

(No Model.)

3 Sheets—Sheet 1.

J. BOLTON.

FEEDING MECHANISM FOR SEWING MACHINES.

No. 376,283.

Patented Jan^y 10, 1888.

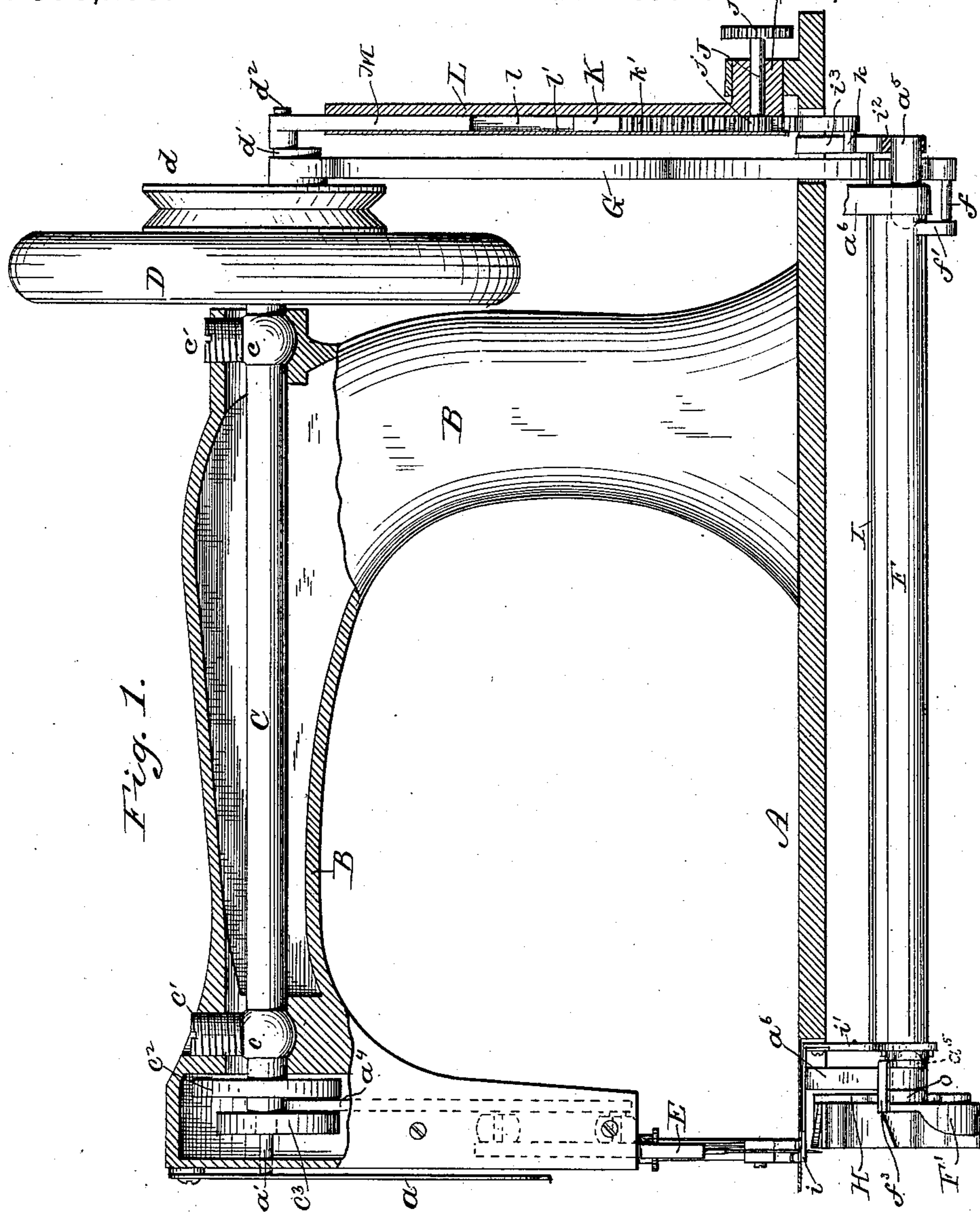


Fig. 1.

