H. L. SMITH.

AUTOMATIC PUMP STOP.

APPLICATION FILED APR. 2, 1920.

1,420,769.

Patented June 27, 1922.

FIG. 2.

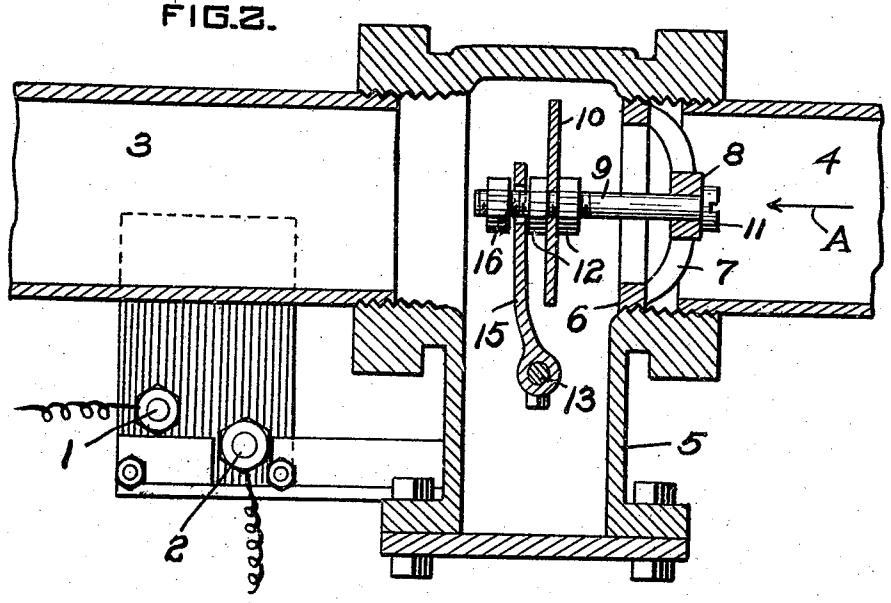
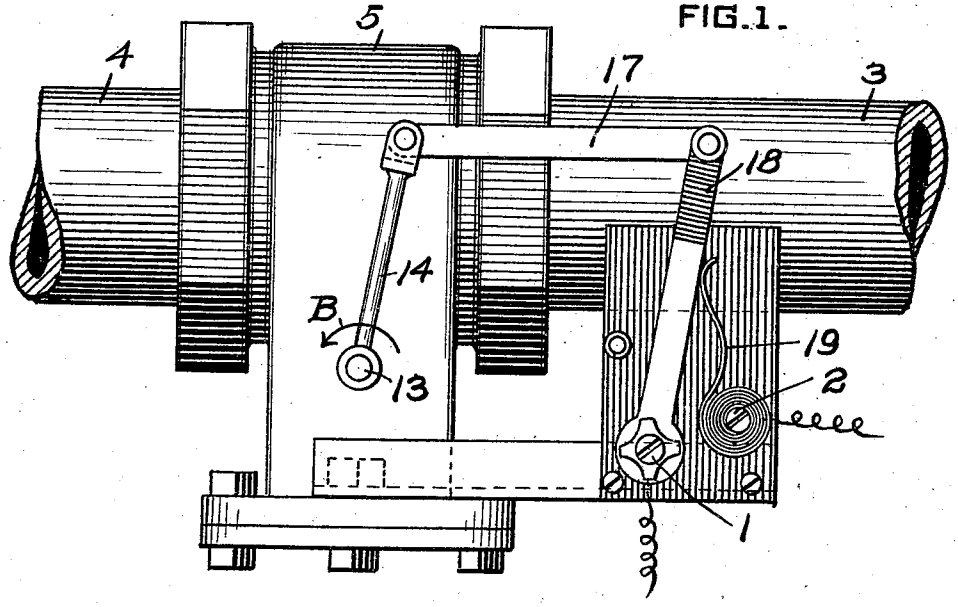


FIG. 1.



WITNESSES

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UNITED STATES PATENT OFFICE.

HUBERT L. SMITH, OF AVONMORE, PENNSYLVANIA.

AUTOMATIC PUMP STOP.

1,420,769. Specification of Letters Patent. Patented June 27, 1922.

Application filed April 2, 1920. Serial No. 370,837.

