

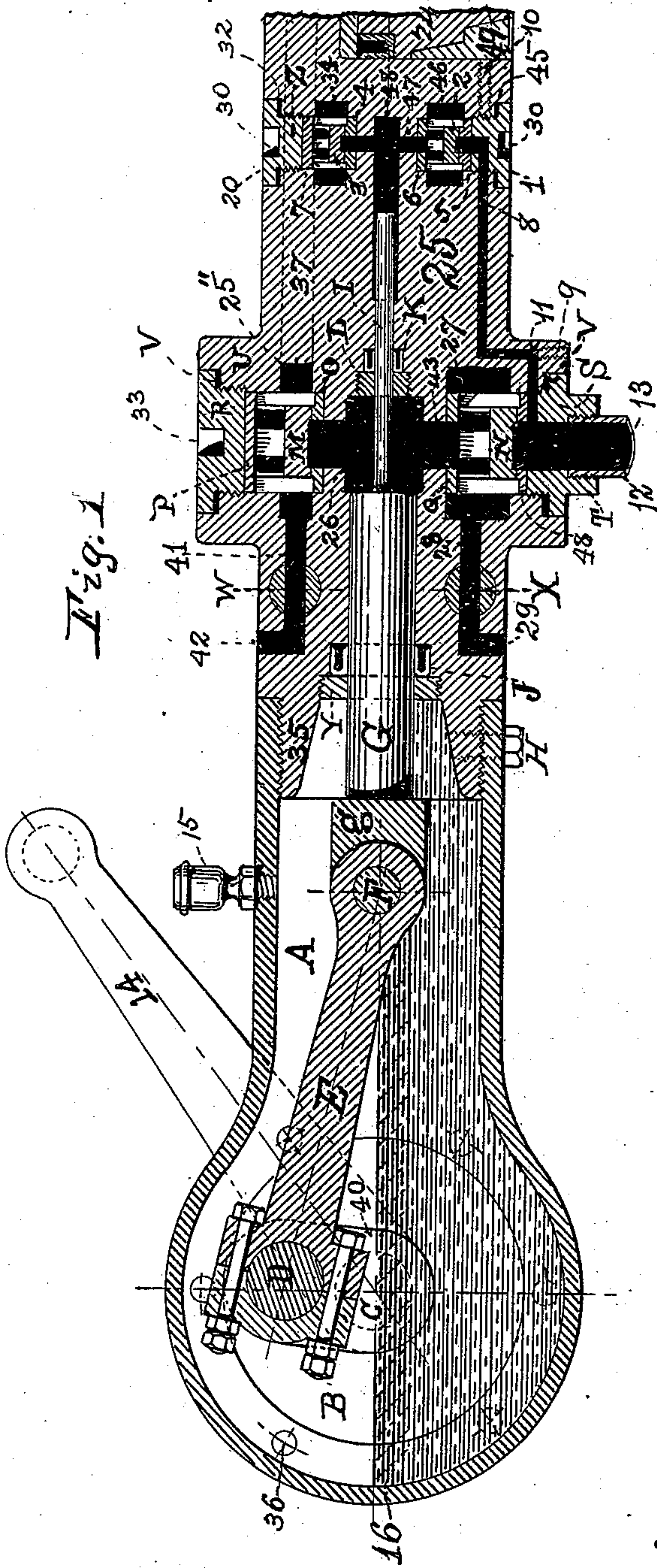
(No Model.)

