

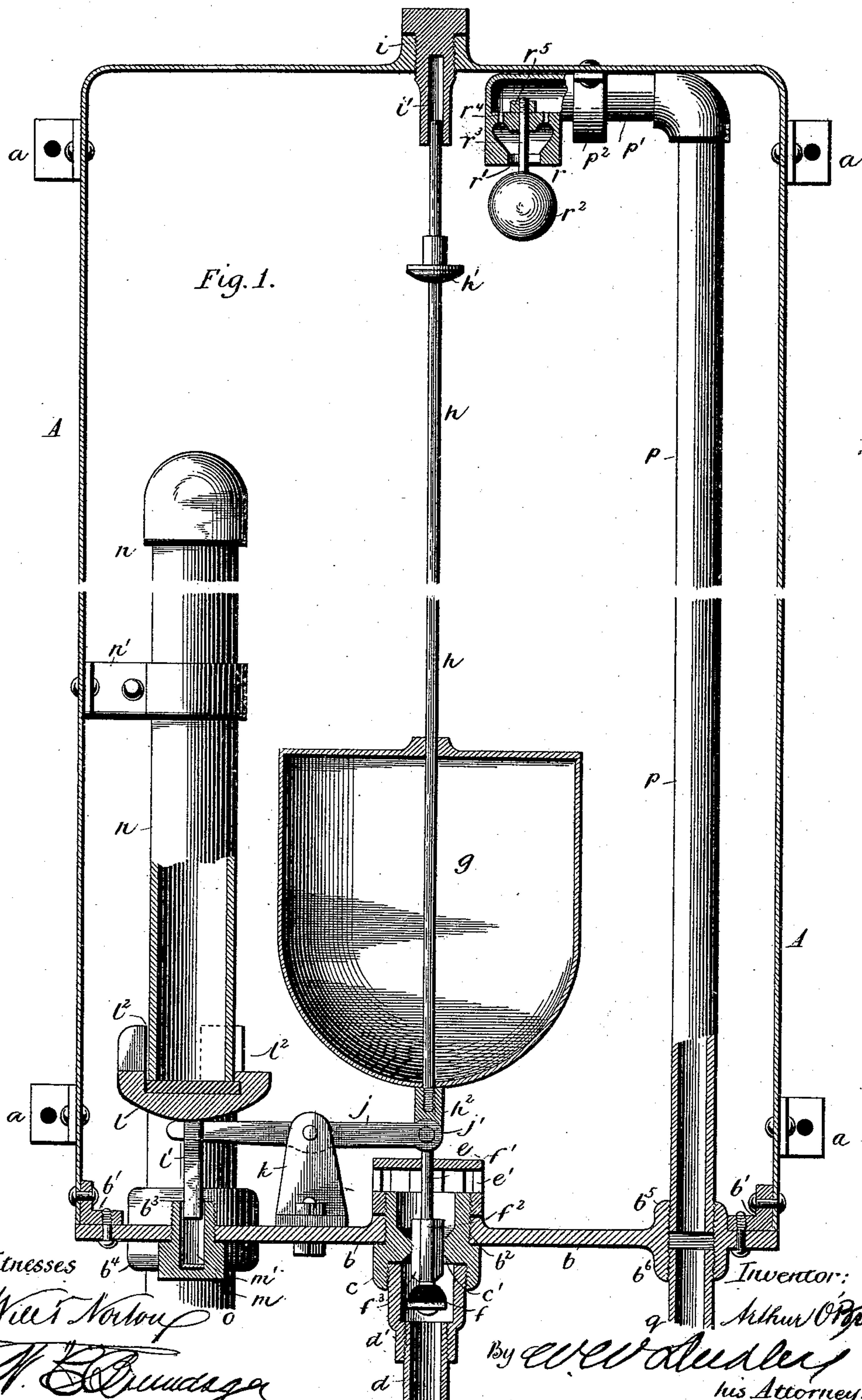
(No Model.)

