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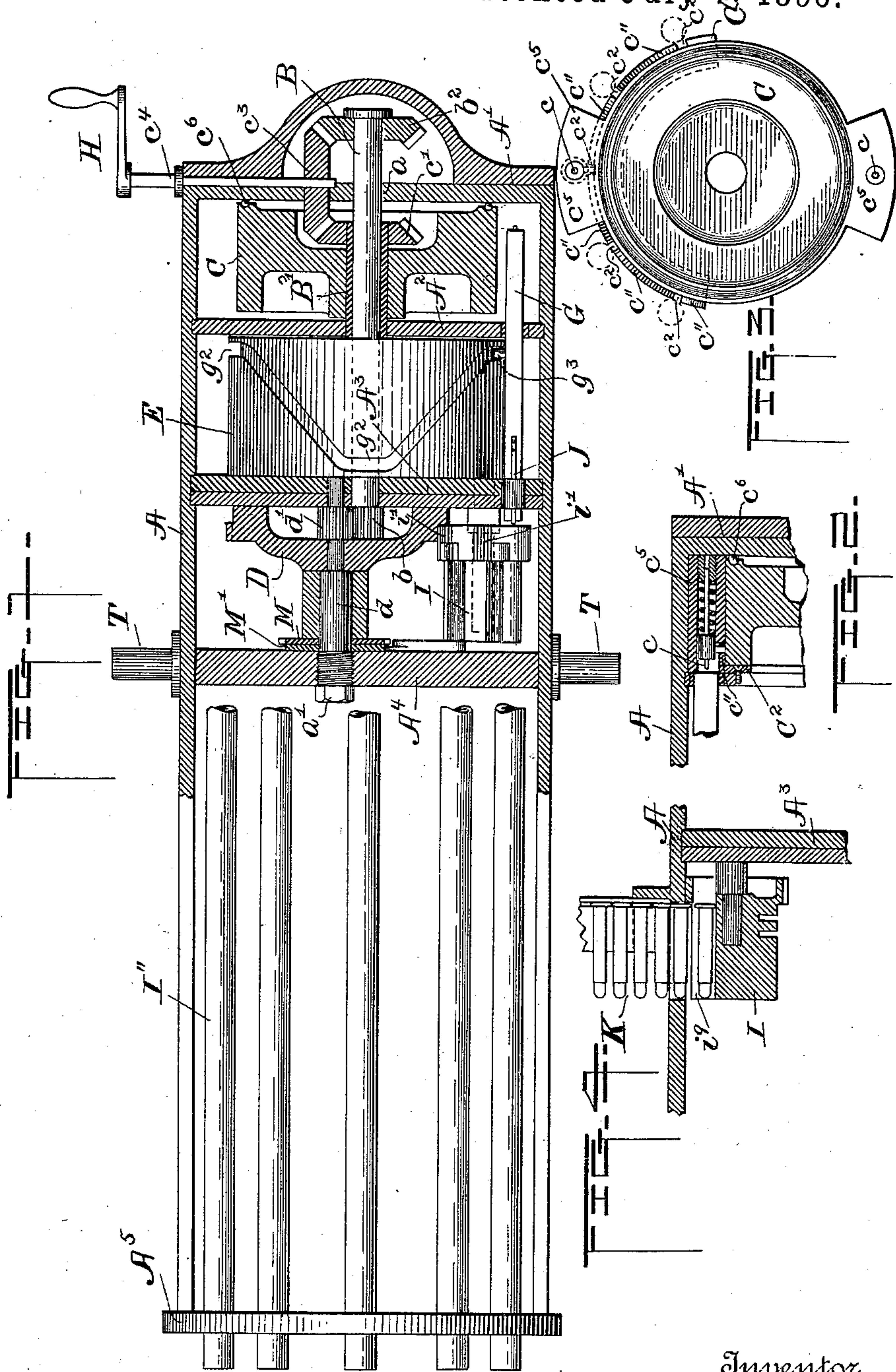
E. WILDER, Dec'd.

L. WILDER, Executrix.

MACHINE GUN.

No. 563,701.

Patented July 7, 1896.



Witnesses
C. W. Smith
J. P. Davis.

Inventor
E. Wilder.
By High Brown & Seung
Attorney

(No Model.)

