

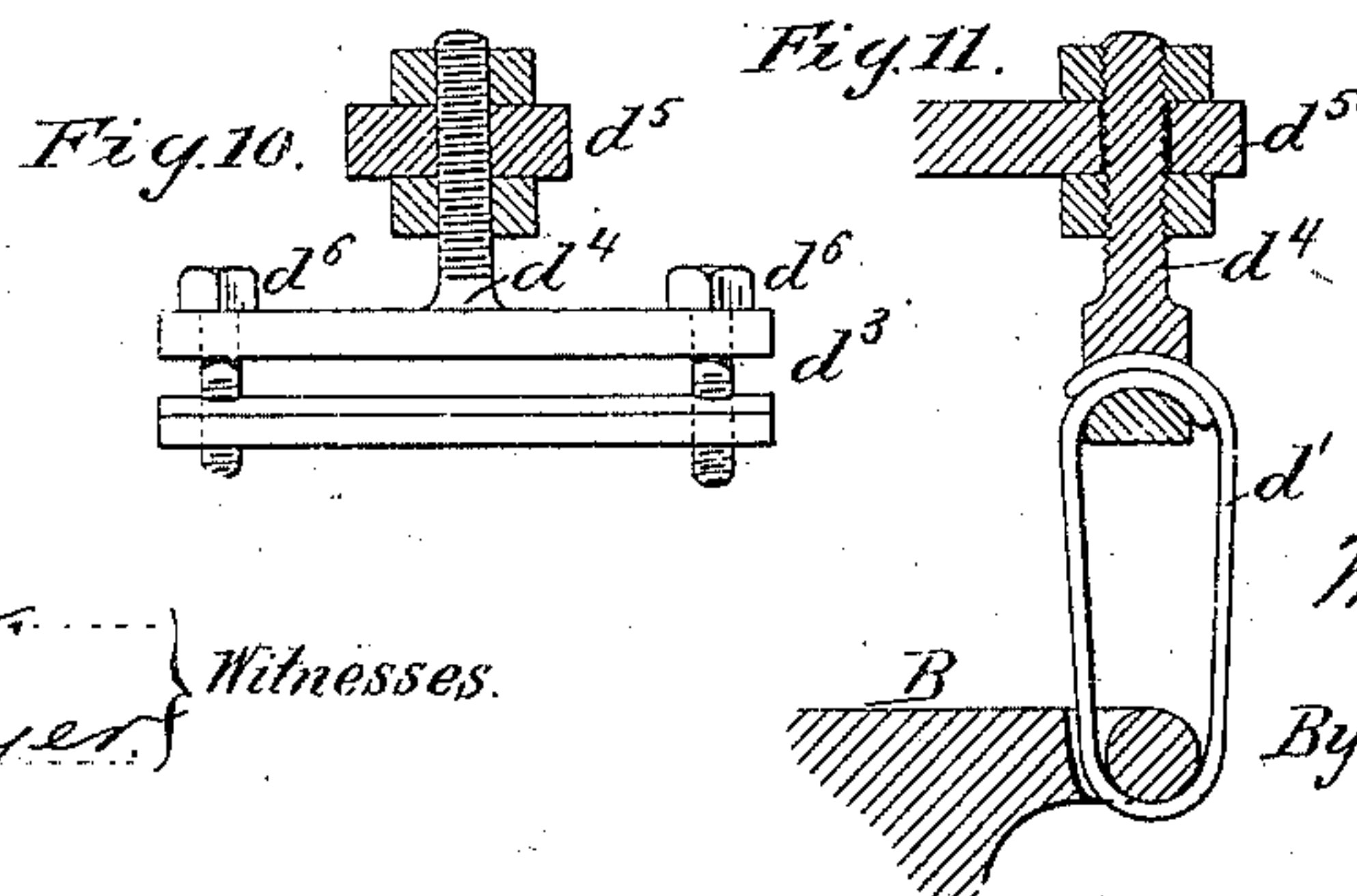
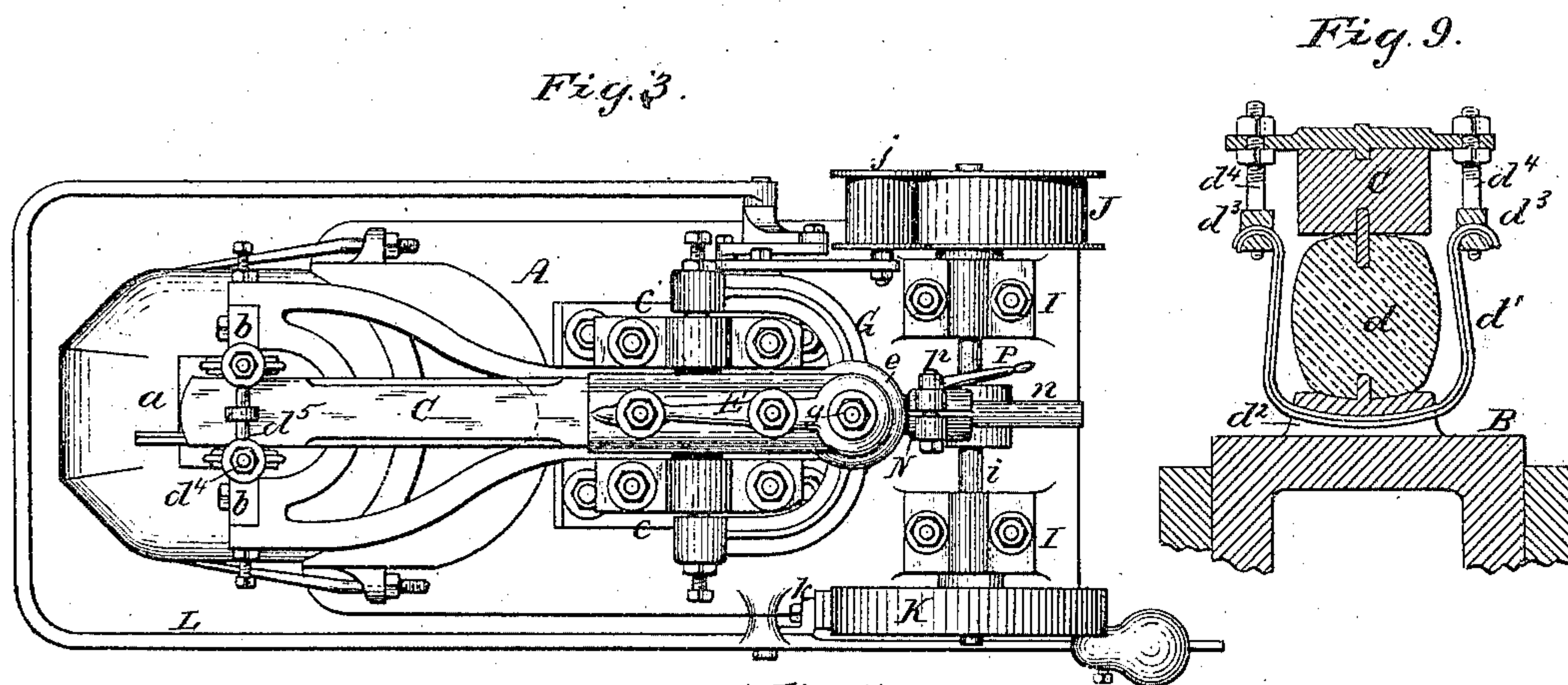