3 Sheets—Sheet 1.

A. O'BRIEN.  
AIR COMPRESSOR.

No. 477,381.

Patented June 21, 1892.



(No Model.)

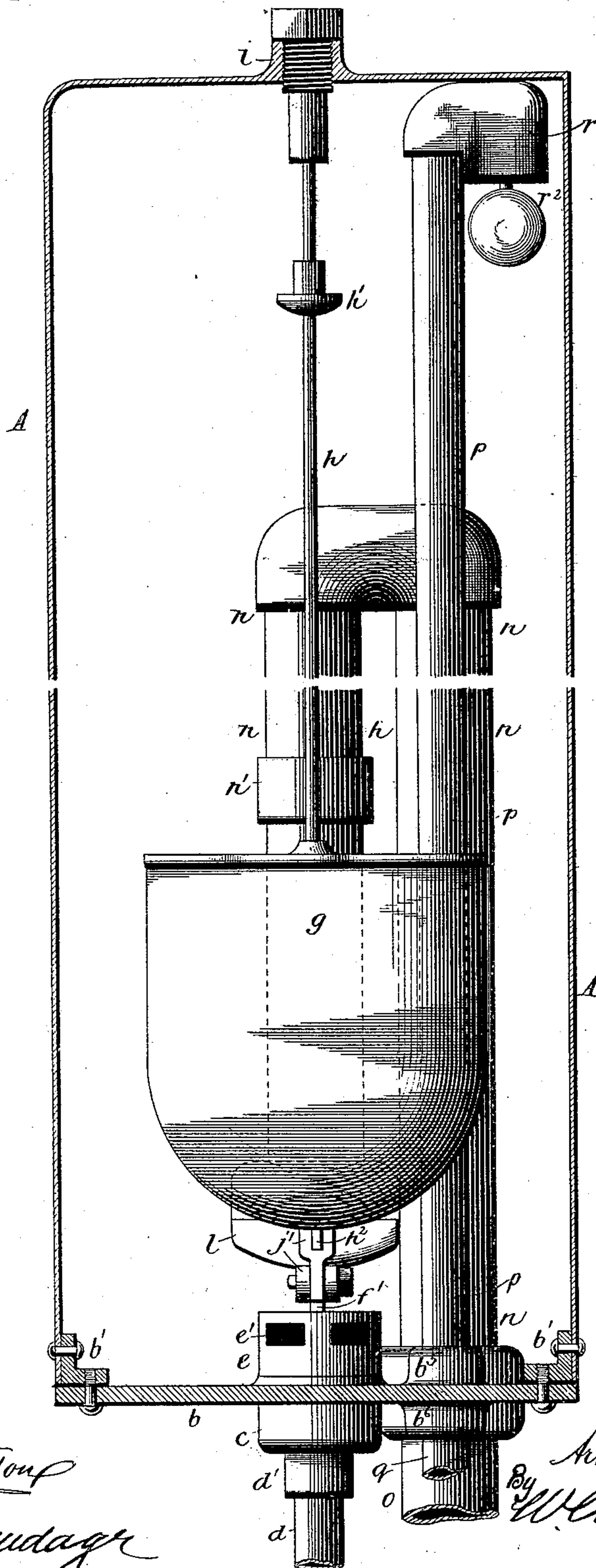
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Patented June 21, 1892.

Fig. 2.



Witnesses:

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H. C. Grundage

Inventor:

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By W. V. Dudley  
his Attorney.

(No Model.)

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Fig. 3.

