Improved Awning.

The common style of awning necessitates the employment of posts and a front rail, to which the awning is quite commonly attached with cords. When a roller is employed to wind up the awning, cords and rollers must also be attached to the front rail, but these are apt to get out of order and cause delay, when, in the case of severe storms of wind, it is desirable to take in the awning quickly. The awning is also liable to get wet while on the roller and mildew, unless a protective covering of board is constructed to shelter it, the latter presenting an unsightly appearance if sufficiently extended to afford the proper shelter.

Miller & McClellan's improved awning, engravings of which are herewith presented, obviates the necessity for posts or supports at the front edge, provides a neat and effective shelter for the awning when rolled up, is perfectly easy to spread out or roll up, is simple in construction, and remarkably tasteful in appearance. It can be fully or partially extended to admit or exclude light without the aid of a step-ladder, and in a moment's time.

Fig. 1 is an engraving of the awning extended, a portion of one of the side flaps of the awning being removed to show a device for sustaining the roller at the middle.

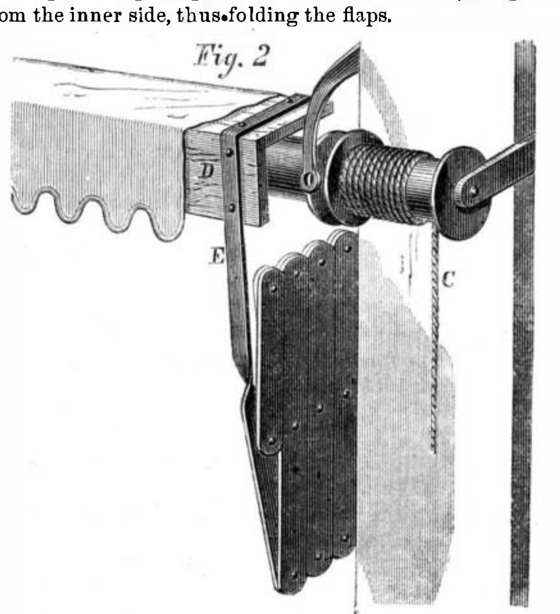
The frame is formed of two lazy tongs, shown extended in Fig. 1, and folded at A, Fig. 2. A coiled spring on each side, one of which is shown at B, Fig. 1, exerts a force sufficient to keep the lazy tongs extended when no resistance is offered to its action. A cord, C, Figs. 1 and 2, is wound upon the roller when the tongs are extended. When the slack end of this cord is pulled it unwinds, at the same time turning the roller and winding up the canvas.

The front edge of the canvas is attached to two thin boards fastened together at right angles, as shown at D, Fig. 2. These boards are attached to the outer link of the lazy tongs, E, Figs. 1 and 2, as shown, thus forming a rail to which the front edge of the awning is attached. The action of the cord, C, in winding up the canvas pulls this rail inward, and, when it is completely drawn in, the outer link, E, of the lazy tongs carries it up over the roller, forming a complete shelter for the awning. When extended, the portion of the board shelter which is over the top of the roller in Fig. 2 assumes a vertical position, as shown in Fig. 1. The board shelter is covered on the outer side by canvas like the awning, which gives it an ornamental appearance, both when the awning is extended and when it is wound up.

MILLER & McCLELLAN'S IMPROVED AWNING.

A pair of supporting rollers at F, Fig. 1, serve to keep the main roller from sagging; and the resistance of the coiled spring, B, together with the action of these rollers, secures smoothness in winding.

The side flaps are run on cords with rings, which also wind up on the principal roller and slide the rings together from the inner side, thus folding the flaps.



We consider this form of awning as far superior to any form of canvas awning heretofore employed, combining, as it does, durability, convenience, and comeliness.

This invention was patented Nov. 12 and 26, 1867, and has been assigned to J. B. Armstrong, President National Bank at Urbana, Ohio.

Communications concerning purchase of rights or licenses should be addressed to Mr. Armstrong as above.

The Friction of Water in Tubes.

The friction or resistance which water encounters in its passage through tubes is much greater than generally supposed. The amount of resistance depends materially upon the smoothness of the walls of the pipe. This resistance is due to the particles of water, which, on coming in contact with the irregularities of the inner surface of the pipe, are thrown out of their true course, and thereby are not only delayed themselves, but impede the motion of other particles, in their onward flow. Experiments have proved that an inch tube 200 feet in length, placed on a level and connected as a discharge pipe from a tank, delivers only one fourth as much water as escapes through a simple orifice in the tank, of the same diameter as the pipe.

Air passing along tubes, is also much retarded, as miners who are obliged to employ such tubes for the ventilation of their mines, are well aware. It is on record that a person connected with a mine in Europe, without properly considering this fact, once erected a heavy bellows, for ventilating purposes, at a water-power two miles from his mine. When he set his apparatus in operation, he found it totally useless, his power was entirely taken up in the friction of the air through his two miles of pipe.

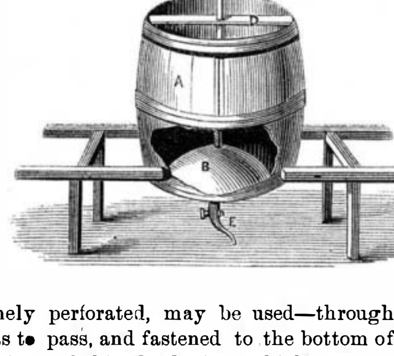
It is a singular fact that the friction of a liquid decreases in proportion as its temperature is increased. This is supposed to be due to a diminution of the cohesive properties of the particles of such liquid. It is well known that the more cohesive the liquid is, which is passed through a tube, the greater the friction and the slower the flow. This is apparent in the comparative flow of such liquids as water, oil, and sirups.