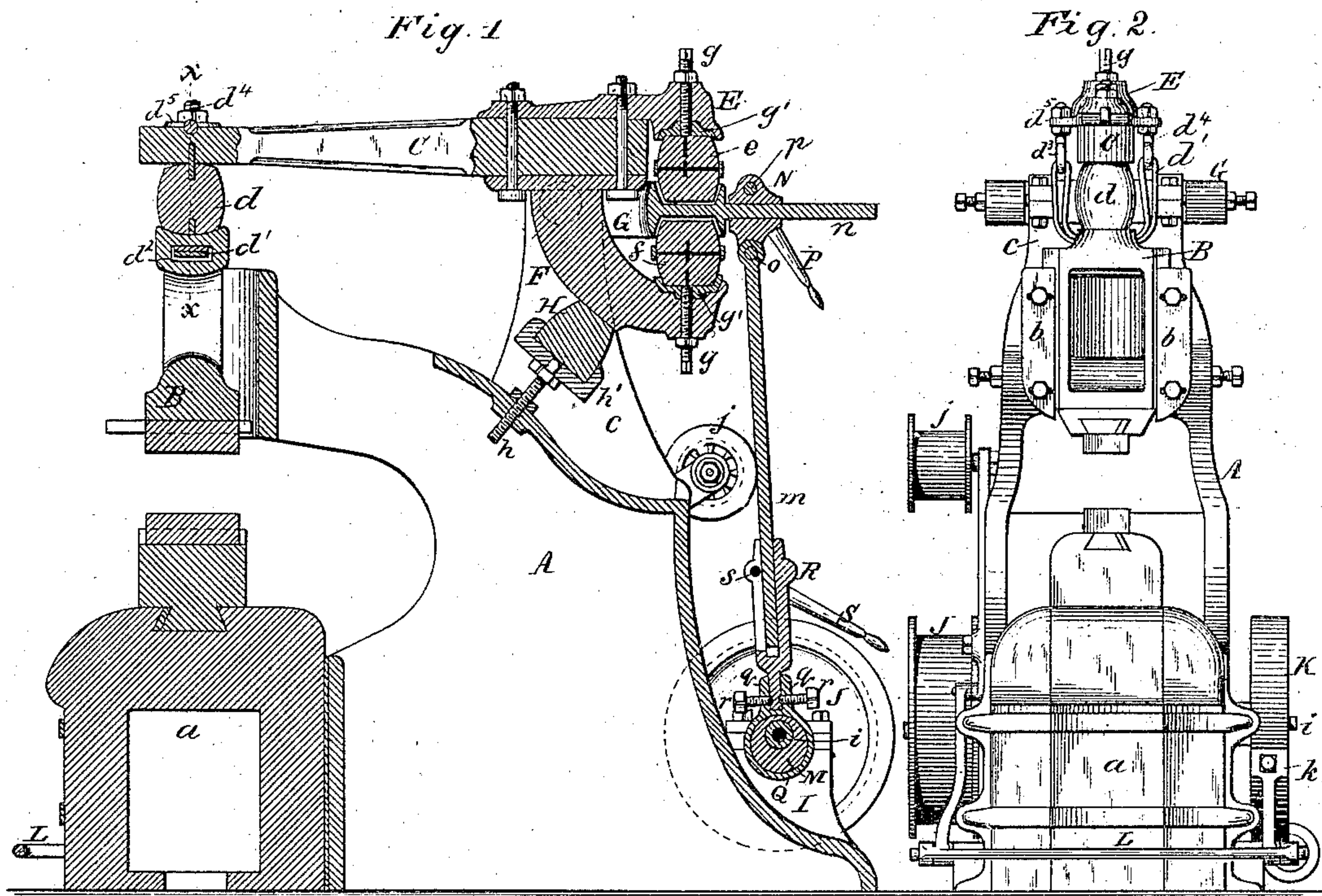
(No Model.)

