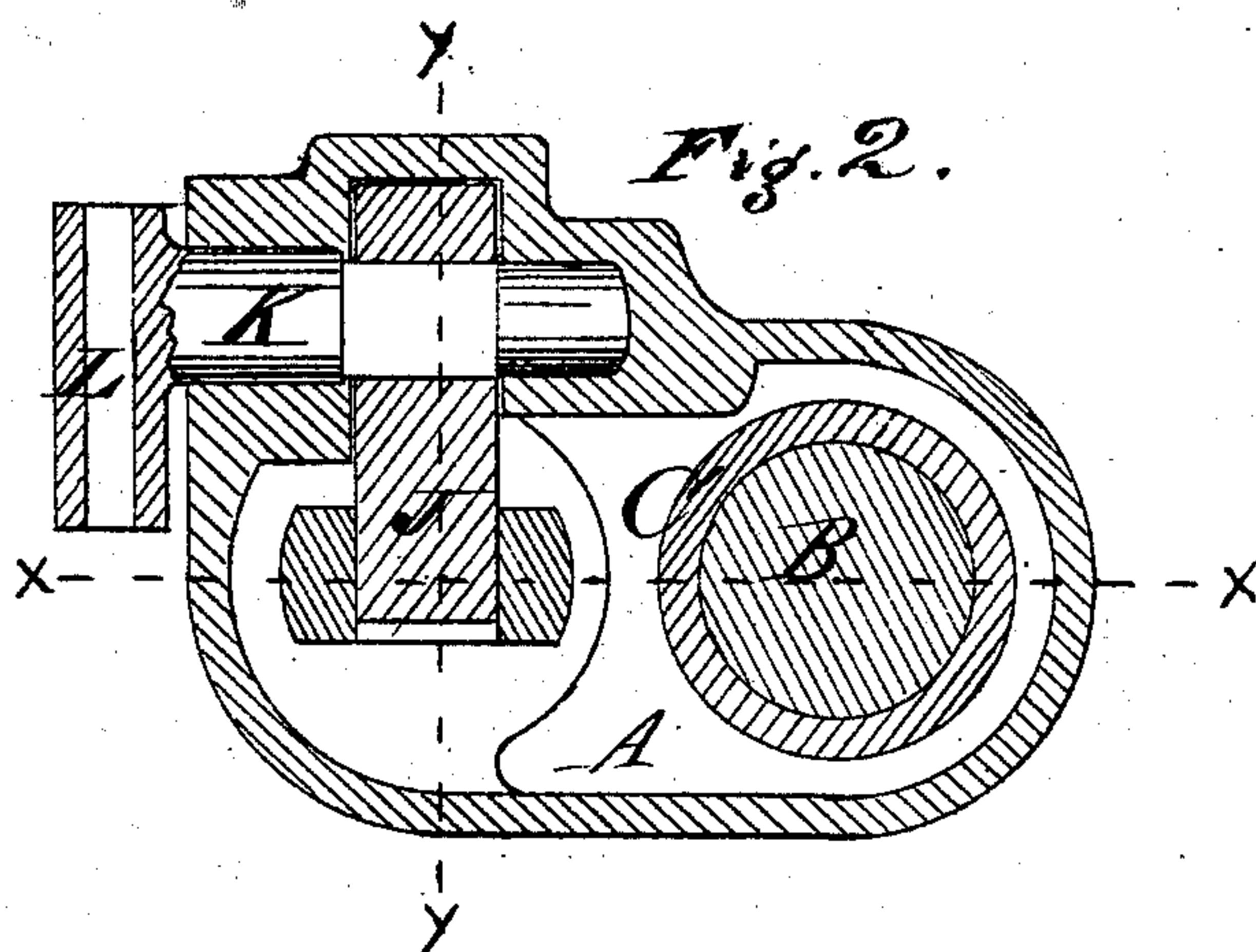