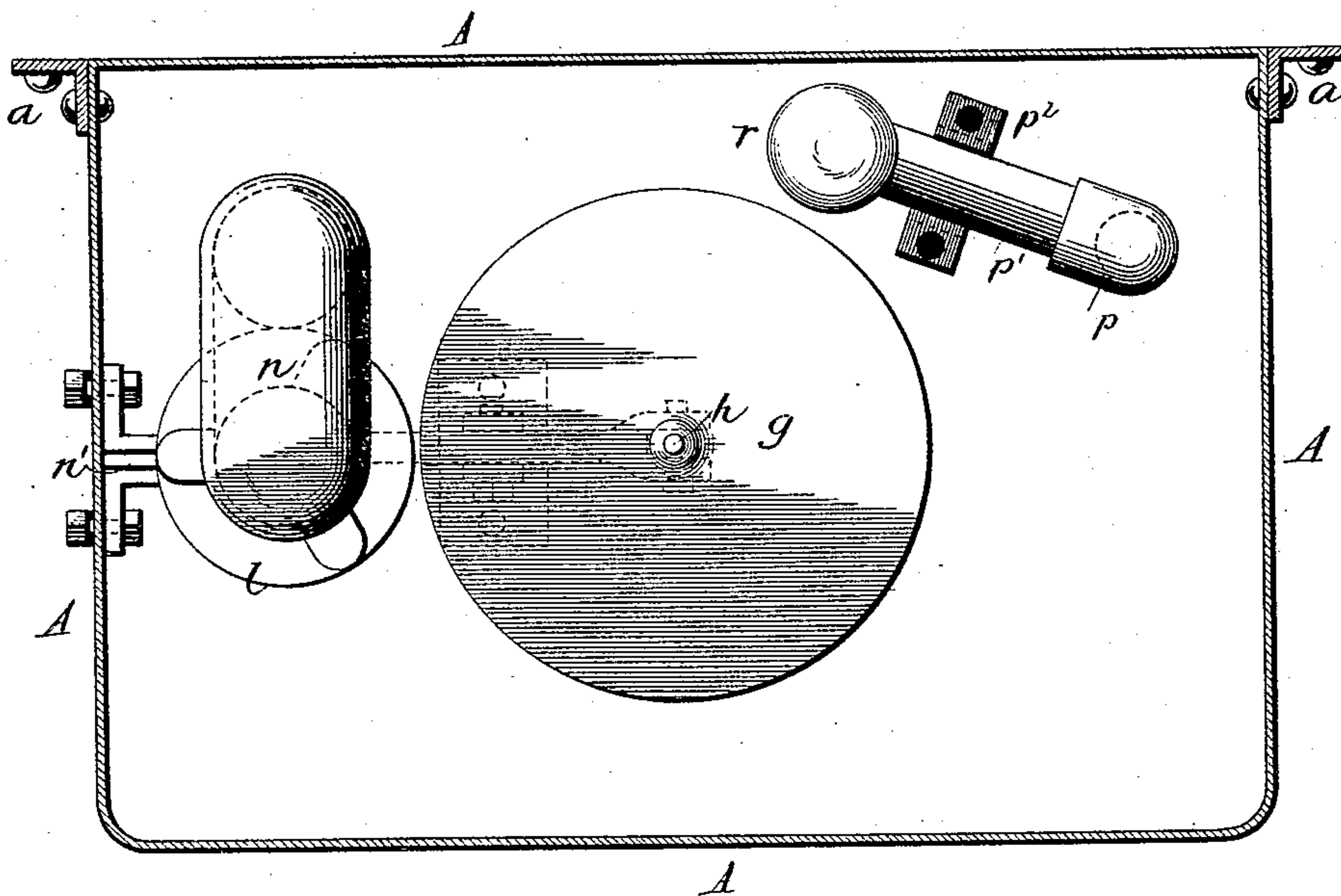