2 Sheets—Sheet 1.

M. DEERING.  
POWER HAMMER.

No. 312,826.

Patented Feb. 24, 1885.



Theo. L. Popp.  
Chas. F. Meyer. } Witnesses.

Michael Deering Inventor.  
By Wilhelm & Bonner.  
Attorneys.



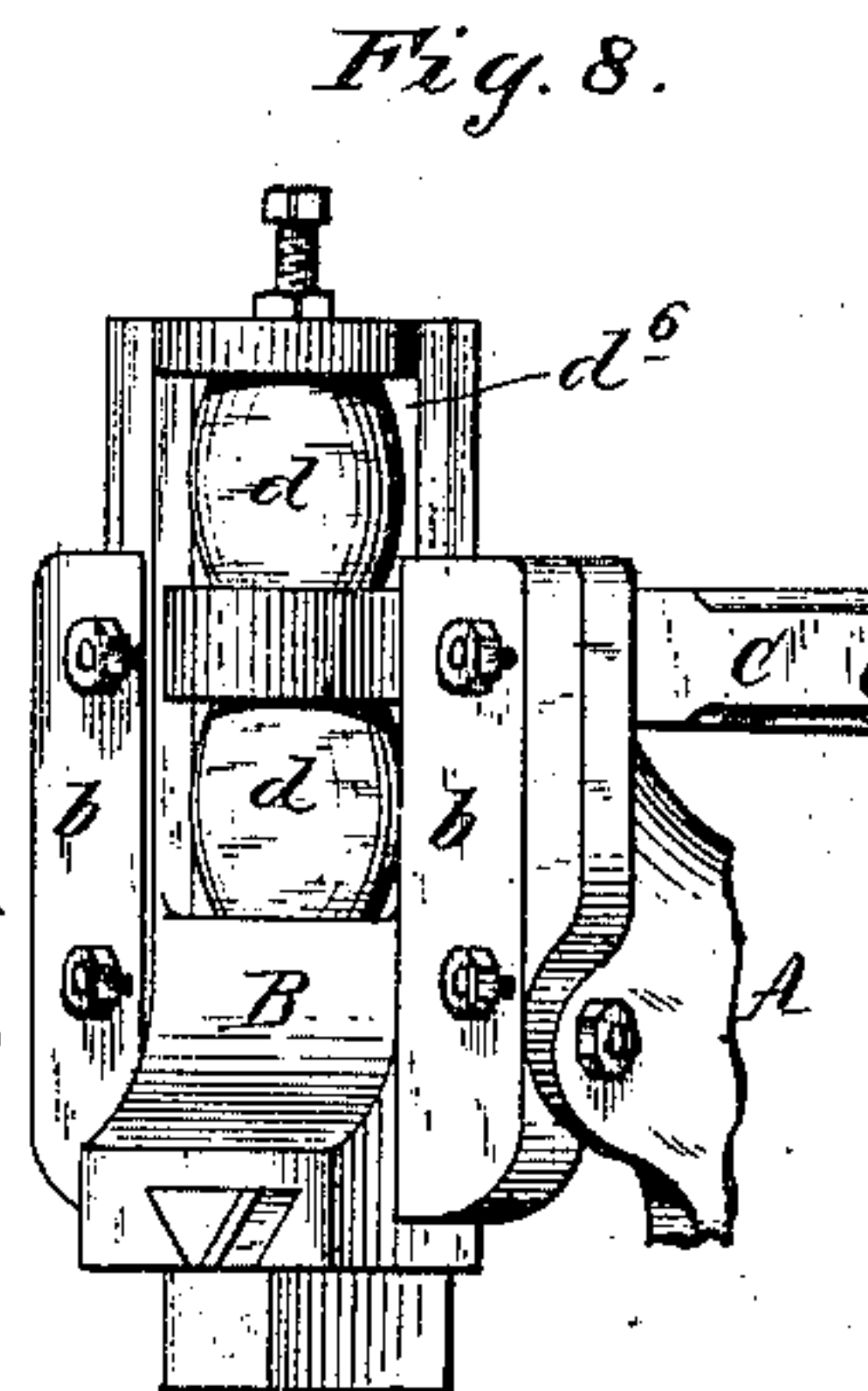