2 Sheets—Sheet 1.

A. E. WATKINS.
HYDRAULIC MINING PUMP OR RAM.

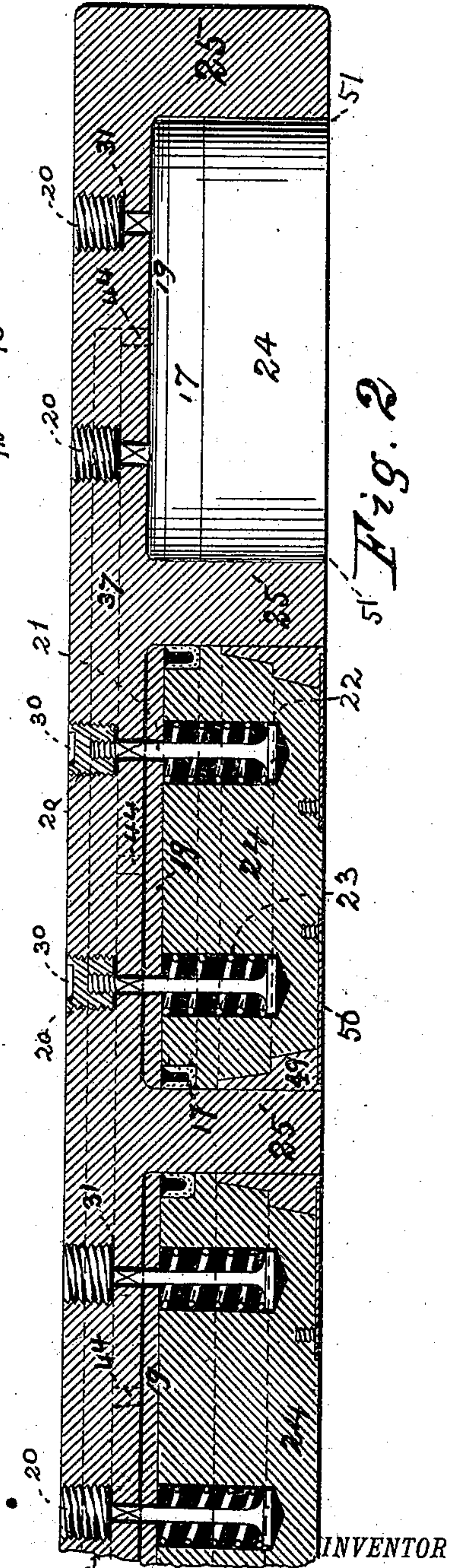
No. 355,669.

Patented Jan. 4, 1887.



WITNESSES:

