

(No Model.)

4 Sheets—Sheet 1.

E. H. CRAIGE.
MECHANICAL TRACING PEN.

No. 426,925.

Patented Apr. 29, 1890.

Fig. 1.

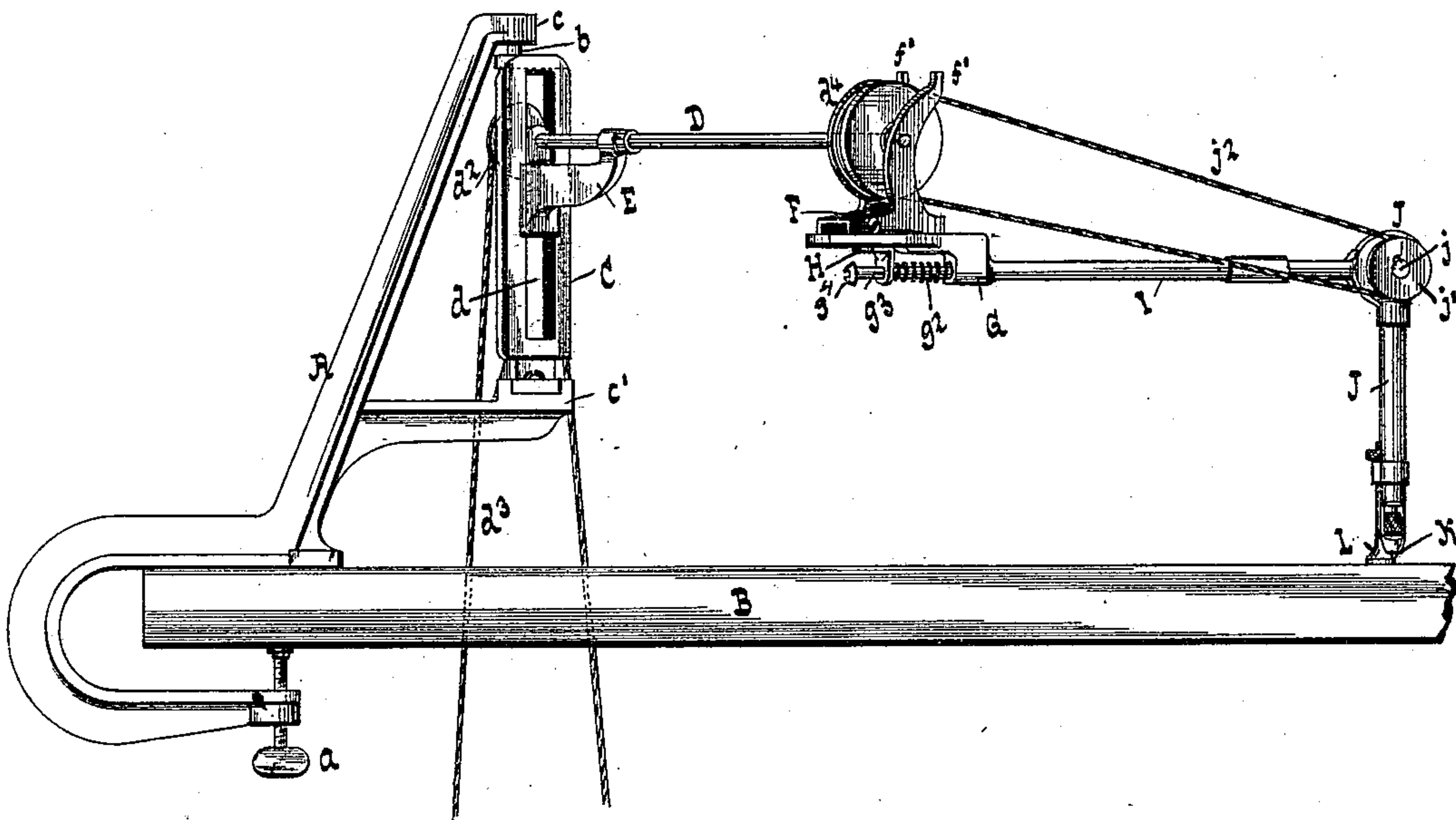
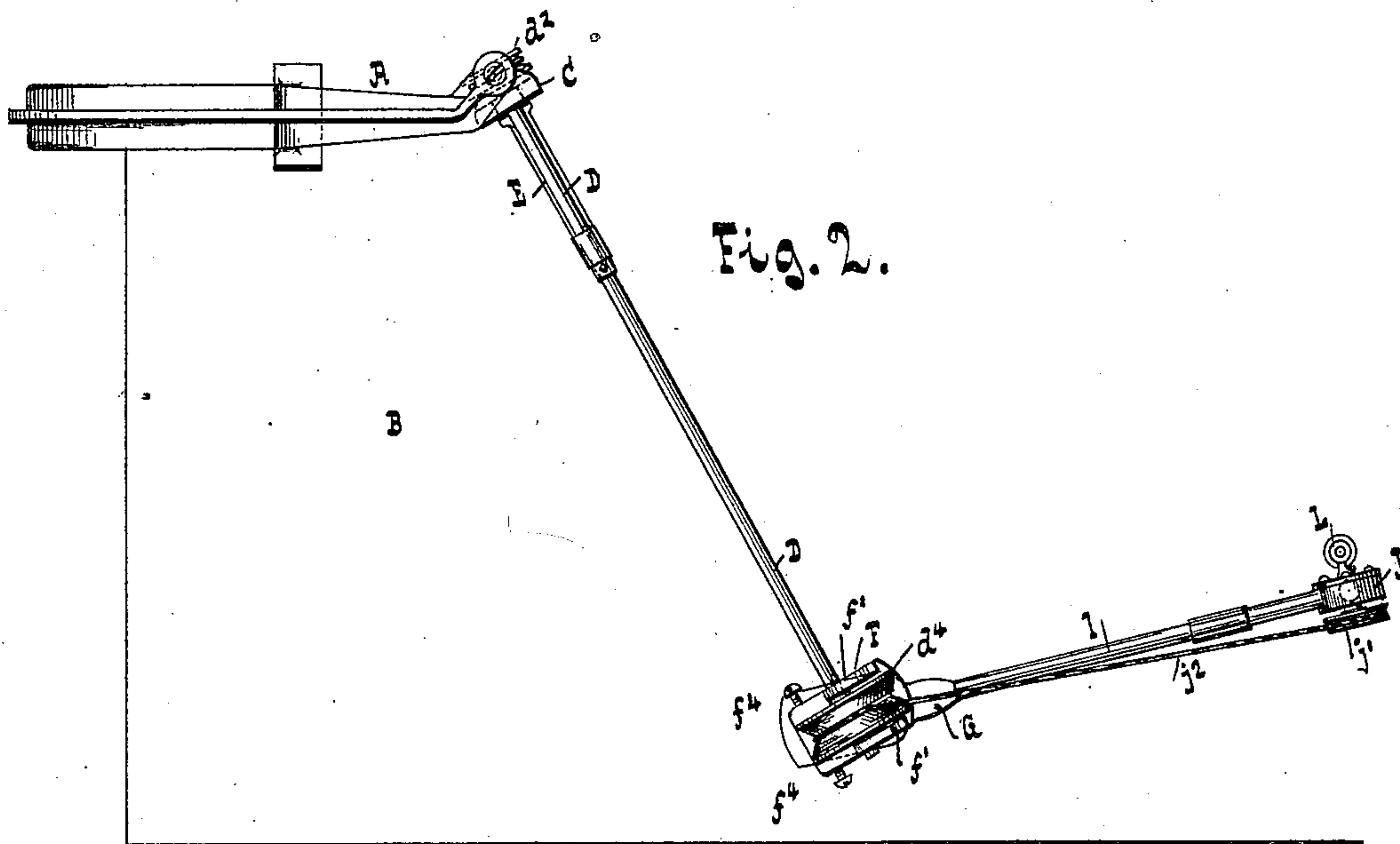


Fig. 2.



