(No Model.) 2 Sheets—Sheet 1.

C. H. TAYLOR.

HYDRAULIC AIR COMPRESSING APPARATUS.

No. 543,411. Patented July 23, 1895.

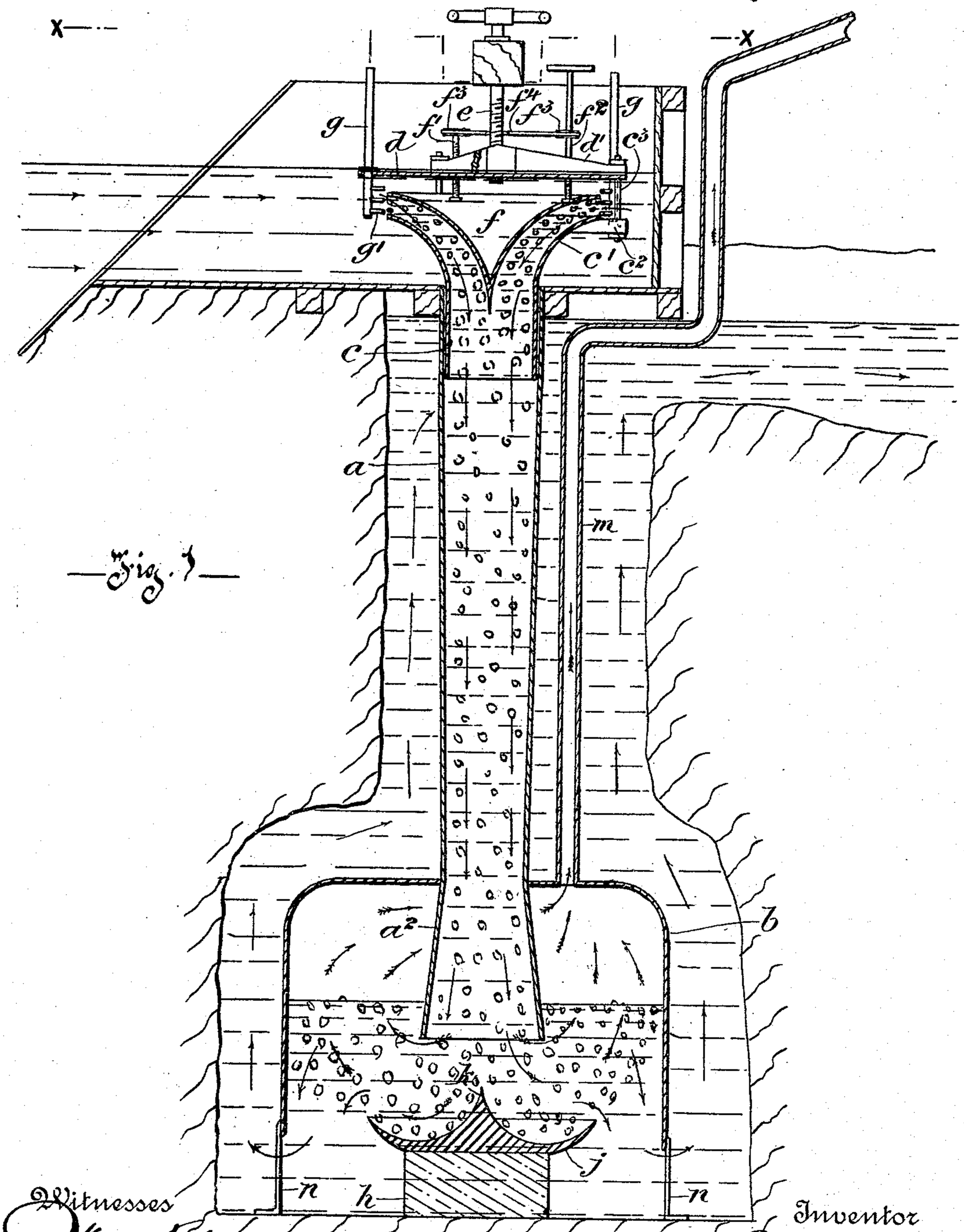

Fig. 1.