Robt. M. Acers
Wm. Rumble



INVENTOR

Alfred E. Watkins

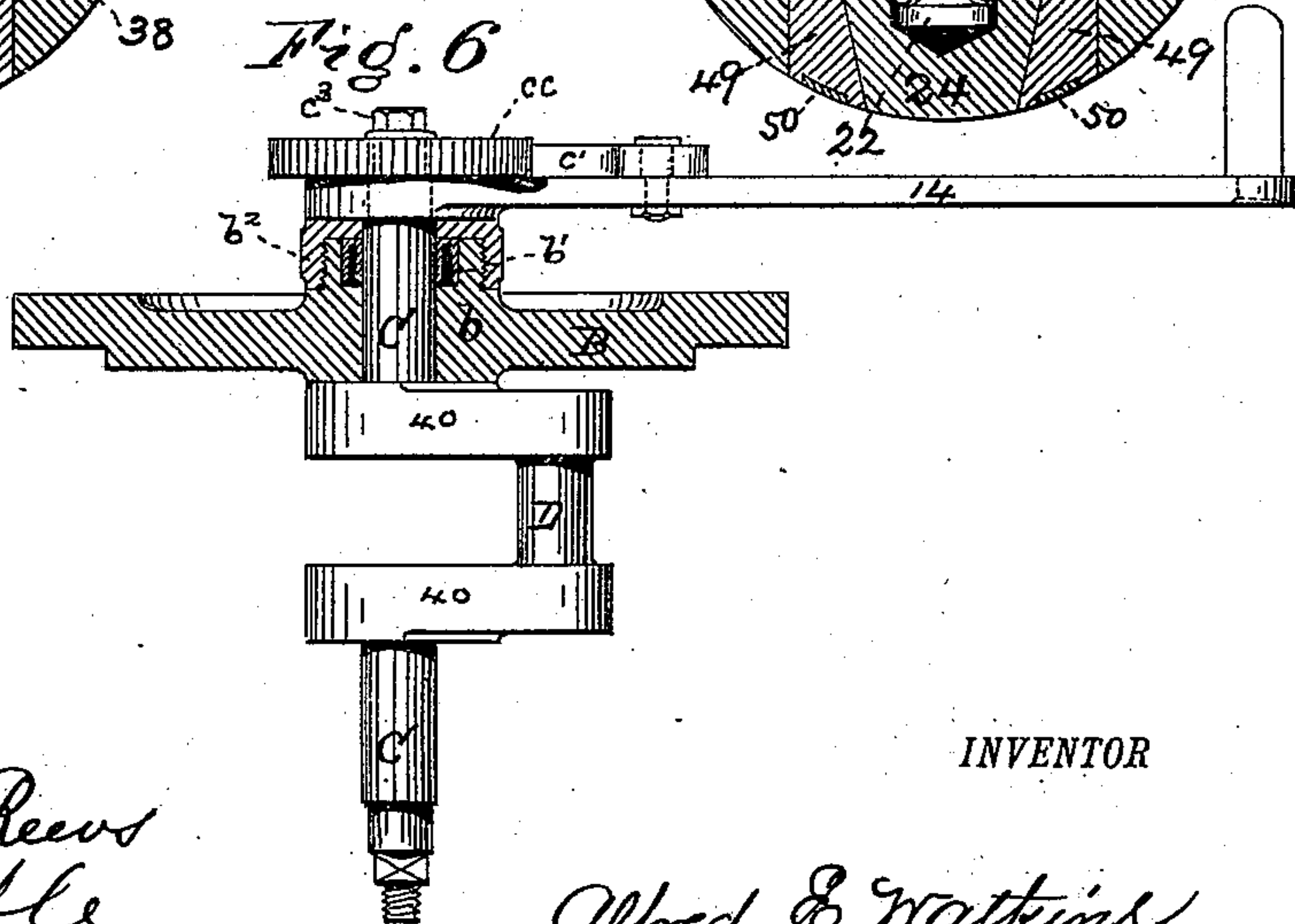
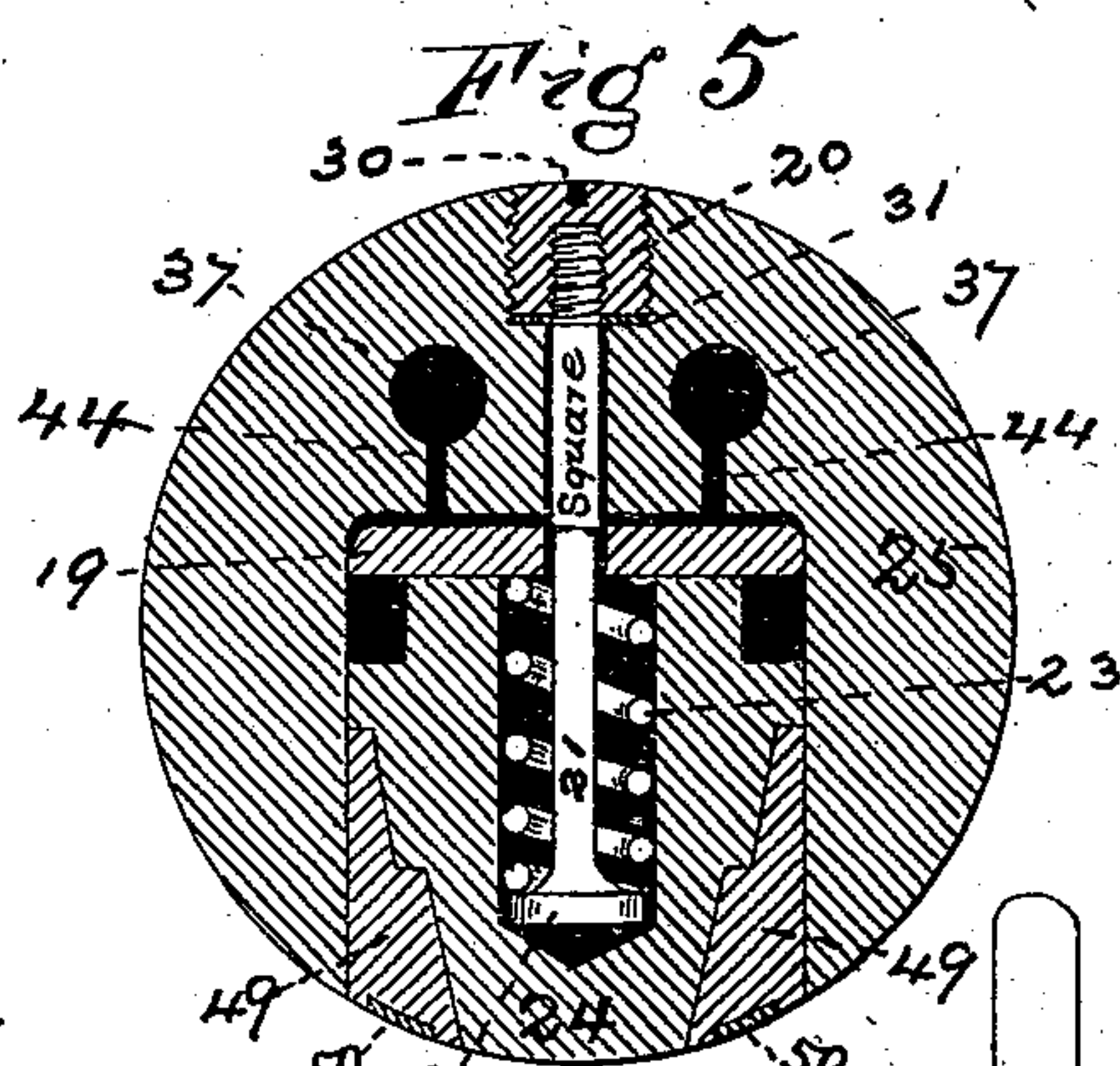
