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Improvement in Feeder for Wool Breakers.

This machine supplies what has long been a great want of the woolen trade, and will doubtless be received as such by those interested. It feeds the wool on to the first breaker card evenly, thus saving a large amount of labor and insuring uniformity of work, which has been impossible by hand feeding. In the accompanying engravings, A is a box into which the wool is loosely thrown, B is an ordinary slat apron, carrying the wool forward toward a vertical apron, C, which is furnished with spikes or forks, which continually lift the wool from the apron, B, to the shorter apron, F, which carries it forward to the feed rolls, H. G is a picker roll, which performs the double function of preventing any large locks of wool from passing on to the apron, F, unopened, and also of keeping the fan, D, clear of wool. I is a movable plate of sheet iron, which with the apron, F, forms a throat for the reception of the wool, and the size of this throat can be enlarged or reduced by raising or lowering the iron plate, I, which is readily done. The operation of the machine is briefly as follows: The wool thrown into the box is carried forward and upward by the two aprons, B and C, to the short apron, F, and is delivered in larger quantities than is required by the card. At this point it is blown by the fan, D, into the "throat," which is thus always kept full, and the surplus is returned to the box, as shown in Fig. 2. It will be manifest to all who examine the subject that the size of the throat will regulate the quantity of wool delivered to the card, which has hitherto been entirely controlled by the speed of the feed rolls. This can still be governed in the same way if preferred, so that any weight of roving can be produced.

This machine was patented August 23, 1864, and is offered for sale by Harwood & Quincy, 25 Bromfield street, Boston, Mass., who will supply all information regarding it.

Improvement in Steam Boiler Gage Cocks.

Sometimes the gage cocks of a boiler become worn and leaky, and it is necessary to re-seat their valves. This can be done only when the steam is down. The object of the peculiar construction of the cock shown in the accompanying engravings is to allow this necessary work to be done at any time, when there is a full head of steam on as well as when the boiler is cold. This is effected by forming the cock in two parts, both of which are furnished with valves, one opening outward and the other inward.

The part, A, has a threaded stem with nut formed on it for seating it in the boiler head, B. The outer end of A is of reduced size and also threaded to receive the part, C, the shoulders of A and C coming together when the parts are united. The bore of A is slightly conical and receives a valve seat, D, in which fits the inward opening valve, E. The part, C, has also a valve seat, F, in the outer end of which is seated the valve, G, operated by the screw, H, and handle, I, in the usual manner. The valve, G, is seated in the screw, H, by means of a thread, as seen. The inner valve, E, is provided with a stem, J, of such a length that its end bears against the inner surface of the valve, G, except when the latter is moved out much further than is necessary to try the steam or water, or the part, C, is wholly removed from the fixed portion, A. In such a case the pressure of the steam closes the valve, E, preventing the escape of steam or water from the boiler. This allows the removal of the part, C, for repairs or re-seating the valve, when the remaining valve, E, can be operated as a try cock by pressing on its projecting stem, J. In ordinary use, when the parts are joined, this stem prevents the closing of the valve, E, and allows the steam or water to escape through the opening, K.

