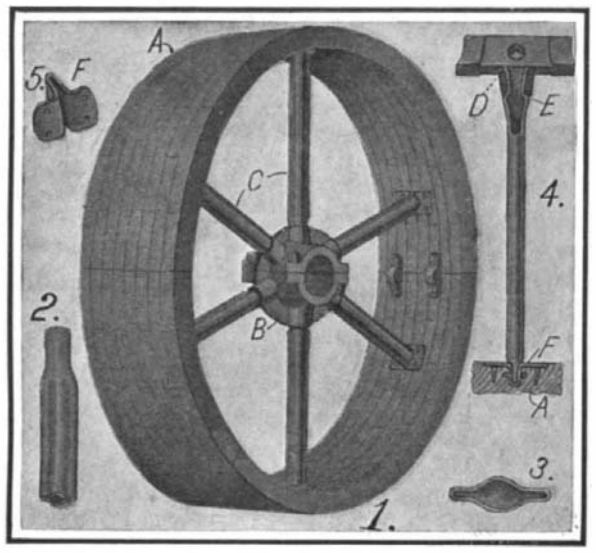
Patent Department

A NEW TYPE OF SPLIT PULLEY.

The pulley illustrated in the accompanying engraving has been designed with a view to combining the advantages of the wooden type with those of the steel



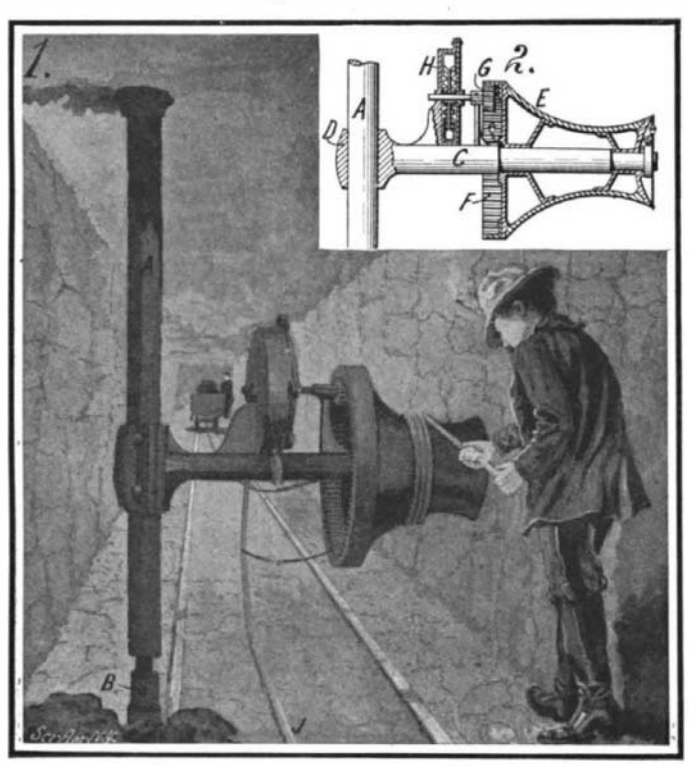
A NEW TYPE OF SPLIT PULLEY.

type of pulley. In the improved construction a wooden rim *A* is used with a metal hub *B* and spokes *C*. The spokes or arms are attached to the hub and rim without rivets or screw-threaded parts. They are made of seamless steel tubing pressed into a ribbed form, as shown in Figs. 2 and 3, so as to increase their rigidity. The hub, which is preferably of malleable iron, is formed with bosses, each of which is provided with a double-tapered orifice. The arms are driven into the orifices in the bosses, and by means of a swage their inner ends are flared out so as to fit the orifice and form a flange, as indicated at *D* in Fig. 4. The spoke is also formed with a flange *E*, which fits against the outer surface of the boss. Thus the arm is held against radial movement in the hub. The opposite end of each arm is flattened to enter a saddle *F* (Fig. 5) which is fitted into the wooden rim of the pulleys. The arm is secured in the saddle by means of a pair of transverse pins, which pass therethrough and enter the wooden rim. It is to be understood that the hub and spokes are first completed, and then the rim is built up and the saddle is fitted into the rim during its construction. The saddles are also made fast to the rim by means of screws. This pulley, it will be observed, combines the strength of the steel pulley at the hub with the lightness and friction surface or grip of a wooden pulley. The construction is very strong, and not liable to break apart in use.

A patent on this improved pulley has been secured by Messrs. R. H. Noble, T. C. Hook, and C. S. Hook of 79 Victoria Street, Toronto, Ontario, Canada.