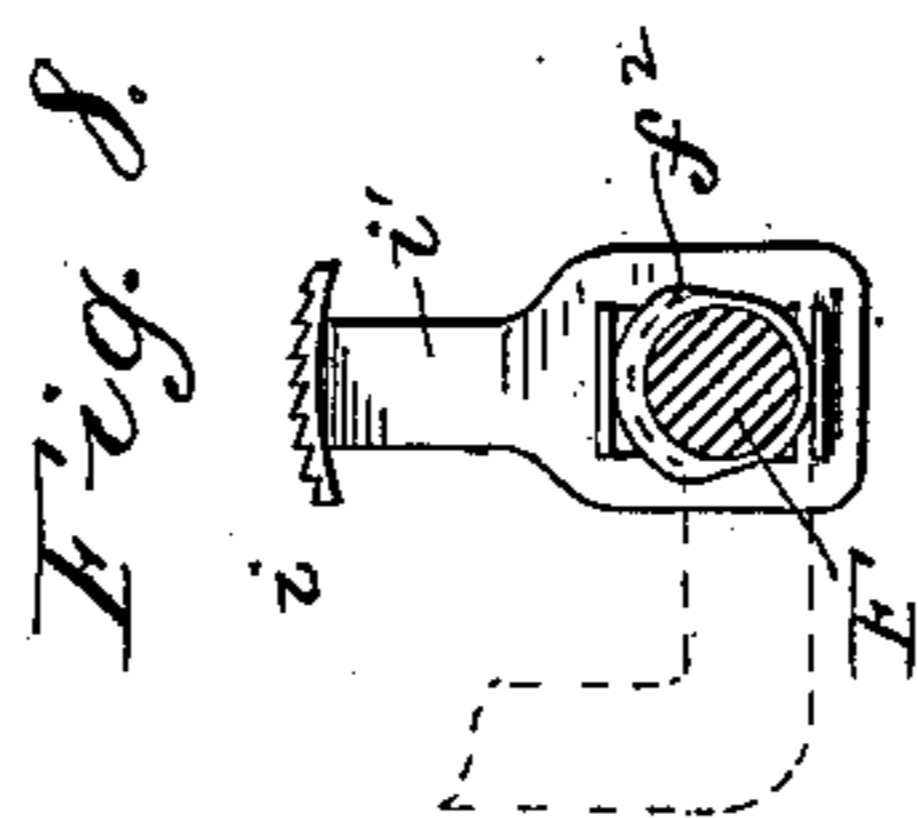


Fig. 8.

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Inventor:

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