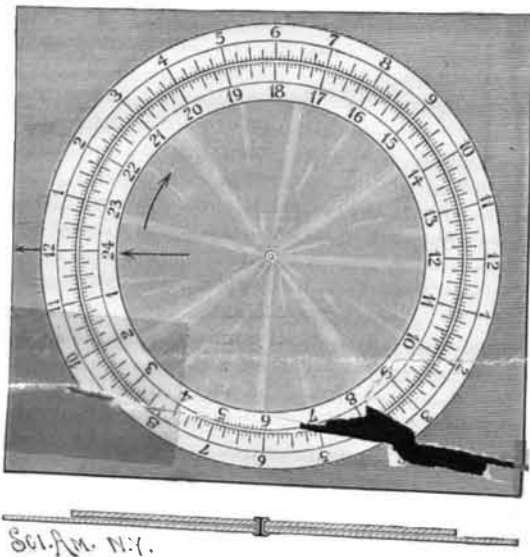
gauge shows the level of water in the well. The space between the outer well casing and the outer shell serves to catch the water that is forced out of the well.

This construction provides a dry gas chamber, and the water forming the seal cannot absorb much gas. The gasometer is small in relation to its capacity, and weighs very little. This invention has been patented by Mr. G. E. Johnson, of Albion, Ind.

TIME CALCULATOR.

This invention provides a simple and easily operated device for the use of time keepers or foremen in manufacturing establishments, to enable them to readily calculate the amount of time consumed by any workman upon any job. A circle in the plate forming the body of the instrument is divided into twenty-four equal parts, representing the hours of the day; each division is subdivided into parts of the hour. The circle is divided into halves, and the divisions in each half are numbered from 1 to 12. Opposite the twelve mark at one side is an arrow to indicate the starting point. Pivoted to the plate is a circular disk similarly divided, but the divisions are numbered from 1 to 24 in the reverse direction. Opposite the twenty-four mark is an arrow.

Suppose, for example, the workman quit at half-past one. The index on the disk is then moved to a point opposite the half-past one mark upon the upper half of the outer circle. He began work at half-past eleven. Now, by following the graduations of the upper half of the scale backward to the mark representing half-past eleven, it will be seen that the mark on the disk opposite half-past eleven is numbered two, thereby indicating that the workman had been employed two hours. It will be seen that the device is simple and easy to handle, and gives perfectly accurate results.

**STRECK'S TIME CALCULATOR.**

This invention has been patented by Mr. S. S. Streck, of 309 Coliseum Street, New Orleans, La.

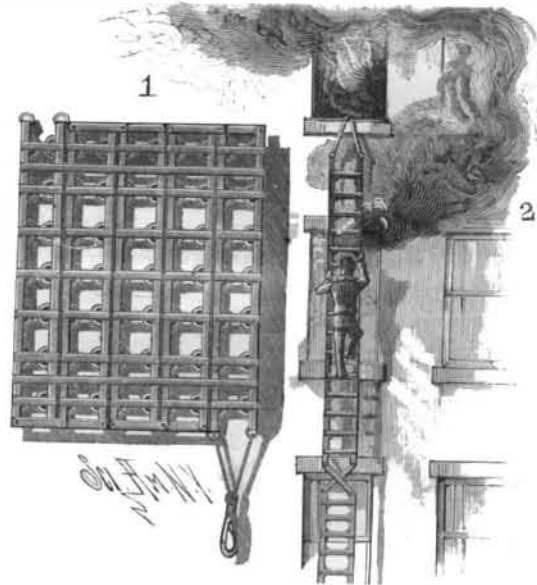
Medical Attendance for Railroad Hands.

The New York elevated railroads have some 4,000 employees, including about 500 repair men, constantly on duty. This is an extremely large proportion of labor for repairs and track inspection, which is necessitated by the peculiar character of the road, and it is a kind of work where the men are particularly exposed to accident and to injury to their eyes. The managers have, therefore, established a regular medical department, with one doctor for the eastern and one for the western division of the city lines, with facilities for prompt communication with any portion of the track. The company pays where men have to be taken to hospital, but its own doctors attend to the slight injuries, which are very numerous. A large satchel, with instruments, bandages, etc., stands ready for emergency, and is carried by the surgeons on duty. Among other functions discharged by the surgeons is the examination of employees for color blindness, sight, and hearing. Those not considered in sound condition are given other and less important positions, where these physical qualities are of less consequence. This medical attendance is without charge to the employees.