PORTABLE WINCH.

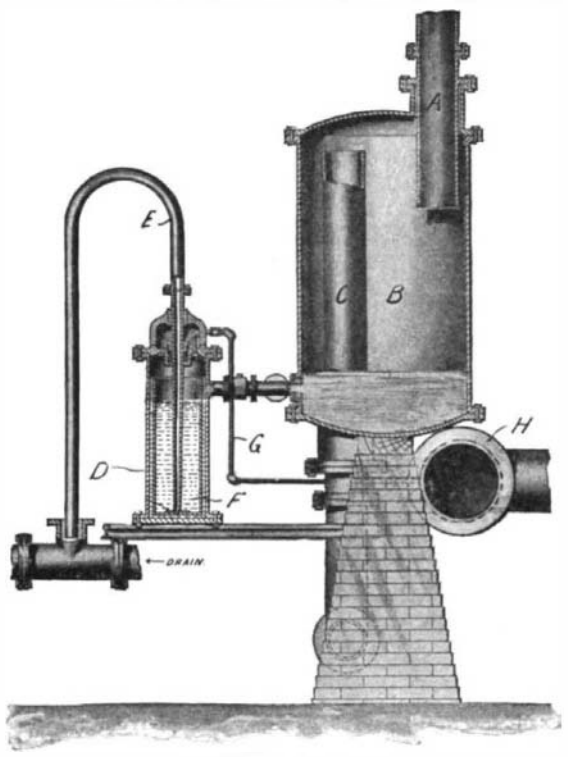
The transfer of heavy material along the low, narrow drifts of a mine may be greatly facilitated by the use of a winch, such as illustrated in the accompanying engraving. This winch is arranged to be attached securely upon the walls of the passage, but in such a manner that it may readily be removed and set up at any other point, as the transfer of material may require. A post, *A*, is provided which is adapted to be used in connection with an adjustable extension piece, *B*, of suitable length to secure the post in upright position between the floor and roof. Extension pieces of different length are furnished to provide for passageways of different height. An arm, *C*, is fastened by means of a clamp, *D*, to the post *A* at any convenient height thereon. A windlass drum *F* is mounted in turn on the arm *C*, being held in place by a collar secured to the end of the arm. The inner end of the drum is provided with an internal gear, *F*, meshing with a pinion *G*. The latter is secured to the shaft of a motor, *H*, which is preferably a turbine propelled by means of air or steam fed through the pipe *J*. Any suitable means may be used for controlling the motor so as to start, stop, or reverse the winch *E*. Owing to its simplicity and portability many useful applications for the winch should be found in a mine. Mr. Charles Wick, of Bingham Canyon, Utah, has just secured a patent on this improved winch.



PORTABLE WINCH FOR USE IN MINES.

AUTOMATIC DRAIN FOR COMPRESSORS.

In certain types of gas compressors it is common practice to inject water either into the compressor or into the discharge pipe therefrom, so as to remove the heat of compression. The accompanying engraving illustrates an apparatus designed to separate the water from the gas automatically, after it has absorbed its quota of heat, and withdraw the water from the separating chamber while maintaining a constant water



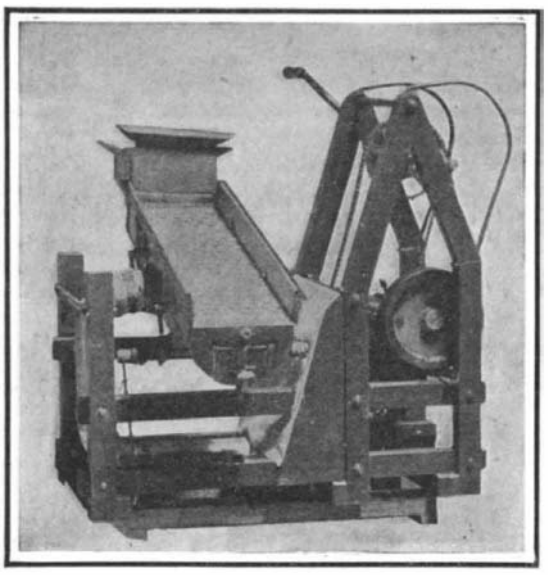
AUTOMATIC DRAIN.

