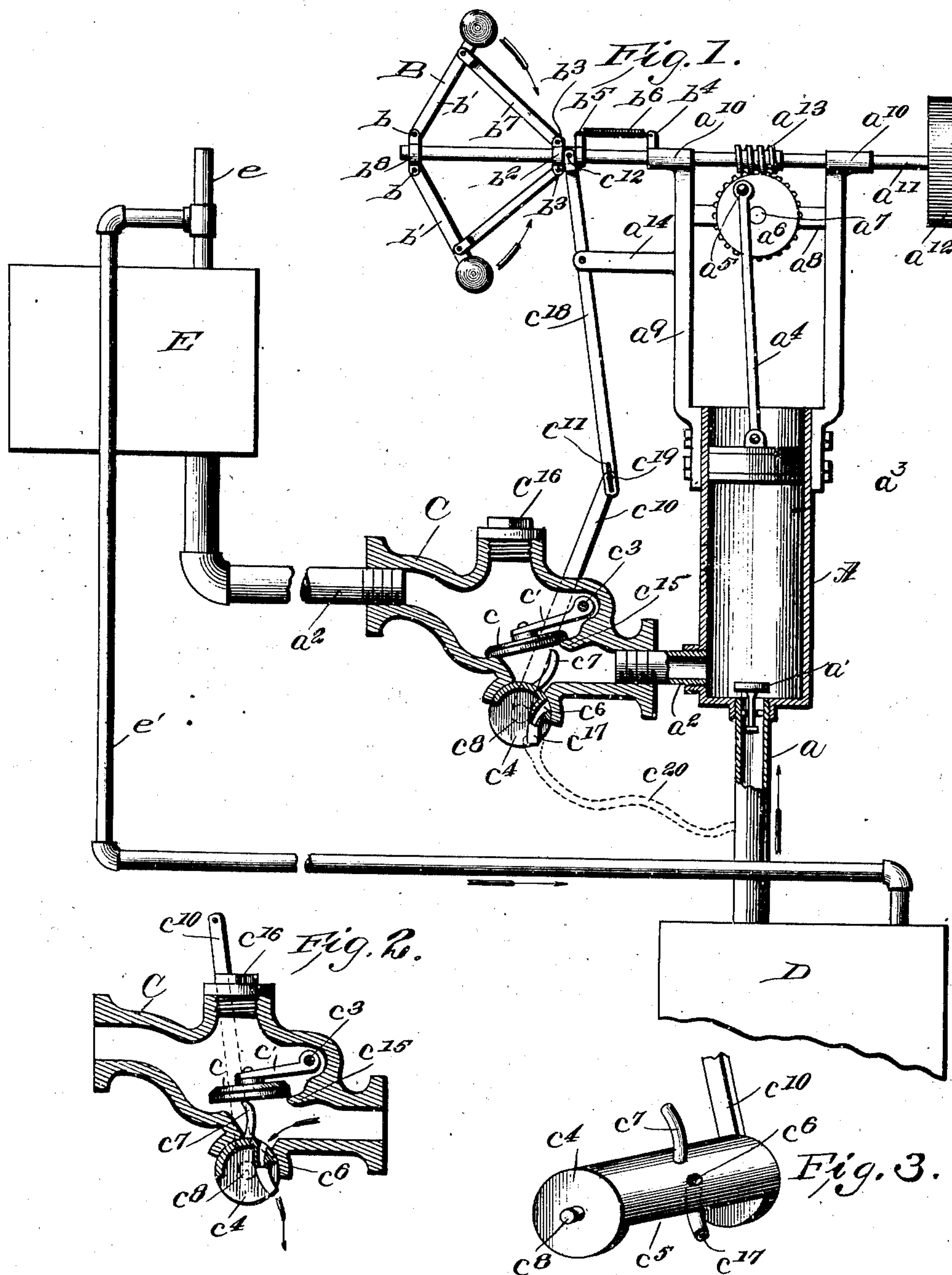


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G. G. FORESTER.
PUMP DRAIN.

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PUMP-DRAIN.

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To all whom it may concern:

Be it known that I, GUSTAV G. FORESTER, a citizen of the United States, and a resident of Bagley, in the county of Guthrie and State of Iowa, have made certain new and useful Improvements in Pump-Drains, of which the following is a specification.

