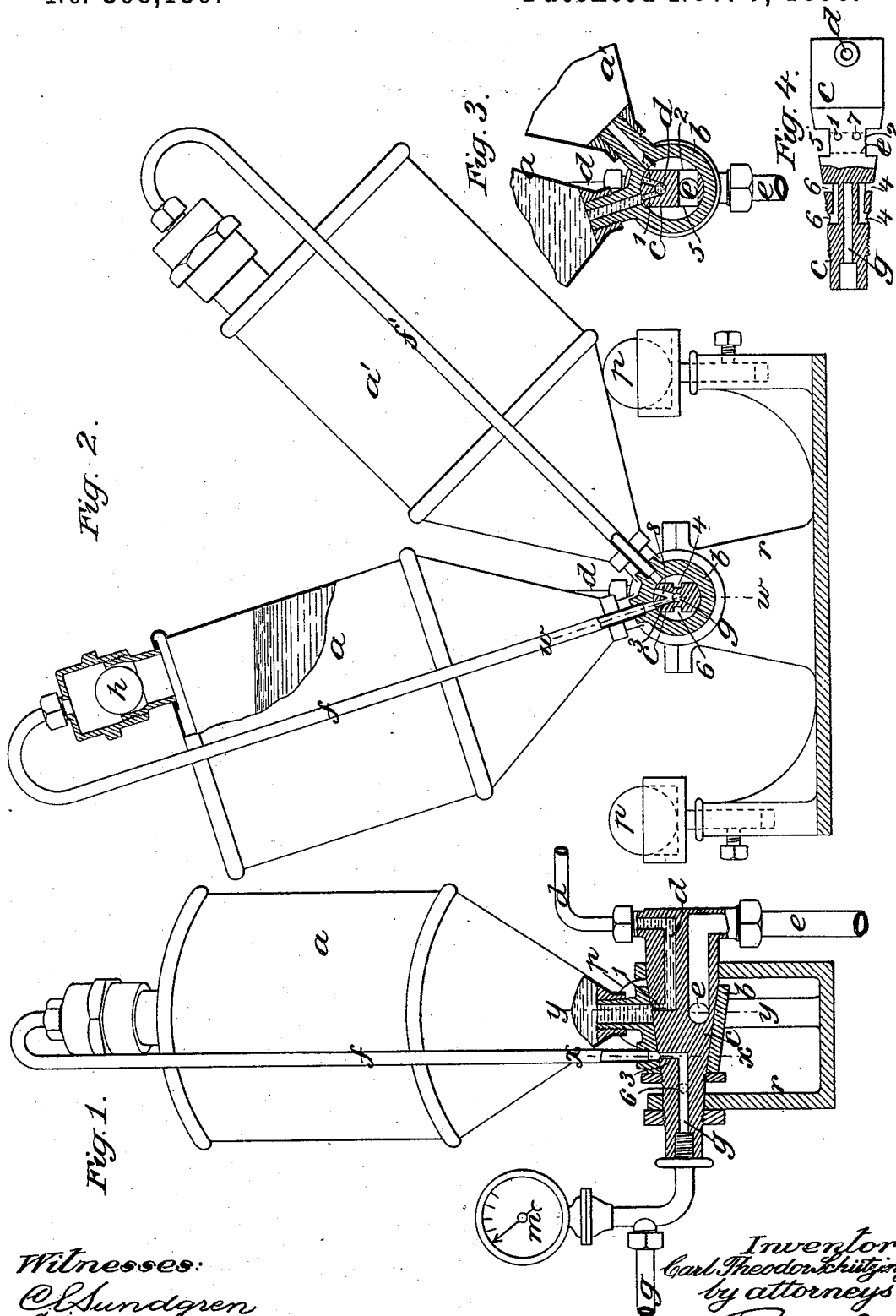


(No Model.)

C. T. SCHÜTZINGER.
HYDRAULIC AIR COMPRESSING APPARATUS.

No. 508,150.

Patented Nov. 7, 1893.



Witnesses:
O. Sundgren
George Barry.

Inventor:
Carl Theodor Chittinger
by attorneys
Brown & Howard

UNITED STATES PATENT OFFICE.

CARL THEODOR SCHÜTZINGER, OF HAMBURG, GERMANY.

HYDRAULIC AIR-COMPRESSING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 508,150, dated November 7, 1893.

Application filed May 13, 1893. Serial No. 474,166. (No model.)

To all whom it may concern:

Be it known that I, CARL THEODOR SCHÜTZINGER, of Hamburg, in the Empire of Germany, have invented a new and useful Improvement in Hydraulic Air-Compressing Apparatus, of which the following is a specification.