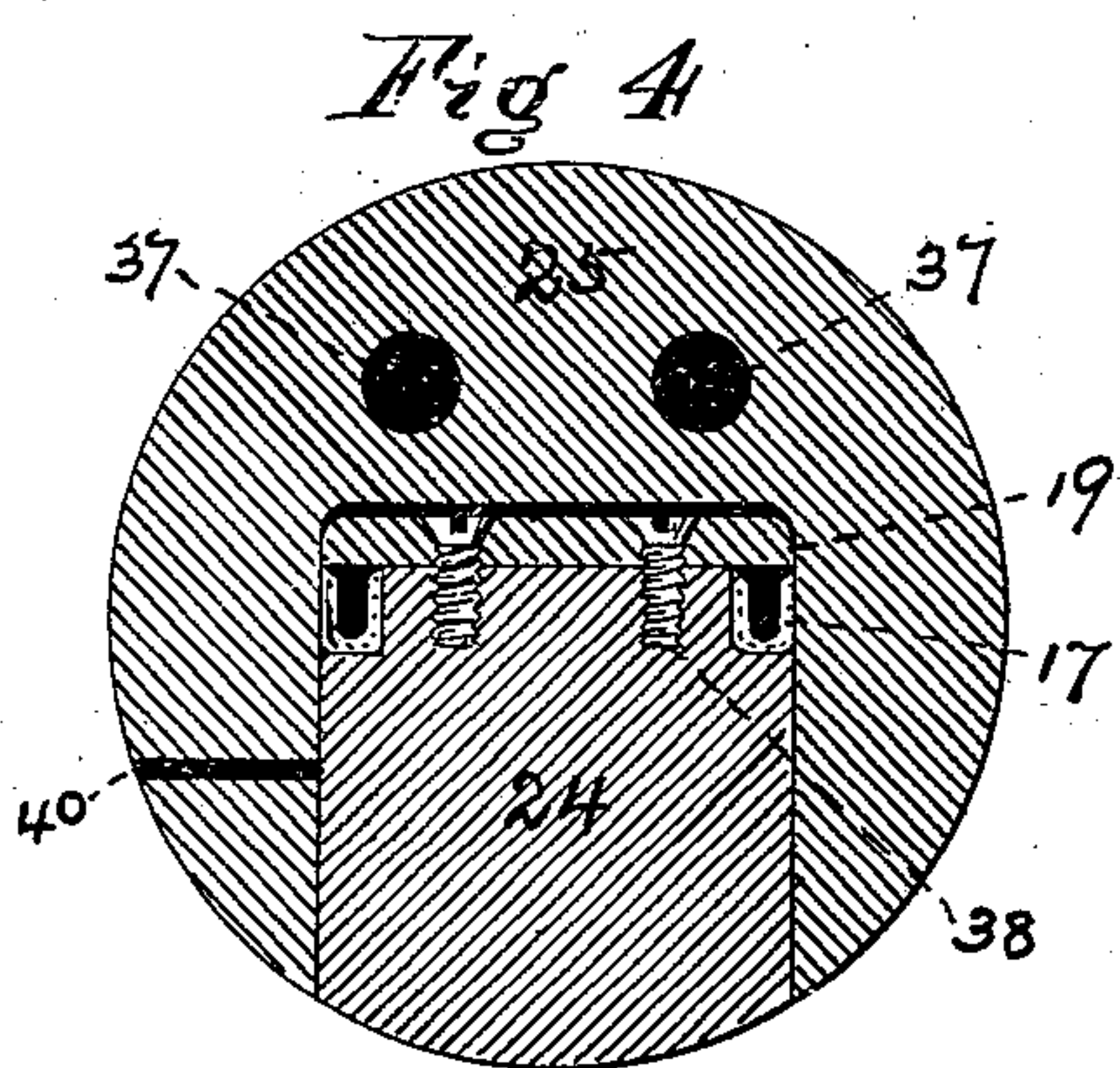
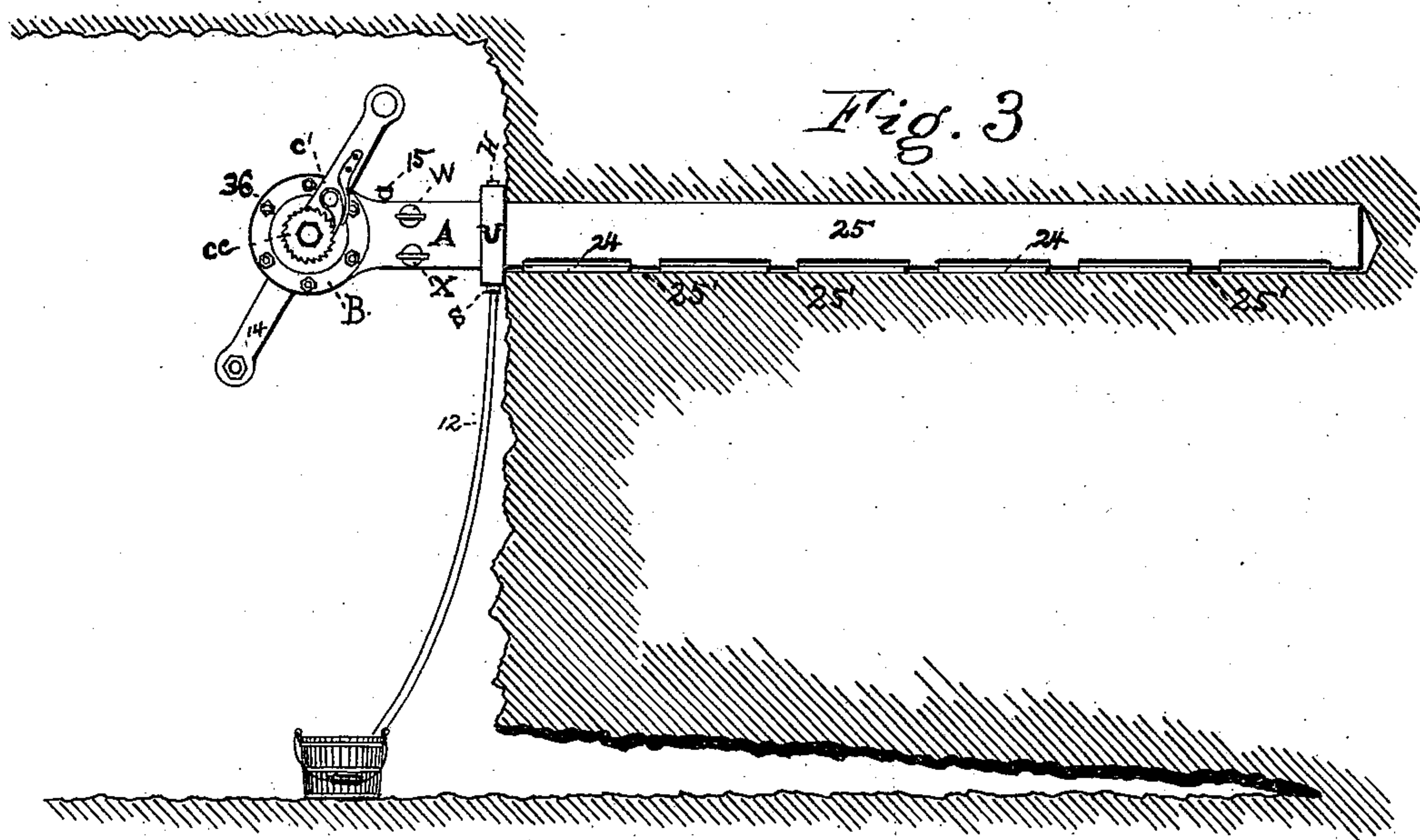
(No Model.)