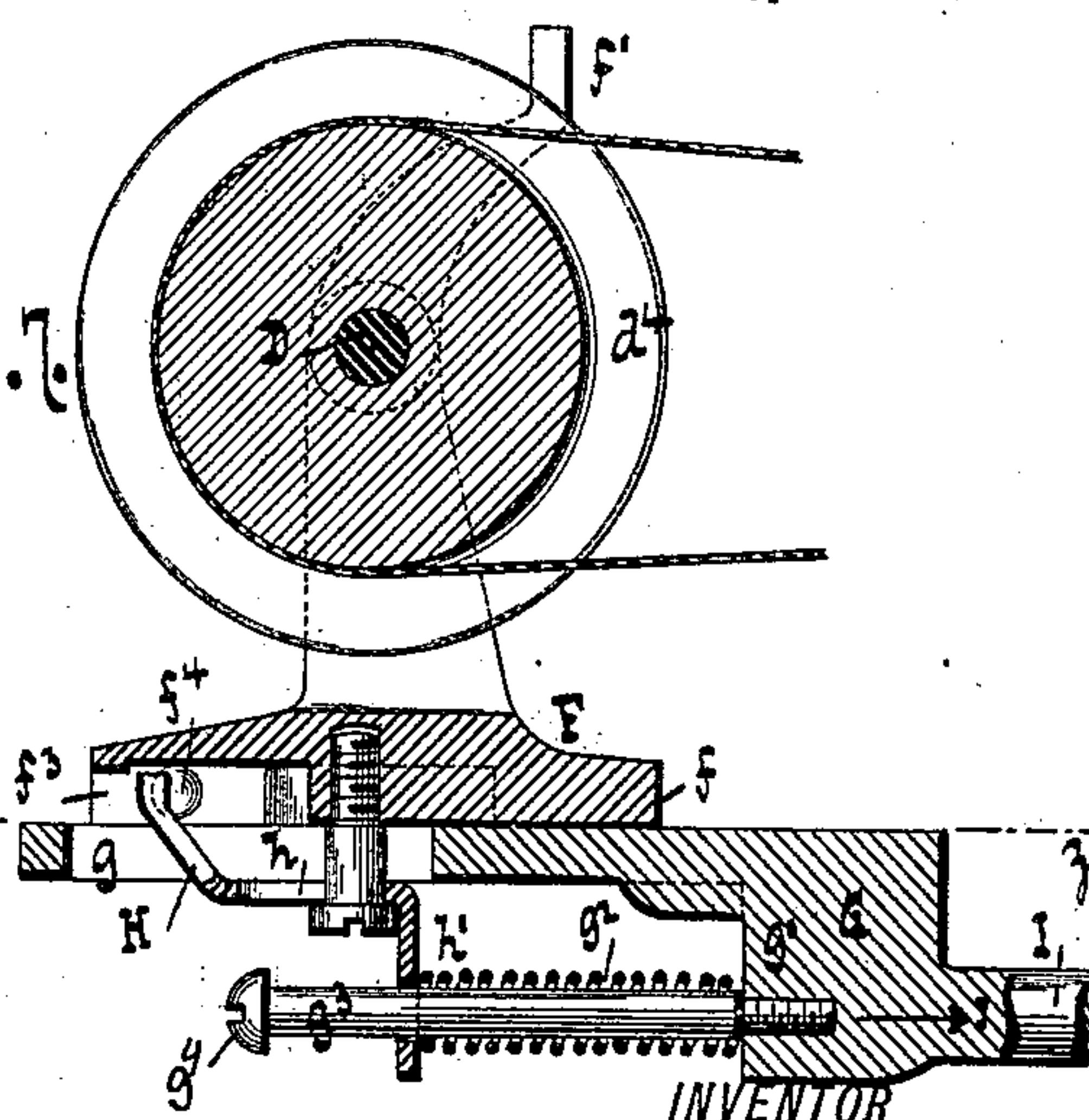
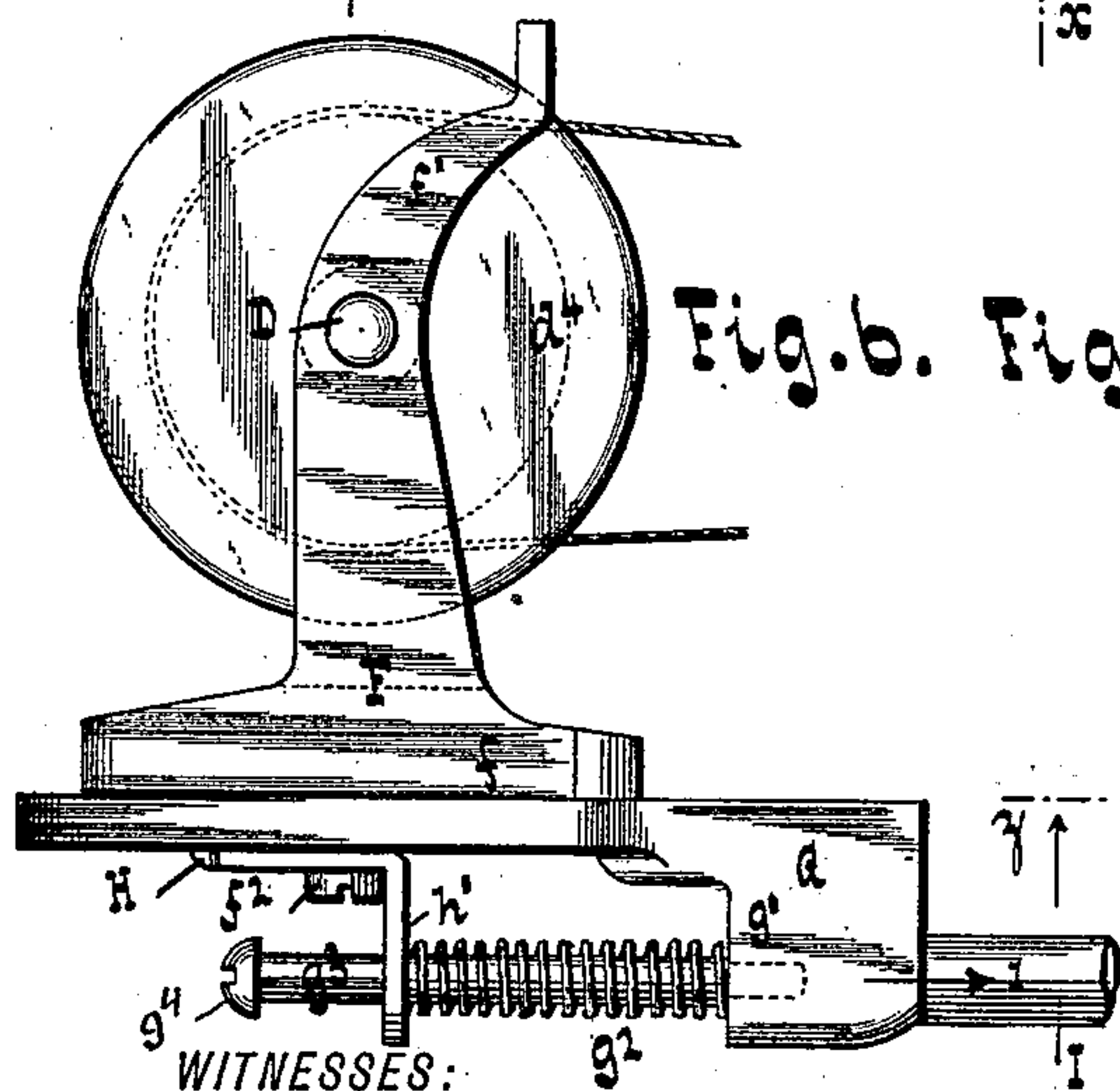
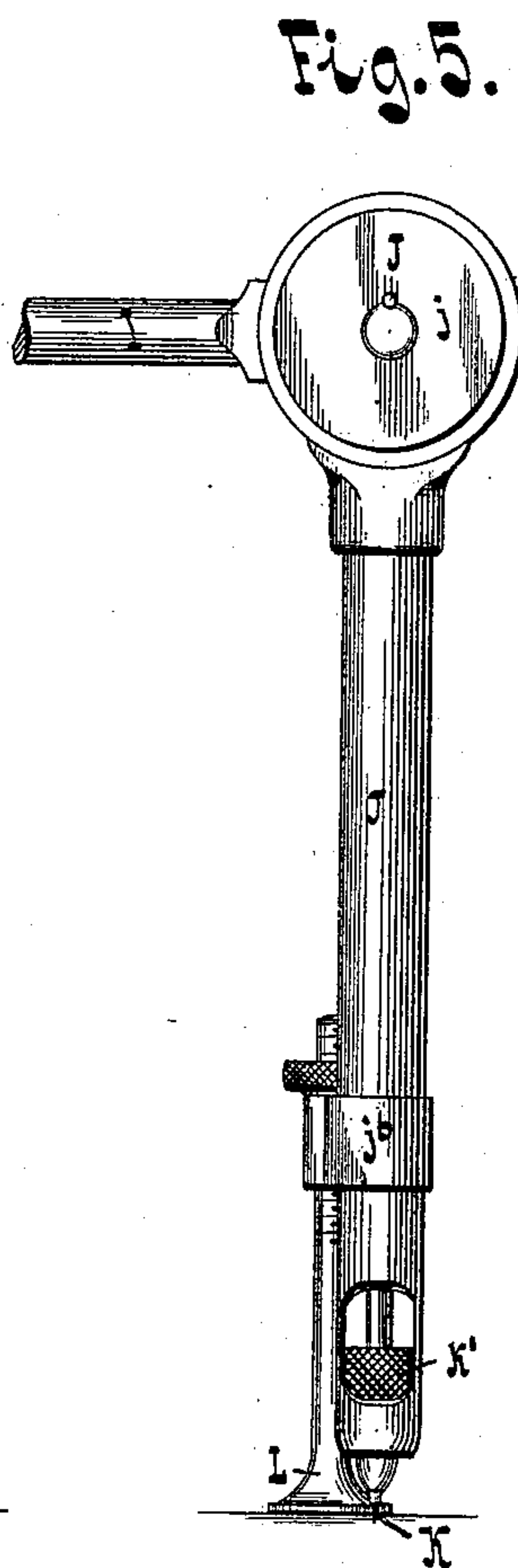