level in the latter, at the same time preventing the loss of any gas withdrawn from the separating chamber in solution in the water. As shown in the illustration, the gas and water, under high pressure, enter, by way of pipe *A*, the separating chamber *B*. The gas passes through pipe *C* to the storage chamber, while the water collects in the bottom of the separating chamber *B*. A pipe connects the chamber *B* with a float chamber *D*, from which a siphon tube *E* leads to the drain. The siphon tube reaches nearly to the bottom of the float chamber *D*, and its lower end is adapted to be opened or closed by means of a float *F* in this chamber. The float *F* is in the form of a cylinder open at the upper end, while within the float at the bottom is a gasket, which is adapted to be pressed against the end of the siphon tube when the float is buoyed up by the water in the float chamber *D*. As the water accumulates in the float chamber *D*, it overflows into the float *F*, and gradually weighs it down until the end of the siphon tube is uncovered. Thereupon the water in the tube is siphoned off until the water level in the float is lowered to such an extent that it will rise again and close the tube. The end of the siphon tube *E* is so far below the level of the water, that there is no possibility of the gas flowing off therethrough, and the water level in the float chamber *D* remains at approximately the level of the upper edge of the float, hence it always covers the inlet pipe connecting the chambers *B* and *D*. This prevents gas from escaping directly from chamber *B* into chamber *D*; but even should any gas escape into chamber *D*, it would be carried off through the pipe *G* to the suction pipe *H* leading to the compressor. Mr. William D. Mount of Saltville, Va., has secured a patent on this drain for compressors.

PANNING WITHOUT WATER.

BY ROLAND ASHFORD PHILLIPS.

No longer need the patient prospector have water in order to pan his gold-bearing sand and gravel; no longer must he turn his back upon the great stretches



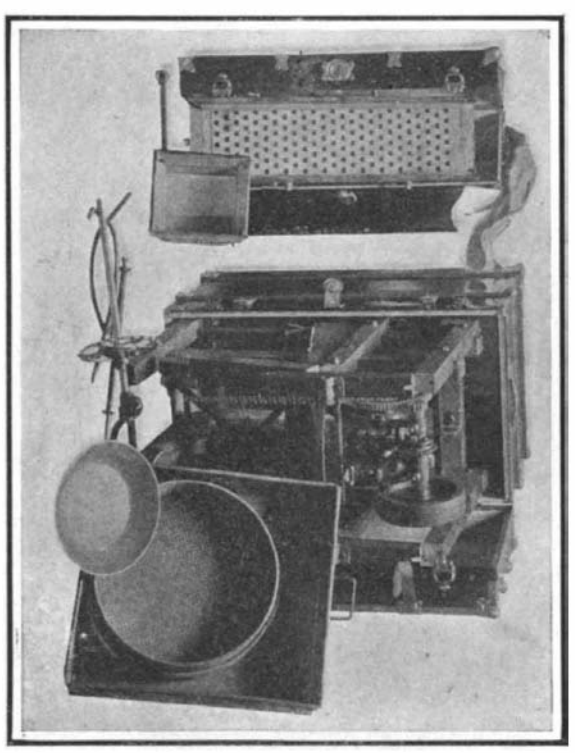
SIDE VIEW OF DRY-GOLD-WASHING MACHINE SET UP READY FOR USE.

of desert because water is not available. For now comes the "dry" machine, using air, which is always available, and which it is claimed will save every bit of "color" that water would save and do the work more expeditiously.

The one crank operates both machine and blower. The sand and gravel are fed in at the hopper on top and allowed to run down the sluice quite in the same manner as in hydraulic sluicing. Here, however, the sluice itself, operated by a simple eccentric, is given a side-shake motion to further separate the particles and to increase the travel of dirt through it.

As may be seen in the illustration, the bottom of this sluiceway contains a series of riffles. These in themselves are unique, and prove to be the vital part of the invention. Instead of projecting above the surface of the sluiceway, as in most sluice boxes, they consist of a series of depressions. Each depressed riffle or pocket is straight across at the upper edge, sloping at the sides, curved at the lower edge, and having the bottom of the pocket so formed sloping in the opposite direction to the inclination of the sluice. The metal forming the bottom of each pocket is continuous at its lower edge with that of the sluice but terminates at the upper end of the pocket at a point vertically below the upper edge of the pocket. The opening thus formed in each pocket is covered with a fine wire screen.