2 Sheets—Sheet 2.

A. E. WATKINS.
HYDRAULIC MINING PUMP OR RAM.

No. 355,669.

Patented Jan. 4, 1887.



WITNESSES:

Robt. M. Reeves
Wm. Rumble

INVENTOR

Alfred E. Watkins.

UNITED STATES PATENT OFFICE.

ALFRED E. WATKINS, OF SOUTH ORANGE, NEW JERSEY.

HYDRAULIC MINING PUMP OR RAM.

SPECIFICATION forming part of Letters Patent No. 355,669, dated January 4, 1887.

Application filed March 11, 1886. Serial No. 194,805. (No model.)

To all whom it may concern:

Be it known that I, ALFRED E. WATKINS, a citizen of the United States, and a resident of South Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Hydraulic Mining Pumps or Rams, of which the following is a specification.

The object of my invention is to produce a new and novel method of using water or other fluids for operating a hydraulic ram or pump for mining purposes.

Referring to the drawings, Figure 1 is a vertical sectional view of my invention. Fig. 2 is another vertical sectional view. Fig. 3 is an outside view of my machine. Fig. 4 is a cross-section of the same, showing position of pressure-blocks. Fig. 5 is another cross-section, showing arrangement of springs for retaining blocks. Fig. 6 is a view of head and cranks and arrangement of their proper position.

Corresponding letters and figures denote like parts in all the views.

25 represents the barrel or plug, made preferably of steel, and about six feet long. This plug 25 is provided with recesses which receive the movable blocks 24, the object of which will be hereinafter more fully described. Within this barrel or plug 25 are placed the two plungers G and I, made of steel and connected together and operated by rod E and knuckle g. Both of these plungers pass through leather packing-cups J and K, held in position by the plugs L and Y. Both of these plungers have a common suction-pipe, 12, which may be connected to any water-supply by means of a rubber pipe. This suction for the large pump or plunger G is direct. It passes through the plug S, under the suction-valve N, into chamber 27, whence it passes over the valve N, through the passage 43 of cage Q, into pumping-chamber 26. The suction for the pressure-pump I passes out of plug S, by way of the channels 12 and 8, into plug 1; thence up through seat 5, under suction-valve 2, into chamber 46; thence over valve 2, through the passage 47, into pumping-chamber 48. The forced water from pump G passes through seat O, beneath force-valve M, up under the valve, and out into chamber 25", whence it passes along the passages 37 37 to the outlets 44 44. The forced water from pressure-pump I passes

up through the seat 4, out from beneath force-valve 3, into chamber 34, which has an outlet into the passages 37 37.

For the purpose of throwing the pump G out of action, a passage, 28, is provided out of the chamber 27 and above valve N. This passage is controlled by a cock or valve, X, and extends through the cock to the exterior, as shown at 29. If the cock X is turned so that passages 28 and 29 are not in connection, the pump G can draw water through its main suction-passage 13; but if this passage is made continuous the pump draws in and discharges air, together with any drip that may pass by the packing K.

