Improved Apparatus for Measuring Liquids.

A means whereby the measurement of liquids could be accurately accomplished without the use of sets of measures into which various liquids must be drawn, has long been a desideratum. The possibility of drawing the required quantity with rigid exactness, directly into the vessel designed for its transportation, is something much to be desired, both as a matter of convenience and of cleanliness. In the case of inflammable liquids, such measurement is also desirable on the score of safety, since the near approach of any artificial light is not necessary.

With the apparatus herewith illustrated, liquids may be accurately measured in drawing, when there is light enough to place the receiving vessel properly; and the annoyances and inconveniences attendant upon the use of portable measures are wholly avoided.

The operation of the apparatus will be at once understood by inspecting the engravings; Figs. 1 representing the complete device, and Fig. 2 showing the same in vertical section.

In these engravings, A represents the outer case, divided into an upper and lower chamber by a diaphragm, B; any convenient quantity of liquid being poured into the upper chamber through the opening at C. It is drawn when wanted through the strainer, D, and subsequently through the measuring chambers, E F G H, and through the tube, I, out through the faucet into the vessel destined to receive it; the dotted line showing the course of the fluid from its entrance to its exit from the apparatus. The chambers, E, F, G, H, and the tube, I, hold, together, one gallon in this instance; but they may be made to hold any quantity desired. The chamber, E, holds half a gallon; the chamber, F, one quart; the chamber, G, one pint; the chamber, H, a half pint, and the tube, I, also one half pint. The measurement of these chambers and the tube, I, are adjusted to accuracy by screw spindles, L.

The upper chamber of the apparatus and the measuring chambers, E,F,G,H, and I, communicate with each other only when valves actuated by the rods, K, are raised. The rods, K, are inclosed by vertical tubes, which ascend to the top of the case; and vent tubes (not shown in the engraving) are also supplied to each measuring chamber so that the flow may be rapid.

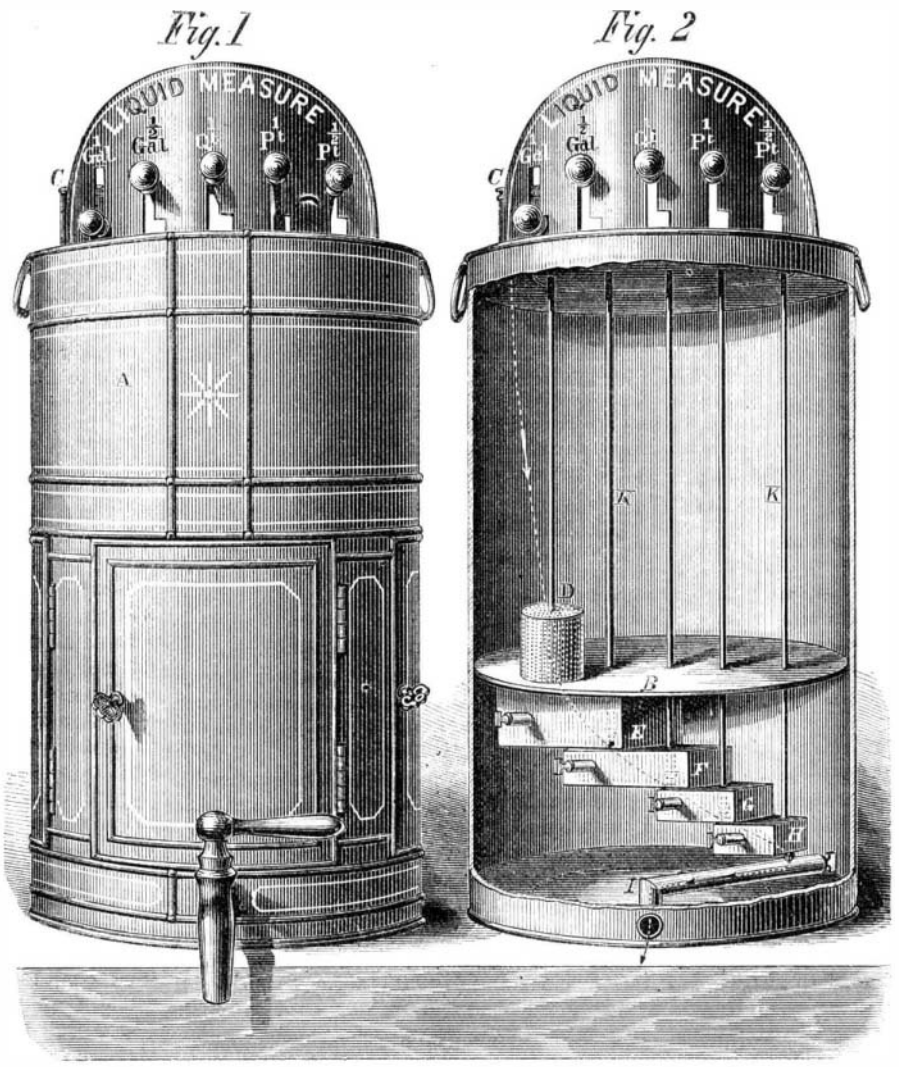
The valve rods, K, are held up by springs, so that, when it is not desired to draw any liquid, the chambers all communicate; and of course the measuring chambers will instantly fill and keep full so long as one gallon remains in the upper chamber. The state of the liquid in the upper chamber may be indicated by any suitable form of gage. Thumb knobs at the top of the rods are arranged as shown, and marked one gallon, half gallon, one quart, one pint, and half pint. The thumb knobs engage in the horizontal portion of the slots in which they slide, by a slight rotary movement, so that any valve once closed will remain closed until the knob is released.

