(No Model.) 2 Sheets—Sheet 1.

H. HOWARD.

AUTOMATIC PUMP GOVERNOR.

No. 420,687. Patented Feb. 4, 1890

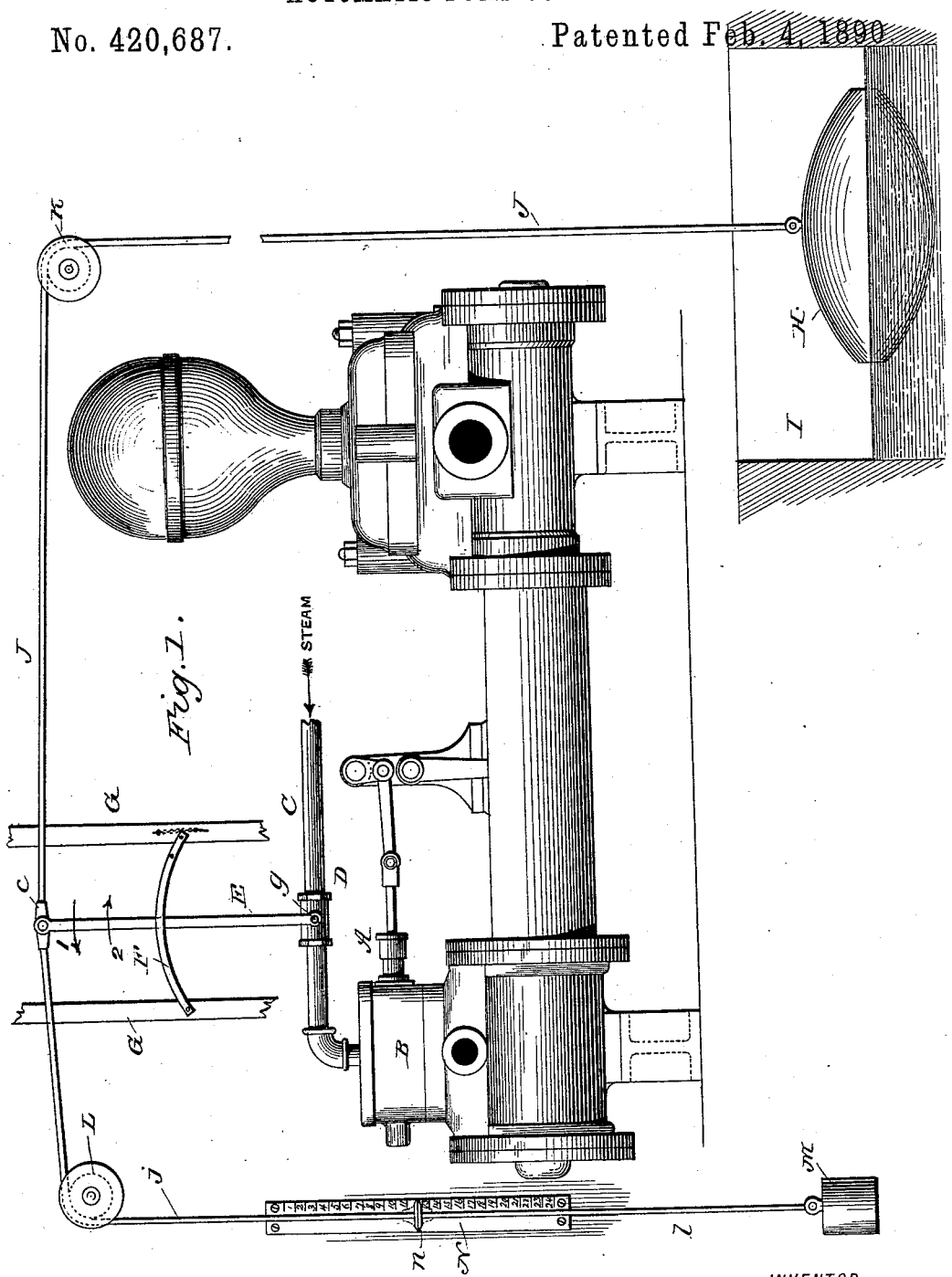

Fig. 1.

