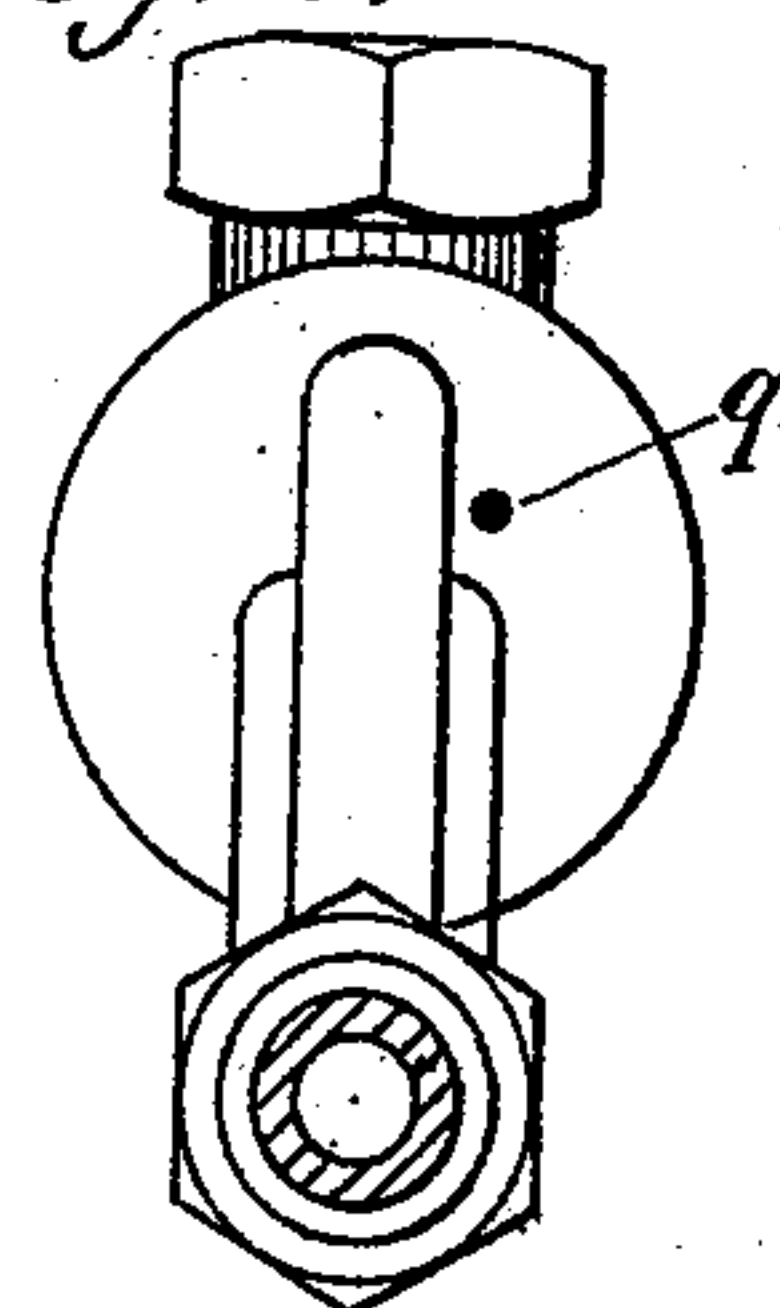
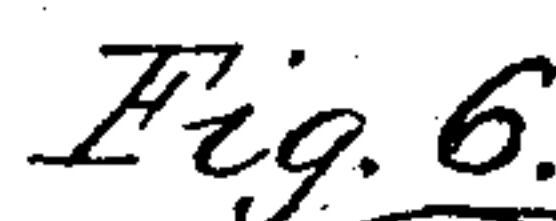