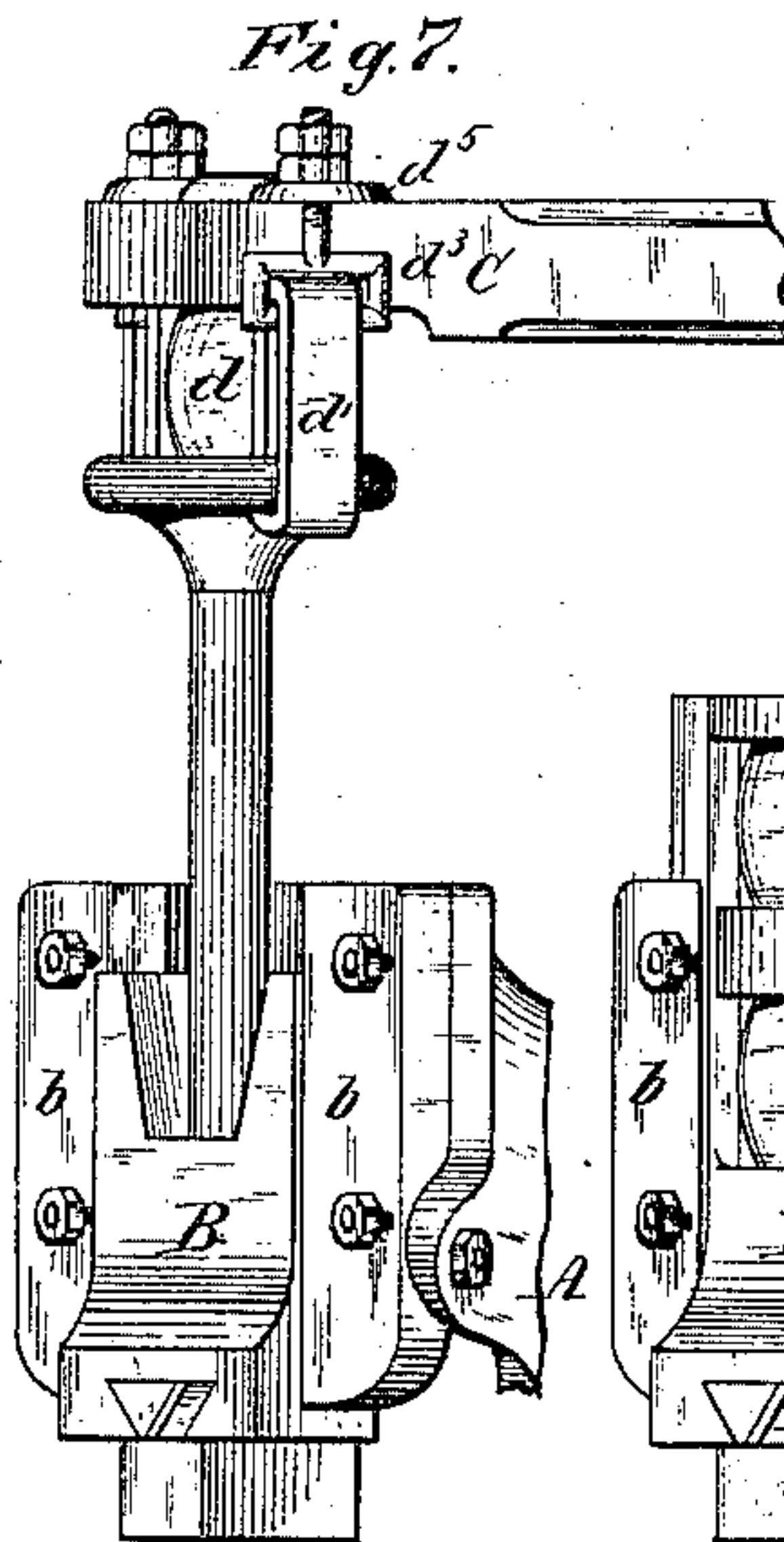
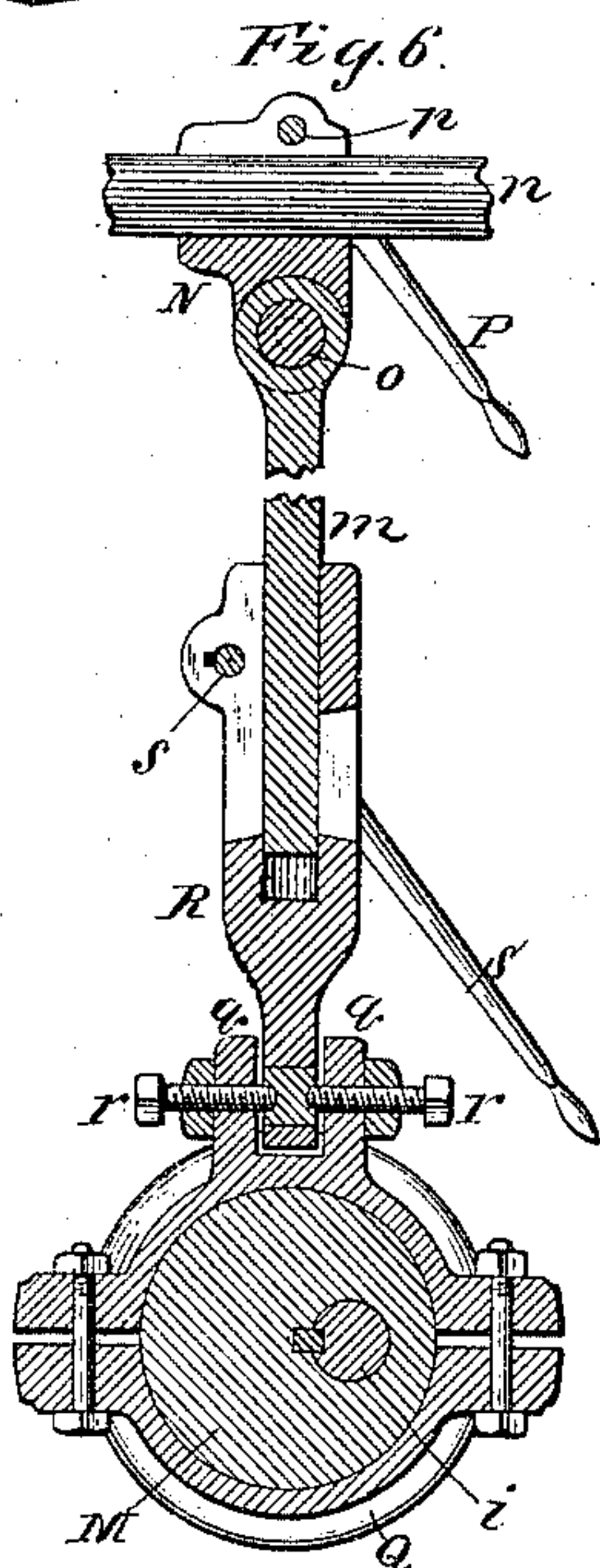
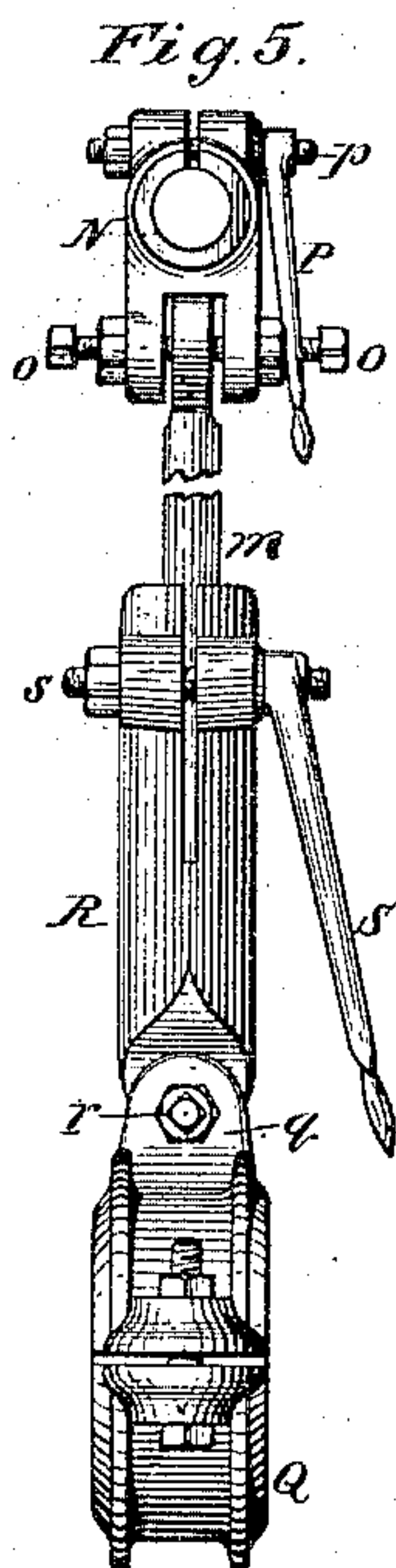