The velocity of water issuing from an orifice is as the square root of its altitude. Thus, calling the velocity of pressure under one foot, 1, the issue under 4 feet pressure will be 2; 9 feet 3; 16 feet 4; and so on. A *short* tube is found to discharge water much faster than a simple orifice in a vessel, without a tube; the difference in favor of the tube is nearly one half. This is due to certain peculiarities in the flow of liquids which can only be explained by the use of diagrams.

The simplest way of ascertaining the rate of discharge from an orifice, such as a pipe, duct, or drain, is to measure the quantity discharged in a given time. Such mode of determination may be readily employed where limited discharges only are in question.—*Mining and Scientific Press.*

A SIMPLE FILTER.

We give an engraving of a simple form of filter which may be of use to some of our readers, as we receive frequent inquiries upon the subject. A represents half a hogshead barrel; B a porous stone basin about 18 inches deep and 3 inches thick—or a double-wall box, having the space between the walls filled with clean sand and charcoal, and the walls finely perforated, may be used—through which the water has to pass, and fastened to the bottom of the barrel. C is a piece of thin lead pipe, which passes through the water to introduce air into the porous basin; D is the cross-piece to support the lead pipe; E is a tap to draw off the pure water, screwed in the bottom of the barrel. A small bunghole may be made in the side of the barrel to let off the refuse water when it requires cleaning.



When the porous stone vessel is used it may be cemented to the bottom. The wooden box, which will answer equally well, may be nailed fast.

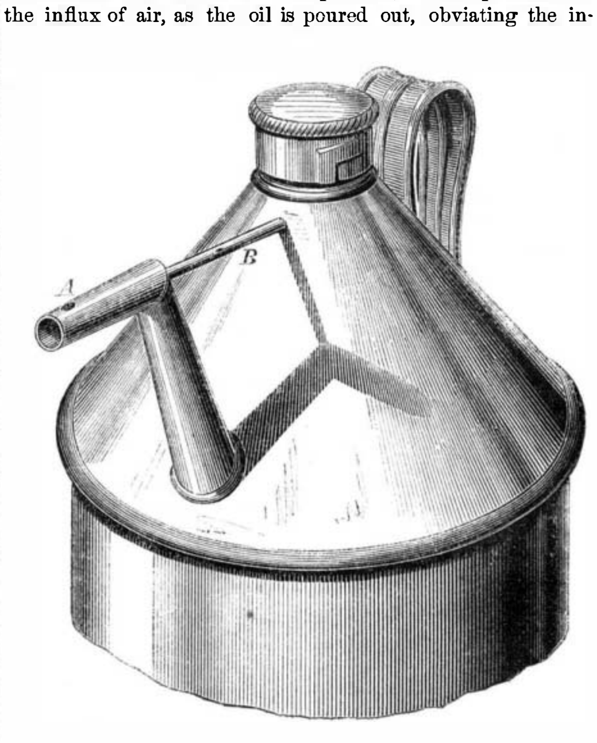
How to Choose a Steam Engine.

"Which is the most economical steam engine?" is a question often asked in these days of steam power.

What is meant by this question is, of course, which will take the least fuel? As the steam engine is quite simple in its best estate, there are but few points to consider in making the choice. It is not, however, the engine which is constructed in the most simple manner, or with the fewest parts, that is the most economical; for if this were the case, the best piston engine would be the one with a single slide valve like our locomotives. Such engines involve considerable waste of steam on account of the large passages between the valve and the piston; they involve also the necessity of exhausting through the inlet passages. These are grave objections when economy is the object sought, and it has been found far better to submit to a little complexity and have these objections removed; consequently the most economical engines are now made with four valves, viz., two inlet and two exhaust valves. The exhaust passages are made more than twice the capacity of the inlets, so that the piston is at once relieved of all counter-pressure, and receives the full value of the acting steam. Besides this, the valves are placed close to the ends of the cylinder so as to shorten the passages as much as possible. The loss of steam in some of the present locomotives amounts to some ten per cent. The boiler should be of such capacity and construction as to generate abundance of steam without a blower or extra draft, and the fire should be surrounded, except at the bottom, with generating surface. If wood is the fuel, the boiler ought to be longer than when coal is used. In either case the draft passages in and around the boiler should not extend longer than the heat maintains its generating power. The locomotive boiler may be considered one of the best type, but it must be of the best material and workmanship, else it will give much trouble. It should be surrounded with brick-work if used for stationary engines.—*Railway Times.*

H. W. STAPLE'S AUTOMATIC LAMP FILLER.

Our engraving represents an improved lamp filler called by its inventor the "Automatic Lamp Filler," which provides for the influx of air, as the oil is poured out, obviating the inconvenience caused by the lack of a vent in the old style of lamp fillers. A small tube, B, leads from the vent in the nozzle of the filler back to the breast of the can, which it penetrates. This tube is soldered to both nozzle and breast of the can, and forms not only a strong brace but permits the air to enter while pouring out the oil.



The ordinary cap, or a cork thrust on to the nozzle in the ordinary way stops at once both nozzle and vent.

This lamp filler was patented, through the Scientific American Patent Agency, Oct. 19, 1869, by H. W. Staples of Saco, Maine, for State rights or licenses to manufacture, address Howard Tilded, 63 Cornhill, Boston, Mass.

THE mechanical condition of surfaces does not wholly determine friction. Much depends upon the adhesive attraction of bodies, as to whether friction will be a maximum or minimum.