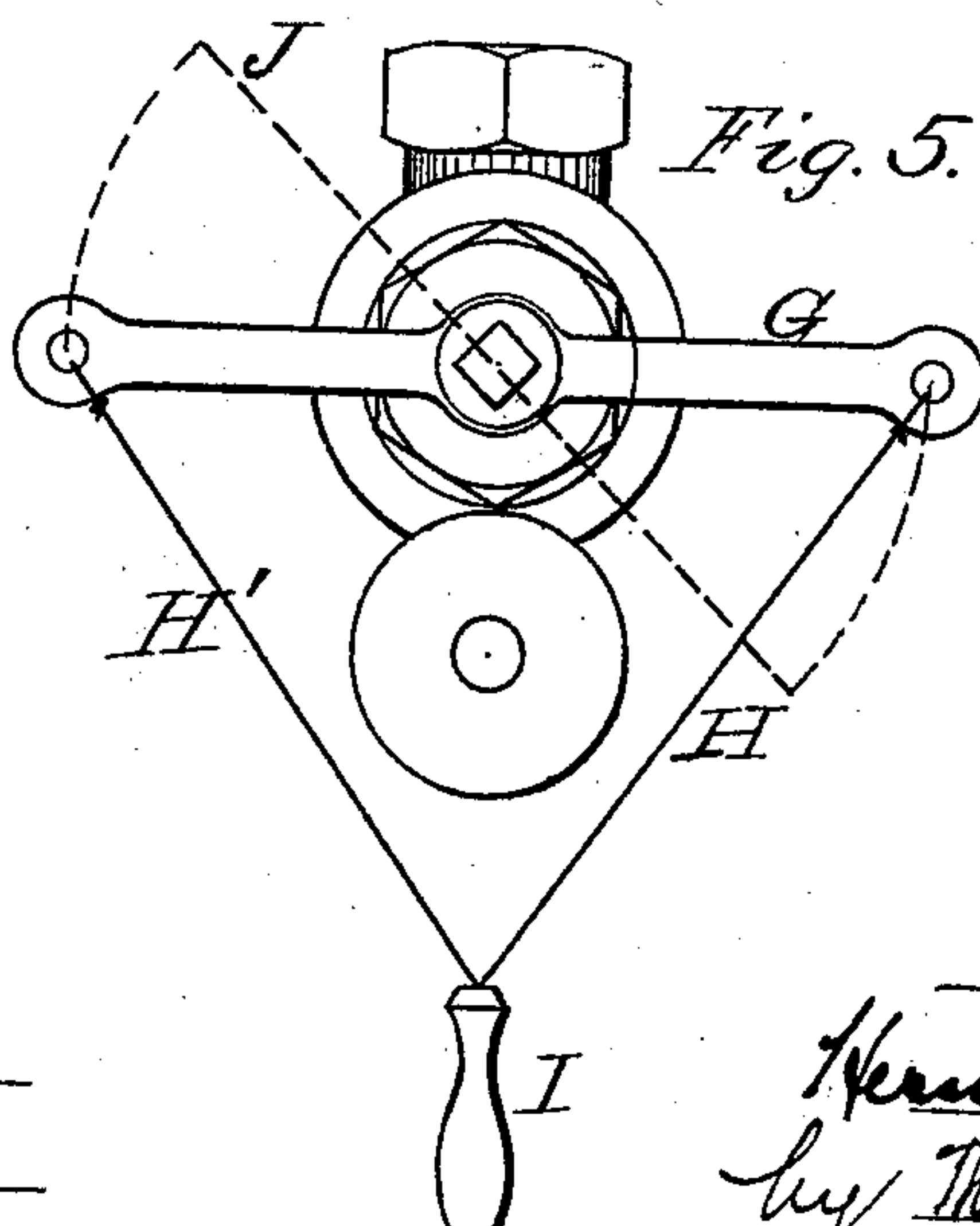
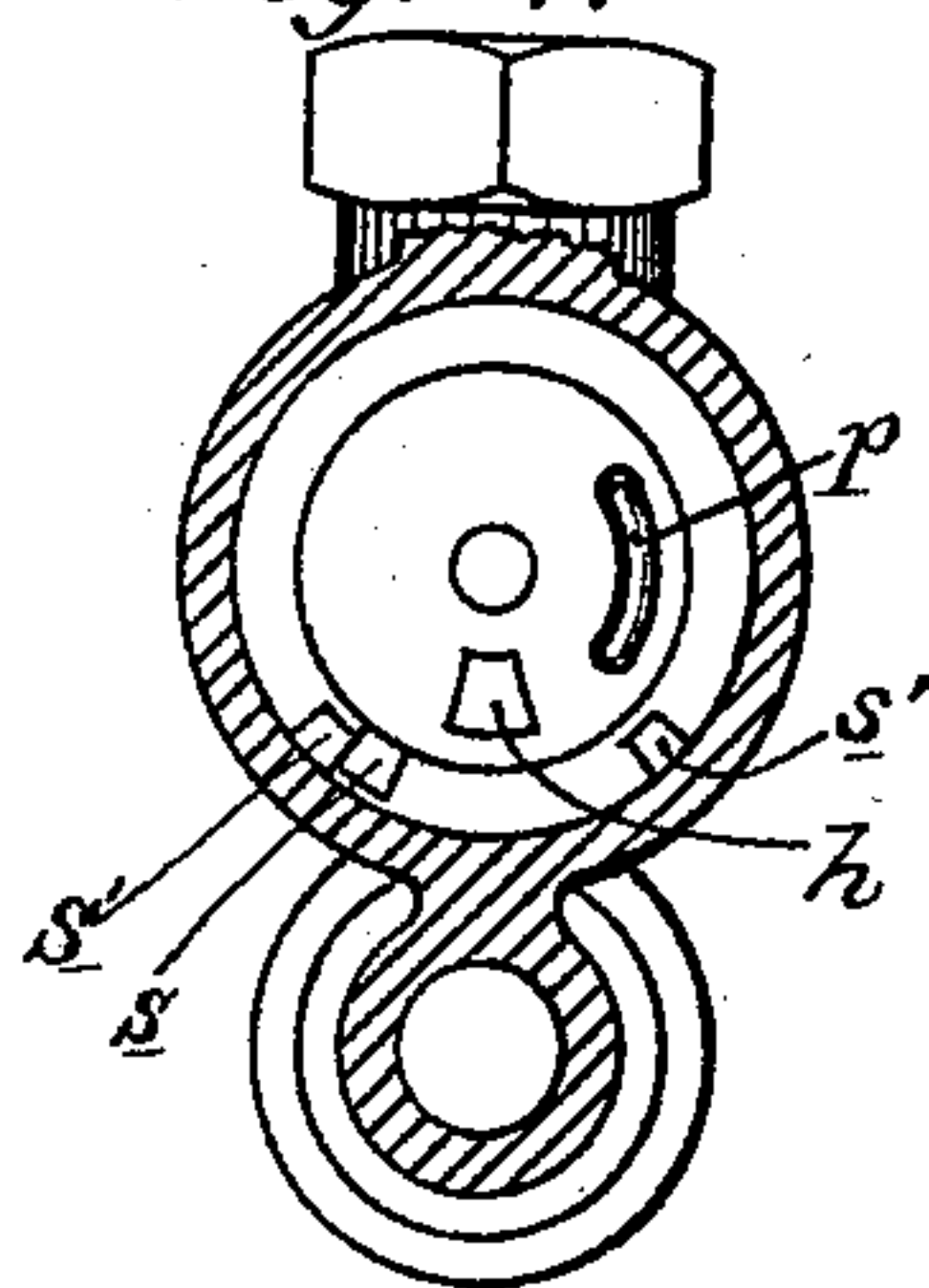