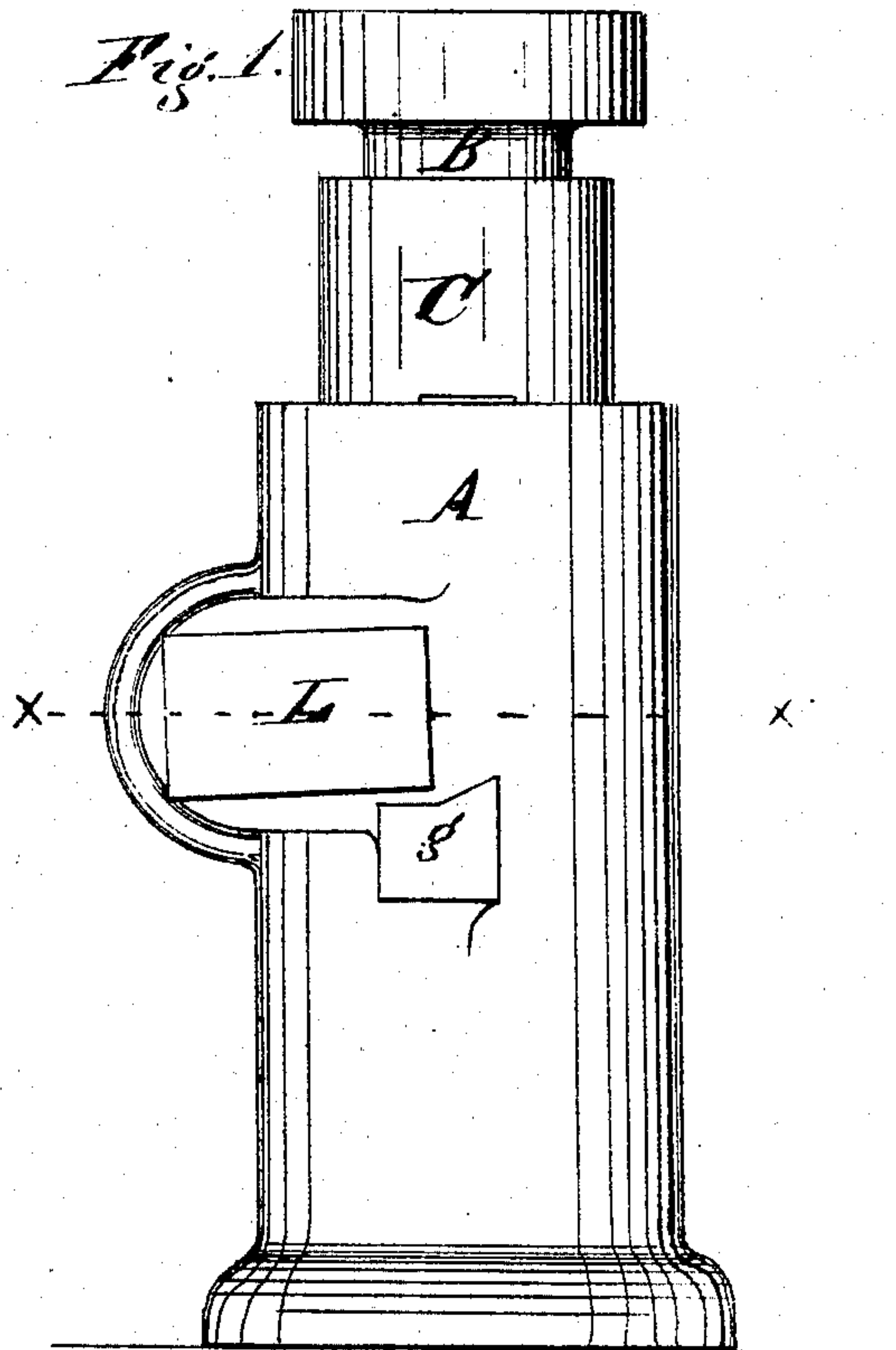