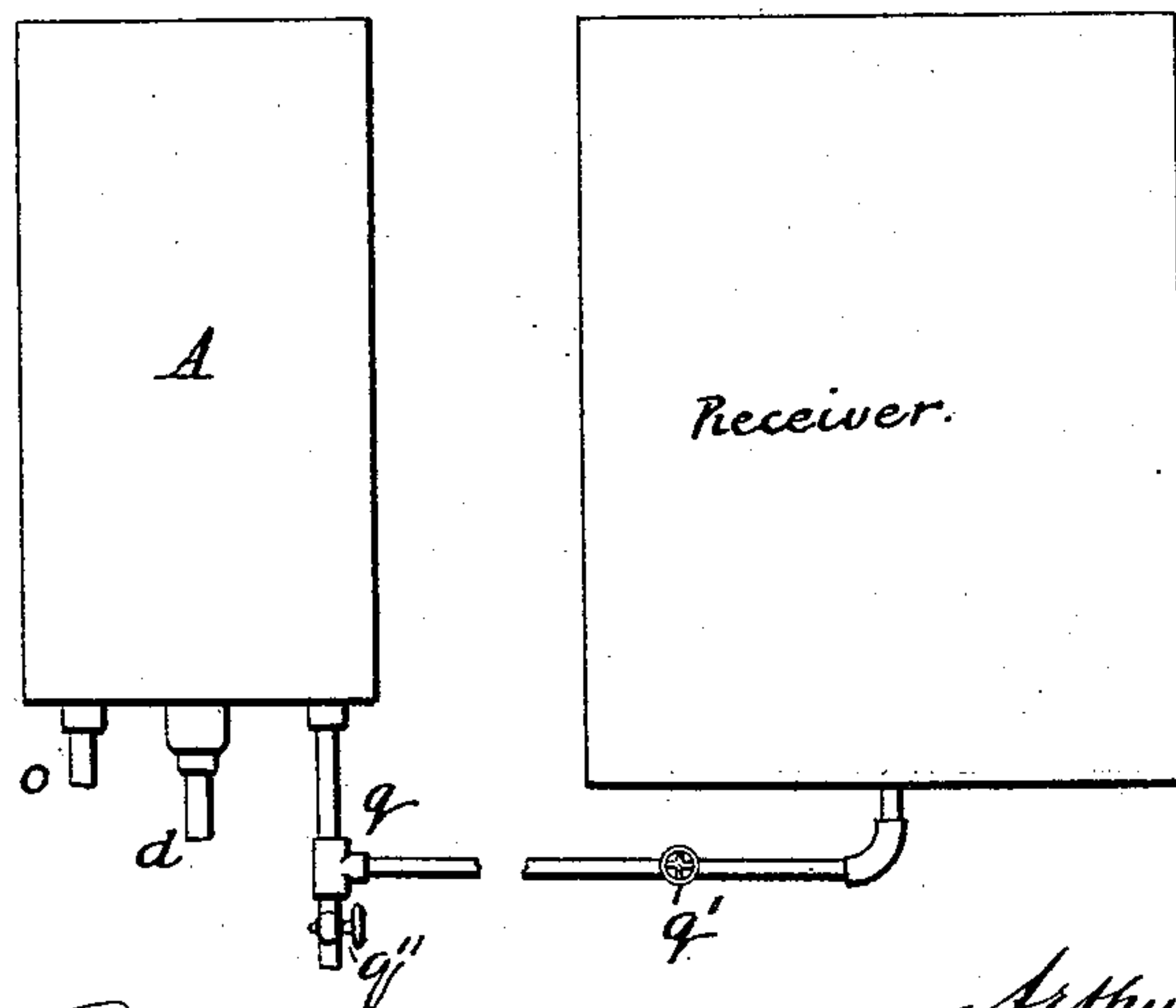