COMBINED SPRING BED AND FIRE ESCAPE.

When necessary, the spring bed shown in Fig. 1 can be unfolded and used as a fire escape, as illustrated in Fig. 2. The apparatus is made up of several sections hinged together at their ends, so as to be folded alongside of each other to form a bed bottom, or extended to stand endwise to each other to form a ladder. Each section is composed of two upper and two lower parallel bars or plates, upper and lower cross plates, and springs held between the bars. These sections are hinged together end to end by upper crossed hinge plates that join the ends of the upper bars and lower cross hinged plates that join the ends of the lower bars. The sections can thus be folded side by side, or extended to form a ladder. When folded, they are held from

spreading apart by two binding plates formed with downwardly projecting arms at their ends to reach over the outside edges of the outside sections, and also with arms to reach down between the adjacent edges of the sections. One of the outside sections is attached to any stationary object in the room by means of a strong cord, so that when the apparatus is cast out of the window, it will be securely suspended from the sill. The

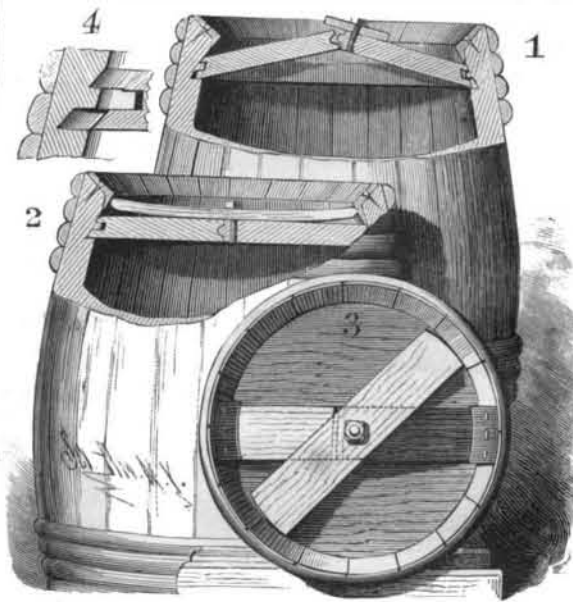
**COMBINED SPRING BED AND FIRE ESCAPE.**

cross pieces of the sections constitute the rounds of the ladder.

This invention has been patented by Messrs. W. G. Wilson and G. Zimmermann; the latter, whose address is 2165 Oldam Street, Philadelphia, Pa., will furnish further particulars.

A NOVEL BARREL HEAD.

The accompanying engraving represents an improved barrel head—the invention of Mr. Francisco J. Oliver, of 43 Cheever Place, Brooklyn, N. Y.—which can be easily placed and locked in position on a finished barrel, or removed from the same without disturbing the hoops, so as to facilitate the inspection, filling, or emptying of the barrel. The head is made in three pieces. The center piece is made in two parts, one of which has on its inner end a projection that fits into a corresponding groove in the inner end of the other part. The form of the beveled periphery of the head and of the corresponding croze in the barrel is plainly shown in the cut; a packing of rubber or other suitable material is placed in the groove of the head; the double joint of the head is made tight and well fitting head. To place the head in position, the side pieces are inserted in the usual way, and then the bevels of the center pieces are placed in the croze directly undershoes fastened to the upper edges of the staves and projecting slightly inward. The inner ends are then fitted into each other, and the two parts are pressed downward to form a straight piece, thereby completing the head. The locking plate, through which passes a bolt secured to the inner end of one of

**OLIVER'S NOVEL BARREL HEAD.**

the center pieces, is then placed transversely over the center part, the bolt passing through an aperture. The plate is then turned so as to cover the center piece, and its ends are placed under the shoes. The nut is then tightly screwed on the bolt against the plate, whereby the entire head is firmly locked in place. The head is removed by first unscrewing the nut, swinging the plate from under the shoes, and then, with the bolt as a handle, raising the center pieces. This head is strong and durable, since it is of the same thickness all over, and it requires no skill to handle it.