by Henry C. Allen.
Atty.

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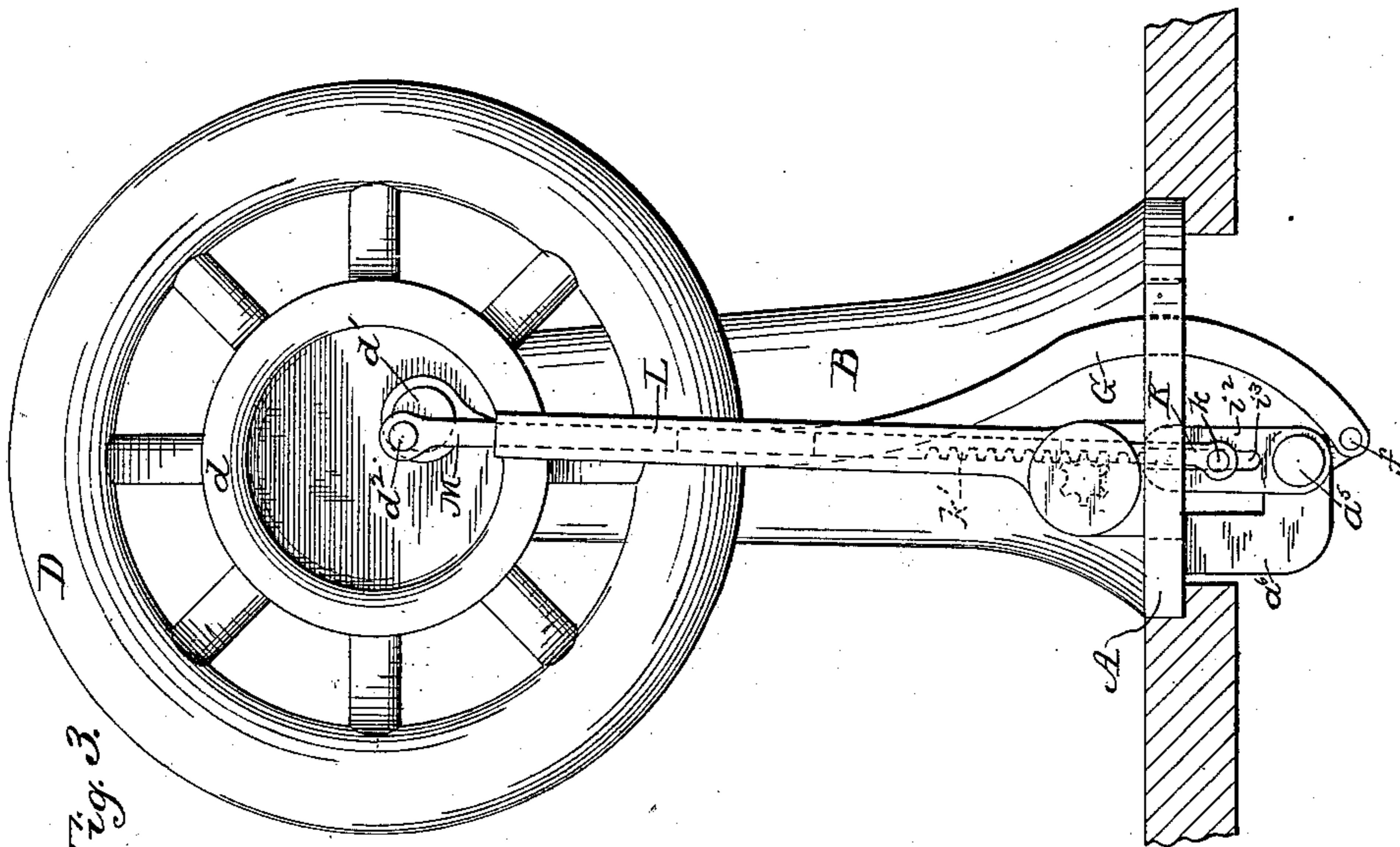