My invention is an improvement in pump drains and consists in certain novel constructions and combinations of parts hereinafter described and claimed.

Referring to the drawings forming part hereof—Figure 1 is a side view partly in section of a pump provided with my improvement. Fig. 2 is a detail sectional view of the valve casing showing the drain and check valves open, and Fig. 3 is a detail perspective view of the drain valve.

In the present embodiment of my invention, the pump cylinder A is provided with a supply pipe *a* communicating with a tank or well D, and provided with a check valve *a'*. A discharge pipe *a*² leads from the pump to the cylinder head E, and in the length of the discharge pipe is interposed a valve casing C. The valve casing C is of the form shown in Figs. 1 and 2, and is provided with a diaphragm *c*¹⁵ having an opening therethrough, which is normally closed by a check valve *c* connected with the free end of an arm *c'* pivoted to the valve casing as at *c*³, a plug *c*¹⁶ being threaded into the casing whereby to obtain access to the check valve. A transverse opening is arranged in the bottom of the casing, and within the opening is journaled a valve or plug *c*⁴, by means of the trunnions *c*⁸ at the end of the valve engaging suitable openings in the sides of the casing. The plug or valve is cut away at *c*⁵ on one side as shown in Fig. 3, and is provided with a drain opening *c*⁶ therethrough, the opening being provided with a nipple *c*¹⁷, for a purpose to be hereafter described. An arm *c*⁷ is connected with the outer face of the valve or plug, and is so arranged that when the plug is rotated to bring the drainage opening into register with the opening in the bottom of the casing, the said arm will engage and lift the check valve as clearly shown in Fig. 2. One of the trunnions of the valve or plug projects through the side of the casing, and has rigidly connected therewith a lever *c*¹⁰, the lever being provided for rotating the plug and being operated in the manner to be presently set forth. The piston *a*³ of the pump is connected by the piston rod *a*⁴, with the wrist-pin *a*⁵, upon a worm wheel *a*⁶ journaled upon a pin *a*⁷ connected with a cross bar *a*⁸, the said cross bar extending between parallel arms *a*⁹ secured to the opposite sides of the end of the cylinder and provided in their free ends with bearings *a*¹⁰. A shaft *a*¹¹ is journaled in the bearings *a*¹⁰, and is provided at one end outside of the arms with a pulley *a*¹², and between the arms with a worm *a*¹³ engaging the worm wheel *a*⁶ whereby to rotate the same. The opposite end of the shaft from the pulley is provided with a governor B, comprising a collar *b*⁸ fixed to the end of the shaft

and provided with oppositely projecting lugs *b* to which are pivotally connected weighted levers *b'*. A sleeve *b*² is slidably mounted upon the shaft, and the said sleeve is also provided with oppositely projecting lugs *b*³, and levers *b'* are pivotally connected with the lugs *b*³ and with the weighted levers *b'* near the outer ends thereof. The sleeve *b*² is also provided with a lug *b*⁴ connected by a spring *b*⁶ with a lug *b*⁴ on the bearing *a*¹⁰ of one of the arms *a*⁹, the spring acting to draw the sleeve toward the said bearing. A bracket arm *a*¹⁴ extends from the arm *a*⁹ adjacent to the governor, and to the said bracket arm is pivoted a lever *c*¹⁸ having at one end a yoke *c*¹² connected with the sleeve *b*², and having at the other end a slot *c*¹¹ engaging a pin *c*¹⁹ on the lever *c*¹⁰ before described.

It will be evident from the description that when the pump is working, the weights on the levers *b'* will be thrown outwardly, thus moving the sleeve *b*² away from the bearing *a*¹⁰, and as a consequence carrying the upper end of the lever *c*¹⁸ outwardly, thus moving the lever *c*¹⁰ and rotating the valve *c*⁴ to move the drainage opening out of register with the opening in the casing and to permit the seating of the check valve. When the pump stops, the tension of the spring will move the sleeve toward the bearing, thus rotating the valve in the opposite direction, opening the check valve and bringing the drainage opening into register with the opening in the casing, whereby to permit the drainage of the water from the discharge pipe and pump and the parts connected therewith.

The cylinder head E is provided with an air pipe *e*, and a return pipe *e'* leads from the air pipe to the tank or well D. If desired a flexible pipe *e*²⁰ may be connected with the nipple and arranged to discharge into the supply pipe *a* of the pump as shown in Fig. 1.