Witnesses
Frank N. Seal
Rufus B. Kimber

Inventor
Clear A. Taylor
By his Attorney
Wm N. Dean

(No Model.) 2 Sheets—Sheet 2.

C. H. TAYLOR.

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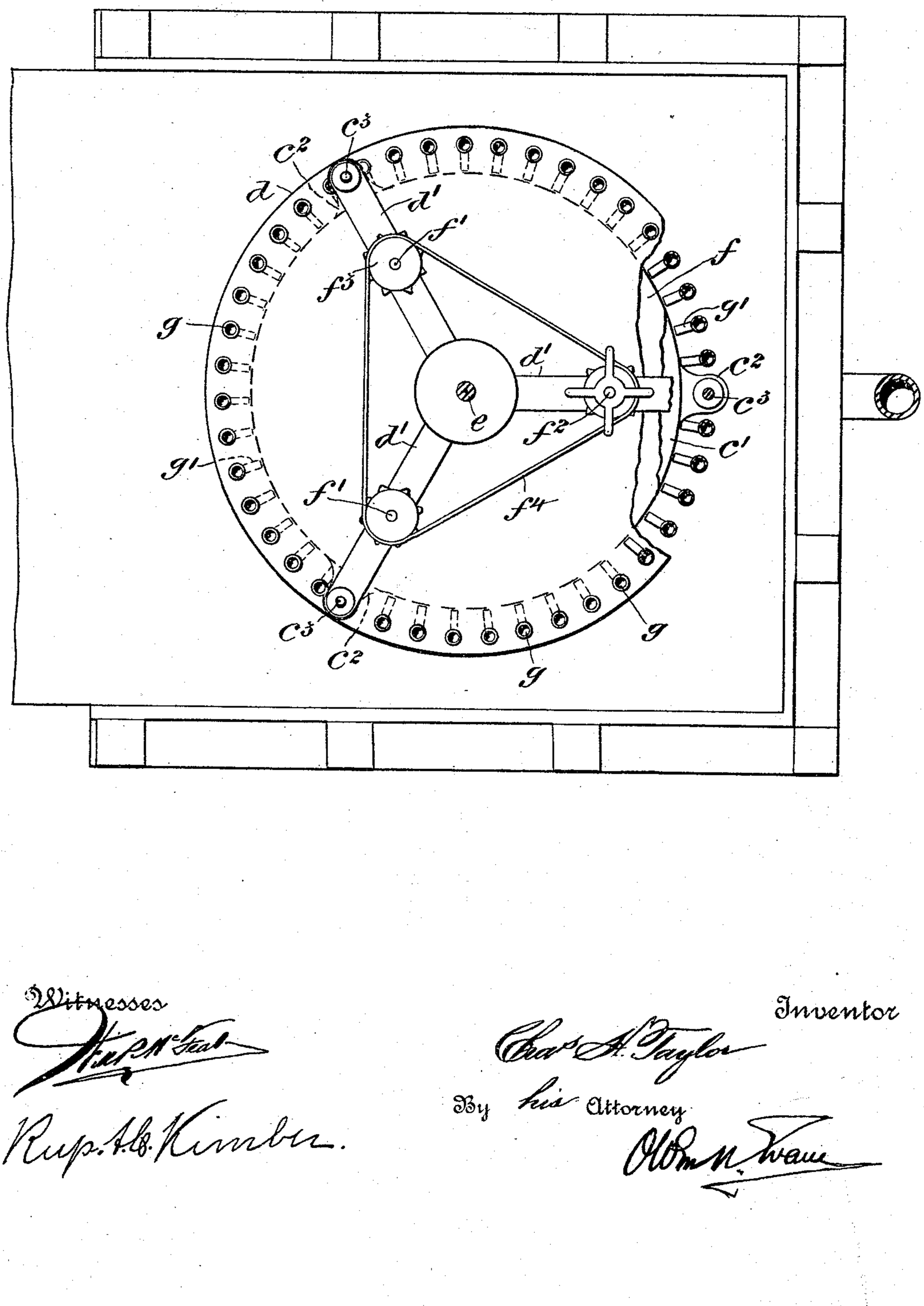
Fig. 2



Witnesses
Rup. A. Stahl
Rup. A. B. Kimber.