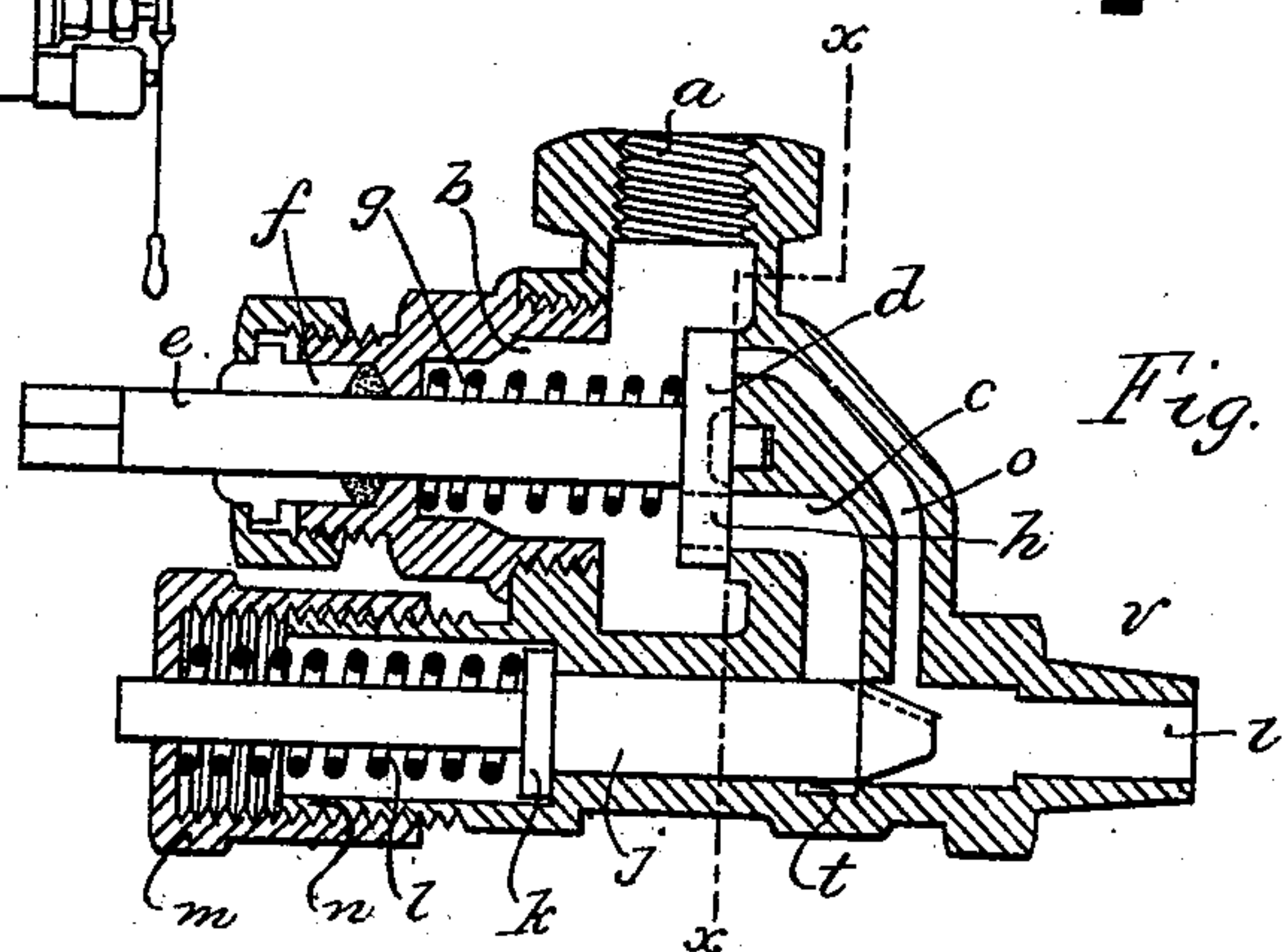
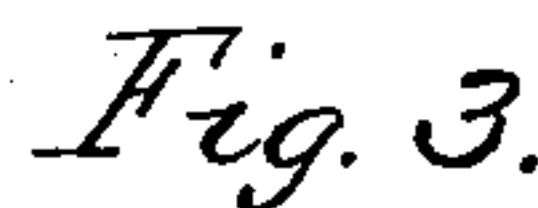