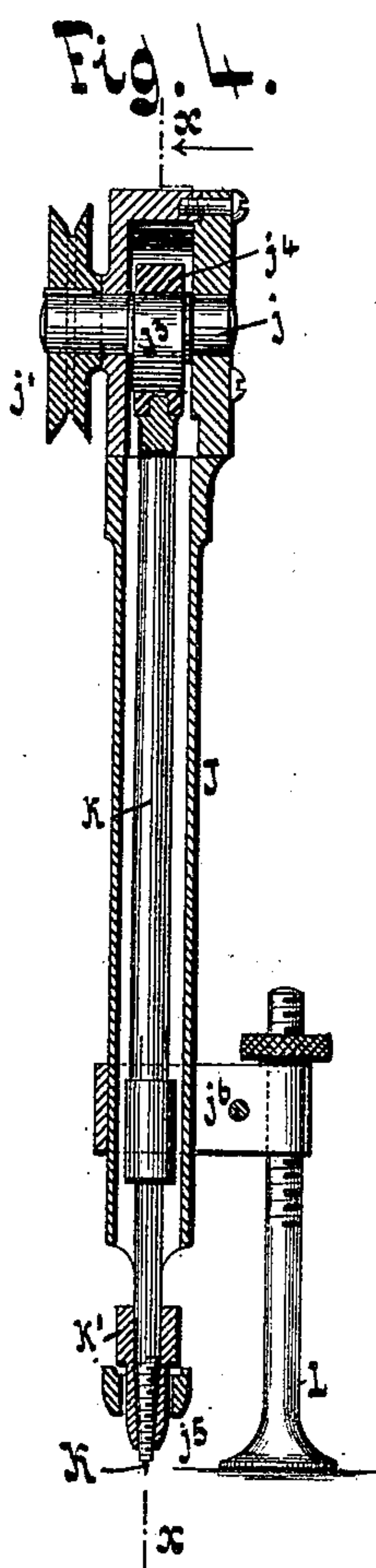
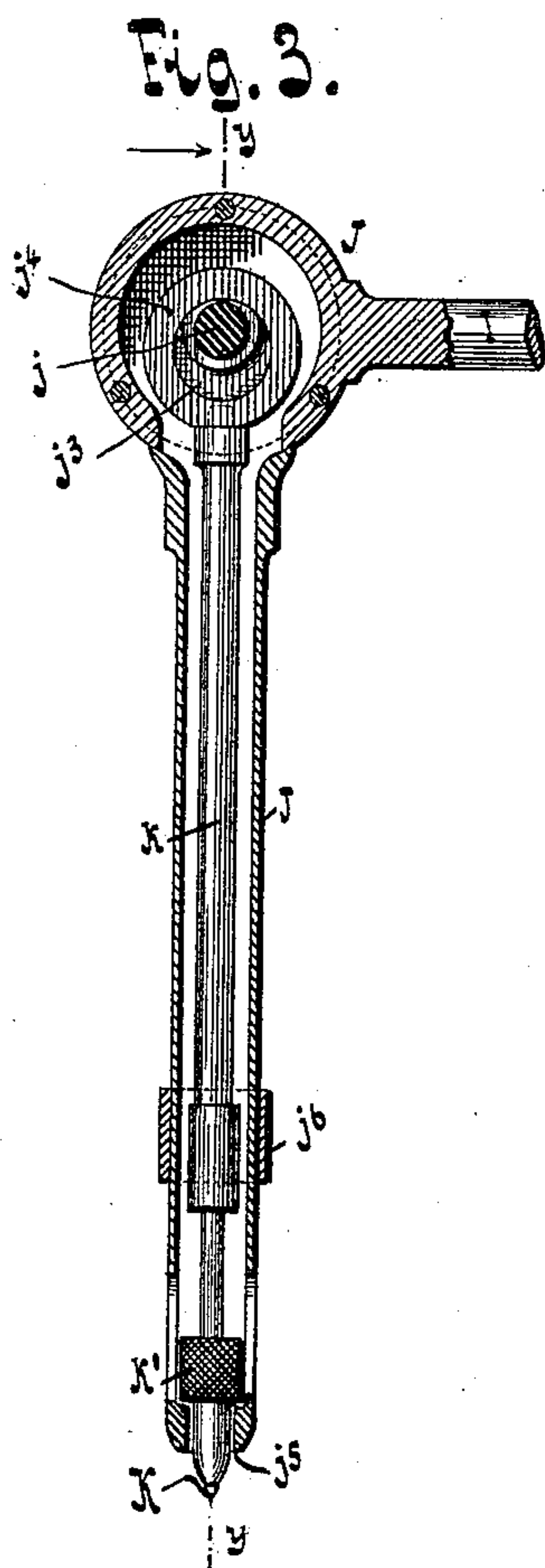
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William Miller