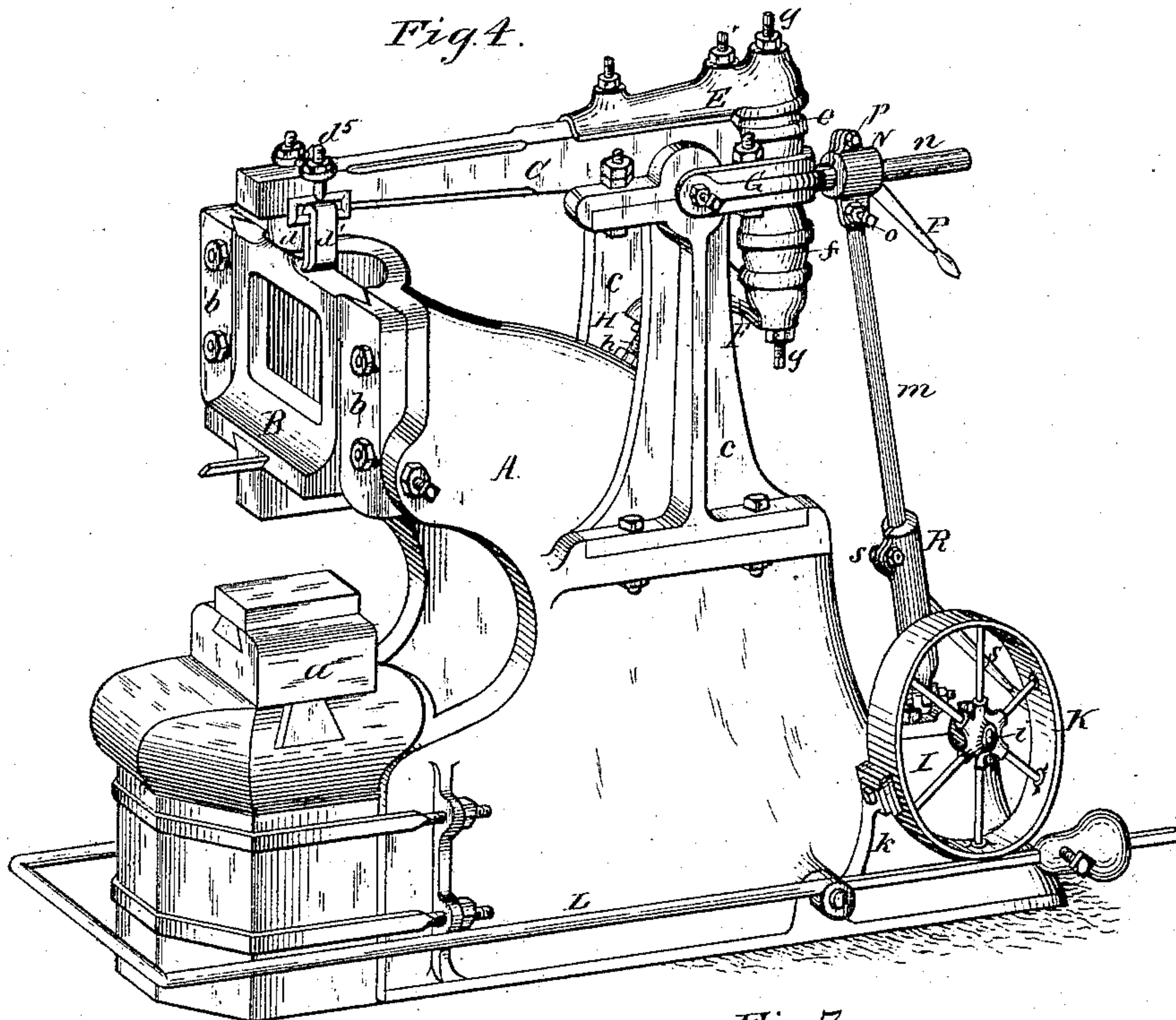
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2 Sheets—Sheet 2.