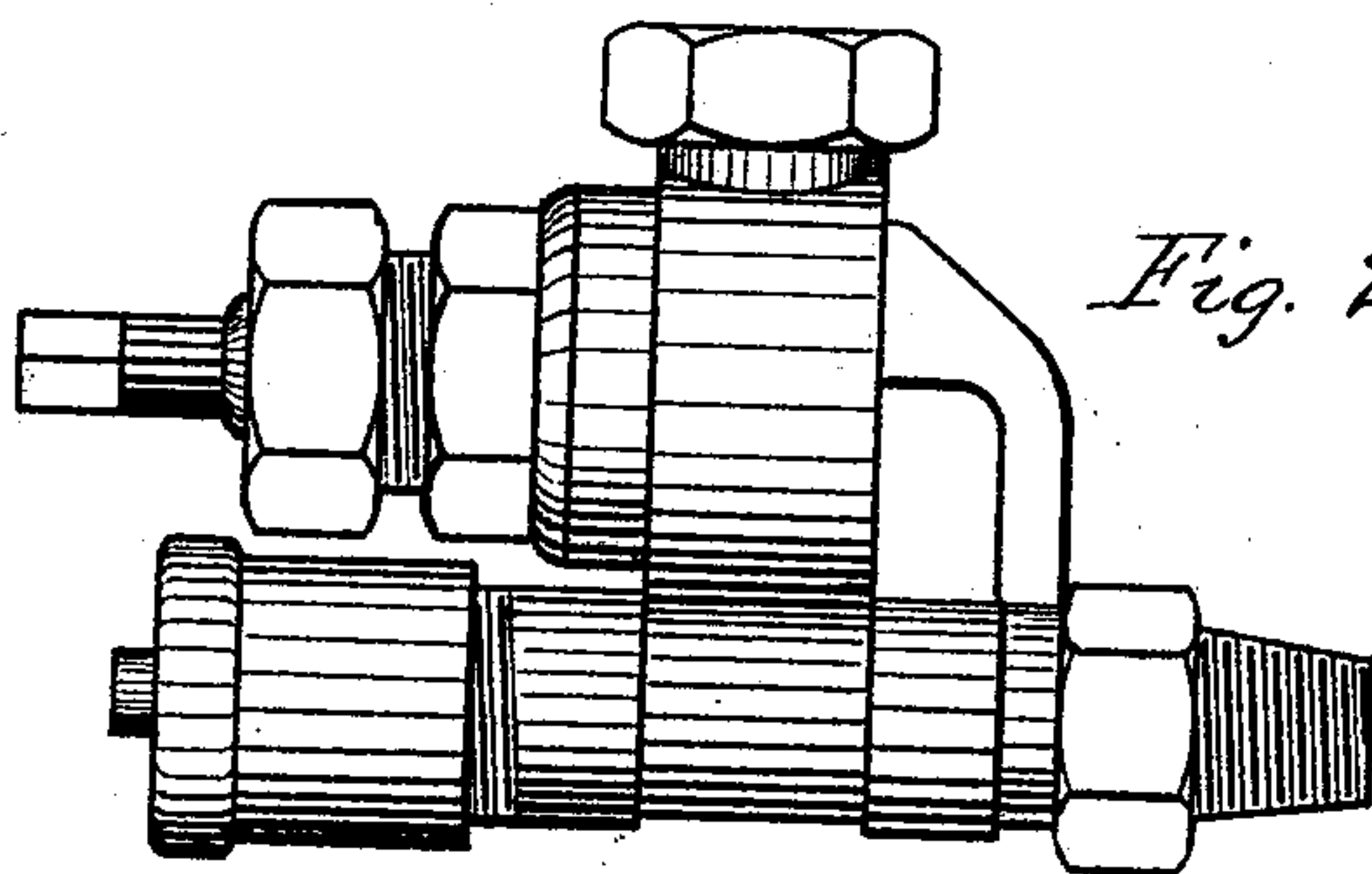
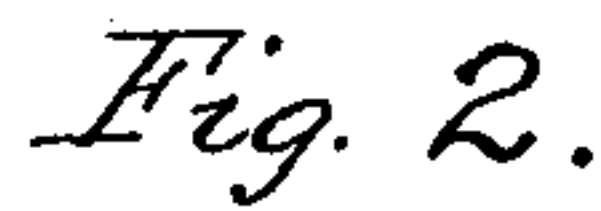