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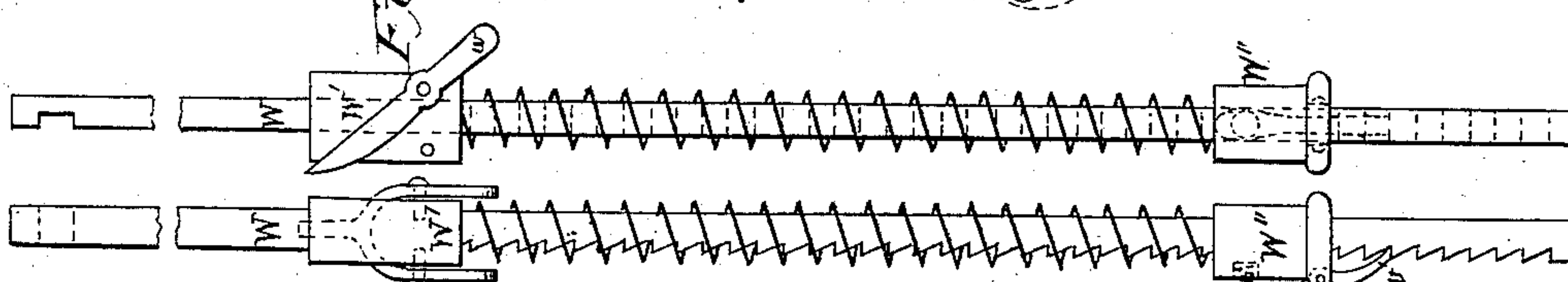
