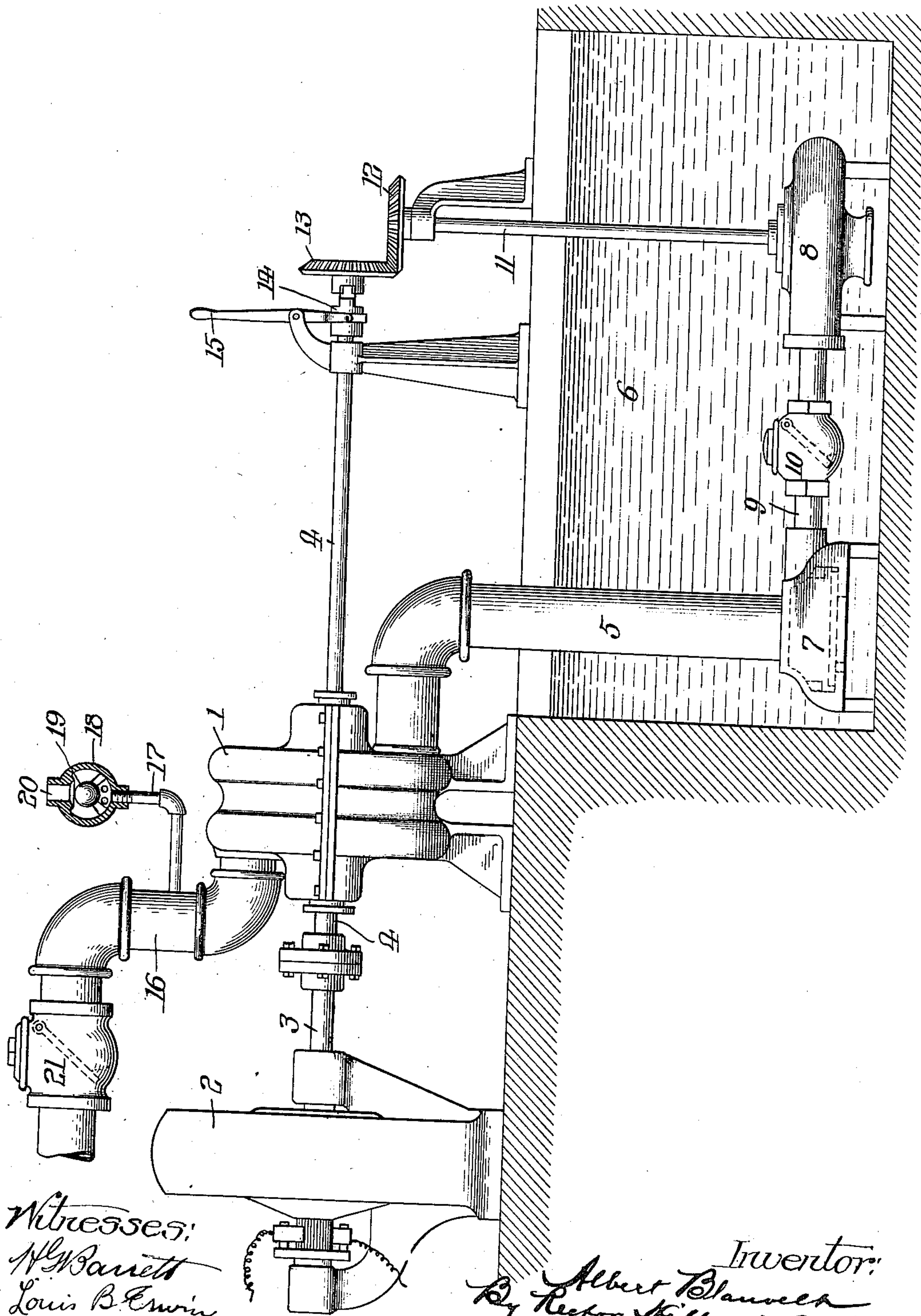


A. BLAUVELT.
 APPARATUS FOR PRIMING AND VENTING WATER PUMPS.
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Witnesses:
 W. J. Barrett
 Louis B. Erwin

Inventor:
 Albert Blauvelt
 By Rector, Hibben & Davis
 His Atty

UNITED STATES PATENT OFFICE.