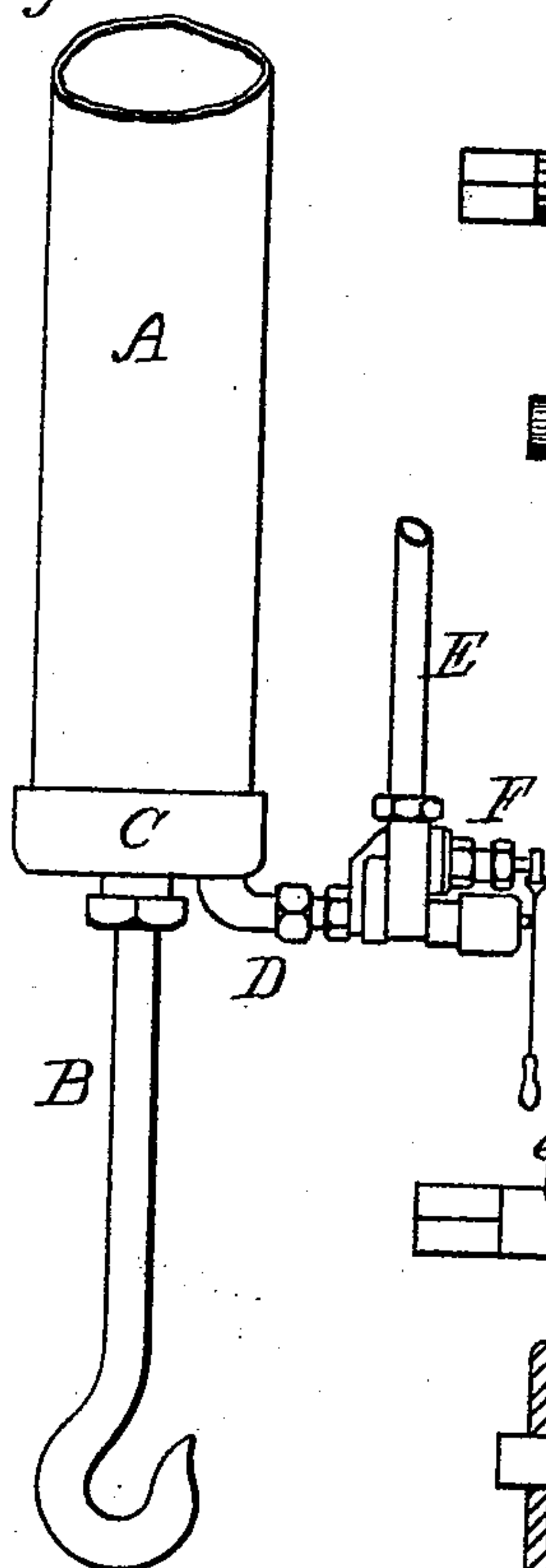
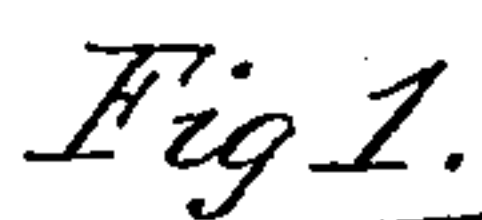