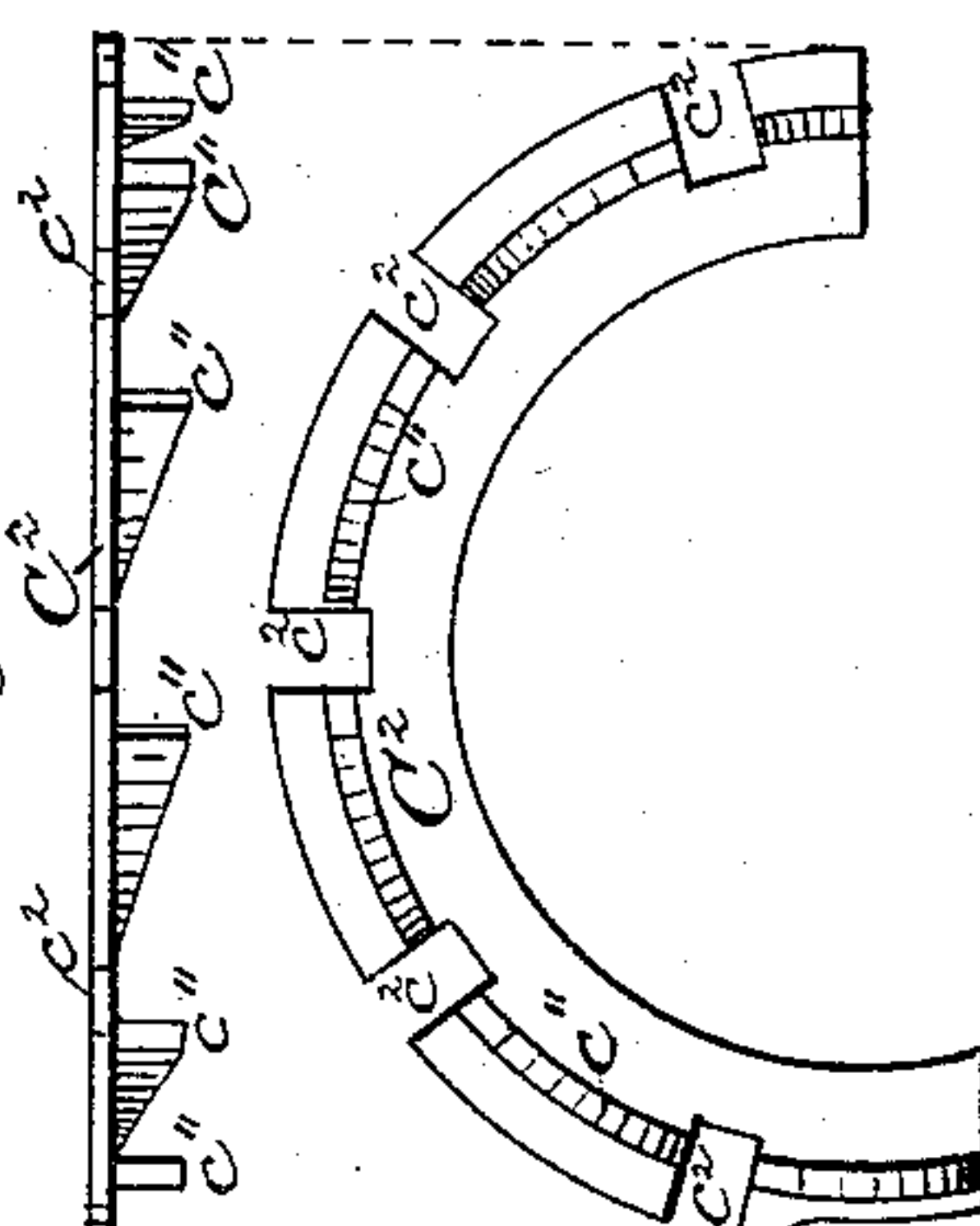
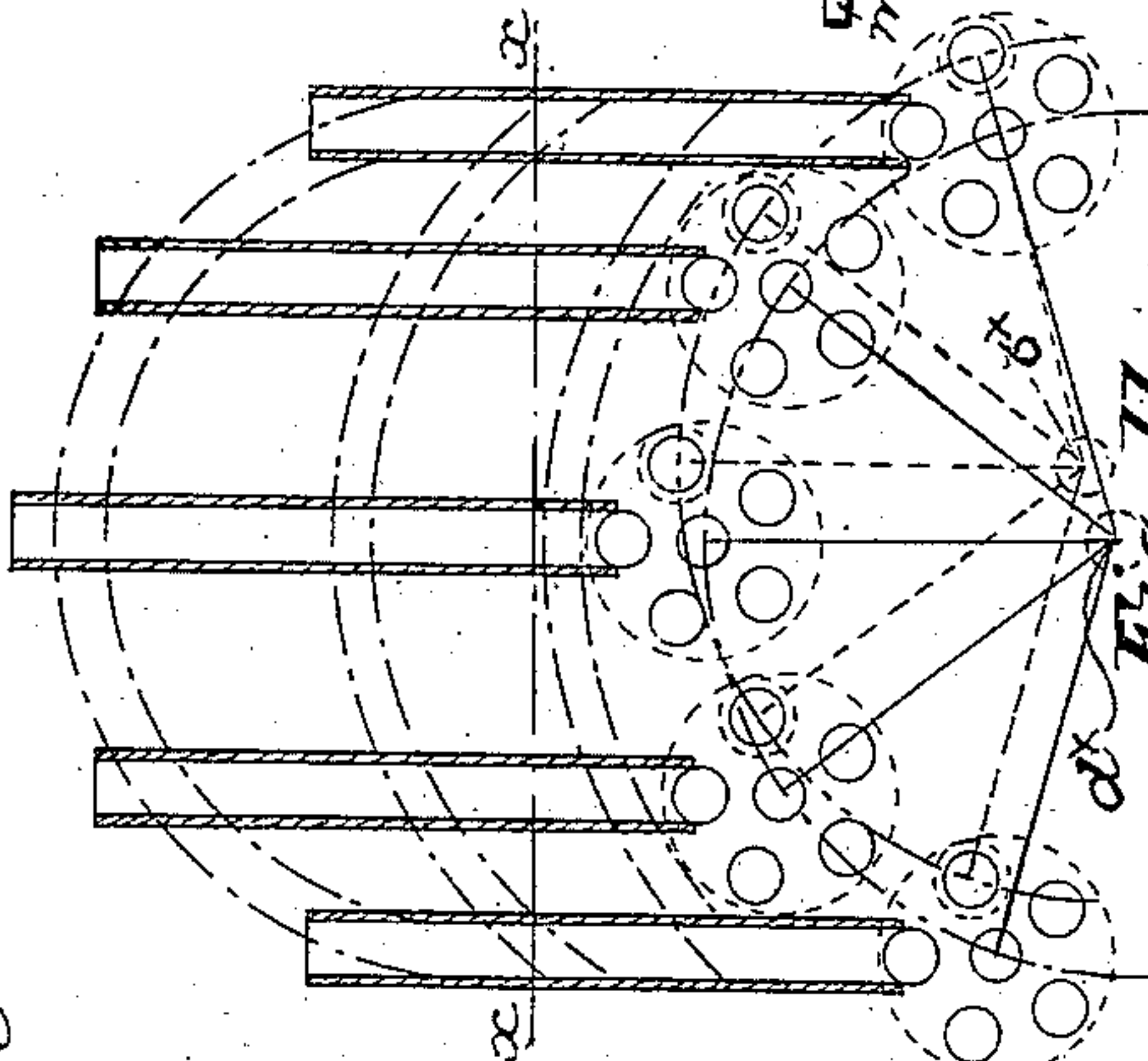