Frozen Fish.

The notice of frozen fish in the SCIENTIFIC AMERICAN of March 20 recalls a similar occurrence under my own observation. Several winters ago I purchased in one of the Hartford, Conn., fish markets three frozen pickarel, and carried them home at night. They were frozen perfectly hard and stiff. I placed them in a large tin pan, and filled it with cold water. In the morning my attention was attracted by a flopping at the pan, and I found one of the fish was splashing about as lively as when he first took the bait.

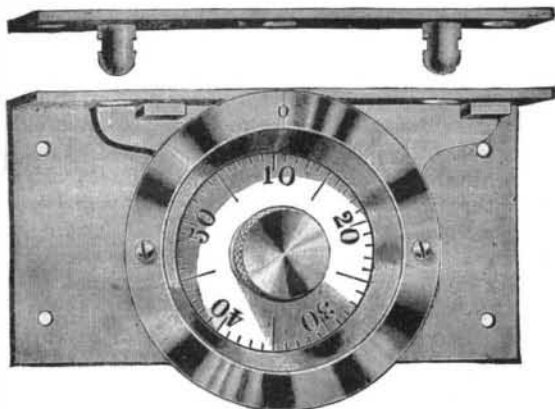
J. H. L.

STEAM DISINFECTER FOR USE IN HOSPITALS.

The importance of having efficient means at command when an epidemic of contagious disorders breaks out in a populous place has been so abundantly proved in this and other countries that great attention has been drawn to the subject, with the view of securing



DIAL OF THE CHAMPION DOOR LOCK.



CHAMPION FLUSH DIAL CHEST LOCK.

the best disinfectant. It has been found by high scientific authorities, says the *Universal Engineer*, that heat alone, without the aid of dangerous chemicals, is sufficient to destroy all the germs of disease, all forms of insect life and low organisms, etc.; and the introduction of steam under regulated pressure into a properly constructed apparatus appears the safest and best method for hospital authorities, etc., to adopt.

Washington Lyon's patent steam disinfecter, as made by Manlove, Alliott, Fryer & Co., of Nottingham, appears to offer a thoroughly practical and efficient means of dealing with bedding, carpets, clothes, etc., without any injury to the fabric and no material damage to colors, as letters and papers can be disinfected without risk of damage. As will be seen from the engraving, the apparatus consists of a large and strong iron chamber, with double walls of boiler plate, provided at each end with a steam-tight door. The chamber is made elliptical in section, to enable large spring mattresses, couches, or bulky articles to be inserted without requiring to be doubled up. Steam from a boiler is admitted into the hollow casing to heat the walls of the chamber. While this is going on, the articles to be disinfected are placed in the traveling cage and rolled into the chamber, the door secured by screw clamps round the edge, and the steam by another pipe admitted to the interior of the chamber at 20 lb. pressure.

The temperature and pressure are regulated by valves and gauges outside, the degrees of temperature corresponding to the several pressures marked on the dial. By employing a higher pressure of steam on the outer casing than in the interior chamber the steam in the latter can be superheated, and consequently dried, preventing the condensation of moisture in the articles while being disinfected. The most approved method of fixing is to place the apparatus midway between two chambers; goods received in one chamber after disinfection are taken out into another chamber, to wholly prevent any contact between the infected and disinfected articles. For rural districts a portable apparatus, with boiler attached, can be made, but a fixed machine in a central position of a

district is the best way. The apparatus has been definitely adopted by the Government, by the Metropolitan Asylums Board, many corporations, and the Government of China have ordered one to be sent to Hong Kong, so that it has successfully passed the experimental stage, and is an acknowledged method of disinfection.

THE "CHAMPION" KEYLESS LOCKS.

Our usual expression for security is that we have placed valuables "under lock and key," but as the lock may be picked and the key lost, this does not always describe the best fastenings. In some of the improved "Champion" locks there is neither key nor key hole. Doors provided with them may be opened from either side, the "Open Sesame" being a knowledge of the combination of figures by which the knob may be made to turn and the door open.

