2 Sheets—Sheet 1.

E. SAVILL.

Machine for Carbureting Air.

No. 219,118. **Patented Sept. 2, 1879.**

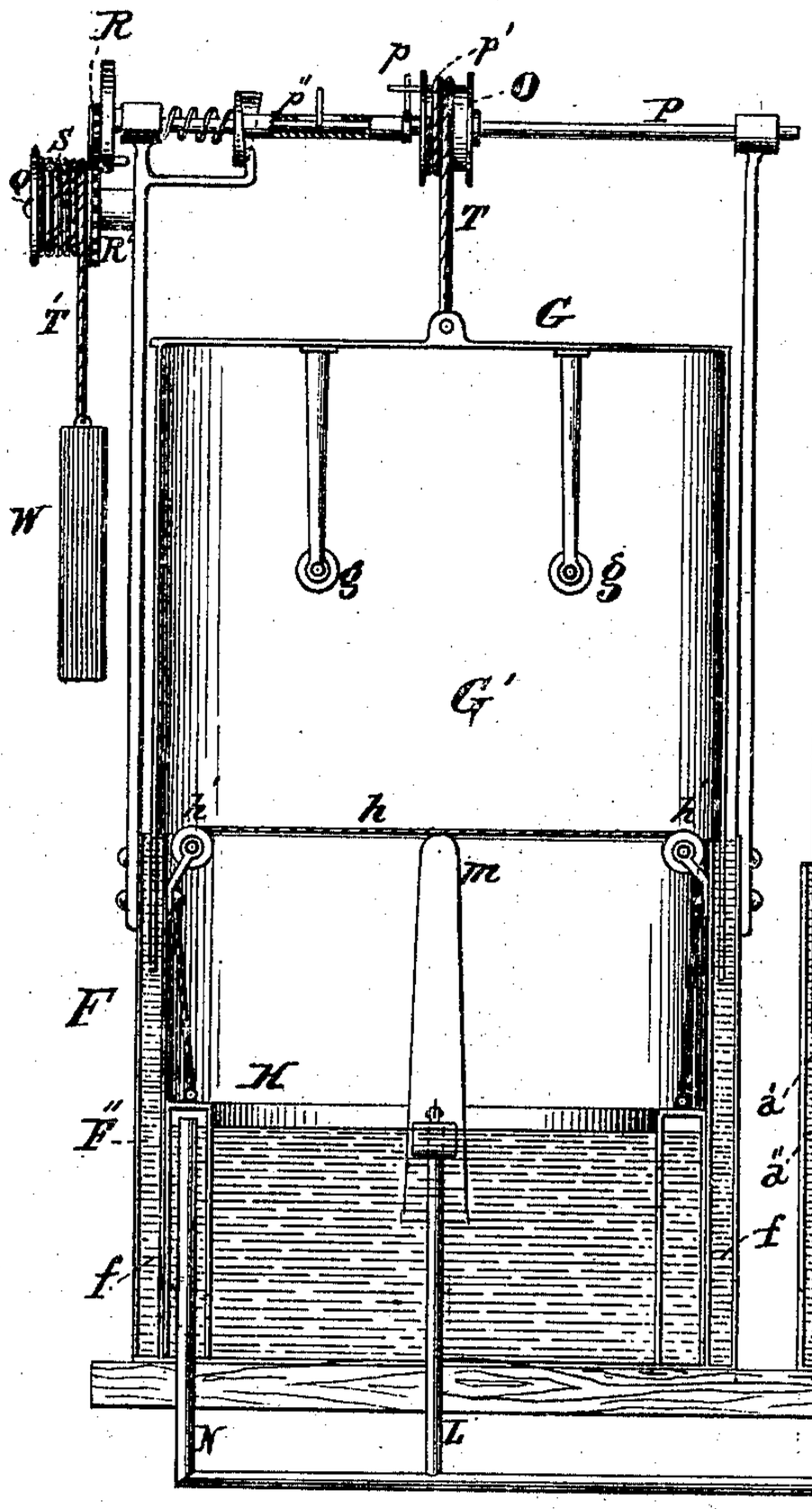
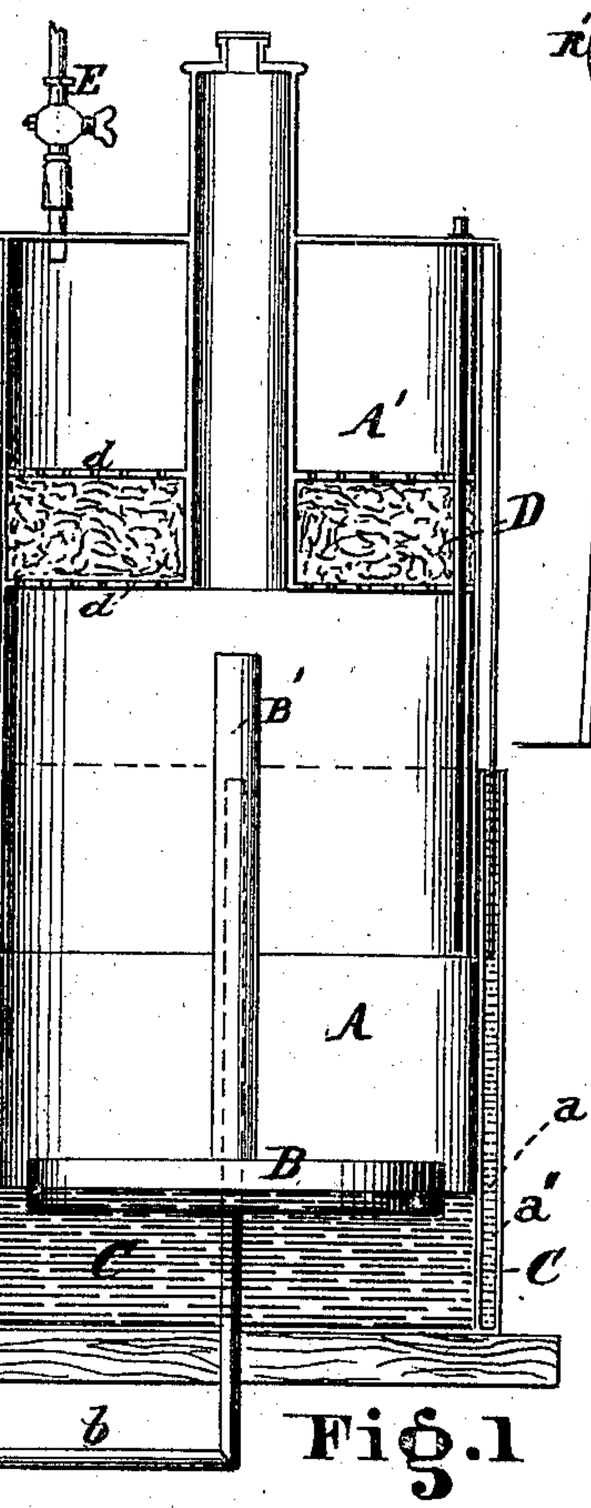