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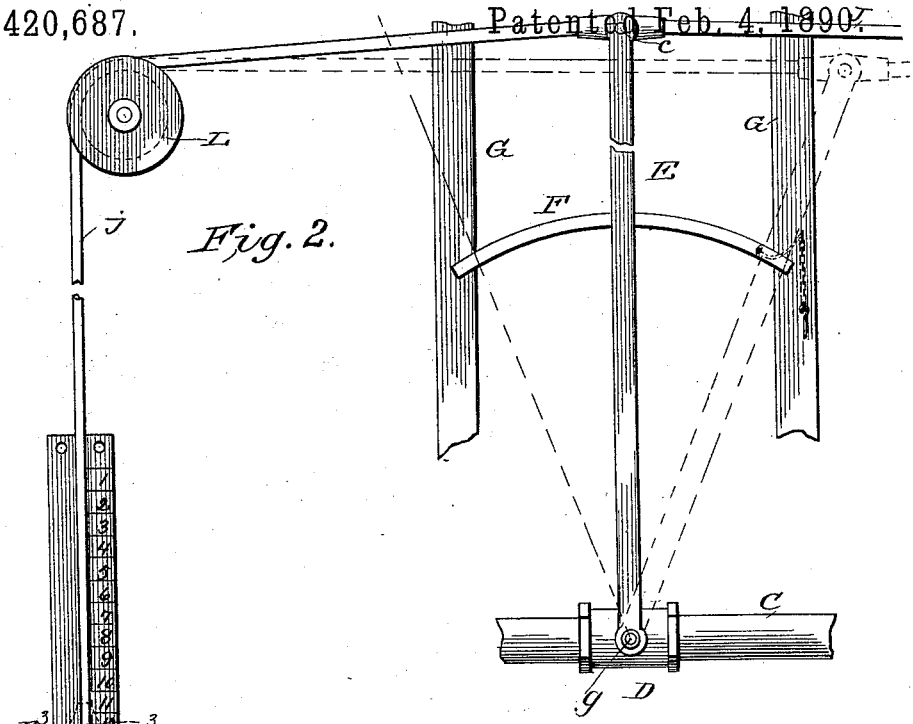


Fig. 2.

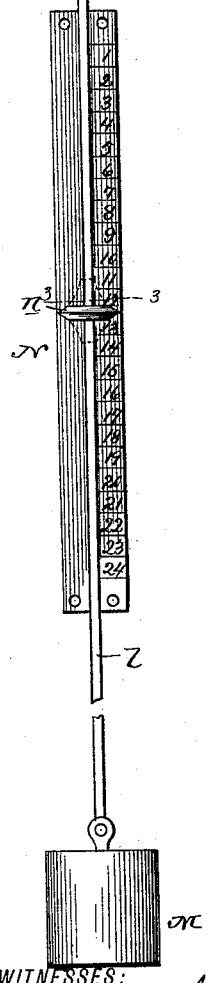
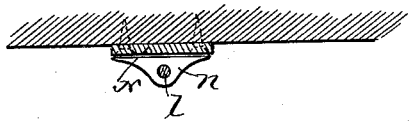


Fig. 3.



WITNESSES:
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UNITED STATES PATENT OFFICE.

HUGH HOWARD, OF HENRYELLEN, ALABAMA.

AUTOMATIC PUMP-GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 420,687, dated February 4, 1890.

Application filed July 13, 1889. Serial No. 317,488. (No model.)

To all whom it may concern:

Be it known that I, HUGH HOWARD, residing at Henryellen, in the county of Jefferson and State of Alabama, have invented certain new and useful Improvements in Automatic Pump-Governors, of which the following is a specification.

My invention has for its object to provide suitable means for automatically governing the speed of pumps, and it is more especially adapted for use in connection with pumps used to draw the water out of mines; and to this end it consists in certain novel features of construction and peculiar combination of parts, all of which will be hereinafter fully described in the annexed specification, and particularly pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation of my improvements, showing same as applied to a pump. Fig. 2 is a detail view of the shifting-lever and its connections on an enlarged scale; and Fig. 3 is a cross-section on line 3 3, Fig. 2.