Fig. 4.



Witnesses:

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# UNITED STATES PATENT OFFICE.

ARTHUR O'BRIEN, OF HELENA, MONTANA.

## AIR-COMPRESSOR.

SPECIFICATION forming part of Letters Patent No. 477,381, dated June 21, 1892.

Application filed September 30, 1891. Serial No. 407,227. (No model.)

*To all whom it may concern:*

Be it known that I, ARTHUR O'BRIEN, a citizen of the United States, residing at Helena, in the county of Lewis and Clarke and State of Montana, have invented certain new and useful Improvements in Air-Compressors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to that class of automatic air-compressors which are designed to be operated by the pressure of water from the ordinary supply-pipes, the object being to produce a compressor of improved construction and operation, and which shall by reason of such improvements be applicable for many purposes—as, for instance, to force or compress air into barrels of beer or the like and to expel the liquor therefrom to the taps, to be employed in connection with flushing apparatus for water-closets, for ventilation, and many other uses where compressed air is or may be utilized.

To these several ends my invention may be said to consist generally in a vessel in which the water from the main rises to compress the air, the pressure of the air being employed to check the inflow of the water, suitable mechanism to permit the discharge of said compressed air from the vessel, a float operating to discharge the contained water, whereby a partial vacuum is formed and an inflow of air permitted, and in certain other details of construction and operation, all of which will be fully and clearly set forth in the following description and pointed out in the claims.

Upon reference being had to the accompanying drawings, in which like letters of reference refer to like parts throughout, Figure 1 represents in vertical sectional view my improved air-compressor with the several parts thereof in their normal positions; Fig. 2, a vertical sectional view taken in a line at right angles to the line of section of Fig. 1. Fig. 3 is a horizontal section of the same, and Fig. 4 represents a diagrammatic view of the apparatus connected with a receiver for the compressed air.

The reference-letter A denotes the outer casing, which is preferably formed of cast metal

and rectangular in shape, and is provided with suitable lugs *a a*, riveted to the sides thereof for connection with a wall or other upright. The base *b*, which forms a part of the casing, is bolted to the lower end thereof, angle-pieces *b'* being preferably employed in the connection. In the center of the base is an opening *b<sup>2</sup>*, which is screw-threaded to permit of the insertion of a hollow screw-threaded plug *c*, having a valve-seat *c'* formed therein, as shown. The water-supply pipe is shown at *d* and is connected with the plug *c* by means of the coupling *d'*, which extends to the valve-seat. The upper reduced end of the plug extends a short distance above the base and serves as a means for connection therewith of a cap *e*, formed with a series of openings *e'* to permit of the escape of the water from the supply-pipe. The valve *f*, which is normally opened, is conically shaped and has a stem *f'*, which passes through an opening in the said cap. The valve is steadied by means of a sleeve *f<sup>2</sup>*, which fits the opening in the plug, and is provided with longitudinal grooves *f<sup>3</sup>*, by which the water is allowed to pass to the interior when the valve is opened. The valve is operated by the action of the float *g*, which is loosely mounted on a rod *h*, having connection at its lower end with the valve-stem, as will be presently described. The upper end of this rod enters a recess *i'*, formed in a screw-plug *i*, which is inserted in the head or top of the casing.

*h'* is a stop secured to the rod *h* and which engages with the float when the water has reached a certain level. The lower end of the rod is screw-threaded for connection with the leaf *h<sup>2</sup>*, which is held between the leaves *j'*, formed on the outer end of a lever *j*, to which is joined the upper end of the valve-stem. This lever is pivoted centrally in a bracket *k*, bolted to the base *b*, and its other end is passed through a slot in the valve-guide *l'*, extending downward from the stop-valve *l*. This valve-guide moves in a recess *m'*, formed in a screw-plug *m*, inserted in the base.

*n* is the siphon-pipe, the return-bend of which terminates at a point near the bottom of the casing and is normally closed at this point by the aforesaid stop-valve *l*, which consists of a cup-shaped casting having water-passages *l<sup>2</sup>* in the sides thereof and a rubber



or other suitable disk in the bottom for making a tight joint. The siphon is supported in its vertical position by means of a stay  $n'$ , bolted to the side of the casing, and its bend  
 5 extends upward to a point a little below the normal position of the stop  $h'$ , and the lower end is secured in a screw-threaded boss  $b^3$  in the base. The discharge-pipe  $o$  is secured in a screw-threaded boss  $b^4$  and registers with  
 10 the siphon, as shown.