Fig.1



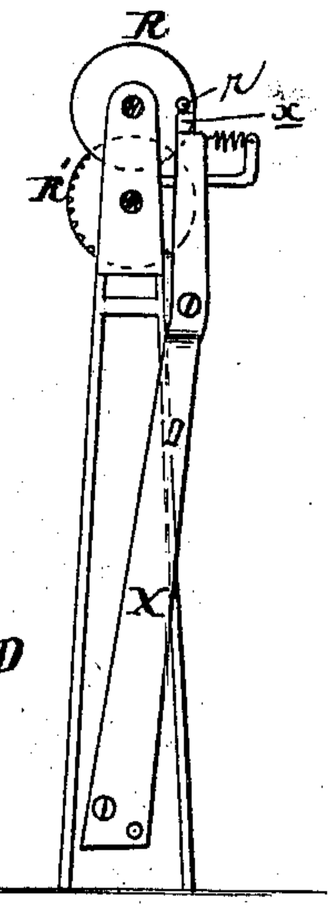


Fig.2

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Fig. 3.

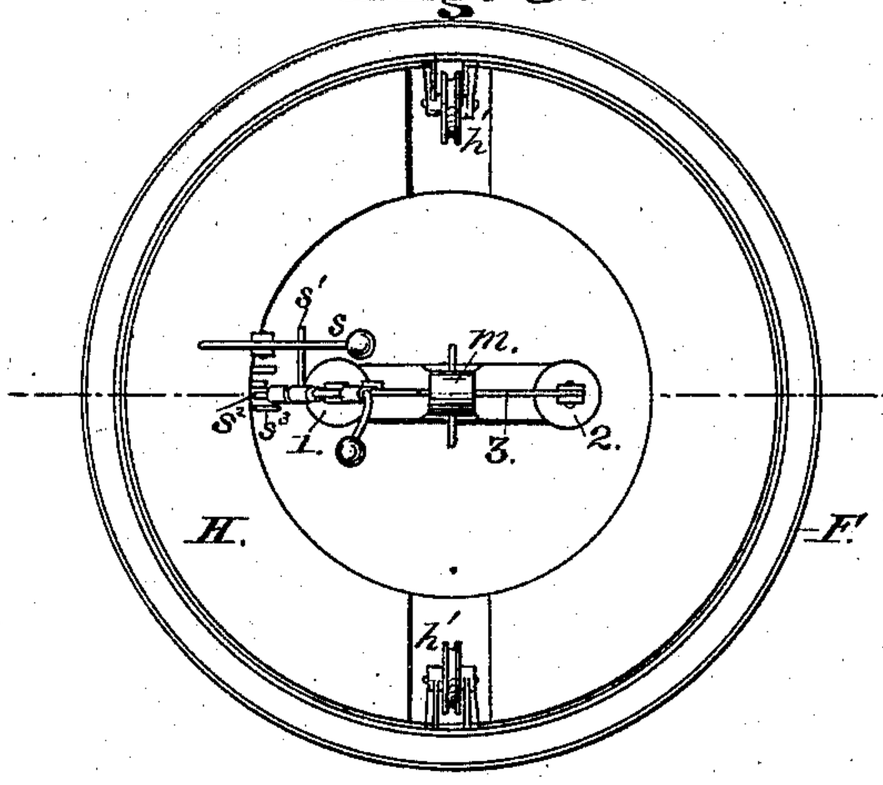


Fig. 4.

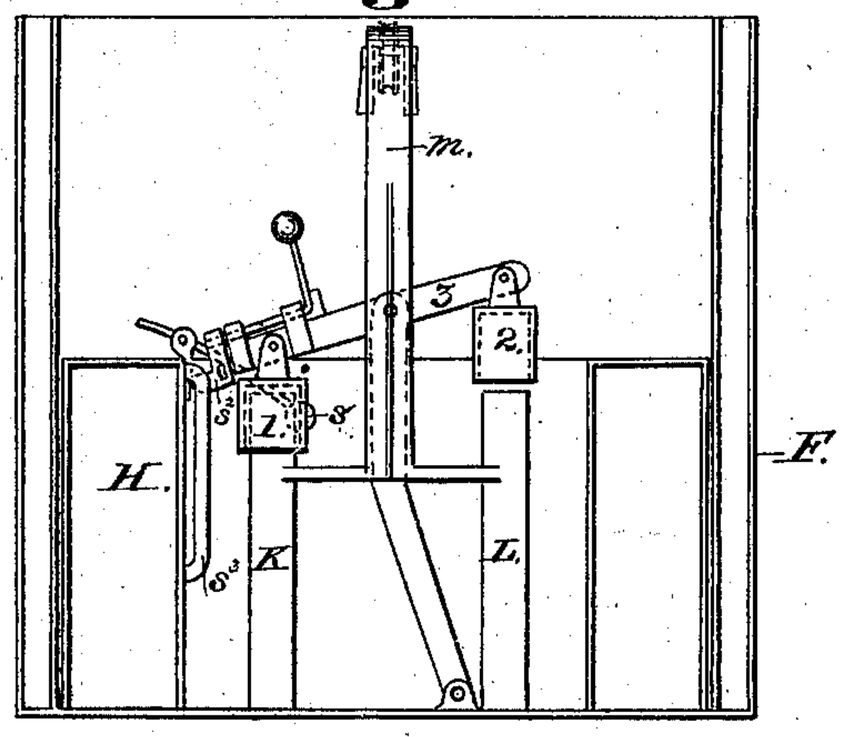
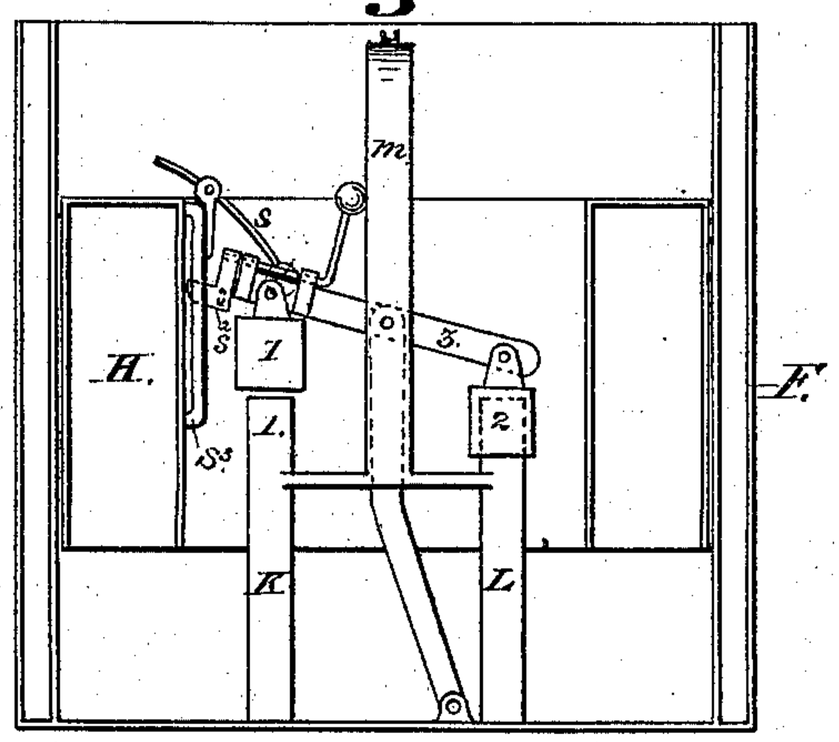