It will be evident from the description that whenever the pump ceases to work the check valve and the drainage valve will be positively opened, and that when the pump commences to work they will be positively closed. The improvement is shown as operated by the governor merely as a matter of convenience, it being understood that it might with equal facility be connected directly with a battery switch, fuel feed lever or throttle valve of the engine, or any other part of the engine or pump that it would be necessary to move to start or stop the engine or pump, the essential point being that the stoppage of the pump will positively open the valves while the starting of the pump will positively close them.

It will be evident that the improvement is entirely automatic in its action, not depending upon any factor except the starting and the stopping of the pump.

I claim—

1. In a device of the class described, the combination with the pump and the cylinder head, and the discharge pipe leading from the pump to the cylinder head, of a governor for the pump, a casing interposed in the pipe and

- having a transverse opening in the bottom thereof, a check valve in the casing, an arm pivoted to the casing and to whose free end the check valve is connected, a plug having a drainage opening therethrough, said plug being rotatable in the opening and normally closing the same, an arm on the plug for lifting the check valve when the plug is rotated to move the drainage opening into register with the opening of the casing, a lever connected with the plug, and a connection between the lever and the governor, whereby said governor will rotate the plug.
2. In a device of the class described, the combination with the pump and the cylinder head and the discharge pipe leading from the pump to the cylinder head, of a governor for the pump, a check valve in the pipe, said pipe having an opening adjacent to the check valve, a plug having a drainage opening therethrough rotatable in the opening and normally closing the same, an arm on the plug for lifting the check valve when the plug is rotated to move the drainage opening into register with the opening of the pipe, a lever connected with the plug, and a connection between the lever and the governor whereby said governor will control the movement of the plug.
3. In a device of the class described, the combination with the pump and the cylinder head and the discharge pipe leading from the pump to the cylinder head, of a check valve in the pipe, said pipe having an opening adjacent to the check valve, a drainage valve rotatable in the opening and normally closing the same, an arm on the valve for opening the check valve when said drainage valve is moved to open position, a lever connected with the drainage valve, and a connection between the lever and the pump whereby the stoppage of the pump will move the drainage valve to open position and whereby the starting of the pump will move said drainage valve to closed position.
4. In a device of the class described, the combination with the pump and the cylinder head, and a discharge pipe leading from the pump to the cylinder head, of a check valve in the discharge pipe, a drainage valve for the pipe adjacent to the check valve, a connection between the drainage valve and the pump whereby the movement of the pump will open and close the drainage valve, and means whereby the opening of the drainage valve will open the check valve.
5. In a device of the class described, the combination with the pump and the cylinder head, and the discharge pipe leading from the pump to the cylinder head, of a check valve in the pipe, a drainage valve adjacent to the check valve, a governor in connection with the pump, means whereby the movement of the governor will open and close the drainage valve, and means whereby the opening of the drainage valve will open the check valve.
6. In a device of the class described, the combination with the pump and the discharge pipe leading therefrom, of a check valve in the discharge pipe, a drainage valve adjacent to the check valve, a governor connected with the pump, a connection between the governor and the drainage valve whereby the movement of the governor will close said drainage valve, and means whereby the closing of the drainage valve will close the check valve.
7. In a device of the class described, the combination with the pump and the discharge pipe leading therefrom, of a check valve in the discharge pipe, a drainage valve adjacent to the check valve, a connection between the pump and the drainage valve whereby movement of the pump will close said drainage valve, and means whereby the closing of the drainage valve will close the check valve.
8. In a device of the class described, the combination with the pump and the discharge pipe, of a check valve in the discharge pipe, a drainage valve adjacent to the check valve, means whereby the stoppage of the pump will open the drainage valve and means whereby the opening of the drainage valve will open the check valve.
9. In a device of the class described, the combination with the pump and the discharge pipe, of a check valve in the discharge pipe, and means whereby the stoppage of the pump will open the check valve.
10. In a device of the class described, the combination with the pump and the discharge pipe, of a check valve in the discharge pipe, a drainage valve in the discharge pipe, means whereby the movement of the pump will operate the drainage valve, and means whereby the drainage valve will operate the check valve.
- GUSTAV G. FORESTER.
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