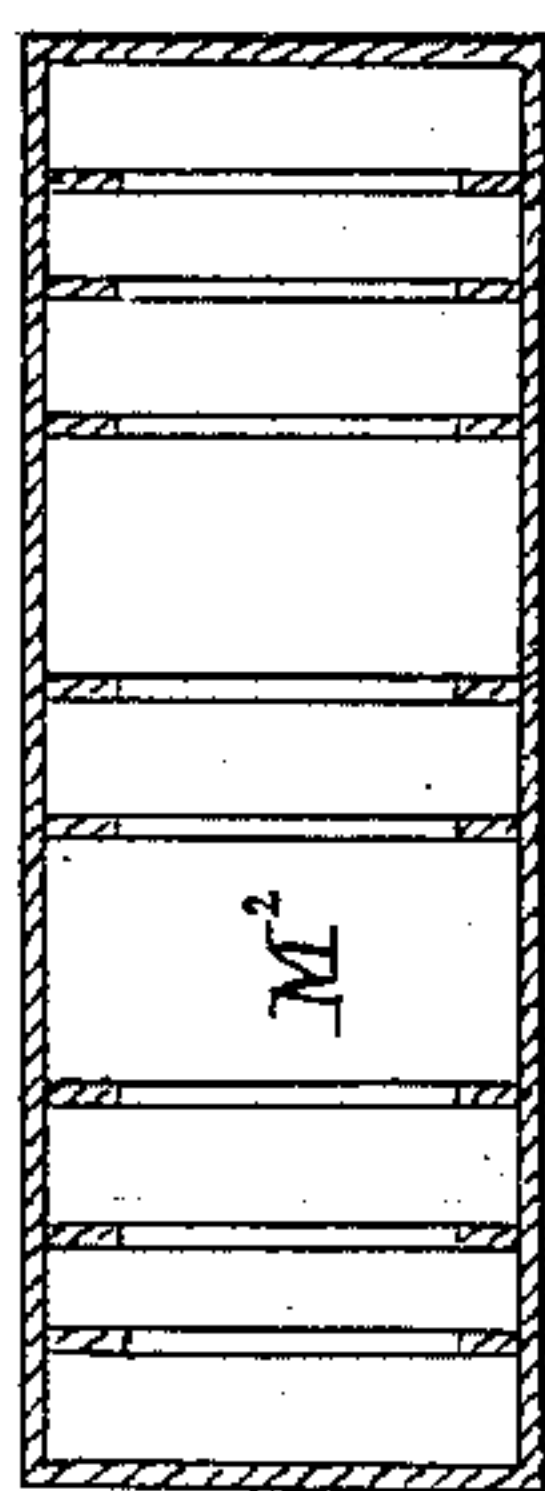
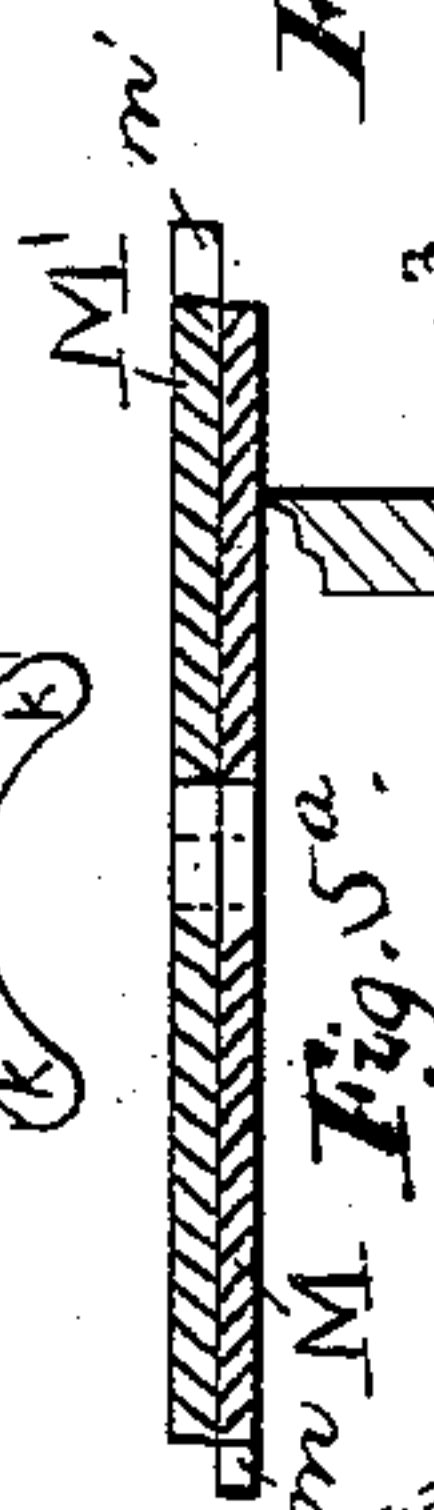