M. DEERING.  
POWER HAMMER.

No. 312,826.

Patented Feb. 24, 1885.



Theo. L. Poppe.  
Chas. F. Meyer. } Witnesses.

Michael Deering Inventor.  
By Wilhelm H. Bournier  
Attorneys.



# UNITED STATES PATENT OFFICE.

MICHAEL DEERING, OF SYRACUSE, NEW YORK, ASSIGNOR TO CHRISTOPHER C. BRADLEY, OF SAME PLACE.

## POWER-HAMMER.

SPECIFICATION forming part of Letters Patent No. 312,826, dated February 24, 1885.

Application filed January 29, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, MICHAEL DEERING, of Syracuse, in the county of Onondaga and State of New York, have invented new and  
5 useful Improvements in Power-Hammers, of which the following is a specification.

This invention relates to an improvement in helve-hammers, and has for its object to produce a helve-hammer which shall deliver  
10 the straight blow of a dead-stroke hammer, and which is at the same time so thoroughly cushioned that the blows are quick and elastic, thereby producing better work with a smaller expenditure of power than heretofore,  
15 and at the same time rendering the hammer more durable.

My invention consists to these ends of the improvements in the construction of the hammer, which will be hereinafter fully set forth  
20 and pointed out in the claims.

In the accompanying drawings, consisting of two sheets, Figure 1 is a longitudinal sectional elevation of my improved hammer. Fig. 2 is a front elevation, and Fig. 3 a top  
25 plan view of the same. Fig. 4 is a perspective view, and Fig. 5 is a rear elevation of the connecting-rod whereby the helve is operated. Fig. 6 is a sectional elevation at right angles to Fig. 5. Figs. 7 and 8 are perspective  
30 views showing modified constructions of the device whereby the hammer is attached to the helve. Fig. 9 is a cross-section in line *x x*, Fig. 1. Fig. 10 is a side elevation, and Fig. 11 a vertical cross-section, of one of the  
35 clamp-bolts on an enlarged scale.

Like letters of reference refer to like parts in the several figures.

A represents the main frame of the machine, and *a* the anvil secured to the lower  
40 part of the frame A.

B is the hammer-head sliding between vertical guides or ways *b*, formed in or secured to the upper front portion of the frame A above the anvil *a*.

45 C represents the helve, and *c* the standards, which are secured to the main frame A, and between which the helve C is pivoted in a well-known manner.

*d* represents a spring of rubber or other

suitable material interposed between the upper end of the hammer-head and the lower side of the front end of the helve.

*d'* represents a flexible band or strap of leather or other suitable material, which passes through an opening, *d''*, in the upper portion  
55 of the hammer-head. The ends of the strap *d'* are attached to the helve by clamps *d'''*, provided with screw-bolts *d''''*, which pass through the ends of a cross bar or plate, *d''''*, secured to the upper side of the helve.  
60

As represented in Fig. 9, each of the clamps *d'''* is composed of two jaws, between which the end of the strap *d'* is clamped by screws *d''''*.

Upon tightening the bolts *d''''* the hammer-head is drawn toward the helve, thereby  
65 clamping the spring *d* firmly between these parts.

The strap *d'* may be composed of several layers or thicknesses, as shown, if desired. The ends of the band *d'* may be passed through  
70 eyebolts, as represented in Figs. 2 and 4 and 7, and secured together by rivets, if desired; but I prefer to secure the band by clamps, as the band is more readily secured in this manner. By this means a strong and at the same  
75 time yielding connection between the hammer-head and the helve is effected, whereby the jar resulting from the blows is greatly lessened. The contiguous faces of the spring and hammer-head are curved to permit of a  
80 slight rocking movement of the spring under the varying positions of the end of the helve. Two straps, *d'*, may be employed to connect the hammer-head to the eyebolts *d'''*, as represented in Fig. 7, in which case the hammer-  
85 head is provided with two openings on opposite sides of the spring *d*. If desired, two springs, *d*, may be employed, one above and one below the helve, and both seated in an opening, *d''*, in the hammer-head, as represented in Fig. 8.  
90

E and F are two rearwardly-projecting arms secured to the rear portion of the helve C by bolts or otherwise.

G represents the yoke or open pivoted frame,  
95 whereby the helve is operated, and which is arranged between the arms E and F of the helve. The yoke is pivoted concentric with



the helve C, between the standards *cc*, and extends rearwardly from the axis on which it rocks and between the arms E and F.

*e* is a spring, of rubber or other suitable material, interposed between the upper arm, E, and the yoke G, and *f* is a similar spring interposed between the lower arm, F, and the yoke, so that the motion of the latter is transmitted to the helve in either direction by a spring. The springs *e* and *f* are adjusted by set-screws *g*, passing through the arms E and F and attached to cups *g'*, in which the springs are seated.

H represents the reversing spring or cushion, secured to the frame A below the arm F in such a position that the arm F will come in contact with the spring H, just before the upward movement or stroke of the hammer is completed and compress the spring, thereby limiting the upward stroke of the hammer and reversing its movement by the reaction of the spring. The spring H is attached to the frame A by a screw-rod, *h*, and cup *h'*, so as to be adjustable toward and from the arm F.

*i* represents the horizontal driving-shaft supported in bearings I, formed on the lower rear portion of the frame A.

J represents the driving-pulley, *j* the tightener-pulley, and K the brake-wheel, *k* the brake-arm, and L the treadle, whereby the brake and tightener are operated, all of any ordinary and well-known construction.

M represents the eccentric mounted on the shaft *i*, and *m* the connecting-rod, whereby the motion of the eccentric is transmitted to the yoke G. The latter is provided with a rearwardly-extending arm or shank, *n*, to which the upper end of the connecting-rod *m* is attached by a split sleeve, N, which is fitted on the shank *n*. The connecting-rod *m* is attached to the sleeve N by pivot-bolts *o*, between which the upper end of the connecting-rod is clamped. The sleeve N is provided with a clamping-screw, *p*, having a hand-lever, P, by which the sleeve N can be tightened or loosened on the shank *n*. Upon releasing the sleeve N it can be adjusted on the shank *n* toward and from the fulcrum of the yoke G, thereby increasing or reducing the length of the stroke, as may be desired.

Q represents the strap which incloses the eccentric M, and which is provided with two jaws, *q q*.