The object of this invention is to provide for the compression of air by an apparatus which shall be automatic in action and require but slight supervision.

An apparatus embodying my invention operates by pressure of water or liquid of any suitable nature and will operate to maintain a pressure of air in a receiver therefor equivalent to the pressure of water to fill said receiver in the first instance or replace air drawn therefrom for any purpose and so maintain constant pressure or tend to restore the pressure diminished by withdrawal of the air to the normal pressure in the said receiver. Such apparatus will be found suitable among various uses, for the raising of liquids such as beer and being simple in operation and construction can be attended to so far as needed by any unskilled person.

Figure 1 of the annexed drawings represents a side elevation of the apparatus, and Fig. 2 a front elevation, said views being partly in section on the lines *w w* Fig. 2 and *x x* Fig. 1 respectively. Fig. 3 represents a section on line *y y* Fig. 1, and Fig. 4 is a plan view partly in section of a part of the apparatus.

On a suitable framework *r* is fixed a horizontal spigot or central stationary shaft *c* which is prevented from revolving and serves as a bearing for a sleeve *b* surrounding it and adapted to revolve or oscillate thereon. This sleeve carries two radially arranged receivers *a a'* preferably of the cylindro-conical form shown in the drawings and so balancing one another as to be in unstable equilibrium and tend to fall and revolve the sleeve to the one side or the other as the weight of the water entering these receivers may determine as hereinafter shown.

In the spigot *c* are certain bores or channels *d e g*. The bore or channel *d* branches into ports 1 and 7 (Fig. 3) for admission of the water under pressure into either of the receivers *a a'*, whichever may be uppermost in the one

or other of their extreme positions. The comparatively large channel or bore *e* communicates with the lateral ports 2 and 5 respectively for egress of the water from either of the receivers *a a'*, namely that which for the time lies lower than the other. The bore or channel *g* communicates with the ports 3 and 8 (Fig. 2) and permits the egress of air from that receiver *a a'* which is highest through the pipe or passage *f* or *f'* leading to the uppermost part of the respective receiver. Other ports 4 and 6 (Fig. 4) in the spigot lead to the open air for admission of air into that receiver *a* or *a'* which at the time lies lowermost as *a'* in Fig. 2. Corresponding passages are made in the sleeve *b* for communication with the receivers *a a'* so that the action is as follows:

Referring to Fig. 2, the receivers are in such position that *a'* rests on one of the rubber or equivalent cushioning stops *p* provided one for each of the receivers. Water enters the higher receiver *a* and rises therein displacing the air compressed by the force of the incoming water and causing it to issue from pipe *f* and port 3 to outlet passage *g* leading to the air receiver or reservoir. As the receiver *a* fills with water its gravity is increased and (the gravity of *a'* diminishing as hereinafter shown) the receiver *a* will at length overbalance the system and cause it to rock so as to bring down the receiver *a* onto its cushion *p*; the water therein empties into port 5 (Fig. 3) to outlet *e* and air enters at port 6 into pipe *f* to replace the out-flowing water. Meanwhile the receiver *a'* will have become filled with water through port 7 and the air therein will have become compressed and driven out at port 8 until the system is again overbalanced and reverts to the position shown in Fig. 2, when the water in *a'* will flow out through port 2 (Fig. 3) to outlet *e* and air to replace the water will enter through port 4. Ball valves or equivalent devices are used as at *h* (Fig. 2) to be floated upward when the respective receiver is filled with water and close the pipe *f f'* so as to prevent water from entering such pipe. The height of the cushions *p p* may be regulated so that the tipping of the system may coincide as nearly as possible with the complete charge of the upper vessel with water.

A pressure gage *m* is provided in the compressed air pipe for indication of the pressure.

Failure of action at any time is illustrated simply by the stopping of the apparatus below the normal pressure on dial *m* due to the water pressure. It may be remedied by lubricating the shaft or spigot *c* and moving the system back and forth once or twice by hand until it works easily.

10 What I claim as my invention is—

An apparatus for compressing air, consisting of a stationary horizontal spigot and a loose rocking sleeve with two attached air and water receivers mounted in unstable equilibrium on said spigot, the said spigot having a pair of water inlet ports for the admission

of water under pressure to either receiver which is raised by the rocking of the sleeve, a pair of compressed air outlet ports adapted to communicate respectively with the upper- 20 most parts of the said receivers, a pair of water outlet ports, and a pair of air inlet ports adapted to communicate with the lower receiver, and the said sleeve having corresponding ports and passages for communication respectively between the said receivers and the 25 said ports in the spigot; all substantially as herein described.

CARL THEODOR SCHÜTZINGER.

Witnesses:

A. SCHAPER,
H. BOBZIHN.