Fig. 3.

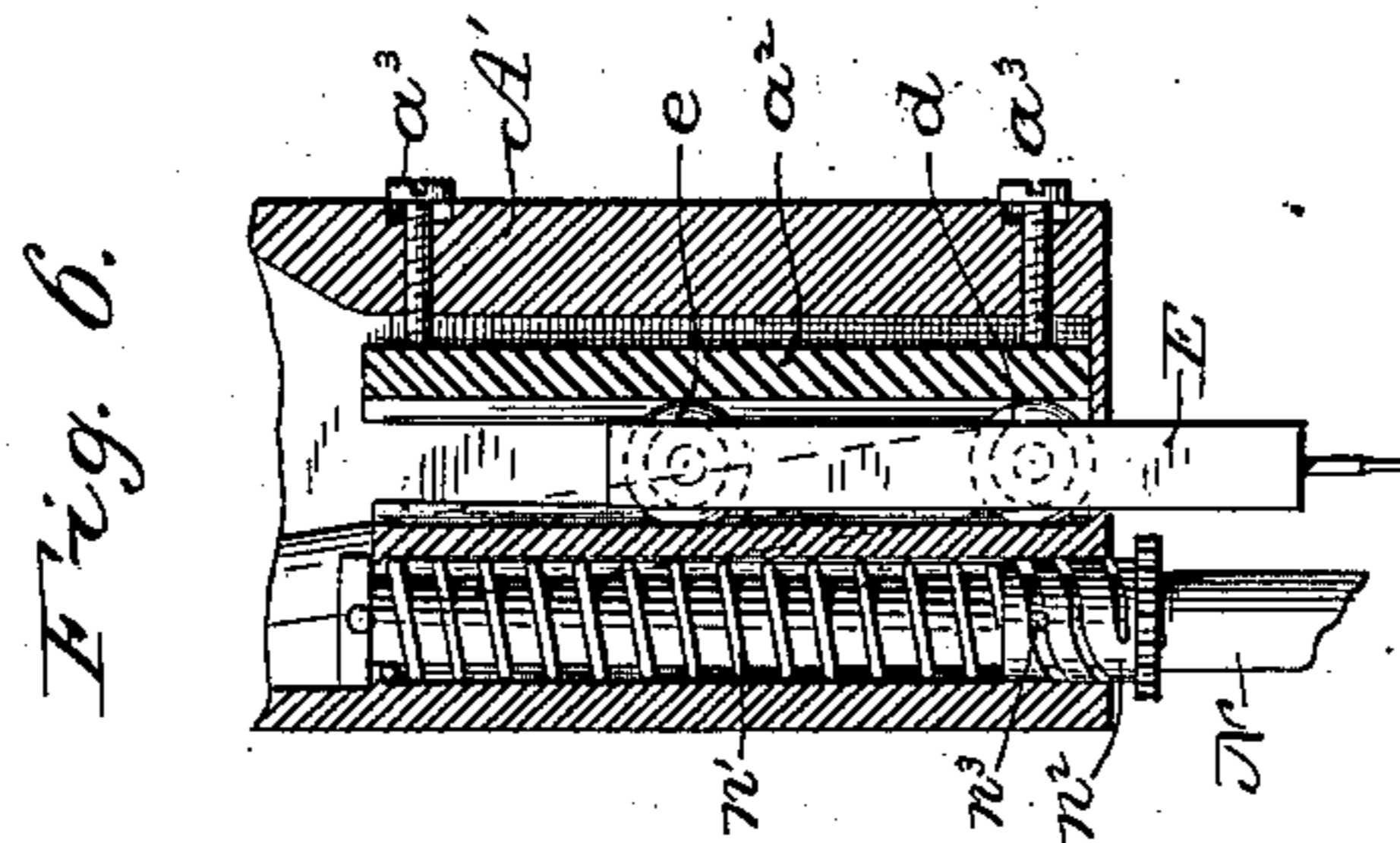


Fig. 6.