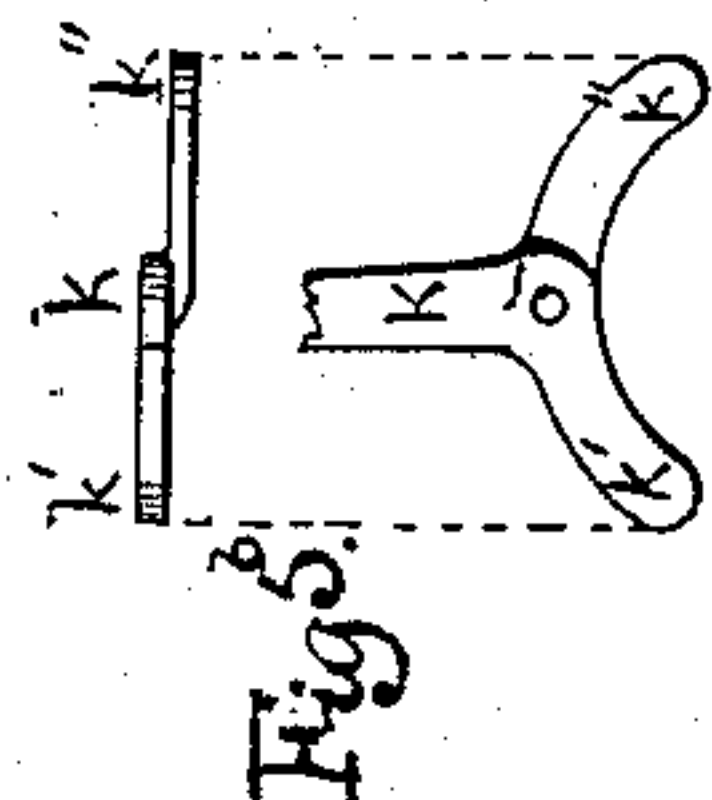
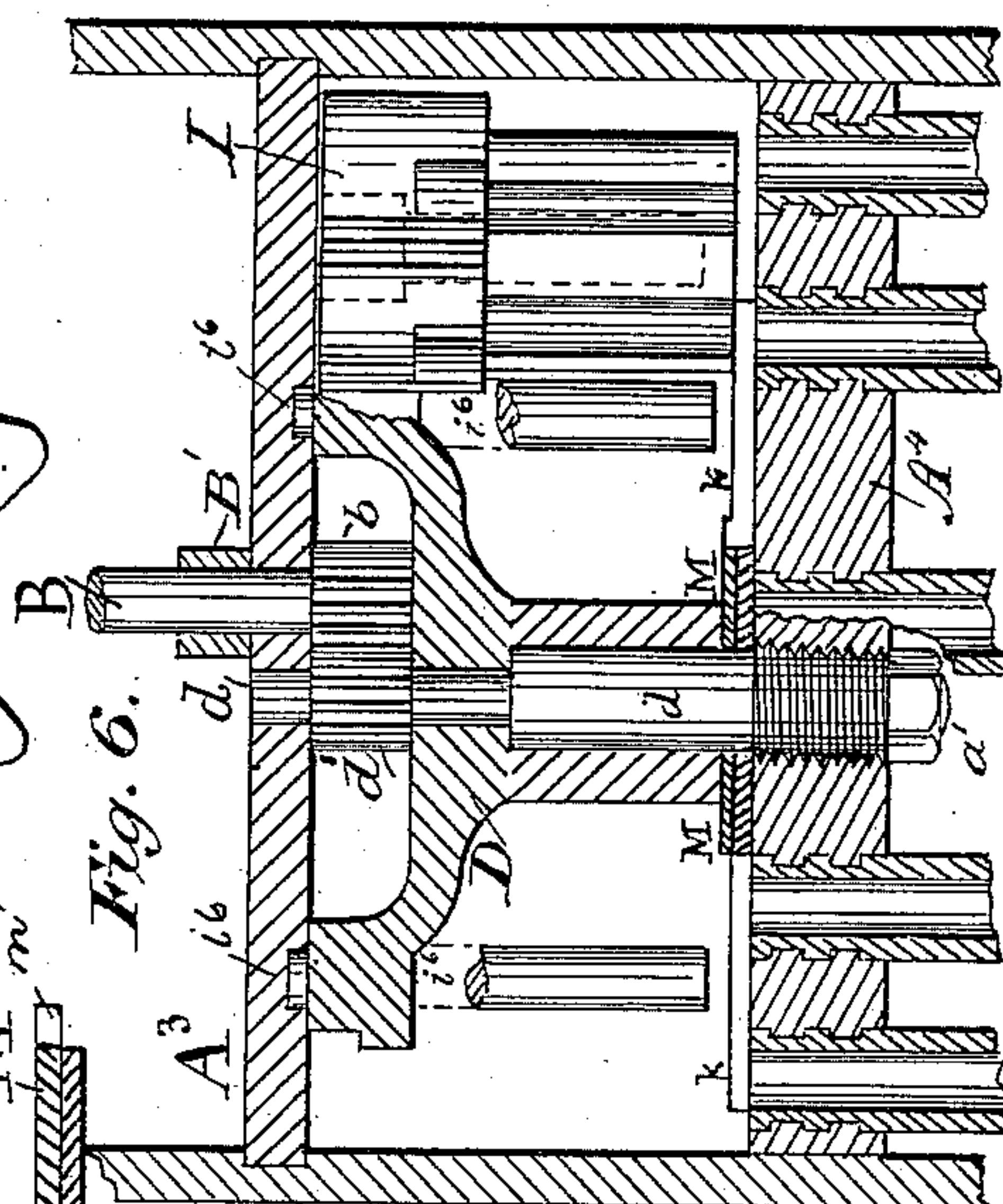