For the purpose of relieving the pressure within the passages 37, chambers 41 and 42 are connected with chamber 25", and provided with a cock or valve, W, to exterior, as shown. If this cock is turned so that passages 41 and 42 do not coincide, the action of the pump will accumulate pressure readily, but relief therefrom will take place so soon as the passages are continuous by turning the cock.

It is obvious that when the two plungers G and I are moved the water or fluid is immediately sucked up through their respective valves, and forced out into the passages 37, through outlet 44, against the movable pressure blocks or rams 24. As the pressure within the machine increases, the plunger G will of necessity require to be relieved of duty, its usefulness being apparent only when running up the preliminary pressure quickly. To relieve this pump of duty it is simply necessary to turn the cock X until the passages leading to and from it are in connection. This operation breaks the vacuum and relieves all parts below the force-valve of strain. This operation, however, does not interfere with the action of the small pump I, which continues in operation; and as its area is very small compared with the area of the surface of the movable rams or pressure-blocks a pressure of several hundred tons can easily be exerted upon any given surface.

In this device I show the pressure of fluid acting upon one or more movable pressure-blocks, 24, which move out from the side of the barrel 25. This arrangement is adapted particularly to breaking down coal or other minerals. In that case the barrel and blocks or rams are

inserted in a hole in the coal or other mineral, and by forcing out the said blocks by the pressure heretofore explained they rend the coal. By a slight change the pressure of the fluid can be used to lift heavy objects or operate a press, and for such like purposes. The blocks 24 are held to the barrel by retaining-bolts 21, with heads 22 and springs 23.

17 is a packing kept in place by plate 19 and screws 38.

40 is an outlet for the fluid under pressure, to prevent the blocks being thrown entirely out.

49 is a shoe held in position by spring 50, to prevent the blocks sticking in the coal.

15 A is a housing or support for the mechanism for operating the pumps G and I. It is secured to the barrel or plug 25 at 35.

E is the connecting-rod joining the plunger G to crank D, as shown. The cranks can be operated either by power or hand.

Although I show this mode of operating the plungers, yet I do not confine myself to it, as other modes may and can be used.

25 The arrangements of the valves and the keeping them in place can be governed by use, and the manner of drilling the several passages in the barrel can be as uses suggest, and the plugging up the passages can likewise be left to use.

30 All the parts are to be made of the best material and of any kind.

The advantages gained by the arrangement is greater pressure out of a given quantity of fluid.

35 What I claim is—

1. In a hydraulic ram or pump, the plunger G, operated in any manner and passing through packing-cups J and K, held in position by plugs L and Y, all placed within the barrel 25,

in combination with the valves N and M, inlet 13, chambers 25" and 27, and outlet 37, with opening 44, all placed within the barrel 25, having the movable pressure-blocks 24, substantially as and for the purpose set forth.

2. In a hydraulic ram or pump, the plunger I, connected to plunger G, as shown, in combination with the inlets 8, 11, and 13, valves 2 and 3, chambers 34, 48', and 46, outlet 37, with openings 44, and the barrel 25, having the movable pressure-blocks 24, substantially as and for the purpose set forth.

3. In a hydraulic ram or pump, the plungers G and I, in combination with the inlets 8, 11, and 13, the chambers 27, 26, 46, 48, 25", and 34, valves N, M, 2, and 3, outlet 37, with openings 44, and the barrel 25, having the movable pressure-blocks 24, substantially as and for the purpose set forth.

4. In a hydraulic ram or pump, the combination of the plungers G and I, the valves N, M, 2, and 3, the inlets 13, 11, and 8, the chambers 25", 27, 46, and 48, the outlets 37, with openings 44, the passage 28, with cock X, the passages 41 and 42, with cock W, and the barrel 25, having the movable pressure-block 24, substantially as and for the purpose set forth.

5. The movable block 24, with shoe 49, held by spring 50, the retaining-bolt 21, the spring 23, the plate 19, and the screws 38, all combined and arranged for the purpose set forth.

Signed at New York, in the county of New York and State of New York, this 8th day of March, A. D. 1886.

ALFRED E. WATKINS.

Witnesses:

ROBT. M. REEVS,
WM. RUMBLE.