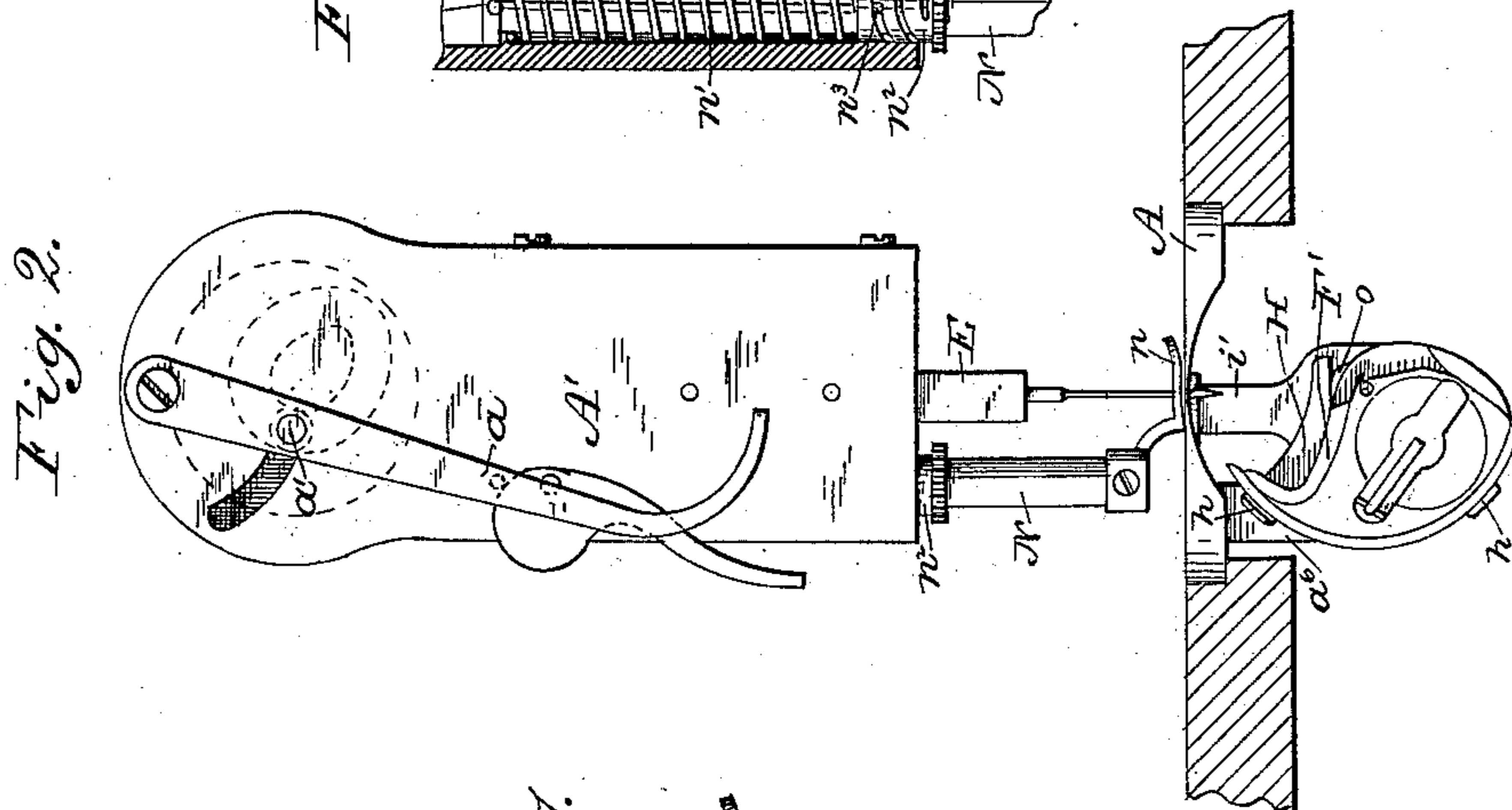
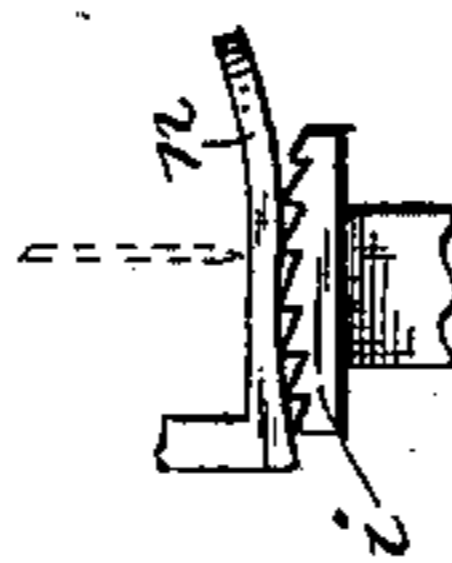