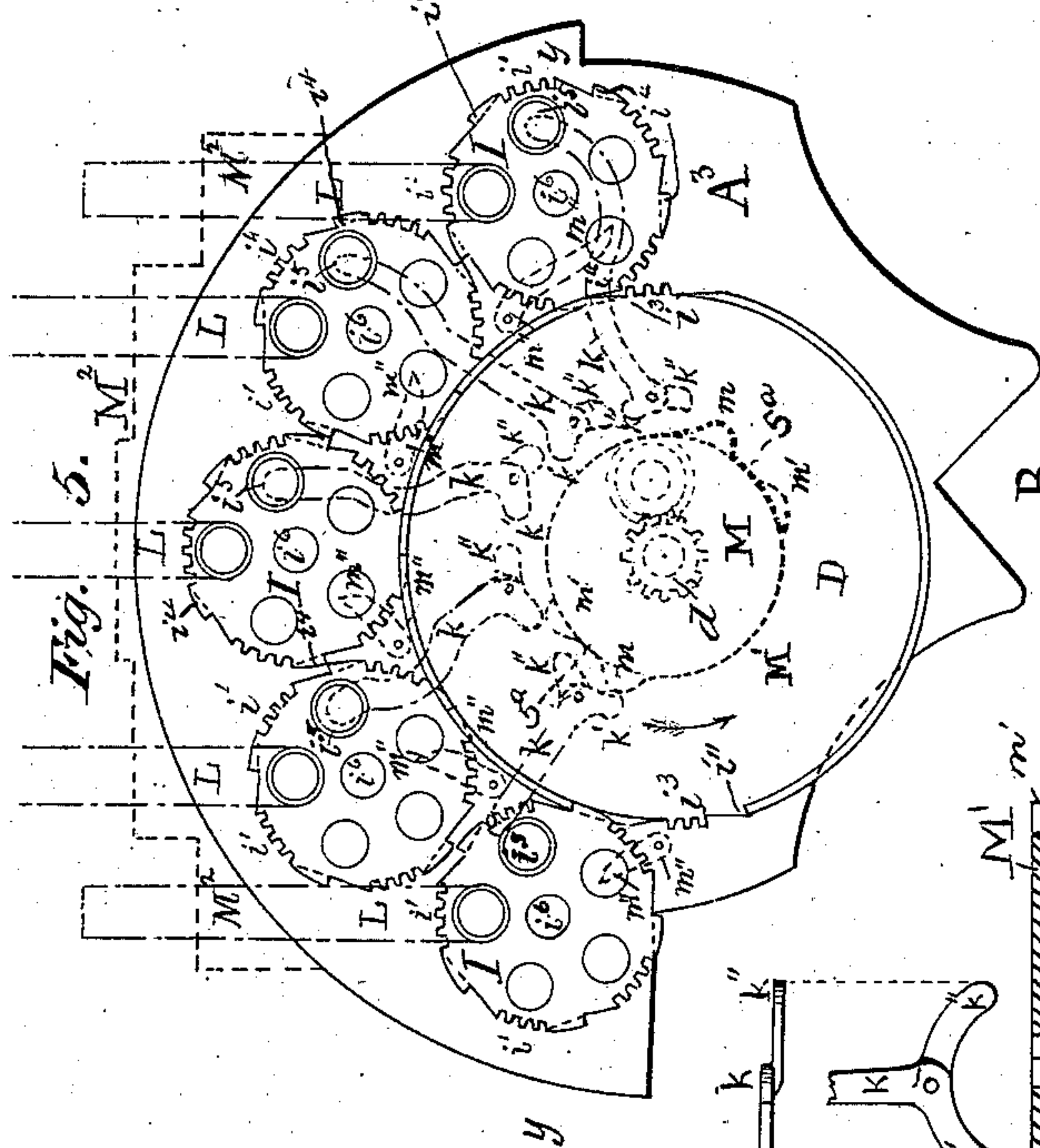
E. WILDER, Dec'd.