If it be desired to have a half pint of the liquid, the knob so marked is depressed. This closes the valve corresponding to the knob, and all flow from chambers above the pipe, I, is cut off. Upon opening the faucet, only the contents of the pipe, I, will be discharged; that is, a half pint. If one pint is desired the knob corresponding to that measure is depressed, and so on for all intermediate measures up to the full measuring capacity of the apparatus.

Each of the several chambers has an inclined false bottom, so that full delivery of its contents is secured, and the chambers are reached for regulating and sealing through doors shown in Fig. 1.

The apparatus may be applied to the filling of barrels, a large size being made for that purpose, and is capable of extension to all wholesale and retail measuring. It may also be connected to liquor casks and applied to milk cans, for which it seems particularly suited, as the measures can be made so as to be readily reached to scald and clean them.

Patented by Martin McDevitt, of Hampton, Va. For further particulars, or for State, county, and town rights, address McDevitt & Woodward, Hampton, Va.



LIQUID MEASURING APPARATUS AND STORE CAN.

The Fire at Hoosick Falls.

The Troy *Times* gives the particulars of the fire on Sunday in the village of Hoosick Falls, by which all of the works of the Walter A. Wood Mowing Machine Company on the north side of the Hoosac river were totally destroyed, excepting one large storehouse. The fire broke out in the main building connected with the works, the machine shop, and destroyed that edifice, the carpenter shop, the blacksmith shop, one storehouse, the office, the foundery, a building in which castings were cleaned, and five tenement houses, occupied by the families of seven of the operatives of the company. The patterns of the company were not injured—the men employed at the works rushing into the pattern shop and removing them at the risk of their lives. The loss is upward of $400,000; and upon it there is an insurance of $245,000, in nearly fifty different companies.

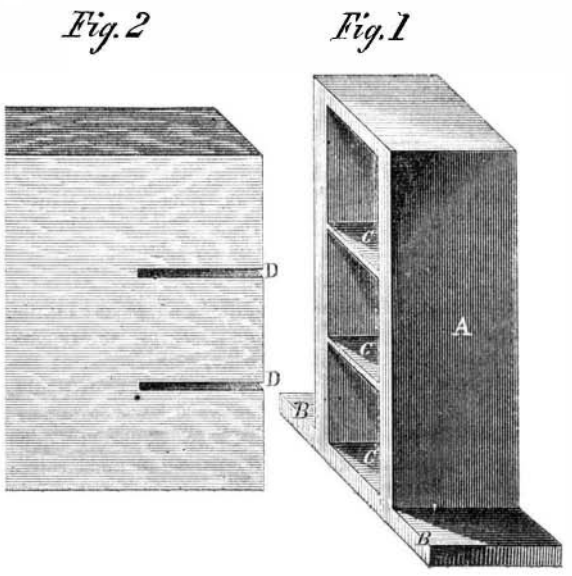
The buildings on the south side of the river were uninjured. These consist mostly of the Caledonian Mills (formerly the Merritt prope d will be kept running as formerly. Immediately u extent of the calamity being determined, Mr. Wood orders for the erection of new works, the plans were prep and to-day a large force of men is engaged constructing new shops. It is believed the new foundery will be in oper on soon—the cupola of the old one being available for use immediately.

In 1859, also, the works were destroyed by fire. Mr. Wood then set himself with his accustomed energy to the task of rebuilding them, and in two weeks they were in operation.

Previous to the late fire the company were turning out one hundred and fifteen machines per day, and within a week it is thought arrangements will be made by which at least fifty per day will be manufactured. Four thousand complete mowing machines were stored in the storehouse which was not burned, and these will be sufficient to enable the company to keep up with their orders.

GALMANN AND RUHE'S IMPROVED JOIST PROTECTOR.

It is well known that the ends of joists placed in walls, particularly in lower floors, are in the ordinary way, exposed to dampness, and consequent decay. In the device we herewith illustrate, we think, an adequate remedy for this has been found.