Fig. 2.

Fig. 7.



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Fig. 4.

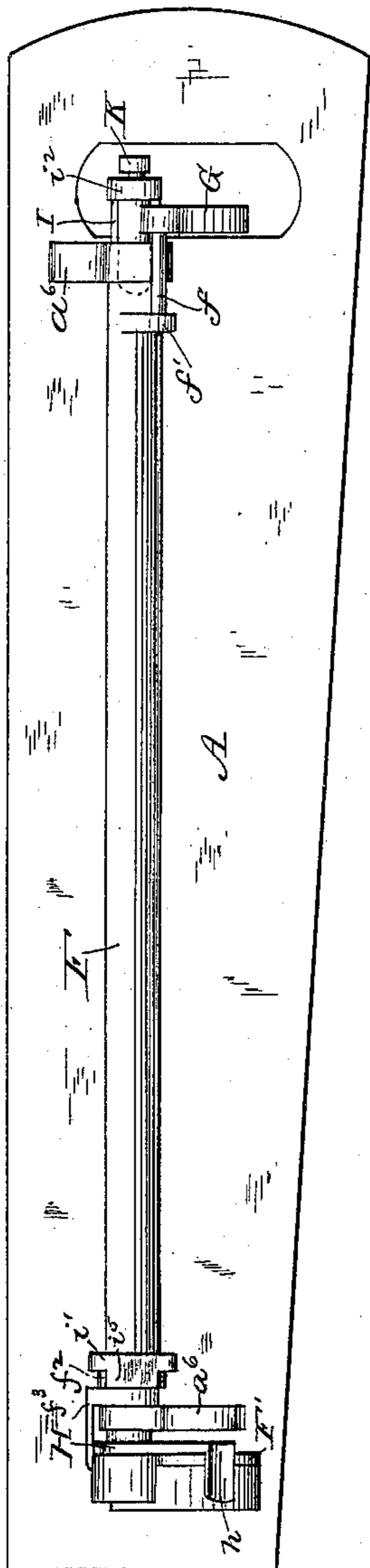
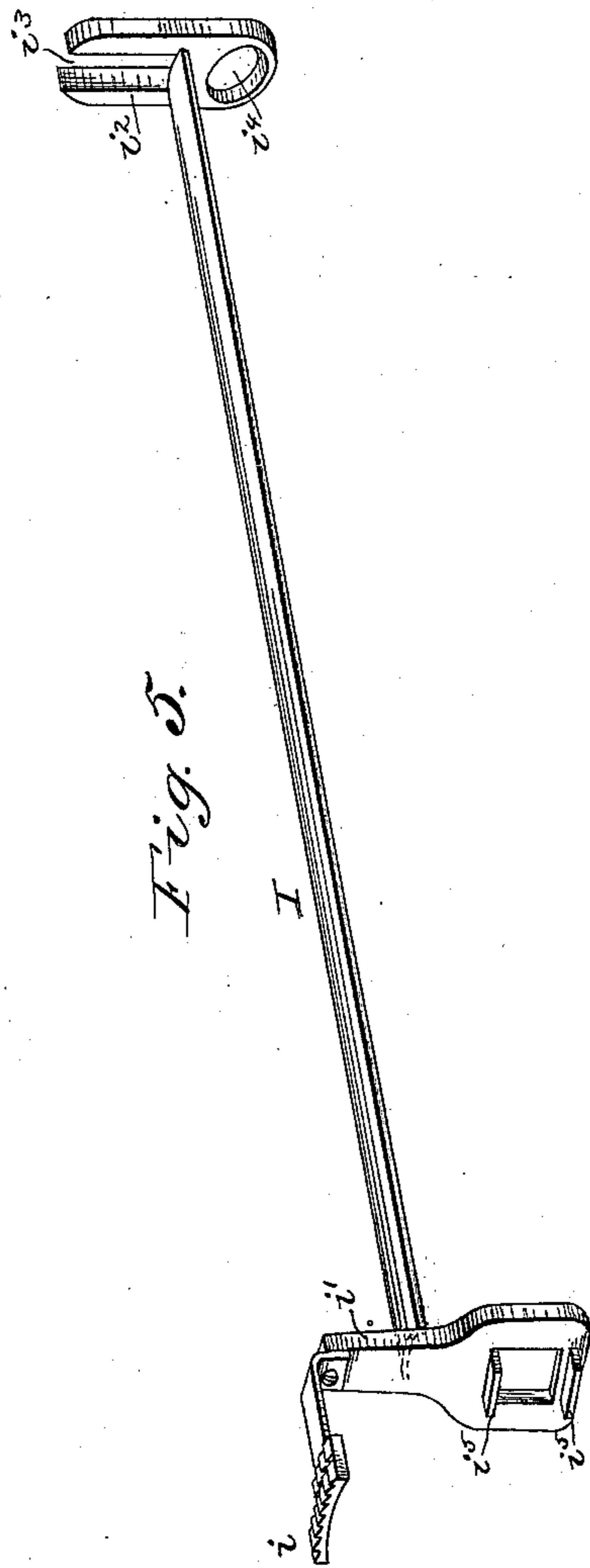


Fig. 5.



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UNITED STATES PATENT OFFICE.

JAMES BOLTON, OF GLEN SPEY, NEW YORK.

FEEDING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 376,283, dated January 10, 1888.

Application filed July 21, 1886. Serial No. 208,940. (No model.)

To all whom it may concern:

Be it known that I, JAMES BOLTON, a citizen of the United States, residing at Glen Spey, in the county of Sullivan and State of New York, have invented certain new and useful Improvements in Feeding Mechanism for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

The object of my invention is to provide a sewing-machine feeding mechanism which will be simple in construction and efficient in operation, and in which the number of parts will be reduced to a minimum, so that the machine may be constructed as cheaply as possible and be very light-running.

In the drawings, Figure 1 is a sectional elevation of a machine embodying my invention. Figs. 2 and 3 are front and rear views, respectively, of the same. Fig. 4 is a bottom view. Fig. 5 is a detail view of the feed-bar and its connections. Fig. 6 is a sectional view of the face-plate, showing the needle and presser-bars. Fig. 7 is a detail view of the presser-foot and feed-dog, and Fig. 8 is a detail view of parts of the feeding mechanism.