Edward H. Craige.
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his ATTORNEYS

(No Model.)

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Fig. 8.

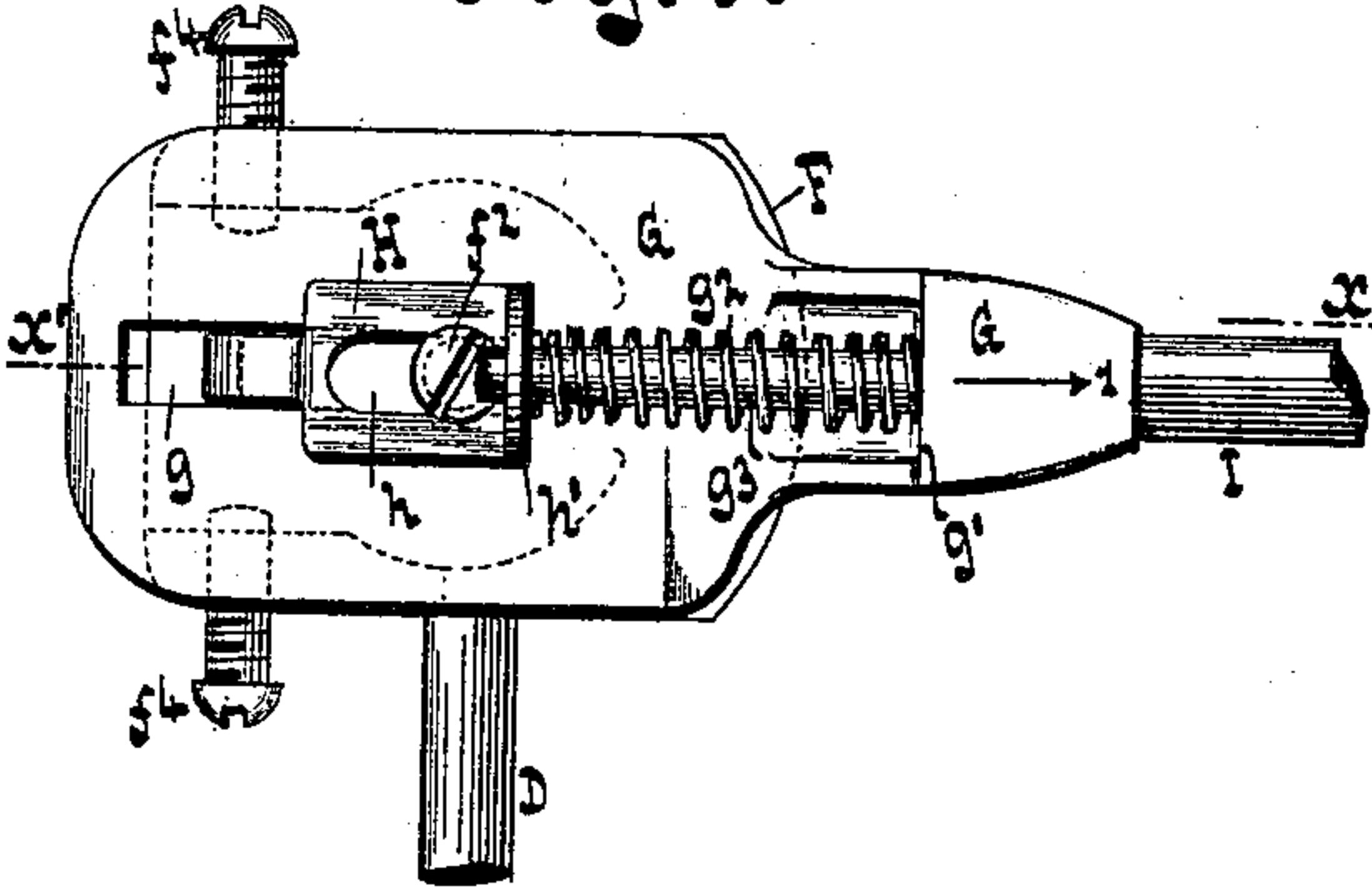


Fig. 9.