Fig. 5.



Attest:

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Inventor:

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Att'ys.

UNITED STATES PATENT OFFICE.

EDWARD SAVILL, OF LEXINGTON, KENTUCKY, ASSIGNOR TO HIMSELF, J. H. DAVIDSON, G. E. BILLINGSLEY, AND W. F. WHITE.

IMPROVEMENT IN MACHINES FOR CARBURETING AIR.

Specification forming part of Letters Patent No. **219,118,** dated September 2, 1879; application filed October 7, 1878.

To all whom it may concern:

Be it known that I, EDWARD SAVILL, of Lexington, in the county of Fayette and State of Kentucky, have invented certain new and useful Improvements in Machines for Carbureting Air, of which the following is a specification.

This invention relates to certain improvements in that class of carbureting apparatus in which the air is supplied to the carbureter by means of an inverted bell adapted to be elevated and depressed automatically at intervals to receive the air and force it through the carbureting-chamber; and the object of the invention is to provide a means for forcing the air into the carbureter while the bell is rising and taking in air, whereby a regular and uninterrupted current through said carbureter is secured.

To this end my invention consists in the combination, with the reciprocating bell inverted in an annular water-chamber, of an annular air-receiver located in the interior of the annular water-chamber, which also contains water, and suitable mechanism for elevating said annular air-receiver during the latter part of the descent of the bell, the said annular water-chamber being connected with the outlet air-pipe of the bell, whereby a supply of air will be stored in said annular chamber, to be supplied to the carbureter when the bell is elevated, as more fully hereinafter specified.

Figure 1 is a sectional elevation of my air feeder and carbureter attached. Fig. 2 is a view of the mechanism, detached, for alternating the air-feeder; Fig. 3, a plan view of the interior cylinder; and Figs. 4 and 5, vertical sections, showing the different positions of valves, &c.

A is the carbureter, which consists of a fixed cylinder, A, and a movable cylinder or pressure-regulator, A′. The cylinder A′ also serves as a gasometer or holder for the carbureted air. The cylinder A is furnished with an annular water-chamber, into which the lower end of the cylinder A′ dips, forming a water-seal.

The air is delivered by the pipe *b* under the float B. The vertical stem B′ of the float is tubular, and closed at the upper end. The air passes downward through the stem and radially under the float, through the oil C, and up around the edge or periphery of the float into the holder A′.

Excelsior or other loose filtering material is placed in the annular chamber formed by the diaphragms *d d*. The diaphragms are perforated, to permit the unrestrained flow of the carbureted air into and out of the chamber D. From the chamber D the air passes into the space A′ of the holder, and thence by the outlet E to the point where the gas is to be used.

The annular cylinder *a′* of the holder A′ passes inside the cylinder *a* of the fixed cylinder A, to form a guide for the ascent and descent of the holder or pressure-regulator.

The air is carbureted while in transit under the float B.

The air-feeder consists of a fixed cylinder, F, with a water-seal, *f*, an actuating-cylinder, G, and an equalizing annular cylinder, H.