(No Model.)

H. SCHWEIM.
PNEUMATIC HOIST.

No. 519,436.

Patented May 8, 1894.



Witnesses.

W. M. Roberts
C. F. Roberts

Inventor

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UNITED STATES PATENT OFFICE.

HERMAN SCHWEIM, OF DETROIT, MICHIGAN, ASSIGNOR OF ONE-HALF TO
GEORGE STARK AND WARREN E. BRINKERHOFF, OF SAME PLACE.

PNEUMATIC HOIST.

SPECIFICATION forming part of Letters Patent No. 519,436, dated May 8, 1894.

Application filed April 28, 1893. Serial No. 472,268. (No model.)

To all whom it may concern:

Be it known that I, HERMAN SCHWEIM, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Pneumatic Hoists, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention consists in the peculiar construction of a controlling valve for the hoist, so constructed and arranged that the portage of the supply valve is proportioned to the pressure in the cylinder, thus obtaining a uniform speed in lifting loads of all sizes within the capacity of the hoist.

The invention further consists in the peculiar construction, arrangement and combination of the various parts, all as more fully hereinafter described.

In the drawings, Figure 1 is a diagram elevation of a pneumatic hoist with my improved valve applied thereto. Fig. 2 is a side elevation of the valve detached. Fig. 3 is a vertical, central section therethrough. Fig. 4 is a cross section on line *x x*, in Fig. 3, showing the shut-off valve and its ports in elevation. Fig. 5 is a front elevation thereof. Fig. 6 is a rear elevation. Fig. 7 is a detached elevation of the regulating valve.

A is the cylinder in which is a suitable piston to which is connected the hoisting rod B extending through the stuffing box in the cap C, all of known and usual construction.

D is the inlet pipe connecting to the lower end of the cylinder A.