Under the sluiceway is a chamber, air-tight except for the screen-covered openings of the pockets, into which the air is led from the blowing engine. This air, escaping through the upper opening in each pocket, effects an agitation of the gold-bearing material, forcing all the lighter stuff gradually to the top and this, of course, is allowed to run down the

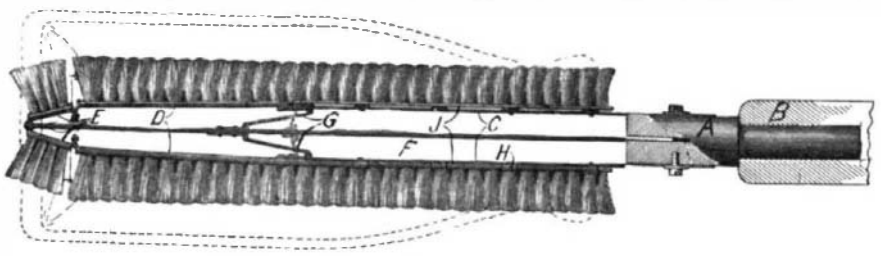


TOP VIEW OF MACHINE, TAKEN APART AND PACKED IN TWO TRUNKS.

incline and is dumped. A clean-up simply means an unlocking of the riffles and the brushing out of the heavy deposit that remains in the multitude of pockets.

The pan shown in the illustration, and furnished with each machine, holds approximately one-twentieth of a cubic yard of gravel. Or, in other words, seven times as much as the ordinary pan. This amount of material can be run through the machine in about five minutes. Afterward the riffles are cleaned, the deposit saved, and a note taken of the location. In his spare moments the prospector can compare notes and find out the most valuable location for serious work. In this manner a man can travel over a great stretch of ground in a remarkably short time, and, when completed, can decide upon the spot that has given him the most "colors."

The advantages of this machine are obvious even to those who do not understand mining. What appears to be of the most vital importance is the fact that the prospector can go anywhere and at any time, without fear of not finding water. This means that the countless thousands of acres of desert and arid lands, known to be extremely rich in gold-bearing sands, yet destitute of moisture, can now be easily and thoroughly prospected.

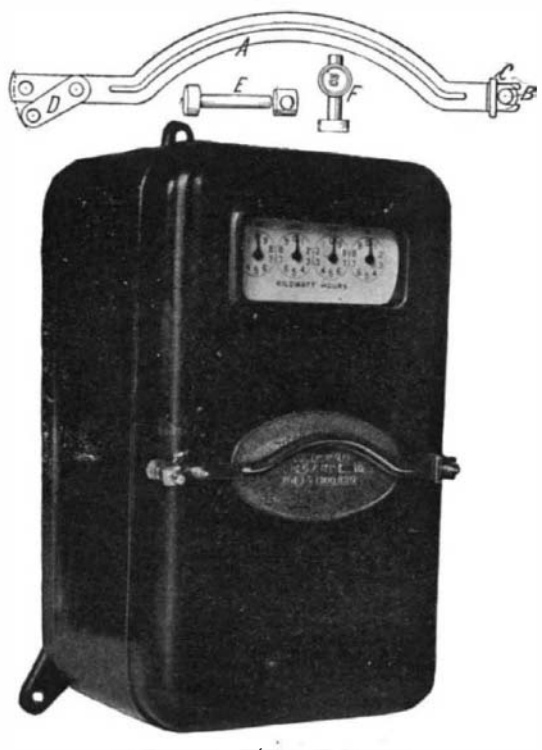


EXPANDING BRUSH FOR CLEANSING BOTTLES.

A great number of these machines are in daily operation, especially in the arid regions of Colorado and Nevada, and their success is vouched for by the many prospectors who are only too happy to be free to go where they choose and be rid of the drudgery of the crude pan and primitive methods that previously existed. Not the least advantage of this prospector's machine lies in the fact that it can be readily taken apart and shipped in two trunks, as the illustration shows. Packed thus, and checked as baggage, it will hardly weigh over 200 pounds. Unpacked, and set up, the weight is 180 pounds, and one man can carry one without much trouble.

LOCK FOR ELECTRIC METERS.