R. DUDGEON.
Hydraulic Jacks.

No. 137,765.

Patented April 15, 1873.



Witnesses

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Louis Cleaman

Inventor

Richard Dudgeon
by his attorney
C. L. Kenrick

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Fig. 3.

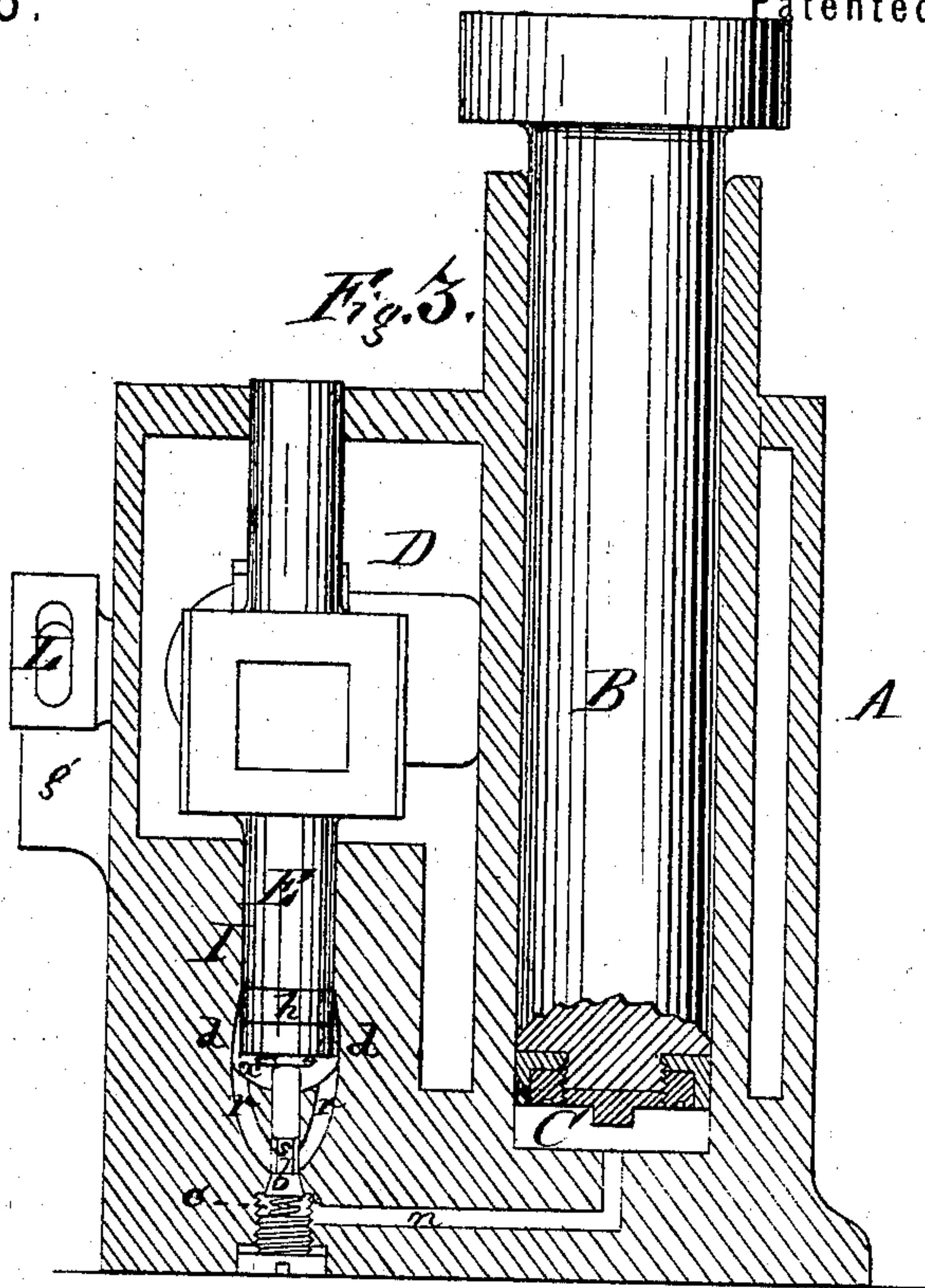


Fig. 5.