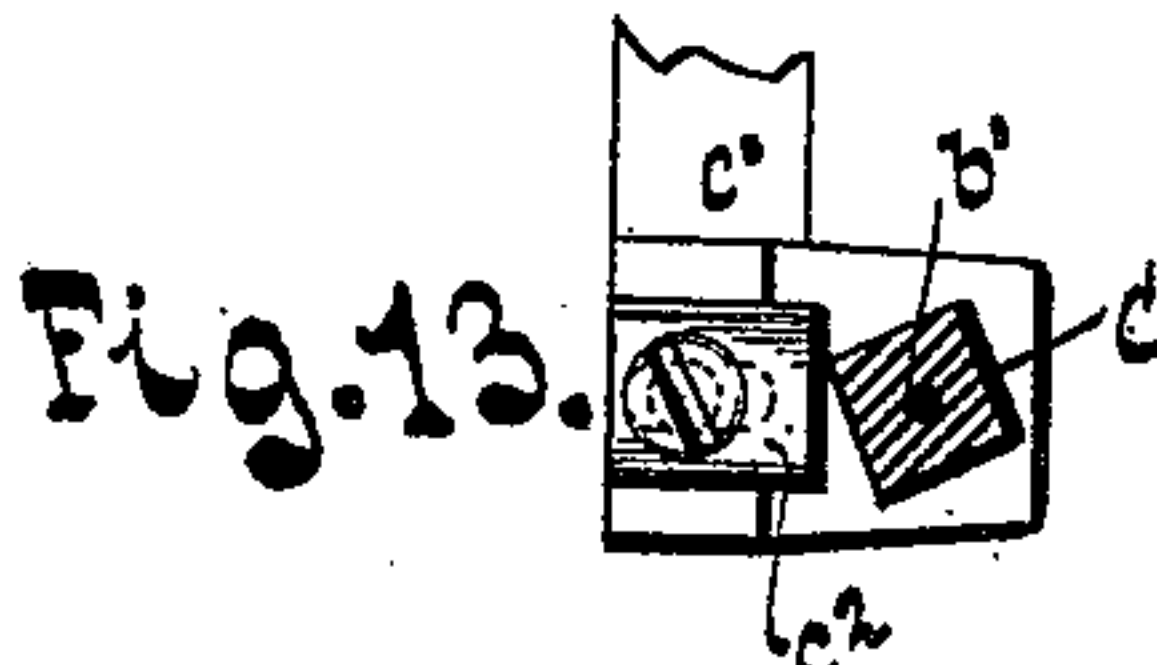
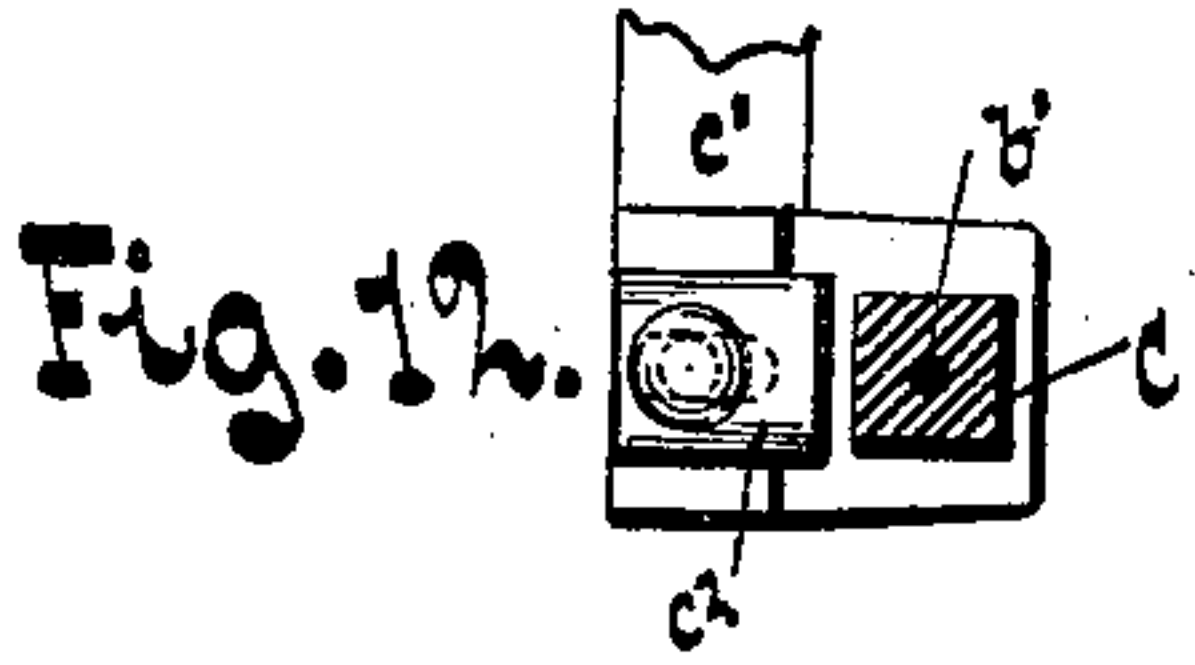
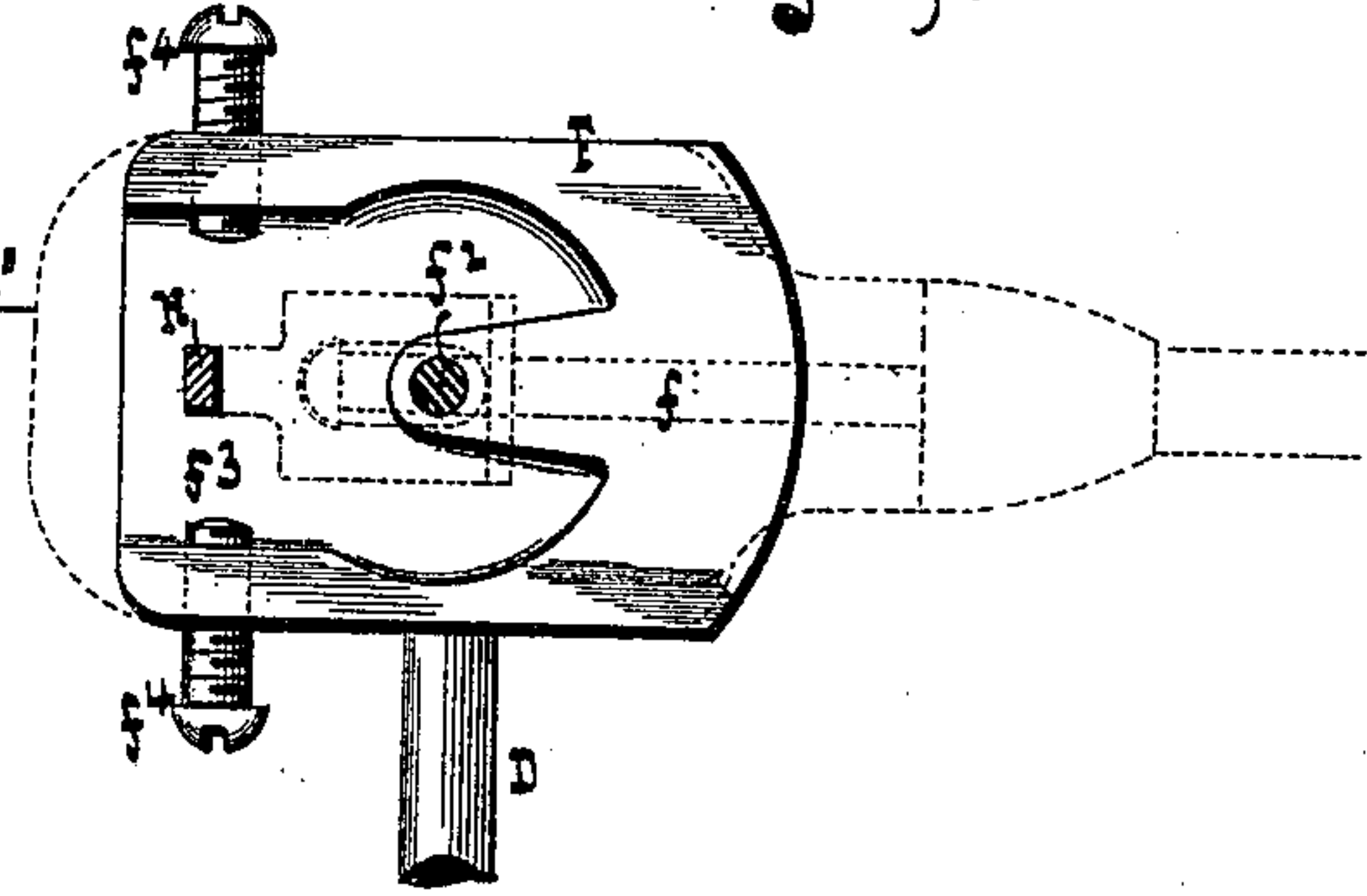


Fig. 10.