A very simple and inexpensive lock has recently been devised for use on electric meters. The lock cannot be opened without breaking a seal, and hence it will reveal any tampering with the meter by an unauthorized person. The lock is particularly adapted for that type of meter in which the cover is secured by two studs on which a pair of keepers are threaded. It comprises a bar, *A*, which extends across the face of the meter, and is made fast to the two keepers in such a way as to keep them from being unscrewed from the studs. One of the keepers, which is screwed onto the stud *B*, is provided with an outwardly projecting flange *C* in which there is a slot. When this keeper has been screwed down against the cover of the meter one end of the bar *A* is passed through the slot. This end of the bar is bifurcated so as to fit around the stud *B*, as shown in the drawing. The stud at the other side of the meter passes through an aperture in the bar *A*, and the keeper *D*, which is screwed onto the stud, serves to hold the bar against the meter. The keeper *D* is provided with an aperture adapted to be brought into register with an aperture in the bar, and when the keeper has been screwed home a seal is passed through the two apertures. The seal consists of a leaden stud such as shown at *E*. On the projecting shank of the stud a collar of lead is fitted, and, by means of a punch, both collar and shank are flattened and jammed together, while an impression is left on the seal as indicated at *F*. It will be observed that the locking bar *A* is curved so as not to cover the volt and ampere readings of the meter. A patent on this improved lock has been granted to Mr. Joseph H. Jackson, of 343 Atlantic Avenue, Brooklyn, N. Y.



LOCK FOR ELECTRIC METERS.

EXPANDING BRUSH FOR CLEANSING BOTTLES.

A new form of brush has just been invented, which is so arranged that after it has been introduced into the bottle, it may be expanded to conform to the shape of the bottle, and thus render the cleansing of the interior more thorough. While the device is particularly adapted for cleansing milk bottles, it may also be employed advantageously for other purposes in which it is necessary to introduce a brush through a small mouth or neck. In our illustration the head *D* of the brush is attached to the spindle *B* of the bottle-washing machine. Secured to the head are two flexible strips *C* of spring metal. Attached to these flexible pieces are a pair of extension strips *D*, which at their opposite ends are connected by a pair of hinged leaves *E*. A controlling slide *F* is attached to the leaves *E* at one end, while its opposite end enters a slot in the head *A*. The controlling slide *F* is connected to the flexible strips *C* by means of links *G*. The backs which carry the bristles of the brush are directly secured to the strips *D* and leaves *E*; but in the case of the flexible strips *C*, clips *H* are provided, which are riveted to the strips *C*, and are arranged to have sliding engagement with flexible backs *J*, on which the bristles are secured. The operation of the device is very simple. When the brush is introduced into the bottle, the controlling slide *F* comes in contact with the bottom of the bottle, and is thus forced back into the slot in the head *A*. This causes the leaves *E* and links *J* to swing open, thereby expanding the brush to conform with the inner contour of the bottle. Messrs. John J. Heywang, Jr., and Minard Slater of 201 West 73d Street, New York city, have secured a patent on this expanding brush.

APPARATUS FOR PURIFYING WATER BY THE INJECTION OF OZONE.

The apparatus shown in the accompanying engraving purifies water by the introduction of ozone through an aspirator. Either direct or alternating current (usually at 110 volts) is taken from the ordinary electric-light circuit and by a transformer is stepped up to about 8,000 volts. This high voltage produces in the ozonizer (a box containing alternate plates of aluminium and micanite) a slight electric discharge, generating ozone from the air drawn through the ozonizer.

The water to be treated flows, under its own pressure, from the city mains through the pipe to its highest point, and in descending draws the ozone, by means of an aspirator, from the ozonizer, the water and ozone thoroughly commingling. This action is continued during the progress of the water in its descent into the glass sterilizer where the ozone ascends in millions of minute bubbles, again coming into intimate contact with all parts of the water and destroying the bacteria therein. The ozonized water then finds an outlet at the top of the sterilizer and may be conducted into any suitable storage receptacle for future use.

The reason for this destruction of the bacteria by the ozone is very simple. Chemical analysis of the bodies of bacteria shows that they are made up of about 84 per cent of water and 16 per cent of solids. Of these solids more than half is made up of carbon. Ozone, being a concentrated form of oxygen, has a very great affinity for carbon; and the moment a bacillus comes in contact with a bubble of ozonized air the carbon of its body combines with oxygen, and the bacillus is consumed as completely as if it had touched a flame. The product of combustion is carbonic acid, which is partly absorbed by the water, the excess rising to the surface of the water and passing off into the air.