ALBERT BLAUVELT, OF CHICAGO, ILLINOIS.

APPARATUS FOR PRIMING AND VENTING WATER-PUMPS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ALBERT BLAUVELT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Apparatus for Priming and Venting Water-Pumps, of which the following is a specification.

My invention relates to the art of water pumps and consists in a new and useful method of and apparatus for priming and venting such pumps.

Heretofore, as is well known, the venting of a water pump was usually performed or regulated by hand and likewise the priming of such pump was effected by an attendant or operator, usually by introducing a sufficiently large quantity of water to prime the latter rapidly, such priming water being introduced either directly to the pump or to the suction thereof, but in practice these methods are not efficient or satisfactory, both the hand venting and priming being objectionable because they are dependent upon the attendant or operator. Moreover, the two described methods of priming are particularly unsatisfactory for the reason that when the priming water is introduced directly to the pump, it is ejected or discharged to a considerable extent as it is received therein, leaving the pump entirely dependent upon its powers of air suction to draw the water from its suction pipe and the other priming method is unsatisfactory for the reason that the priming tank is liable to run dry through failure of the operator to refill the same, and the priming valve, after being operated, is liable to be left open, with the result that the air will enter the pump suction by way of the priming pipe and therefore defeat the operation of the pump.

The general object of my invention is to provide a method and system of pump venting and priming which is practically automatic and is not dependent upon the presence or judgment of an attendant or operator for its operation but which shall be started and operated as an incident to the operation of the pump and shall operate coincidentally therewith.

A further object of my invention is to prime and vent a pump in an efficient and reliable manner, more or less regardless of the air exhausting power of the pump, there-

by giving such pump a higher suction lift than would otherwise be practicable. To this end, speaking in general terms, I provide the discharge or delivery pipe of the water pump with an automatic venting device and also provide such pump with an auxiliary pump operated coincidentally with the water pump for the purpose of pumping water into the suction of the main pump for priming the latter.

In the accompanying drawing, the single figure represents in a more or less diagrammatic form an apparatus capable of carrying out my method.

Referring to the embodiment of my invention as it is illustrated in the drawing, for convenience in description, the water pump 1 may be of any of the usual and well known constructions or types, such as the centrifugal, positive displacement, or rotary type and the same may be driven by any suitable prime mover, which also may be of any suitable or desired character, although in the present instance I have shown such prime mover as an electric motor 2, whose armature shaft 3 is coupled to the driven shaft 4 of the water pump. The pump suction is represented by the suction pipe 5 depending into the water supply indicated by 6 and provided at its lower end with the usual foot valve 7. My priming system is adapted to cooperate with the pump suction at a point above the foot valve and to this end I provide an auxiliary pump 8 of any suitable type of construction and preferably, though not necessarily submerged in the water supply in convenient relationship with the pump suction and having its discharge or delivery pipe 9 communicating with the main pump suction 5 at a point above the foot valve. As stated, it is not necessary that this auxiliary pump shall be submerged, so long as it is located with reference to a water supply as to take suction water promptly and easily without special venting or priming. The discharge pipe 9 of the auxiliary pump is preferably provided with a check valve 10, although the same is not essential in practice. The auxiliary pump is provided with a shaft 11 which is adapted to be driven by the main pump shaft 4 through the medium of suitable driving connections such as the bevel gears 12 and 13, the former of which is secured to the upper end of the shaft 11 and the latter of which

is adapted to be operatively connected with the shaft 4 by means of the clutch 14 which is operated or controlled by the clutch lever 15.

5 The discharge or delivery pipe 16 of the main pump is provided with a take-off pipe 17 which communicates with a ball valve casing 18, in which is arranged a ball float valve 19 which will permit the air issuing
10 from the main pump or connections to pass off readily through the discharge port and passage 20 but which will shut off the discharge of water therethrough when the
15 water enters the ball casing and causes the ball to rise or float and thereby become seated upon the port and passage 20. If desired the discharge or delivery pipe 16 may be provided with a check valve 21 which is
20 customarily used in practice, particularly where the pump is called upon to discharge against an initial head.