Inventor
Chas. H. Taylor
By his Attorney
Oliver N. Shaw

UNITED STATES PATENT OFFICE.

CHARLES H. TAYLOR, OF MONTREAL, CANADA, ASSIGNOR TO JOSEPH ROWAT FAIR AND HENRY MILLEN, TRUSTEES, OF SAME PLACE.

HYDRAULIC AIR-COMPRESSING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 543,411, dated July 23, 1895.

Application filed February 13, 1895. Serial No. 538,301. (No model.)

To all whom it may concern:

Be it known that I, CHARLES HAVELOCK TAYLOR, of the city of Montreal, in the district of Montreal and Province of Quebec, Canada, have invented certain new and useful Improvements in Hydraulic Air-Compressing Apparatus; and I do hereby declare that the following is a full, clear, and exact description of the same.

This invention relates to apparatus of the type shown and described in my allowed application for United States Patent filed April 19, 1894, under Serial No. 508,197, and has for its object to improve the construction of such apparatus, whereby a thorough control and regulation of the flow of water and intake of air can be secured.

The invention consists of the several devices, arrangements, and combinations of parts hereinafter set forth, and pointed out in the claims.

For full comprehension, however, of the invention, reference must be had to the annexed drawings, forming a part of this specification, in which like symbols indicate corresponding parts, and wherein—

Figure 1 is a vertical sectional view of my improved apparatus, and Fig. 2 an enlarged horizontal section of same on line $x\,x$, Fig. 1.

a is the stand-pipe or conductor, sunk in a well as formerly, and extending from the timbers of the usual dam formed about the opening of the well to a cylindrical base or dome b, resting on the bottom of the well, and through the top of which the stand-pipe passes. The lower end of the stand-pipe reaches to about the center of the height of the dome.

To properly direct the water to the stand-pipe a and to control and regulate the flow and extent of head thereof, I use a movable or adjustable receiving-end or mouthpiece, preferably constructed as follows: A short length of cylinder c, with a flared mouth c', forms the mouthpiece proper, the lower end of the cylinder being adapted to enter and work within the upper end of the stand-pipe; and this mouthpiece is formed with radial lugs c^2, through which it is connected by bolts c^3 with a movable supporting-frame comprising a disk d and radiating arms d', through which disk and the ends of such arms the bolts c^3 pass.

The movable supporting-frame is carried and operated by means of a screw e, having its bearing in an upper cross-timber of the dam.

A regulating or cut-off device in the form of an inverted cone f is located between the supporting-frame $d\,d'$ and the mouthpiece, being supported by adjusting-screws $f'\,f'\,f^2$, each of which carries a sprocket-wheel f^3, and the one f^2 being provided with an extended stem and a hand-wheel, whereby, through a connecting drive-chain f^4, taken over the sprocket-wheels, the three screws can be simultaneouly rotated and so raise or lower the cone f relatively to the mouthpiece, in order to increase or diminish the inflowing head of water. The necessary air-ducts are in this case shown as a number of vertical tubes g carried by and passing through the disk d of the movable supporting-frame, and each having a series of nozzles g' directed toward the space between the mouthpiece and the regulating or cut-off device, which latter, in its adjustment up or down, also serves to regulate the quantity of air admitted by cutting off one or more of the series of nozzles g'.

The stand-pipe a is preferably tapered gradually toward a point just above the dome b, or "expansion-chamber," as it might be called, for the purpose of maintaining a uniform speed of travel of the descending body of water, while the portion a^2 extending into the expansion-chamber is gradually expanded toward its end for the purpose of increasing the speed of flow above that point of the descending body of water, the expansion of the end of the pipe having the effect of increasing the speed of flow of the upper body of water.