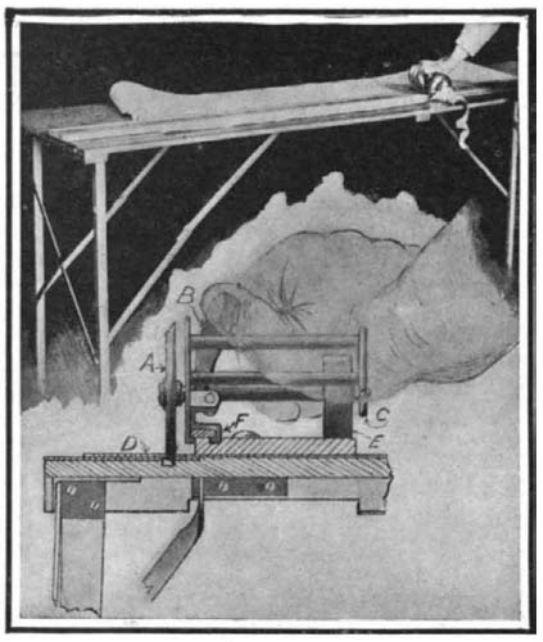
The cost of purifying water by this process is but a small fractional part of a cent per gallon.

With six feet of overhead space the apparatus is capable of purifying 4,000 gallons of water per day, and can be accommodated on a shelf three feet long and one foot wide, the area required being only slightly increased for larger installations.

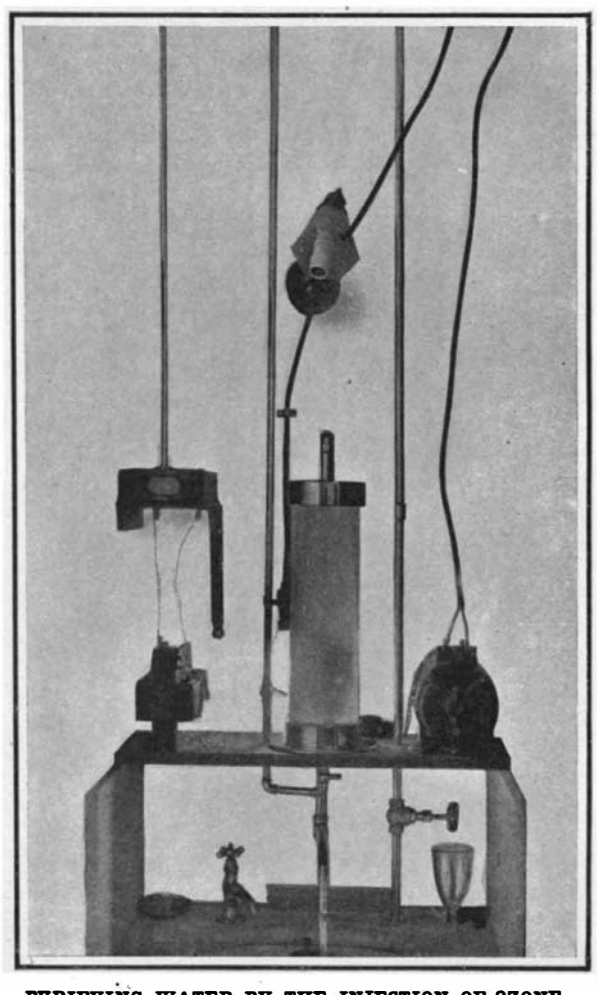
PAPER HANGER'S TRIMMER.

Pictured in the accompanying engraving is a paper hanger's table of improved design with a device mounted thereon, whereby wall paper may be cut and trimmed with clean edges. The table is of the folding type, and is so arranged that when folded it occupies an unusually small compass. The surface of the table is inlaid at one edge adjacent to the cutter with strips of wood of different color, and is provided with a scale extending at right angles to the inlaid strips. This serves as a gage for cutting the paper to the desired dimensions. The cutter may be removed from the table top when it is desired to fold the table. The sectional view in our engraving shows the details of the cutting device. It consists of a cutting wheel or disk *A*, which is arranged to be moved laterally by means of a thumb lever *B* against a straight edge so as to insure a clean cut. The shaft on which the cutter wheel is mounted carries a roller *E* at the opposite end, which is pressed against the table by the operator when moving the cutter over the paper *D*. To protect the hand from the rotating parts, a cage *C* extends over the shaft and roller *E*, and this is grasped by the hand of the operator with the thumb conveniently placed on the lever *B*. The carriage on which the cutter is mounted is provided with fingers *F*, which engage a guide rail mounted on the table top parallel with the straight edge. Were it not for the lever *B*, which enables the operator to press the cutting disk *A* against the straight edge, any inequalities in the guide rail would separate the wheel slightly from the straight edge, causing a ragged cut of the paper.

The inventor of this improved paper hanger's trimmer is Mr. E. E. Gobie, Brattleboro, Vt.



PAPER HANGER'S TRIMMER.



PURIFYING WATER BY THE INJECTION OF OZONE THROUGH AN ASPIRATOR.