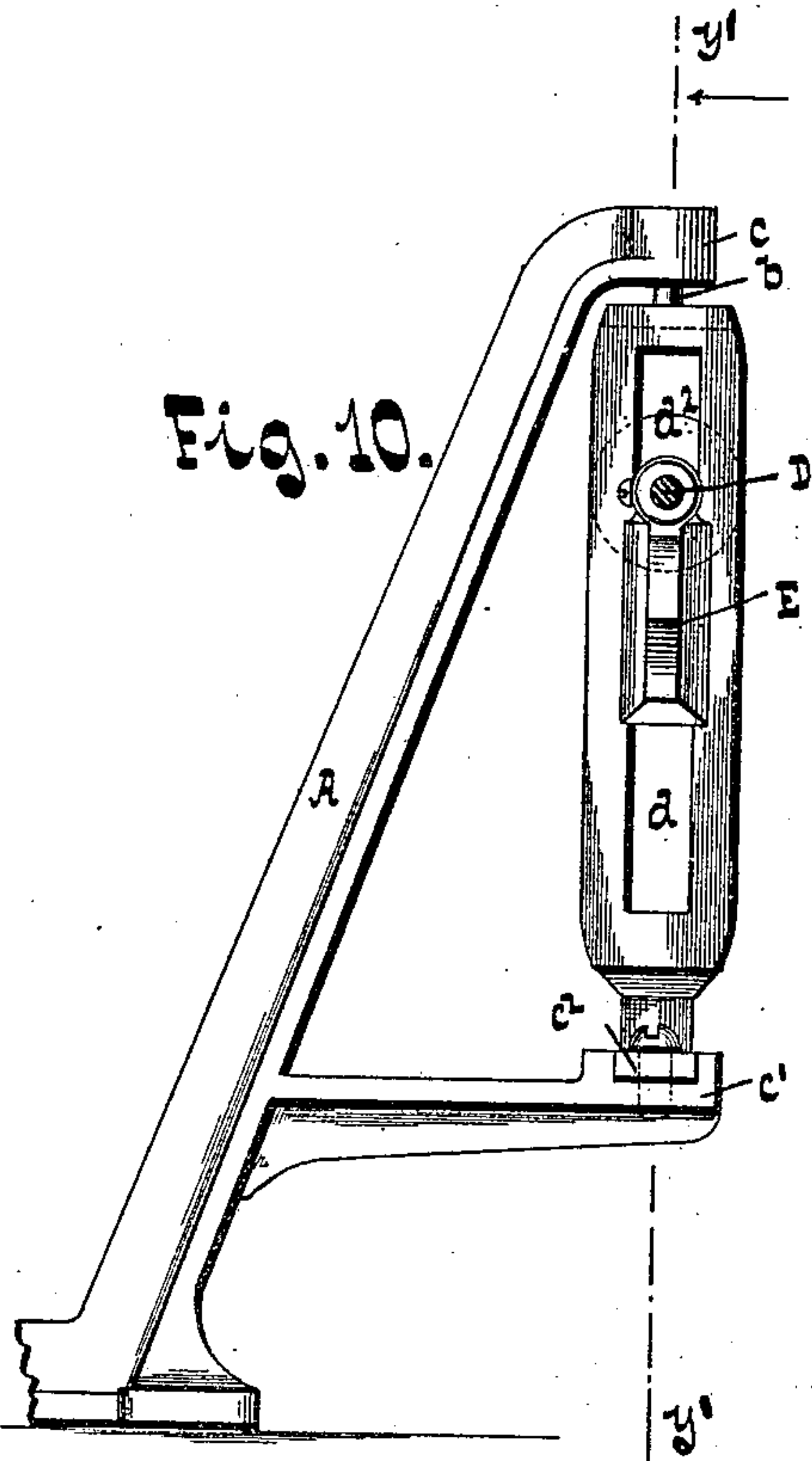
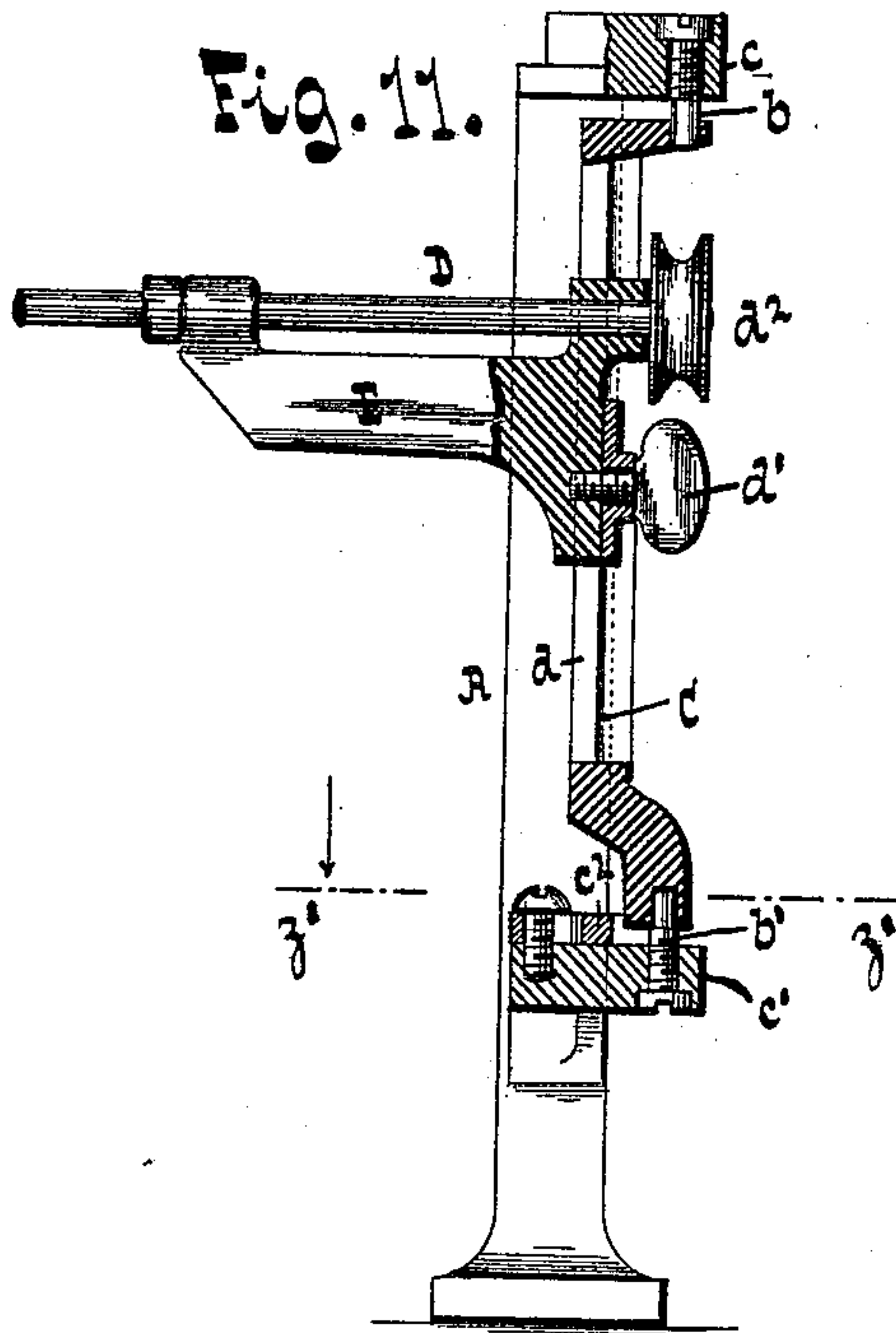


Fig. 11.



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Fig. 14.