Referring to the accompanying drawings, A indicates a pump of any desired or preferred construction.

B represents the steam-chest of the same, and C the steam-pipe, which connects with the chest B, as shown, and which is provided with a throttle-valve D, of any desired construction.

E denotes a shifting-lever, which is connected at its lower end to the projecting stem *g* of the throttle-valve, its upper end being guided by and operating in a suitable sector-shaped guideway F, secured to a frame G, suitably arranged near the pump, as shown.

H denotes a float, which in practice is disposed in a suitably-arranged reservoir I, formed within the mine, to which is connected one end of a wire cable J, which is passed over a suitable guide pulley or pulleys K, arranged within the mine and extended to without the mine, and clamped, as at *c*, to the upper end of the lever E, and extended, as *j*, over a suitable guide pulley or pulleys L, its outer end *l* extending downward and provided with a counterbalance-weight M, said weight being of less weight than the float H.

By reference to Fig. 1 of the drawings it will be observed that the lever E is of such a length that its connection with the cable is such that it will deflect the cable out of its true line between its guides J K as the arm E is swung from end to end, thereby the more readily overcoming its dead-center.

The depending portion *l* of the cable is provided with a suitable pointer or finger *n*, which traverses the face of an indicator-plate N, which is provided with a suitable scale, numbered from 1 to 24, as shown, and by means of which the depth of the water in the reservoir may be readily ascertained.

The operation of my invention is as follows: At some convenient point within the mine from which it is desired to pump the water a reservoir I is formed for the water to collect, and in this reservoir is placed the float H. The cable J is then run over suitable guide-pulleys and connected with the shifting-lever E in the manner before described and the weight M adjusted to the free end of the cable. Now as the water rises in the reservoir the float will rise and the weight M fall, drawing the cable with it and moving the shifting-lever E in the direction shown by arrow 1, and thus gradually opening the throttle-valve and admitting a pressure of steam, said pressure increasing with the degree of the rise of the float in the reservoir, and thereby causing the pump to work faster. When the water in reservoir falls, the float will gradually drop, and pulling on the cable will force the lever E over to the position shown by arrow 2, and thereby decrease the steam-pressure and cause the pump to slow up. It will be understood that the float being heavier than the weight it will pull the same up during this movement. Should it be desired to hold the lever in position to cut off the steam-supply and stop the pump from operating, the same may be locked in the position indicated by arrow 3 by means of a pin or keeper S, passed through the sector guide-plate, as shown.

It will be readily understood that as the water in the reservoir rises or falls the float and cable attachments will automatically regulate the supply of steam and cause the pump to work faster or slower, as the occasion may require, and by arranging an indi-

cator-finger on the cable in the manner described the same will indicate at a glance the depth of the water within the reservoir.

From the foregoing description, taken in connection with the accompanying drawings, the advantages of my invention will readily appear. It will be seen that the same is exceedingly simple in construction, cheap as to cost, and positive in its desired operation.

While I have described my invention as being more particularly adapted for operation in pumping water from mines, it is manifest that the same may be readily adapted for use in connection with suction-pumps for general uses.

It will be understood that my improvement can be readily adjusted for use in connection with a cut-off valve of any preferred construction.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of a reservoir, as I, a float arranged in said reservoir, a cable connected at one end to said float and passed over supporting-guides K J, an indicator arranged on the free end of said cable, a steam-pump, and the lever E, connected at one end to the throttle-valve of said pump, its opposite end connected to the cable at a point between the guides J K, all arranged substantially as and for the purpose described.

2. The combination of a reservoir, as I, a float arranged in said reservoir, a cable connected at one end to said float, the guides or supports K J, over which said cable is passed, a counter-balance secured upon the depending free end of said cable, an indicator-plate, an indicator-finger secured upon said depending end, adapted to traverse said indicator-plate, a steam-pump, and the lever E, connected at one end to the throttle-valve, its opposite end connected to the cable at a point between the guides J K, said lever adapted to be oscillated by the reverse movements of said cable, all arranged substantially as and for the purpose described.

HUGH HOWARD.

Witnesses:
A. O. KEHM,
R. E. EVANS.