It is simply a box support or protector, of cast iron, made in the form shown in Fig. 1, A being the side walls of the box, C horizontal partitions, and B a bottom flange or base.

In inserting the joist, slots, D, are sawn in the end, into which the partitions, C, enter when the joist is placed in its proper position. This gives a greater number of bearings.

We think this device, simple as it appears to be, is a very practical and useful one, and have no doubt it will meet with with favor from architects and builders.

Patented, through the Scientific American Patent Agency, Feb. 1, 1870, by H. Galmann and Charles Ruhe, of Buchanan, Pa. Address as above for further information.

IT is thought the Mont Cenis tunnel will be completed about the end of January, 1871.

OBITUARY--SETH BOYDEN.

We regret to record the death of Mr. Seth Boyden, who, at the time of his death, was one of the oldest, as he had been in his life one of the most prolific, inventors this country has produced. Mr. Boyden invented and commenced the manufacture of patent leather at Newark, N. J., in 1819, having taken up his residence in that city in 1815. He invented a brad machine, in 1816, which largely reduced the cost of manufacturing brads. In 1826 he made the first specimens of malleable castings, and continued in their manufacture till 1831. About this period he devised the first locomotive with outside connecting rods. He also devised a cut-off, and was of much assistance to Professor Morse in working out the details of electric telegraphy. It is said that he produced the first daguerreotype ever taken in this country. He also, in 1849, succeeded in making spelter, and laid the foundation for such success as zinc mining has attained in this country. He subsequently succeeded in imitating Russian sheet-iron, but at a cost which would not admit of competition with the foreign article. One of the latest of his inventions was a machine for making hat bodies, which has gone into general use.

The last time we met Mr. Boyden was about a year since, in a hat-manufacturing establishment in Newark, where his machines were employed. We found him in the office reading proof sheets of a paper upon some subject connected with electricity. Age and the ordinary cares and pains which accompany it, seemed entirely forgotten in his enthusiasm for science; for Mr. Boyden, though a practical man, was one of those scientifically practical men whose zeal is directed by knowledge. Perhaps no man of his time has done more to promote the industrial arts in this country than Mr. Boyden, who, though his inventions have been mines of gold to others, lived a poor man, and died at the age of 82 a poor man, in all except the respect and honor which reward a good life.

Length of Journals.

Another consideration of considerable importance to the smooth and safe working of shafting is the length of the journals. From a number of years' experience I have been led to believe, that with cast iron, one and a half times the diameter of the shaft is the best proportion for the length of the bearing, and with wrought iron, one and three quarters the diameter.

On the question of shafts revolving in the steps of plummer blocks and the proportions necessary to effect motion without danger of heating, it is essential (without entering largely into the laws of friction on bodies in contact) that we should ascertain from actual practice and long-tried experience the best form of journals of shafts adapted for that purpose. The lengths proportionate to the diameters have already been given, but we have yet to consider the dimensions of the journals of large shafts where they are small in comparison with the pressure or the weight they have to sustain. Let us, for example, take a fly-wheel shaft and the foot or toe of a line of vertical shaft extending to a hight of six or seven stories in a mill filled with machinery, and we have the safe working pressure per square inch as indicated in the last column in the following table:

DESCRIPTION OF SHAFT.	Length and diameter of shaft in inches.	No. of square inches in bearing.	Weight on bearing in lbs.	Weights in lbs. per square inch on bearing.
Fly-wheel shaft, wrought iron.....	12 x 14	252	45,024	178·21
Vertical shaft, cast iron.....	" x 11	95	23,061	242·70
Horizontal shaft, cast iron.....	15 x 10	150	6,000	40·00
Horizontal shaft, wrought iron.....	6 x 3	18	540	30·00
" "	2 x 4	8	160	20·00

From the above it will be seen that in fly-wheel shafts the pressure should never exceed 180 lbs. per square inch, and in that of the toes of vertical shafts 240 lbs. per square inch. Even with this latter pressure it is difficult to keep the shafts cool, and it requires the greatest possible care to keep them free from dust or any minute particles of sand or other sharp substances getting into the steps. The feet of vertical shafts also require the very best quality of gun metal for the shaft to run in, and fine limpid oil for lubrication to prevent the toe from cutting. It is, moreover, necessary for the shaft to fit well on the bottom of the step, and not too tight on the sides, and to have a fine polish.

Another point for consideration is the proper form of the journals of shafts, and that is, they should never have the journal turned or cut square down to the diameter.

From a series of interesting experiments it has been shown that the square-cut shaft loses nearly one fifth of its strength, and by simply curving out the shaft at the collars of the bearing, the resistance to strain is increased one fifth.—*Fairbairn's Principles of Mechanism.*

THE North German Ocean Observatory last year concluded an important examination of the courses followed by steamships between the Lizard and New York, to discover by what route a steamship can accomplish the distance between the two points in question, at various seasons of the year, in the shortest time.