Situated beneath the lower end of the stand-pipe, and supported preferably by a base of masonry h, is a spreader j, somewhat of saucer-form in cross-section, but with a central conical upward projection k, which, meeting the falling body of water, has the effect of spraying it, thus liberating more effectively the air-bubbles carried by it.

The air when separated passes up the conductor m to the usual tank or receiver in the customary manner, and the water is prefer-

ably allowed to travel through ports *n* at the base of the dome *b* and pass from the well at the top, as formerly.

What I claim is as follows:

1. In hydraulic air compressing apparatus, an open ended stand pipe or conductor located beneath and adapted to receive a falling body of water and having a movable telescopic receiving end for increasing or diminishing the height of said stand pipe for the purpose set forth.

2. In hydraulic air compressing apparatus having a stand pipe or conductor for a falling body of water, with its open receiving end located beneath such body of water, a movable regulator or cut off device adjustable relatively to the receiving end of the stand pipe, with means for operating same, for the purpose set forth.

3. In hydraulic air compressing apparatus having a stand pipe or conductor for a falling body of water, a series of air inlets located at the receiving end of the stand pipe or conductor and a regulator or cut off device common to and movable across the open ends of the series of inlets with means for operating same, for the purpose set forth.

4. In hydraulic air compressing apparatus, a stand pipe or conductor for a falling body of water having its upper end located beneath the water level and provided with air inlets communicating with the atmosphere, and its main length of tapering form toward a point near its lower delivery end for the purpose set forth.

5. In hydraulic air compressing apparatus, a stand pipe or conductor for a falling body of water having its upper end located beneath the water level and provided with air inlets communicating with the atmosphere, and an expansion chamber or dome at its lower end into which such lower end is introduced and expanded, for the purpose set forth.

6. In hydraulic air compressing apparatus having an open ended stand pipe or conductor with air inlet thereto, a spreader located beneath the lower open end of such stand pipe, for the purpose set forth.

7. In hydraulic air compressing apparatus having a stand pipe or conductor, a spreader of saucer form with central upward projection located beneath the lower end of such stand pipe, for the purpose set forth.

8. In hydraulic air compressing apparatus, having a stand pipe or conductor, a movable telescopic receiving end for increasing or diminishing the height of said stand pipe or conductor and a movable regulator or cut off device adjustable relatively to such movable receiving end, for the purpose set forth.

9. In hydraulic air compressing apparatus having a stand pipe or conductor, a movable receiving end for such conductor, a series of air inlets located to deliver into the movable receiving end and a movable section acting as a combined water flow regulator, and air cut off device, for the purpose set forth.

10. In hydraulic air compressing apparatus, a stand pipe or conductor for a falling body of water having its upper end in the form of a movable telescopic section carrying air inlets communicating with the atmosphere and its main length tapering inward from its upper end to within a short distance of its lower end which is expanded for the purpose set forth.

11. In hydraulic air compressing apparatus, the combination of the stand pipe or conductor, having at its upper end, a movable receiver, a series of air inlets a movable section acting as a regulator and cut off device, and at its lower end an expansion chamber or dome with air outlet therefrom, for the purpose set forth.

12. In hydraulic air compressing apparatus, the combination of a stand pipe or conductor having at its upper end a movable receiver, a series of air inlets, a movable section acting as a regulator and cut off device, and at its lower end an expansion chamber or dome with air outlet therefrom and a spreader within the expansion chamber and located beneath the lower end of the stand pipe for the purpose set forth.

13. Hydraulic air compressing apparatus comprising a water conductor having its upper end adjustable and carrying air inlets communicating with the atmosphere at the end into which the water falls in order that air may be sucked into same by the action of the water and an air conductor leading from the lower or delivery end of said water conductor into which such air passes, and through which it is forced by said body of water to a tank or receiver as set forth.

Montreal, January 31, 1895.

CHARLES H. TAYLOR.

In presence of—

FRED. J. SEARS,

RUSS H. KIMBER.