A denotes the bed-plate of the machine, preferably made narrow, as shown in Figs. 2, 3, and 4, and cast integral with the bracket-arm B. The main shaft C is preferably provided with rounded enlargements or journals *c* near its opposite ends to fit in concave bearings milled in the upper part of the arm, said shaft being held in its bearings by screws *c'*, having concave ends fitting the rounded journals *c*. These screws not only hold the shaft securely in its bearings, but prevent endwise movement thereof, and can be conveniently adjusted to take up wear. The openings in the ends of the arm in which the shaft is journaled are made large enough to permit the said shaft, with its ball-journals, to be passed endwise through the same.

The fly-wheel D is attached to the shaft C in any suitable manner, and the pulley *d* and crank-pins *d'* and *d''* are all preferably formed integral with the said fly-wheel.

At the forward end of the shaft C, and preferably cast integral therewith, are the needle-bar-operating crank-disk *e'* and the disk *e''*, in which is formed the cam-groove *e'''*, for operating the take-up lever *a*, pivoted to the face

plate or cap A' and provided with a pin, *a'*, extending through a slot in said face-plate into said groove.

The needle-bar E is made very short, as shown in Fig. 6, and is provided with anti-friction rollers *e*, running between bearings, one of which is formed by a gib, *a''*, which may be adjusted by the screws *a'''* to take up wear. The needle-bar is connected with its crank by the pitman *a''*, which, owing to the shortness of said bar, is made longer than usual. This short needle-bar, with its anti-friction rollers, can be run with very little oil, so that the annoyance caused by soiling the work by oil from the needle-bar will be greatly lessened or avoided altogether.

F is the shuttle-operating rock-shaft, pivoted in the present instance on bearing-pins *a''*, passing through lugs or hangers *a'''*, depending from the bed-plate, said pins having rounded ends fitting into concave recesses in the ends of the shaft. Said shaft may, however, be provided with ball-journals like those for the main shaft C, if desired. The shaft F receives a rocking movement from the crank-pin *d'* through the pitman G, connected by the pin *f* with the arm *f'* of the said shaft. The shuttle is preferably held to the driver F' by clamping-arms *h*, carried by a plate, H, operated by a stationary cam, *o*, as more fully shown and described in my application Serial No. 208,939, filed simultaneously herewith, the said driver being in the present instance connected with its shaft by an arm, *f'''*.

The feed-dog *i* is connected to an arm, *i'*, preferably cast integral with the shaft or bar I, and the latter is provided at its rear end with a second arm, *i''*, also preferably cast integral with said bar, said arm *i''* having a slot, *i'''*, and an opening, *i''''*, the latter being of proper size to receive the rear journal pin or screw, *a''*, of the shuttle-operating shaft F. The arm *i'* is slotted to receive the shuttle-operating shaft F, and is provided with flanges *i''*, between which works the cam *f''* on the said shaft, the office of the said cam being to give up and down movements at proper intervals to the said arm *i'* and to the feed-dog connected therewith. The arm *i''* is rocked to give the forward and back or feeding movements to the feed-dog by a pin, *k*, carried by an adjustable bar or lever, K, provided with a rack, *k'*, with

which meshes a pinion, j , carried by a small shaft, J , and having an ordinary milled head or nut, j' , by which it may be turned to adjust the bar K vertically to move the pin k nearer to or farther from the center of motion of the arm i^2 to vary the rocking or vibrating movements of the said arm, and thus regulate the throw of the feed-dog operatively connected therewith, as above described. The bar K , as it is adjusted, slides vertically in a groove, l , milled in a lever, L , fulcrumed in an upright, d^6 , on the bed-plate, the shaft J passing through the block L' on the lower end of the said lever, the pitman M , by which the lever is operated from the crank-pin d^3 , also sliding in the upper part of the said groove, so that only the horizontal movements of the said pitman are imparted to the said lever. The groove l may be covered by a plate, l' . It will thus be apparent that as the lever L is vibrated the bar K will be swung on the pinion j as a fulcrum, and that as the said bar is adjusted vertically by the said pinion the distance between the pivotal point of the said bar and the pin k on the lever end thereof will be varied, this variation, in connection with the adjustment of said pin in the slot of the arm i^2 , making what may be termed a "double adjustment" of the feed, so that but a very slight vertical movement of the pin k will be necessary to effect a considerable variation to the feed. In other words, the vertical adjustment of the bar or lever K lengthens or shortens the lower arm thereof, by which the arm i^2 is operated, and at the same time changes the position of the pin k in the slot of the arm i^2 , so that if the said pin be lowered the length of its movement is increased, and at the same time it is brought nearer to the center of movement of the said arm, so that it vibrates said arm through a larger arc in proportion to the arc which is traversed by itself. As the feeding movement always commences with the arm i^2 vertical or in the position shown in Fig. 3, the feed, whatever its length, will always commence from the same point, the variations for different lengths of stitches being at the forward part of the stroke of the feed-dog.