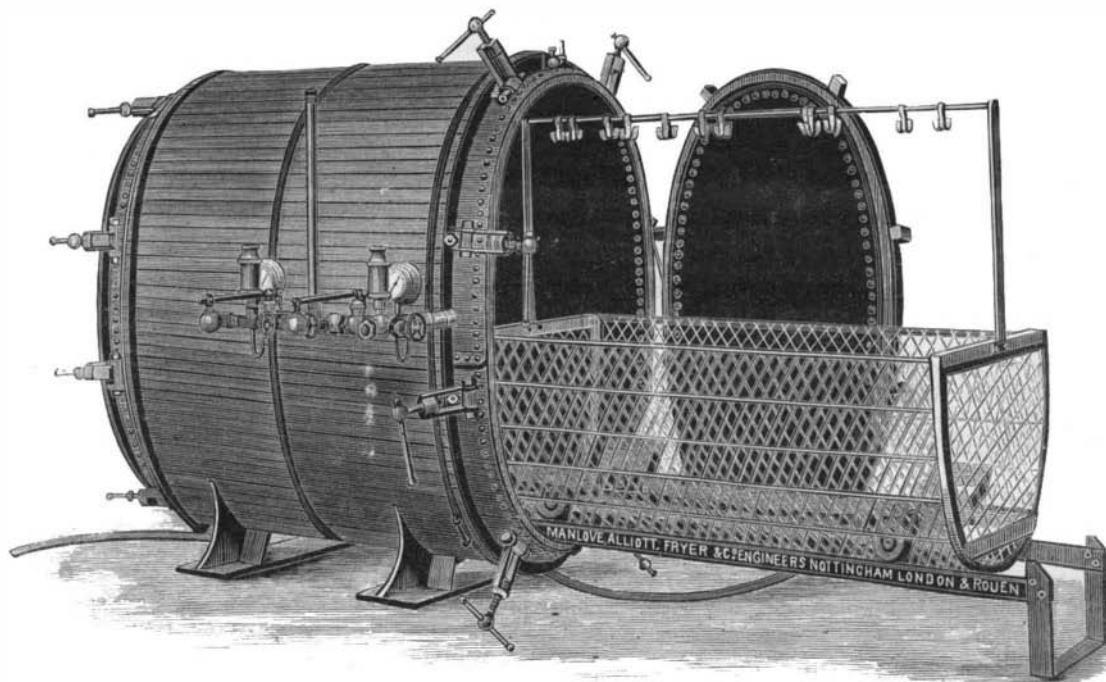
Several forms of these keyless locks are manufactured, the shapes varying according to the purpose for which they are to be used. We illustrate the two forms which will be of more particular interest to builders. The first, known as the "Champion" flush dial chest lock, will be found of much value in protecting a fine set of tools or other shop valuables from theft or the inconvenient curiosity of visitors or borrowing by associates.

As its name implies, the lock is let in flush with the woodwork, that it may not be exposed to injury. It is made entirely of brass, with the dials nickel plated. To open a chest so fastened, it is necessary to know the three numbers which make up the combination. As the possible combinations are almost infinite, there is no chance of the secret being discovered. The numbers may be changed at pleasure, so that, should the combination become known to any undesirable person, it is a simple matter to change it. In construction, the lock is strong and reliable, and being so much more simple, it can be opened in much less time than an ordinary safe.

Perhaps it may be feared that the combination might be forgotten, but it must be remembered that a key is not only liable to be left behind, but as well to be lost or duplicated. The combination necessary for the unlocking of a keyless lock may be recorded in any number of places, and in such a way that detection would be impossible. The beveled form of the numbered dial is considered preferable for a great many purposes, but these minor details are susceptible of a large variety of designs.

The second lock illustrated, the "Champion" keyless door lock, is, we believe, the first keyless dial lock applied to a wooden passage door. We show it in section, and also the outside and interior parts, which are visible when it has been applied to a door. The difficulty heretofore has been to control the fastening from both sides. As now arranged, the door may be opened from either side, and the lock may be put in place with little trouble. The section shows its construction.