To all whom it may concern:

Be it known that I, HUBERT L. SMITH, a citizen of the United States, and a resident of Avonmore, in the county of Westmoreland and State of Pennsylvania, have made a new and useful Improvement in Automatic Pump Stops, of which the following is a specification.

My invention consists of an automatic stop for pumps and is operated by cessation of the flow of fluid in a pipe line the normal circulation through which is maintained by the pump to which my invention is applied.

The object of my invention is to stop the operation of the pump motive power whenever the pipe flow ceases because of a broken pump part, a break in the pipe line in front of the pump, exhaustion of the fluid in the reservoir or chamber being pumped out, or other cause.

In the accompanying drawings which illustrate a preferred embodiment of my invention, Figure 1 is a side elevation of a section of a pipe line with my device applied thereto and Fig. 2 is a longitudinal, vertical section through same but looking in the opposite direction. The pump which circulates fluid through the pipe is not illustrated. This particular installation is intended for an electrically driven pump and the pump control consists of a make and break circuit including binding posts 1 and 2 from which wires lead to the pump motor starting box relay.

Two lengths 3 and 4 of the pipe line are connected by a T like member 5 which forms a housing and mounting for the operating mechanism. An annular ring 6 is positioned in member 5, axially alined with pipes 3 and 4 and forms a valve seat. It is provided with a transverse arm 7 having a central boss 8 which forms a journal bearing for a sliding rod 9 upon which a circular valve disk 10 is mounted. If the pump impels the fluid through the pipe in the direction of arrow A in Fig. 2, the fluid pressure against disk 10 will force the latter from its seat, its movement being limited by head 11 on rod 9. Disk 10 is secured in place on rod 9 by nuts 12.

A shaft 13 is spaced from rod 9, located at right angles thereto and is journaled in the walls of member 5. One end of shaft 13 extends through the wall of member 5 and mounts an arm 14. A lever 15 is mounted on shaft 13 within member 5, extends upwardly and is provided with an opening to receive rod 9 which is loosely secured to lever 15 by nut 16.

Arm 14 is connected by a bar 17 to the free end of a switch blade 18, pivoted on binding post 1. A current conducting spring 19 is mounted on binding post 2 and is positioned to contact with switch blade 18 when the latter is in the position shown in Fig. 1 which is the position it will assume when there is a flow of fluid through the pipe in the direction of arrow A.

If the source of fluid supply should be exhausted at any time while the pump is pumping against a head, pressure in pipe 4 will decrease below that in pipe 3 and disk 10 will be seated. Its seating movement will slide rod 9 into pipe 4 and, through lever 15 rotating shaft 13, move arm 14 in the direction of arrow B, Fig. 1. This action pulls switch blade 18 away from spring 19 thus breaking the pump motor circuit. The distortion of spring 19, when in the position shown in Fig. 1, is not great and the movement of blade 18 to the left as far as indicated by the movement of lever 15 will be sufficient to separate blade 18 and spring 19.

The circuit is completed at any time by manually moving blade 18 into contact with spring 19 and holding same until the pump starts the fluid circulating.

In the absence of means functioning as my device, the motor would continue to drive the pump irrespective of the flow of fluid. If a piston rod of the pump should break, my device would immediately terminate the driving of the pump and avoid injury by the broken parts. Similarly, with the failure of other essential parts of the pump, or the supply line, its operation will cease and damage be avoided.

While I have shown my device operating to break an electric circuit it is obvious that a steam throttle or an internal combustion engine sparking circuit may be substituted for the electric motor circuit without departing from the spirit of my invention.

I claim:—

1. The combination with two aligned pipe sections of a pump for forcing liquid therethrough, a T connecting said sections and depending therefrom, a sliding valve so po-

sitioned within said T as to be closed by back pressure upon a cessation of liquid flow through said pipe sections and means operating upon the closing of said valve for shutting off said pump.

2. The combination with a pump of a pipe line connected to the outlet thereof, of a valve in said line normally held in open position by the flow of liquid through said pipe line and adapted to be closed by back pressure upon the cessation of flow and means operatively connected to said valve for shutting off the pump upon the closure of said valve.

In testimony whereof, I have hereunto subscribed my name this 29th day of March, 1920.

HUBERT L. SMITH.