$p$  is the air-pipe, and  $q$  a continuation thereof. These pipes are secured in screw-threaded bosses  $b^5$   $b^6$  in the base in a manner similar to that employed in connecting the  
 15 siphon and discharge-pipe. The pipe  $p$  has a short section  $p'$ , which is supported by a stay  $p^2$ , bolted to the head of the casing.

$r$  is a check-valve formed in the section  $p'$ , and consists of a seat  $r'$  and a float-valve  $r^2$ ,  
 20 the stem or guide  $r^3$  of which works in an opening in the partition  $r^4$ , a nut  $r^5$  limiting the downward movement thereof. The valve is operated and closed when by reason of leakage the water rises to a point above the predetermined level, and this construction prevents  
 25 the passage of water into and through the air-pipe.

The operation of my apparatus is as follows: The parts being in the position shown in the  
 30 drawings, the outlet for the air is closed by means of suitable cocks, as shown at  $q'$   $q''$  in Fig. 4. The water from the main enters through the supply-pipe at a pressure of, say, thirty pounds, and continues to flow until the  
 35 pressure of the air within the casing equals the pressure of the water, the inflow of which is then checked. The float which is raised by the inflowing water assumes a position, when the flow is checked, a little below the stop.  
 40 The cock  $q'$  in the air-pipe is then opened and the compressed air is conveyed to the desired point and utilized, as before stated. The pressure from the air being relieved, the water again flows until the float engages the stop  
 45 and operates the rod and lever. This movement closes the valve in the supply-pipe and opens the valve of the siphon. The contained water flows through the siphon until the float in its downward passage operates the lever  
 50 and shifts the valves to their normal position. The outflow of the water tends to create a partial vacuum, which is filled by air from the air-pipe, cock  $q'$  being closed and  $q''$  being opened,

as will be apparent. The air-pipe cock  $q''$  is then closed and the parts are in position for  
 55 the next operation. If by reason of leakage or otherwise the inflow of water is not checked by the action of the compressed air the water will upon reaching a certain level close the air-pipe float-valve and prevent the water  
 60 from entering said pipe, as has been already stated.

The advantages of my improved construction of compressor will be apparent. I have combined simplicity with efficiency and have  
 65 produced an apparatus which can be employed with equal success in many ways. The action is perfect, and the parts being few are not likely to get out of order or become broken.  
 70

What I claim as new, and desire to secure by Letters Patent, is—

1. In an air-compressor, the combination, with a holder, of a water-supply pipe, a vertically-movable valve for controlling same, a  
 75 rod extending upward from said valve and having the stops thereon, as described, a float thereon for engaging the stops, a siphon discharge-pipe, a valve for controlling the same, a pivoted lever connecting the valve and rod  
 80 for simultaneously operating both valves, an air-pipe for admitting and discharging air, and a float-valve therefor, all substantially as and for the purposes set forth.

2. In an air-compressor, the combination, 85 with a holder, of a supply-pipe therefor, a perforated cap above the supply-pipe, a valve for controlling the supply, operated by a float, a siphon discharge-pipe the return-bend of which terminates at a point near the base of  
 90 the holder, a valve for said discharge-pipe, a lever pivoted to a standard above the base connections, between the discharge-valve and the float mechanism, whereby both valves are simultaneously operated, an air-pipe for ad-  
 95 mitting and discharging air, having its opening near the top of the holder, a seat in said opening, and a float-valve operating therewith, all substantially as and for the purposes set forth.  
 100

In testimony whereof I affix my signature in presence of two witnesses.

ARTHUR O'BRIEN.

Witnesses:

WILL T. NORTON,  
 ARTHUR BROWNING.