E is the air supply pipe and F is the valve in said pipe. The interior construction of this valve is shown in Fig. 3.

a is the inlet passage connecting into the pressure chamber *b* and from this chamber is a supply passage *c* controlled by the valve disk *d* secured at the inner end of the stem *e* passing through a suitable stuffing box *f* in the casing.

g is a spring, seated at one end against a shoulder in the casing, and at the other end against the disk *d* acting to hold that valve to its seat. The disk is provided with a supply port *h*, which when registered with the mouth of the passage *c* will allow the air to

pass from the pressure chamber *b* into said passage *c* and when turned away therefrom will close said passage.

i is an inlet passage connected with the inlet pipe D and the supply passage *c*. At the juncture of these two passages *c* and *i* is arranged the plug valve *j* closing communication between said passages. This valve is provided with a restricted passage-way or port *v* which affords a constant communication from the passage *c* to the passage *i*.

k is a shoulder or ring on the valve *j* against which abuts a coiled spring *l*, the other end of which bears against the adjusting nut *m*, which is screw-threaded upon the nipple *n* of the casing so that the tension on said spring may be adjusted at pleasure.

o is a passage-way leading from the passage *i* to the disk *d*.

p is a passage formed by a groove in the face of said disk and so constructed and arranged that when it is turned in one position, one end of the groove will register with the passage way *o* and the other will register with the exhaust aperture *q* in the casing, thereby establishing communication between said exhaust passage and the passage *i*.

G is an actuating lever having a central hub secured upon the squared end of the stem *e* of the valve *d*.

H and H' are flexible cords extending from opposite ends of the lever G to a handle I which is fixed to the cords at equal distances from said lever and centrally therewith, as shown in Fig. 5.

The parts being thus constructed their operation is as follows: To start the device, the operator draws upon the cord H (or H'), rocking the lever G to the position shown in dotted lines at J. This will rotate the disk *d* until the port *h* registers with the supply passage *c* allowing the air to pass from the pressure chamber *v* into the passage *c*, and thence through the restricted passage *k* into the inlet pipe *i*, and thence into the cylinder. Proportioned to the load to be lifted, the pressure in the cylinder will accumulate beneath the piston and proportioned to the tension of the spring *l*, that pressure will act upon the valve *j* to force it from its seat more or less. For instance, supposing that the

spring *l* were set to resist a pressure of ten pounds before the valve *j* would be opened, if the load requiring twenty pounds to lift it is placed upon the hoist, as soon as the pressure in the passage *i* and the lower end of the cylinder increases beyond ten pounds such pressure acting against the inner face of the valve *j* will force that valve from its seat and increase its portage, maintaining this opening proportionate to the pressure in the cylinder, while the load is being lifted. In case a fifty pounds pressure were required the portage would be proportionately greater, but the speed at which the load would be lifted would be exactly the same. When it is desired to stop the travel of the piston, the operator simply draws straight downward upon the handle *I* which acting through both cords *H H'*, draws the lever *G* to a horizontal position and shuts the port *h*. To lower the load the operator draws upon the cord *H'* rocking the lever *G* in the opposite direction from that before described, which maintains the closed condition of the port *h* but registers the groove *p* with the passage *o* and exhaust port *q*, thereby allowing the air to pass from the cylinder out through each port. If a greater speed is desired in raising the load I reduce the tension of the spring *l* by withdrawing the nut *m*, when the portage of the regulating valve will be greater, proportioned to a given pressure and consequently the speed at which the load will travel will be correspondingly greater.

While I have shown and described the regulating valve *j* as applied only to the lifting of the load it is evident that the lowering

thereof may be controlled in the same manner and the spirit of my invention includes such valve applied at either point.

r is a pin at the forward end of the disk *d* and acting as a support and guide for the inner end of the valve stem.

I preferably form a passage *t* entirely around the plug valve *j* for two reasons: first to prevent the pressure upon one side of the valve from forcing it to a seat on the other side, thereby causing undue friction in its operation, and second—so that if the valve turns, the restricted port *v* will always be in communication with the passage *c*. I also preferably arrange stops *s s'* on the valve *d* and the casing to limit the movement of said valve.

What I claim as my invention is—

In a pneumatic hoist, the combination with a hoisting cylinder and a piston therein, an air supply pipe for the cylinder, a longitudinally reciprocating plug valve in the pipe acting in the direction of the cylinder pressure and having a restricted port therein, an adjustable pressure spring on the valve, a casing having a portage to the air pipe at and across which the valve moves, a supply opening in the casing, an exhaust passage from the air pipe to the casing, and a valve in the casing controlling the air supply and exhaust, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

HERMAN SCHWEIM.

Witnesses:

HENRY C. COLBURN,
CHAS. F. DOHERTY.