In practice when it is desired to start the main pump and to prime the same for such operation, the clutch 14 is shifted to operatively connect the two shafts 4 and 11 and
25 the motor 2 is thereupon started, so that both of the pumps will be started and run coincidentally and with the result that the auxiliary pump will pump water into the suction
30 5 of the main water pump and will supply the latter with the necessary priming water. After the main pump has been properly started and is properly drawing and pumping the water the auxiliary pump may be
35 stopped by disconnecting the clutch 14, although as a matter of fact no injurious results would arise if the auxiliary pump was left in operation through any inadvertence or oversight of the attendant or operator.

40 As is well known, a water pump, while not very effective as an air exhausting pump, becomes effective as a sucking or lifting pump in solid water and it is therefore the object of my system to provide such pump with
45 the necessary priming water and to continue such supply until the main pump can lift its own suction water through the foot valve. When the pump is thus primed by solid
50 water from the submerged or auxiliary pump and vented as described the main pump can operate under suction lifts which are so high as to be impracticable for the usual water pump, which is dependent on air exhaustion as a means of starting.

55 It will be understood that the auxiliary pump may be of any desirable proportions relative to the main pump, but ordinarily is of a capacity and of a speed adapted to thoroughly prime the main pump in the course
60 of a comparatively few minutes and may ordinarily be run at a somewhat higher speed and be of a considerable smaller size than the main pump. It will also be understood that as soon as the air is blown out of
65 the main pump and connections and the

water begins to flow, the ball check valve 19 will close and prevent needless waste of water.

I claim:

1. Apparatus for priming a main water 70 pump comprising in connection with a main water pump and its prime mover and with the suction pipe and foot valve of such pump, an auxiliary pump which is power-operated and disconnectible and whose discharge is connected with such suction pipe
75 at a point above the foot valve and whose suction is independent of the suction of the main pump.

2. Apparatus for priming a main water 80 pump comprising in connection with such pump and its prime mover, an auxiliary water pump whose discharge is connected with the suction of the main water pump and whose suction is independent of the suction of the main pump and operating connections for driving the auxiliary pump coincident with the main pump but capable of disconnection at the will of the operator. 85

3. Apparatus for priming a main water 90 pump comprising in connection with such pump and its prime mover, an auxiliary water pump whose discharge is connected with the suction of the main water pump and whose suction is independent of the suction of the main pump and operating connections between the two pumps for operating them coincidentally but capable of disconnection at the will of the operator. 95

4. Apparatus for priming a main water 100 pump comprising in connection with such pump and its prime mover, an auxiliary water pump whose discharge is connected with the suction of the main water pump and whose suction is independent of the suction of the main pump and operating devices adapted to be connected and disconnected for driving the auxiliary pump coincidentally with the main pump said operating devices being disconnectible at the will of the operator. 105

5. Apparatus for priming a main water pump comprising, in connection with such pump and its prime mover, a centrifugal auxiliary water pump whose discharge is
115 connected with the suction of the main water pump and whose suction is independent of the suction of the main pump.

6. An apparatus for priming a main water pump comprising, in connection with a main 120 water pump and its prime mover, a power-operated auxiliary water pump which is adapted to be disconnected at the will of the operator and whose discharge is connected with the suction of the main water pump
125 and operated in unison with such main pump, in combination with venting apparatus consisting of a valve casing communicating with the discharge or delivery pipe of the main water pump and valve mechanism 130

ism therein adapted to permit the escape of air displaced from the main pump and its connections by the entrance of priming water therein from the auxiliary pump, said valve being arranged to automatically close when reached by water due to the displacement of said air.

7. An apparatus for priming a main water pump comprising, in connection with a main water pump and its prime mover, a power-operated auxiliary water pump which is adapted to be disconnected at the will of the operator and whose discharge is connected with the suction of the main water pump and operated in unison with such main

pump, in combination with venting apparatus for water pumps consisting of valve casing communicating with the discharge or delivery pipe of the main water pump and a float ball valve in said casing for permitting the discharge of air displaced from the main pump and its connections by reason of the entrance of priming water from the auxiliary pump, said valve being arranged to automatically close when reached by water due to the displacement of said air.

ALBERT BLAUVELT.

Witnesses:

S. E. HIBBEN,
SYLVIA BLISS.