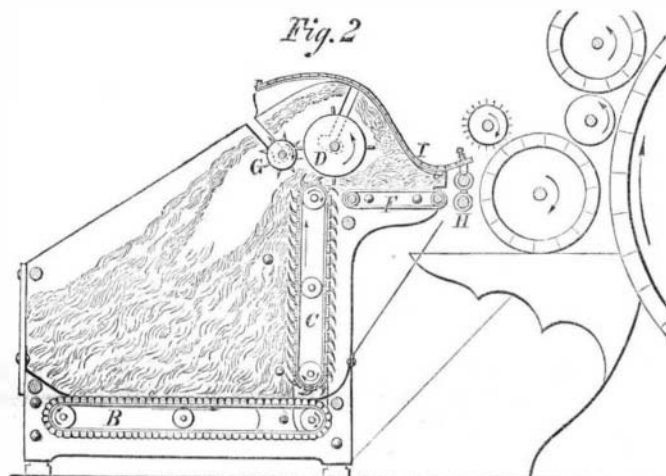
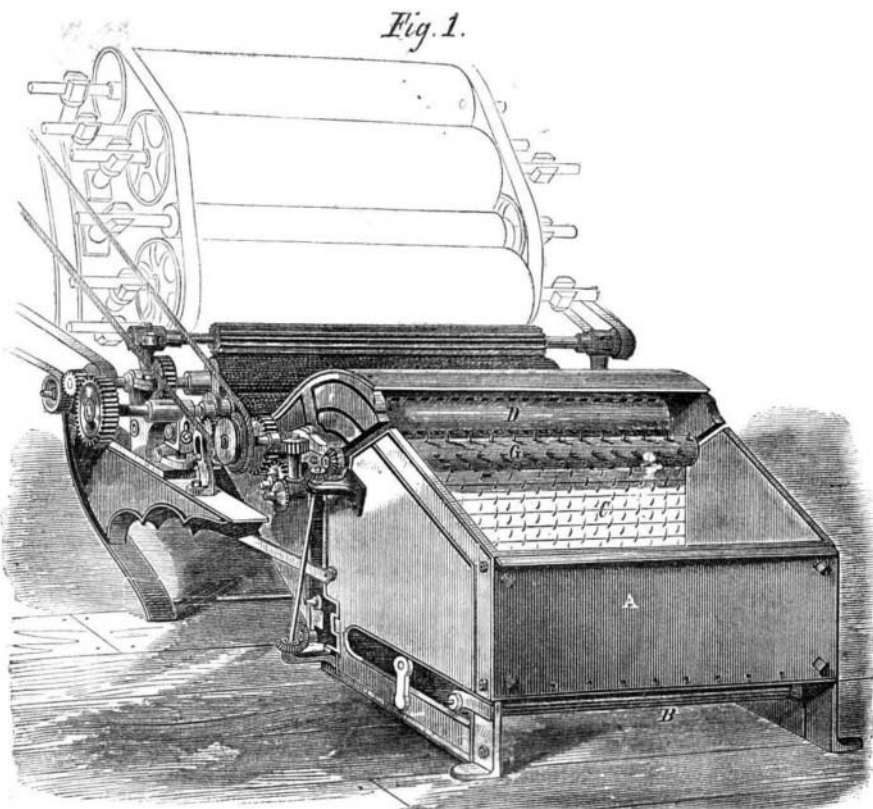
The advantages of this gage are sufficiently apparent without further description. We consider it to be a valuable improvement.

Patented January 21, 1868, by William G. Thomas, who may be addressed relative thereto at Centralia, Pa.

GAS MEASUREMENT.

In the entire range of articles in ordinary use, there is probably not one that is measured with greater average accuracy

prised and indignant to find that it is as large, or nearly as large, for April. An individual complains that the gas bill last presented to him is as large as the one for the previous month when "he had sickness in his family and gas was kept burning all night for a week." Indeed the opinion of many sufficiently intelligent to judge fairly about ordinary business transactions, is that gas meters are a humbug and a blind, used only to give a show of fairness in assessments, and that gas bills, like doctor's bills, are made out upon the principle of about how much, from the apparent character of their residences, and other indications of wealth or poverty, people will submit to without protest. These opinions are erroneous, as we shall proceed to show: the fact being, that the errors of gas meters, when errors exist, are mostly in favor of the consumer. In order to corroborate our statement, it will be necessary to explain the construction and operation of gas meters. In doing this we shall, as much as possible, avoid technical terms, and shall use the simplest illustrations, our object being not to enlighten those who are already informed upon the subject, but to show, in the plainest manner, to those who have not correct ideas of gas meters, the principles upon which they are constructed.



THE BOLETTE FIRST BREAKER FEEDING MACHINE.