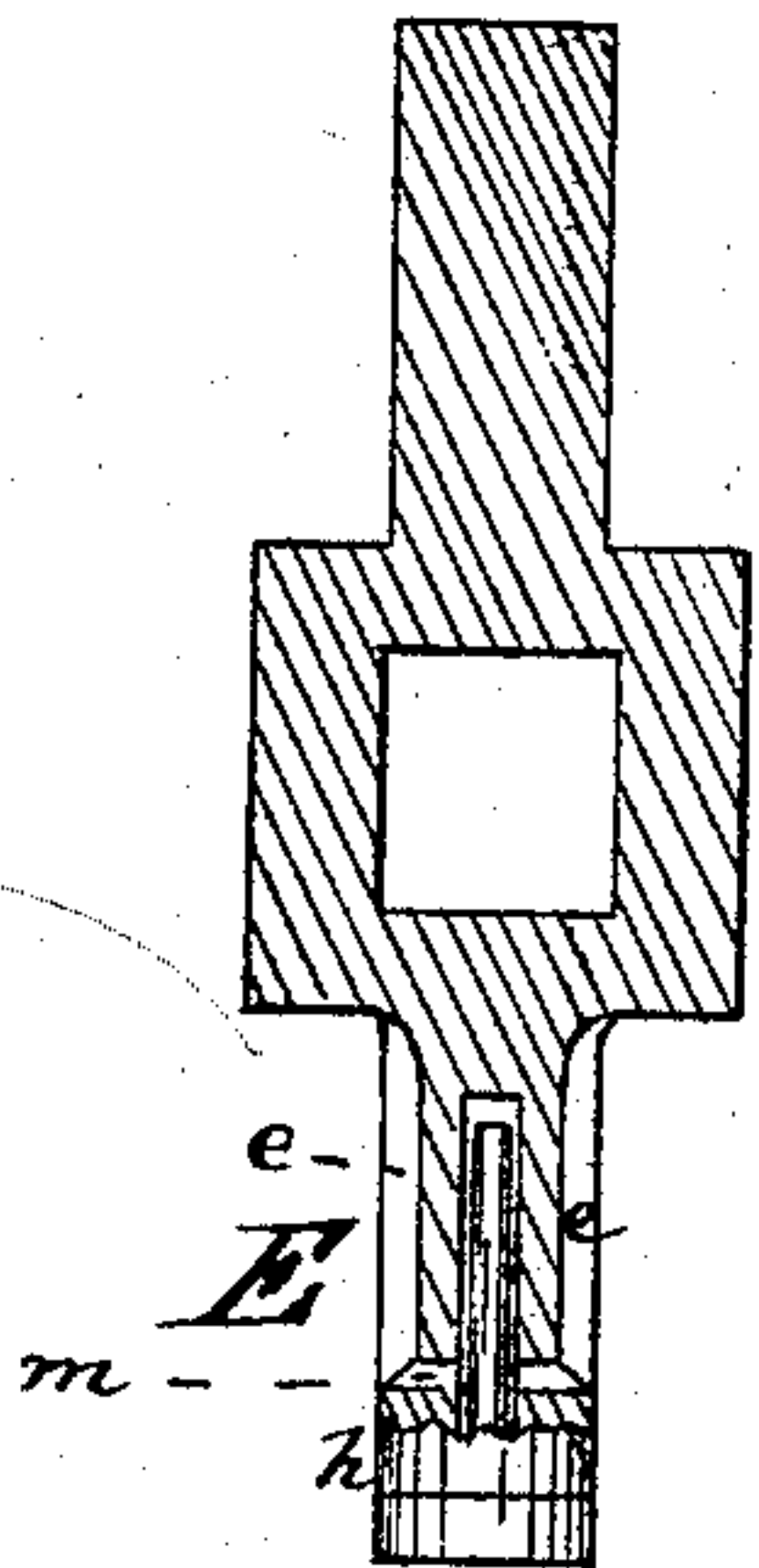
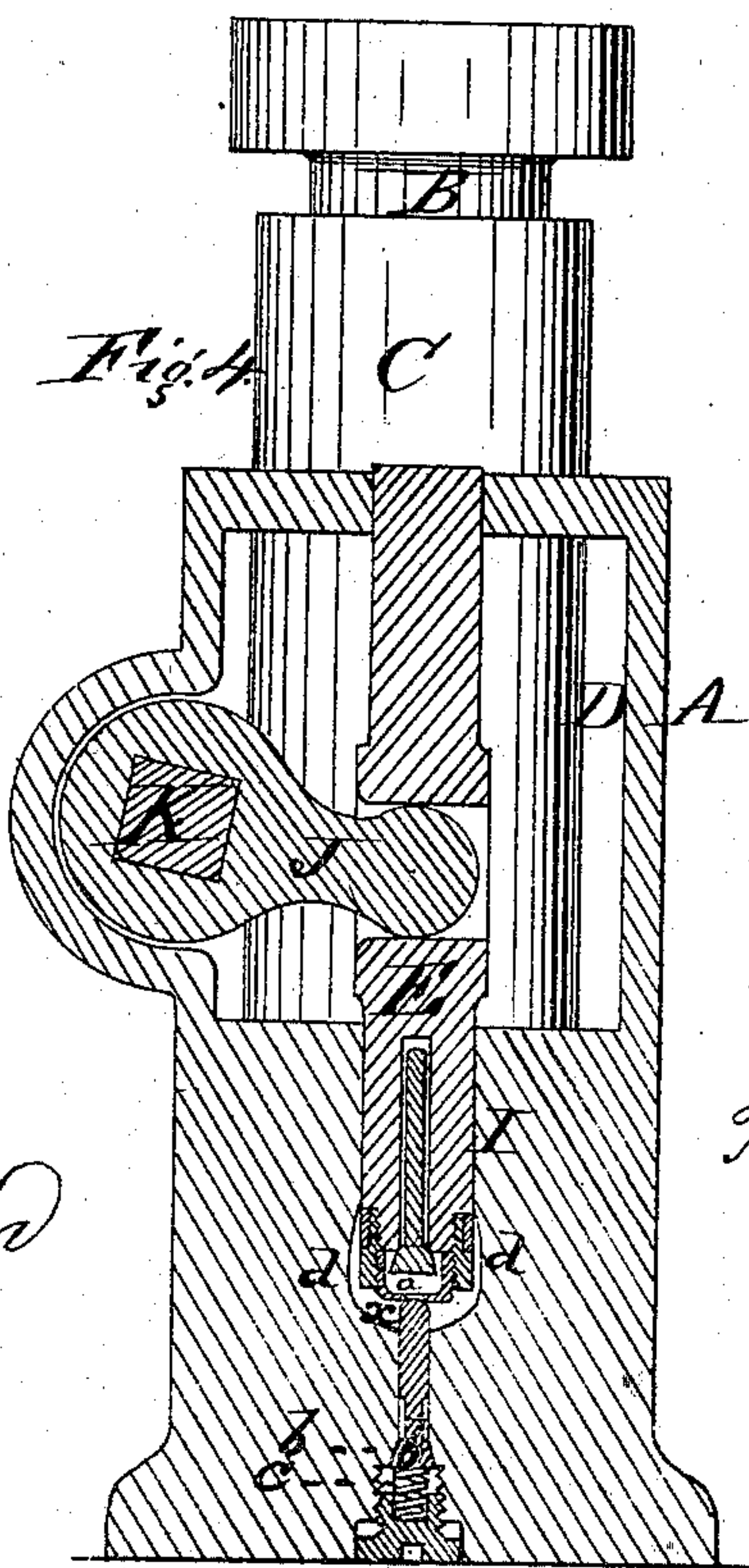