R represents a split sleeve attached to the lower end of the connecting-rod *m* and projecting with its lower end between the jaws *q* of the eccentric strap Q. The lower end of the sleeve R is pivoted between the jaws *q* by screw-threaded pivot-bolts *r*, which work in threaded openings in the jaws *q* and clamp the lower end of the sleeve R between them. The pivots *r* stand at right angles to the pivots *o*, whereby the connecting-rod is enabled to adjust itself freely if the pivots should be out of true. The sleeve R is clamped on the lower end of the rod *m* by a clamping-screw, *s*, pro-

vided with a hand-lever, S. Upon releasing the sleeve R the rod *m* can be adjusted in the cavity of the sleeve, thereby increasing or reducing the length of the connecting-rod and lowering or raising the hammer accordingly.

It will be seen that in my improved hammer the connecting-rod whereby the yoke is driven from the driving-shaft is rendered easily adjustable both as to length and on the yoke, that the connections between the yoke and the helve and between the helve and the hammer-head are thoroughly cushioned, and that the hammer has a rectilinear movement, and delivers a square blow in the manner of a dead-stroke hammer.

In ordinary dead-stroke hammers, in which the actuating mechanism is connected with the hammer head or ram by a walking-beam, the blow is not only dragging, which prevents the iron from being forged with the desired rapidity, but the blow is also comparatively hard and non-elastic, whereby the iron in the supporting-frame and in the guides, anvil, and hammer-head rapidly changes its molecular condition and becomes crystallized, which results very soon in a breakage of one or more of these parts. In my improved hammer the blow is straight, quick, and elastic, whereby these difficulties are entirely obviated, and also a considerable saving in power is effected and a finer regulation of the force of the blow is attained than is possible in either an ordinary dead-stroke or an ordinary helve-hammer.

I claim as my invention—

1. In a dead-stroke hammer, the combination, with the hammer, of straight guides between which the hammer moves in a rectilinear reciprocating movement, a pivoted helve connected with the hammer, a yoke to which the actuating mechanism is connected, and springs interposed between the yoke and the helve, whereby the movement of the helve in either direction is cushioned, substantially as set forth.

2. The combination, with the hammer B, of a helve, C, having rearwardly-extending arms E F, a pivoted yoke, G, arranged between said arms, and springs *e f*, arranged, respectively, on the upper and lower sides of the yoke, between the latter and the arms E F of the helve, substantially as set forth.

3. The combination, with the stationary frame A and hammer B, of a helve, C, having rearwardly-extending arms E F, a pivoted yoke, G, arranged between said arms, and springs *e f*, arranged, respectively, on the upper and lower sides of the yoke between the latter and the arms E F of the helve, and a reversing-spring, H, secured to the frame, substantially as set forth.

4. The combination, with the hammer, of straight guides between which the hammer moves in a rectilinear reciprocating movement, a helve flexibly connected with the hammer and provided with rearwardly-extending arms, a yoke arranged between the arms of



the helve, springs interposed between the yoke and the arms of the helve, and the actuating mechanism connected with the yoke, substantially as set forth.

- 5 5. The combination, with the hammer and the helve, of a spring interposed between the same, and a flexible band or strap whereby the hammer is attached to the helve, substantially as set forth.
- 10 6. The combination, with a hammer-head, B, provided with an opening,  $d^2$ , of the helve C, spring  $d$ , strap  $d'$ , clamp-bolts  $d^3$ , and plate  $d^5$ , substantially as set forth.
- 15 7. The combination, with the hammer and helve, of a yoke provided with a rearwardly-extending shank or rod, and a connecting-rod attached adjustably to said shank or rod, substantially as set forth.
- 20 8. The combination, with the yoke G, having a shank,  $n$ , of the connecting-rod  $m$  and divided sleeve N, attached adjustably to the shank  $n$ , substantially as set forth.
- 25 9. The combination, with the yoke G, having a shank,  $n$ , of the divided sleeve N, attached adjustably to the shank  $n$ , and the connecting-rod  $m$ , pivoted to the divided sleeve N, substantially as set forth.
10. In a power-hammer, the combination,

with the eccentric M and rod  $m$ , of the divided sleeve R, attached to the eccentric, and a clamp by which the end of the rod  $m$  is adjustably secured, substantially as set forth. 30

11. In a power-hammer, the combination, with the eccentric M and rod  $m$ , of the divided sleeve R, pivoted to the strap of the eccentric, substantially as set forth. 35

12. The combination, with the yoke G and eccentric M, of the rod  $m$ , sleeve R, pivoted to the strap of the eccentric, and the sleeve N, pivoted to the upper end of the rod  $m$  by a pivot standing at right angles to the pivot at the lower end of the sleeve R, substantially as set forth. 40

13. In a power-hammer, the combination, with the eccentric M, of the strap Q, provided with jaws  $q$   $q$ , pivot-bolts  $r$ , secured in said jaws, and a connecting-rod clamped by said pivots between said jaws, substantially as set forth. 45

Witness my hand this 2d day of January, 1884. 50

MICHAEL DEERING.

Witnesses:

ORLANDO C. WOOD,  
HERMAN J. BIERHART.