The actuating-cylinder has an alternating motion, derived from the mechanism above the air-feeder, which will be referred to hereinafter.

When the cylinder G ascends, a vacuum is formed under it, which is filled by the influx of air through the pipe K, Fig. 4. When the cylinder G descends, the pipe K is closed, and the air driven out by the pipe L, Figs. 1 and 4. A portion of this air passes directly to the carbureter, while the remainder is stored in the annular equalizing-cylinder H. When the cylinder G descends, the rollers *g g* engage with the rope or chain *h*, which passes around the rollers *h′ h′*, and is attached to the top of the cylinder H on opposite sides, as shown.

In the center of the cylinder F is erected a standard, *m*, over which the rope *h* is passed. When the rollers *g g* engage the rope *h* they depress it on each side of the standard *m*, elevating the annular cylinder H.

During the early part of the descent of the actuating-cylinder G the air is driven out of the feeder by the pipe L and into the carbureter by the pipe *b*. During the later portion of the descent of the actuating-cylinder the air is driven partly through the pipes L and *b* to the carbureter, and partly through the pipes L and N to the annular cylinder. The air thus stored in the annular cylinder serves to maintain the supply to the carbureter while the

actuating-cylinder ascends and draws into the space G′ a new volume.

The descent of the cylinder is effected by gravitation; but the ascent is obtained by means of the spool or drum O, shaft P, spur-gears R R′, drum S, and ropes or chains T T′.

The spool O is loosely fitted to the shaft P, so that when the driving-arm p' is disengaged from the driver p the weight of the cylinder G will revolve the spool backward and uncoil the lifting-rope.

When the actuating-cylinder G descends nearly to the bottom of the cylinder F, an arm on the cylinder G engages with the lever X, which, provided with a detent, x, to the motion of the gearing R R′ and weight W, frees the spur-wheel R, when the driver p on the sliding sleeve p'' engages with the driving-arm p' on the spool O, and revolves this spool in the direction to lift the cylinder G.

The drum S is fitted to revolve freely on the stud Q, and is connected with the spur-gear R′ by the ordinary ratchet and pawl, thus permitting the drum to be revolved independently in one direction while winding up the weight W.

The weight operates, by gravitation, each time the detent x on the lever X is released from the pin r on the disk R, which is effected by the descent of the bell against the lower edge of the lever X, to elevate the bell and take in a fresh supply of air.

The valves 1 and 2, Figs. 3 and 4, are water-sealed to prevent the return of air through the pipes K and L. The valves are actuated at the termination of each stroke or motion of the cylinder G. While the annular cylinder is down, as shown in Fig. 4, the lever 3 is depressed at its left-hand end by means of the weighted lever s, which sits over a pin, s^1, swiveled to the end of said lever 3, the pin s^1 being provided with a right-angled extension, s^2, which is adapted to travel in a guide, s^3, formed on the inside of the annular receiver H. When in this position the valve 1 on the air-inlet pipe K is closed, and the valve 2 on the outlet-pipe L opened.

When the receiver H is elevated, the friction of the extension s^2 in the guide s^3 reverses the position of the lever 3, closing valves 2 and opening valve 1, as shown in Fig. 5. admitting air to the interior of the bell G, and discharging it from the receiver H through pipes N and b to the carbureter, thus keeping up a proper supply of air to the carbureter during the ascent of the bell.

The action of the air-feeder and the carbureter is automatic, the weight W being wound up from time to time, when the mechanism shown produces the reciprocating action of the actuating-cylinder, and a steady supply of air to the carbureter is obtained. In like manner the oil or other carbureting medium in the carbureter simply requires to be renewed as may be necessary. The air passes through the oil under constant pressure, passing through the filtering-chamber to equalize the pressure and delivery to the distributing-pipes, and through the outlet to the point where the gas is to be burned.

Having described my invention, what I claim is—

1. The combination, in an apparatus for carbureting air, of the cylinders F and G and the rollers g g with the annular cylinder H, rope or chain h, pulleys h' h', and standard m, all constructed and operating substantially as and for the purposes described.

2. In combination with the bell G, annular receiver H, rollers g g, chain h, pulleys h' h', and standard m, the lever 3 and valves 1 and 2, and mechanism for operating the same to open and close pipes L and K, substantially as and for the purposes specified.

In testimony whereof I have hereunto set my hand this 3d day of September, 1878.

EDWARD SAVILL.

Witnesses:

HENRY MILLWARD,

J. E. STEVENSON.