Fig. 4.



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UNITED STATES PATENT OFFICE.

RICHARD DUDGEON, OF NEW YORK, N. Y.

IMPROVEMENT IN HYDRAULIC JACKS.

Specification forming part of Letters Patent No. **137,765**, dated April 15, 1873; application filed February 12, 1873.

To all whom it may concern:

Be it known that I, RICHARD DUDGEON, of the city, county, and State of New York, have made an invention of certain new and useful Improvements in Hydraulic Jacks; and that the following is a full, clear, and exact description and specification of the same.

The objects of this invention are to permit the liquid to flow freely from the ram-cylinder to the reservoir when the lower pump-valve is opened. To this end my invention consists of certain combinations and arrangements of the parts of the jack, which are specified at the close of this schedule.

In order that my improvements may be fully understood, I have represented in the accompanying drawing and will proceed to describe a hydraulic jack, embodying them in the best form at present known to me.

Figure 1 of the said drawing represents an elevation of the hydraulic jack. Fig. 2 represents a horizontal section of the same at the line *x x* of Fig. 1. Fig. 3 represents a vertical section of the same at the line *x x* of Fig. 2. Fig. 4 represents a vertical section of the same at the line *y y* of Figs. 2 and 3. Fig. 5 represents a vertical section of the pump-plunger cross-wise of Fig. 4.