It will thus be seen that as the connections between the upper and lower shafts are located outside of the arm no openings in the latter will be required for access to interior mechanism, and thus the arm, not being weakened by such openings, may be made smaller than where such openings are necessary, and will still be stiffer than usual. In practice the connections between the upper and lower shaft will be protected by a hinged guard normally held in place by a spring, but capable of being turned down when access to the parts covered thereby is necessary.

As the feed-dog swings in the arc of a circle in its feeding movements I prefer to arch the upper or feeding face thereof, as more clearly shown in Fig. 7, and I form that part of the presser-foot n which is rearward of the needle concave, to correspond to the curvature of

the upper side of the feed-dog. By thus constructing these parts between which the work is held in feeding so that their adjacent surfaces will be parallel there will be no puckering of the goods during this operation. The presser-foot turns upward, as usual, in front of the needle to permit of the easy entrance of the work, and the bearing portion of the said foot is the concave part rearward of the needle.

The presser-bar N is formed shorter than usual, and is held down against the work by an ordinary coiled spring, n' , the lower end of which bears on a corkscrew-thimble, n^2 , supported by a pin, n^3 , entering said bar. The said pin n^3 is fixed in the head or face plate. The said thimble is provided with a milled head by which it may be turned so that the spiral slot therein, traveling over the said pin, will cause the said thimble to be raised or lowered to vary the stress of the spring n' , as may be desired.

As the operation of my machine in sewing is practically the same as that of other similar machines, it will be readily understood from the foregoing by those skilled in the art to which my invention relates, and further explanation thereof than that already given will therefore not be necessary.

I do not claim herein the enlarged or ball journals for the main shaft C , this feature of my invention being embraced by my application No. 256,685, filed December 1, 1887.

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

1. The feed-bar I , provided with the rigid arms i' and i^2 , extending above and below the said bar, and the feed-dog connected with the arm i' , combined with bearings on which the said arms can rock, a cam for imparting vertical movements to the arm i' and the feed-dog, and mechanism for imparting rocking or feeding movements to the said arms, bar, and feed-dog, substantially as set forth.

2. The combination, with the feed bar or shaft I , its arms i' and i^2 , and the feed-dog i , of the shuttle-operating rock-shaft F , arranged at the center of movement of the said arms and provided with the cam f^2 , and mechanism for rocking the said shaft F and the feed bar or shaft I , substantially as set forth.

3. The combination, with the feed bar or shaft I , its arms, and the feed-dog, of the adjustable bar or lever K , having a pin working in a slot in the rear arm of the bar or shaft I , the grooved lever L , the pitman sliding vertically in and thus adapted to vibrate the said lever L , a crank for operating the said pitman, and means for raising and lowering the said feed-dog, substantially as set forth.

4. The combination of the feed bar or shaft I , having two arms, to one of which the feed-dog is connected, bearings on which the said arms can rock, the adjustable bar or lever K , having a pin working in a slot in the other of said arms, said bar or lever being also provided with a rack, a pinion meshing with the said rack, the grooved lever L , the pitman M , and

the crank by which the latter is operated, and means for raising and lowering the said feed-dog, substantially as set forth.

5 5. The combination, with the driving and the shuttle-operating shafts, the feed bar or shaft and its attached parts, and the cam f^2 , of the crank-pins d' and d^2 , the disk or pulley by which said crank-pins are carried, the pitman G, connected with the shuttle-operating shaft, 10 the pitman M, the grooved lever L, the bar or lever K, provided with a rack and with a pin, k , the pinion J, and the shaft and head for the latter, substantially as set forth.

6. The combination, with the arched feed-dog moving in a curved path, of the presser- 15 foot, the bearing portion of which, fitting against said dog, is arched rearward of the needle only to correspond with the curvature of the said dog, substantially as set forth.

In testimony whereof I affix my signature in 20 presence of two witnesses.

JAMES BOLTON.

Witnesses:

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E. D. SMITH.