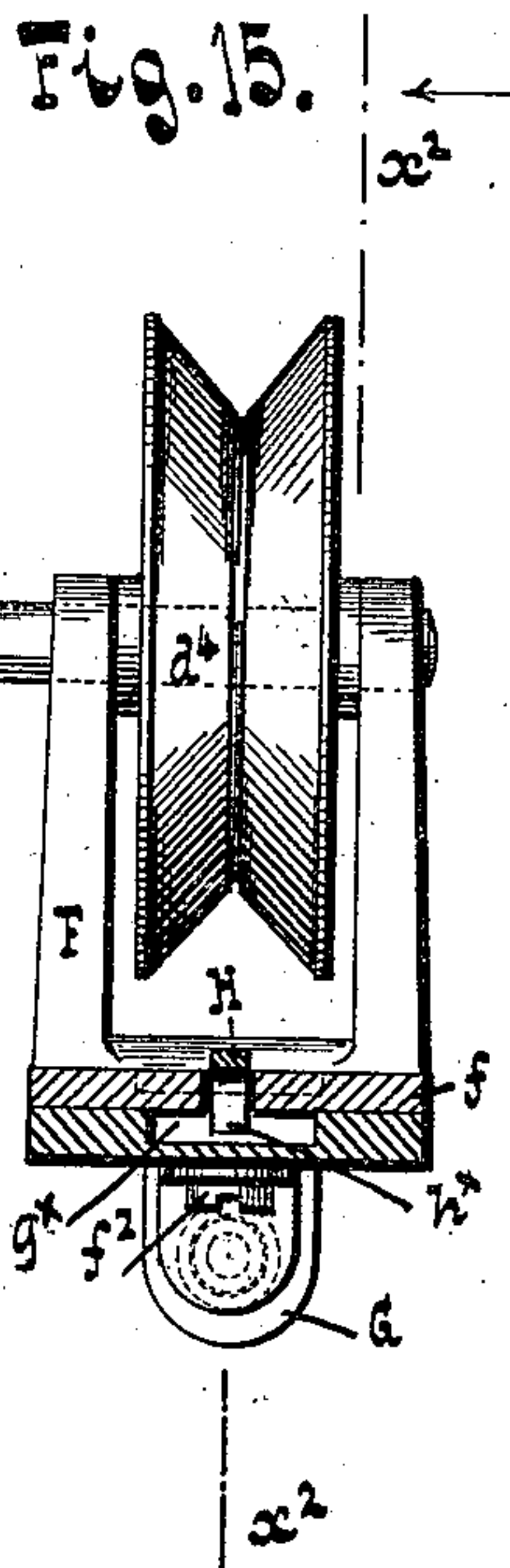
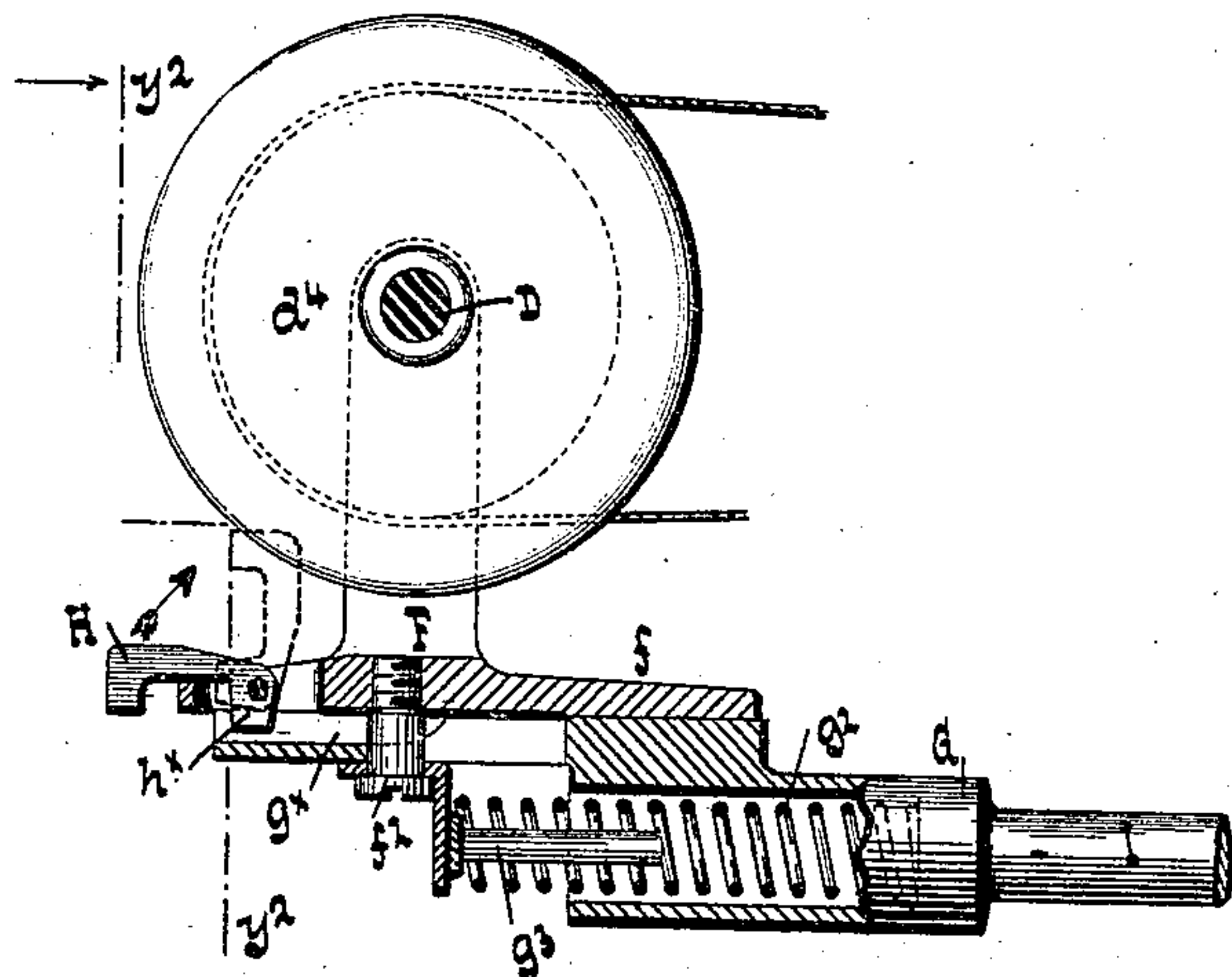
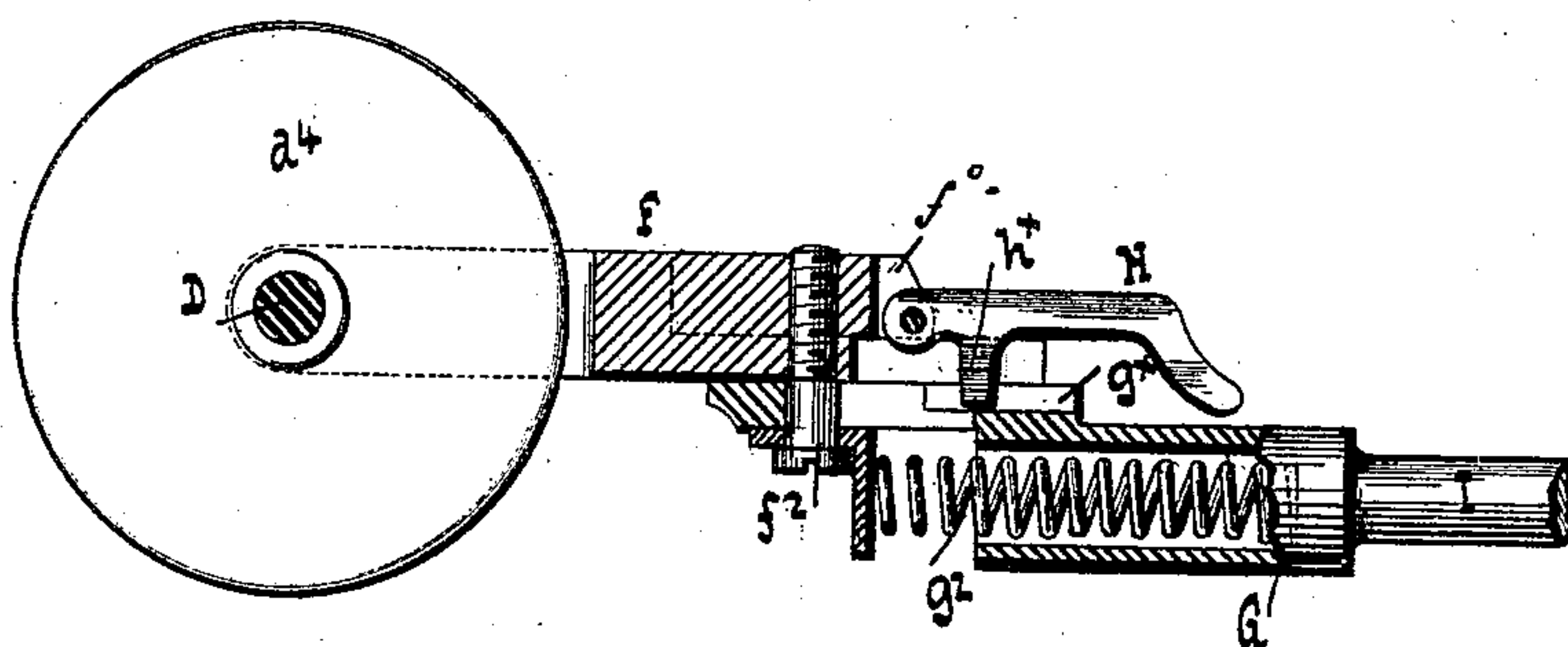


Fig. 16.



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UNITED STATES PATENT OFFICE.

EDWARD H. CRAIGE, OF BROOKLYN, NEW YORK.

MECHANICAL TRACING-PEN.

SPECIFICATION forming part of Letters Patent No. 426,925, dated April 29, 1890.

Application filed June 6, 1889. Serial No. 313,354. (No model.)

To all whom it may concern:

Be it known that I, EDWARD H. CRAIGE, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Mechanical Tracing-Pens, of which the following is a specification.

My invention has for its object to enable the operator to guide the tracing-pen and to give him complete control of the mechanism employed.

The peculiar and novel construction of this mechanism is pointed out in the following specification and claims, and illustrated in the accompanying drawings, in which—

Figure 1 represents a side elevation. Fig. 2 is a plan or top view. Fig. 3 is a longitudinal section of the casing which contains the tracing-pen detached, on a larger scale than the previous figures, the line $x x$, Fig. 4, indicating the plane of section. Fig. 4 is a similar section in the plane $y y$, Fig. 3. Fig. 5 is a side view of the same. Fig. 6 is a side elevation of the parts which connect the jointed arms, on a larger scale than Figs. 1 and 2. Fig. 7 is a vertical section of the same, the line $x' x'$, Fig. 8, indicating the plane of section. Fig. 8 is an inverted plan of the same. Fig. 9 is a horizontal section in the plane $z z$, Fig. 7. Fig. 10 is a partial side view of the main standard and of the swivel-bracket mounted in the same. Fig. 11 is a vertical section in the plane $y' y'$, Fig. 10. Fig. 12 is a horizontal section in the plane $z' z'$, Fig. 11. Fig. 13 is a similar section showing the parts in a different position. Fig. 14 is a vertical section of a modification of the parts shown in Figs. 6 to 9 inclusive, the plane of section being indicated by the line $x^2 x^2$, Fig. 15. Fig. 15 is a transverse vertical section of the same in the plane $y^2 y^2$, Fig. 14. Fig. 16 is a sectional side view of another modification of the same parts.