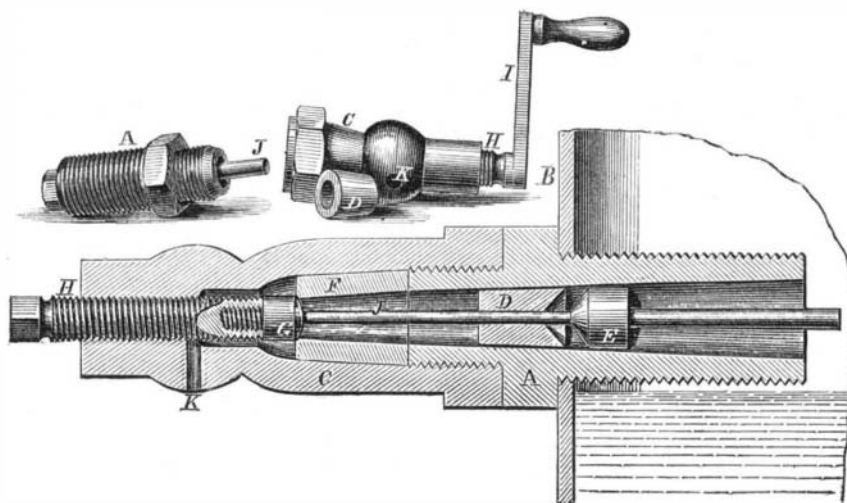
than illuminating gas, and probably there is not another, in the accurate measurement of which the public at large have so little confidence. There are many reasons for the origin of such doubts, most of which must be charged to the consumers, some of them to the gas-manufacturing companies, and the balance to the defective method of selling gas, at a given rate per thousand cubic feet, as is generally the case, without regard to quality.

Most people who use gas do not take any pains to inform themselves in regard to the manner of its measurement, do not understand even the fundamental principles of a gas meter, and have not the least idea of its construction. Some might, no doubt, be found who can not even read the ordinary dial correctly.

The effect of such ignorance is suspicion and doubt. In vain may meter inspectors test, and meter manufacturers la-

Gas meters are of two kinds—wet and dry. Wet meters are so called because it is essential to their operation to keep a certain level of some liquid (water or glycerin), within the case. Dry meters do not require any such appliance, hence the name applied to them. Dry meters are the more commonly used on account of their requiring less attention than wet meters, which have, when water is used, to be kept supplied with it and protected from frost. The use of glycerin obviates the replenishing and care to prevent freezing, as that liquid is non-volatile, and not liable to be frozen.

To understand the principle of the wet gas meter, it is only necessary to imagine a wheel, having buckets attached to the perimeter, the top of each bucket placed toward the bottom of the next one in order, forming a series entirely around it. Imagine, further, the wheel immersed in a tub of water to somewhat more than half its diameter, its axle being supported by bearings attached to the sides of the tub. Let a pipe pass through the side of the tub near the bottom and turn up under the series of buckets on that side where the buckets are bottom side up. Now invert another tub of equal size to the first one, over it, close the joint air-tight, and insert a tube in that, and you have a rude wet gas meter. If gas is forced into the lower tube, the upper one being left open, it will bubble up through the fluid and fill the inverted buckets of the series, which, being thus rendered buoyant, will rise to the surface, and in so doing, revolve the wheel to which they are attached, and bring other buckets of the series over the mouth of the pipe. Thus a continuous rotation would be kept up provided that the buckets could be so arranged that less power is required to force the buckets under the surface of the fluid than their buoyancy upon the opposite side is able to overcome. In actual practice this is accomplished by a very ingenious arrangement. The pipe in the up-



THOMAS' BISECTED GAGE COCK.

bor to convince the public of the accuracy of gas meters while it exists. The dissatisfaction engendered by want of information is increased by the irregularity of amounts consumed in different periods of time without (to the consumer) any apparent cause. Were the bills constant in amount, or only increased as the nights lengthen, to be again diminished as the demand for artificial light decreases with the approach of summer, many would be content to believe in the justness of the measurement without further question; but such is not the universal experience. A merchant, perhaps, having paid a bill for gas used in his warehouse in January, is sur-

per inverted tub permits the discharged gas to escape from the meter. Now, the number of buckets in the series being known, and the amount which they will each hold, it is an easy matter to determine the amount of gas discharged at each revolution of the wheel, or for any number of revolutions. Suppose it to be a cubic foot for each revolution: then a pinion of six teeth, attached to the axle of the bucket wheel, working upon a wheel of sixty teeth, would, in revolving once, move the latter one tenth of a revolution. If to this wheel a pointer and dial were attached, and upon the dial the nine digits and zero were placed at equal intervals, this