The smaller part of the cylinder, A, is screwed into the ring, R, on the outer face of the door. The spindle is then put in, and the under plate, U, of the bolt case is laid against the inner face of the door. The screws, CC, secure this plate to the cylinder, A. The lock is adjustable to any door. The mechanism by which the dial piece, D, operates the bolt is connected with the bar, B. Before the case is put on, the combination is to be set, in a manner described in the directions accompanying each lock.



STEAM DISINFECTER FOR USE IN HOSPITALS

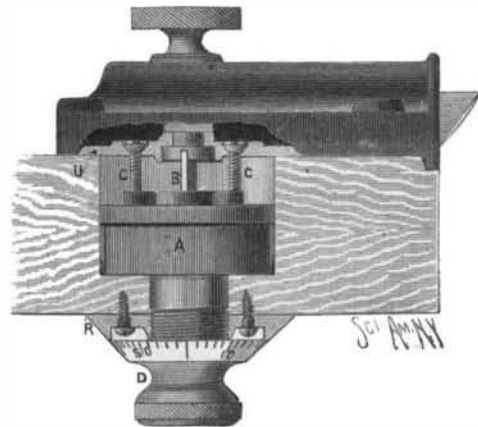
By means of the latch shown on the inner side of the case, the bolt may be "thrown off," as in ordinary night latches. But a single revolution is required preliminary to unlocking, and the combination is made

directly by turning at once to each of the three numbers. The simplicity and strength of the lock adapt it for use in the best houses. The dial, shown full size in our illustration, may be either nickel plated or bronze.

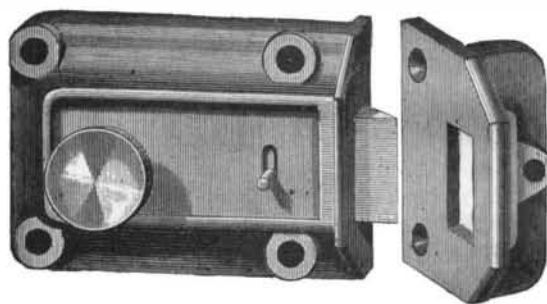
The Champion locks are, for the most part, the invention of Milton Jackson, now Manager and Treasurer of the Miller Lock Co., of Philadelphia, who are the sole manufacturers, and to whom all further inquiries should be addressed.

The Fattening Effect of Chewing Gum.

A Southern paper (*Macon (Ga.) Messenger*) says: "Twenty years ago the rule was that Southern women



CROSS SECTION OF CHAMPION KEYLESS DOOR LOCK.



INSIDE LATCH OF CHAMPION DOOR LOCK.

were thin and delicate; it is not the rule now. Southern women are not physically equaled in all North America. Any physician who is as well informed as he ought to be will tell you that this is true. This change is due to the habit of chewing gum. You may smile, you may even laugh, if you please, but I am telling you a plain fact. As to Southern men, they are as thin and gaunt as they ever were, and so they will remain until they cease to chew tobacco and begin to chew gum."

Liquid Carbonic Acid.

A patent recently taken out proposes to produce the carbon dioxide gas for liquefaction by having a solution of sodium bisulphate in a leaden container, and running into it some carbonate or bicarbonate, dissolved or suspended in water, the evolved carbon dioxide being drawn off over a drying mixture into a gasometer, from which it is drawn for liquefaction by compression. Liquid carbonic acid, equal to 500 liters of gas at ordinary pressure, can be supplied for one shilling. In using this for various purposes, it is proposed to pass the gas that escapes after using over moist sodium carbonate, which is thus converted into bicarbonate, which can be again used as a source of supply of the carbon dioxide. There is a bore hole near the village of Burgbrohl, on the Rhine, which yields a constant supply of very pure carbon dioxide. This village is near to the Lake of Larch and the interesting volcanic district surrounding it, where there are a very large number of mineral springs and exhalations of carbon dioxide. This bore hole was sunk some two years ago, and has given a constant supply of gas amounting to about 2,160 cubic meters per twenty-four hours. Apparatus has been erected for liquefaction of the dioxide, and this is now regularly carried on close to the bore hole. The water which rises with the gas is very cool, and is employed to cool the

compressing apparatus. About 500 liters of gas are compressed per minute into about one liter of liquid. This is sent away in wrought iron vessels containing about eight liters,