Similar letters indicate corresponding parts.

In the drawings, the letter A designates a standard which is so constructed that it can be readily secured in the position in which it is required. In the example shown in the drawings it is secured to a table B by means of a clamping-screw a . In the standard A is mounted a swivel-support C, (best seen in Figs. 10 and 11,) which carries the shaft D.

This swivel-support turns on pivots $b b'$, which are secured in arms $c c'$, projecting from the standard A. On the arms c' is secured the adjustable stop c^2 , and if this stop is moved back away from the pivot b' it does not interfere with the movement of the swivel-support C; but if said stop is moved forward to the position shown in Figs. 11, 12, and 13 the revolving motion of the swivel-support is limited, as indicated in Fig. 13. The object of this limitation will be presently explained.

The shaft D has its bearings in a bracket E, which is fitted into a slot d in the swivel-support, and which can be adjusted in said slot by means of a set-screw d' , Fig. 11. On the inner end of the shaft D is firmly mounted the pulley d^2 , to which motion is imparted by means of a belt d^3 , Fig. 1.

If the standard A is secured to the table of a sewing-machine, the belt d^3 will be made to extend round a pulley mounted on the crank-shaft of the sewing-machine; but said belt may be passed round a pulley mounted on a line-shaft overhead or in any other suitable position. By means of the stop c^2 the revolving motion of the swivel-support C is limited, so that the pulley d^2 cannot be thrown in a position in which the belt d^3 would be liable to run off. By adjusting the bracket E in the slot d the proper tension of the belt d^3 can be maintained.

The outer end of the shaft D extends through a bracket F. (Best seen in Figs. 6, 7, 8, and 9.) This bracket consists of a base-plate f and two uprights $f' f'$, between which is situated the pulley d^4 , which is firmly mounted on the shaft D. The base-plate f is connected to a head G by means of a screw-pivot f^2 , which is tapped into the base-plate and extends through a slot g in the head G, Figs. 7 and 8, and also through a slot h in the stop H. In the example shown in Figs. 6, 7, 8, and 9 this stop extends into a cavity f^3 in the bottom of the base-plate f , and through the sides of said base-plate extend two set-screws $f^4 f^4$, (best seen in Fig. 9,) which limit the movement of the stop H, and consequently the movement of the head G round the screw-pivot f^2 . Between the tail h' of the stop H and a shoulder g' of the head G is placed a spiral spring g^2 , through which extends a rod

g^3 , which is secured in the head G and extends freely through the tail h' of the stop H. The spring g^2 has a tendency to throw the head G out in the direction of arrow 1, Figs. 6, 7, and 8, and the rod g^3 is provided with a head g^4 , which limits the movement of the head G.

From the head G extends a rod I, which carries the casing J of the tracing-pen K, Figs. 3, 4, and 5. The casing J forms the bearings for a shaft j , on which is mounted a pulley j' , which connects by a belt j^2 with the pulley d^4 on the shaft D; and in order to prevent this belt from running off from its pulleys the revolving motion of the head G round the set-screw f^2 is limited by the stop H. The proper tension of the belt j^2 is preserved by the spring g^2 . When it is desired to pack up the machine for transportation or otherwise, the belt j^2 is thrown off from the pulleys j' d^4 and the head G is drawn out, so as to throw the stop H backward into the enlarged portion of the cavity f^3 in the base-plate F, Fig. 9. The head G can then be turned, so as to bring the rod I alongside of the shaft D, or nearly so.

On the shaft j in the casing J is mounted an eccentric j^3 , round which passes a strap j^4 , and from this strap extends a rod k , which carries the tracing-pen K. On the tracing-pen K is secured the sleeve k' , which extends loosely through the guide-opening j^5 , formed in the lower end of the casing J, so as not to interfere with the rocking motion imparted to the rod k by the eccentric j^3 . If the sleeve k has worn off, it can be replaced by another without renewing the rod k . By these means there is only a single bearing between the rod k and the casing J, so that the friction between the operative parts is reduced.

On the casing J is secured a bracket j^6 , which carries the foot-piece L, said bracket being provided with an internal screw-thread which engages the upper threaded portion of the stem of the foot-piece, so that the position of the tracing-pen in regard to the work can be adjusted.

In the example shown in Figs. 6, 7, 8, and 9 the stop H is secured to the head G; but said stop may be attached to the bracket F, either in the manner shown in Figs. 14 and 15 or in the manner shown in Fig. 16. In the example shown in Figs. 14 and 15 the stop H is hinged to the base-plate f of the bracket F. If the stop occupies the position shown in full lines in Fig. 14, its nose h engages a recess g in the head G, which is wide enough (see Fig. 15) to allow the head or the bracket F to turn the required distance in either direction; but if the stop H is turned to the position shown in dotted lines in Fig. 14 the head G can be turned so as to bring the rod I in line, or nearly so, with the shaft D.

In the example shown in Fig. 16 the bracket F is in a horizontal position, and the stop H is hinged to the extension f^0 , so that its nose

h engages a recess g in the head, said recess being of sufficient width to permit the required freedom of motion.

If the stop H is raised, the rod I can be swung round to the required position for packing.

What I claim as new, and desire to secure by Letters Patent, is—

1. In mechanism for producing and controlling the movements of a mechanical tracing-pen, the combination, with the standard A, of the swivel-support C, the bracket E, secured in the swivel-support, the shaft D, mounted in said bracket, the pulleys d^2 d^4 and the bracket F, mounted on this shaft, the head G, secured to the bracket F by a pivot f^2 , the rod I, extending from said head, the casing J, secured to the rod I, the tracing-pen K, contained in said casing, the shaft j , journaled in the casing, the pulley j' , mounted on this shaft, and mechanism, substantially as described, for imparting to the tracing-pen a rising and falling motion.

2. The combination, with the standard A, of the swivel-support C, mounted in said standard, the bracket E, fitted to the swivel-support and made adjustable on the same, the shaft D, mounted in the bracket, the pulleys d^2 d^4 , mounted on said shaft, the bracket F, head G, rod I, casing J, tracing-pen K, shaft j , pulley j' , and mechanism, substantially as described, for imparting to the tracing-pen a rising and falling motion.

3. The combination, with the standard A, the swivel-support C, the bracket E, the shaft D, and the pulley d^2 , of the stop c^2 , substantially as and for the purpose described.

4. The combination, with the standard A, the swivel-support C, the bracket E, the shaft D, the pulleys d^2 d^4 , the standard F, the head G, connected to the standard by the pivot f^2 , the rod I, and tracing-pen K, carried by said rod, of the stop H, substantially as described.

5. The combination of the casing J, having the guide-bearing j^5 at its lower end, the tracing-pen K, and the sleeve k' , secured to the tracing-pen and loosely fitting in the guide-bearing, with the rod k , the strap j^4 , the eccentric j^3 , and the shaft j , substantially as described.

6. The combination of the bracket F, carrying the pulley d^4 , and the slotted head G, pivoted against and sliding on the bracket and provided with a stop H, with the rod I, the casing J, the shaft j , the pulley j' , and the spring g^2 , acting against the stop and the head to slide the latter on the bracket carrying the pulley, substantially as described.

In testimony whereof I have hereunto set my hand and seal in the presence of two subscribing witnesses.

EDWARD H. CRAIGE. [L. S.]

Witnesses:

J. VAN SANTVOORD,
W. HAUFF.