The movable parts of the jack, represented in the accompanying drawing, are contained in a case, A, from which the ram B is caused to protrude by the injection of a liquid into the cylinder C, in which the ram moves. The liquid for the purpose is contained in a cavity, D, of the case, forming a reservoir, from which the liquid is forced into the cylinder C of the ram by means of the pump-plunger E. The pump-plunger moves in the pump-barrel I, and is operated by the rocking-arm J, which is made fast to a rock-shaft, K. This rock-shaft K is supported in bearings in the case, and one of its ends protrudes through the adjacent side of the case, and is fitted with a socket-head, L, to which the pump-lever is applied. The pump-plunger is fitted at its lower end with an ingress-valve, *a*, which is seated in a valve-seat that is formed at the lower end of the plunger. The access of the liquid from the reservoir to the ingress-valve is had through two longitudinal passages, *e e*, in the sides of the pump-plunger, to a cross-passage, *m*, and through

the cross-passage to the valve-chamber, in which the valve-stem moves. The egress-valve *b* of the pump is arranged in a valve-chamber in the base of the jack-case, below the pump-plunger, and is pressed upward against its seat by a spring, *c*. A portion, *s*, of the valve-stem is smaller than the valve-chamber, to permit the fluid to pass round the valve-stem to the valve-port, and the adjacent portion of the valve-chamber is connected with the pump-barrel above by the passages *r*. The lower part of the valve-chamber, beyond the valve-seat is connected with the ram-cylinder by a passage, *n*. The egress-valve opens in a downward direction, and its stem projects upward toward the pump-plunger. At the lower end of this plunger is a guard, *x*, which covers the ingress-valve and is perforated to permit the passage of the liquid. This guard forms in substance a prolongation of the pump-plunger, and it and the valve-stem of the egress-valve are so arranged relatively to each other that when the plunger is depressed to its lowest position the guard *x* comes in contact with the valve-stem and depresses the egress-valve, thus opening it and permitting the fluid to flow out of the ram-cylinder into the lower part of the pump-barrel. The passage of the fluid from the pump-barrel back to the reservoir D is then permitted by the following construction: The cavity at the lower end *d* of the pump-barrel is enlarged or made of larger internal diameter than the pump-plunger, so that when the pump-plunger is depressed sufficiently to open the egress-valve *b* the lower ends of the side passages *e* communicate with the upper part of this enlarged cavity; hence, during such depression, the liquid passes in a backward direction around the plunger-packing *h*, through the enlargement, into the side passages *e e*, and thence to the reservoir; and the enlargement constitutes a reverse passage for the liquid in its backward movement from the ram-cylinder to the reservoir.

In order that the pump-plunger may be properly operated a stop, *g*, is cast fast to the exterior of the ram-case, below the position of the pump-lever when it is in place, and the latter is constructed with a spur at one edge, in the usual manner. When the pump-lever is inserted in the socket-head L with the spur

downward, the spur prevents the pump-plunger from being depressed sufficiently to open the egress-valve *b* by striking the stop *g* before the guard *x* comes in contact with the stem of the valve *b*; but when the pump-lever is reversed so that its spur is uppermost, the stop *g* does not obstruct the downward movement of the pump-lever until the plunger has been depressed sufficiently to open the egress-valve, and also to place the longitudinal passages of the pump-plunger in connection with the reverse passage *d* of the pump-barrel.

The jack thus described may be constructed in various forms, and of such dimensions as are required for the different purposes to which it is applicable; and the office of the valve-guard in opening the egress-valve may be per-

formed by a projection of the pump-plunger in a proper position relatively to that valve.

What I claim as my invention in hydraulic jacks is—

1. The combination and arrangement of the pump-plunger, constructed with longitudinal passages, the pump-barrel, and the reverse-passage, substantially as before set forth.

2. The combination and arrangement of the pump-plunger, the pump-barrel with its reverse-passage, the egress-valve and the guard thereof, substantially as before set forth.

In testimony whereof I have hereunto set my hand.

Witnesses: RICHARD DUDGEON.

WALTER BUCHANAN,

JOHN F. DETMAR.