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MACHINE GUN.

No. 563,701.

Patented July 7, 1896.



Witnesses:

J. H. Goods

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Fig. 10.

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MACHINE GUN.

No. 563,701.

Fig. 12. Patented July 7, 1896.

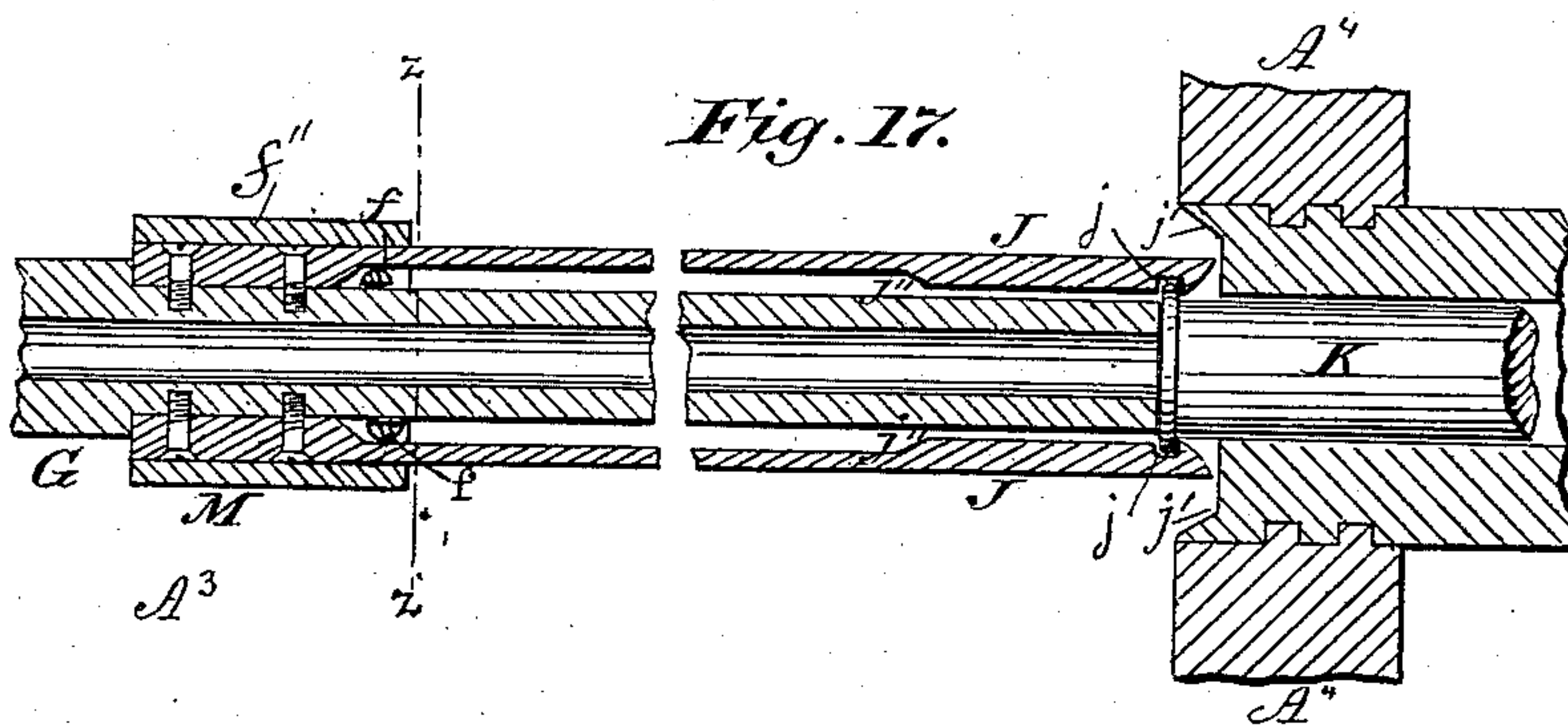
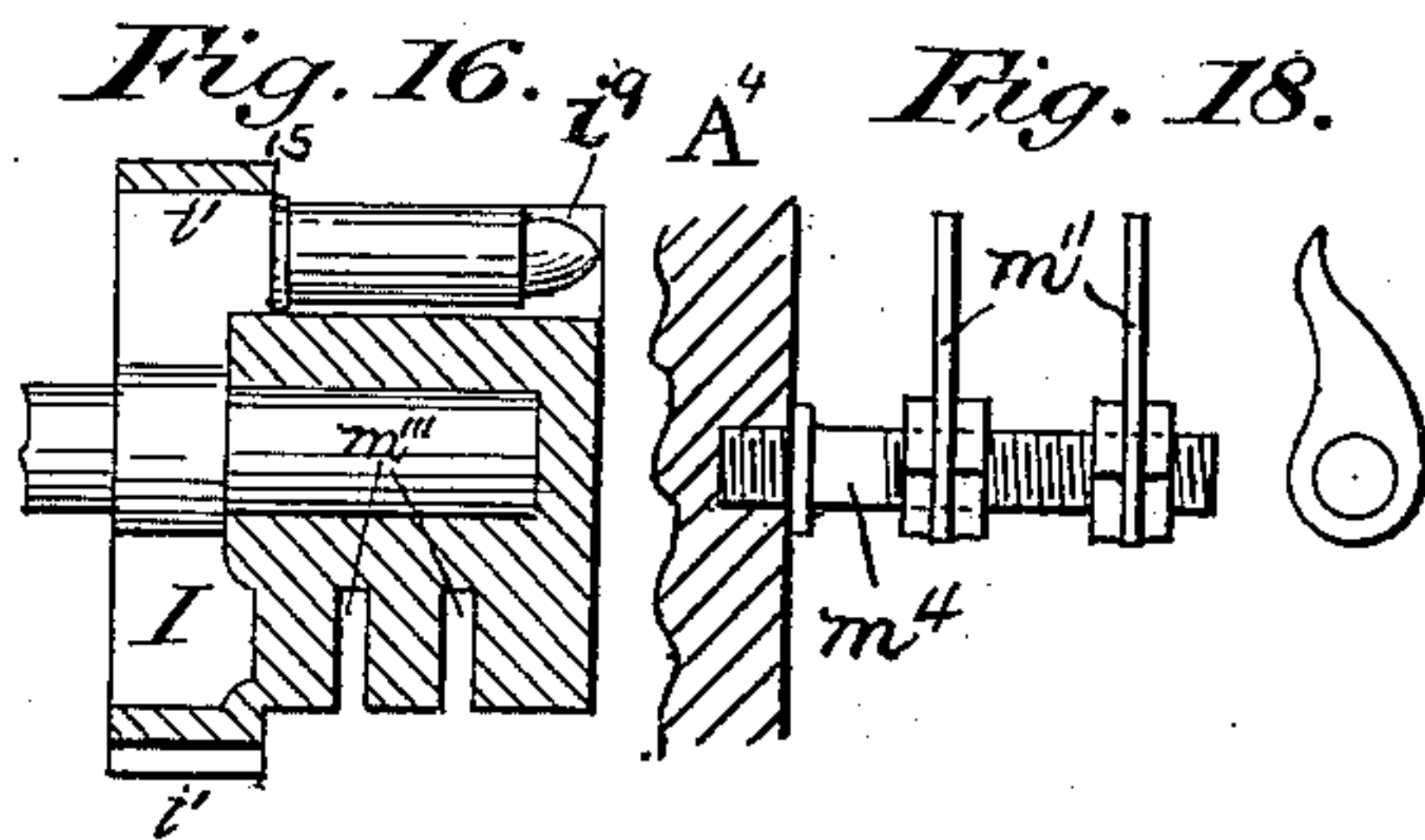
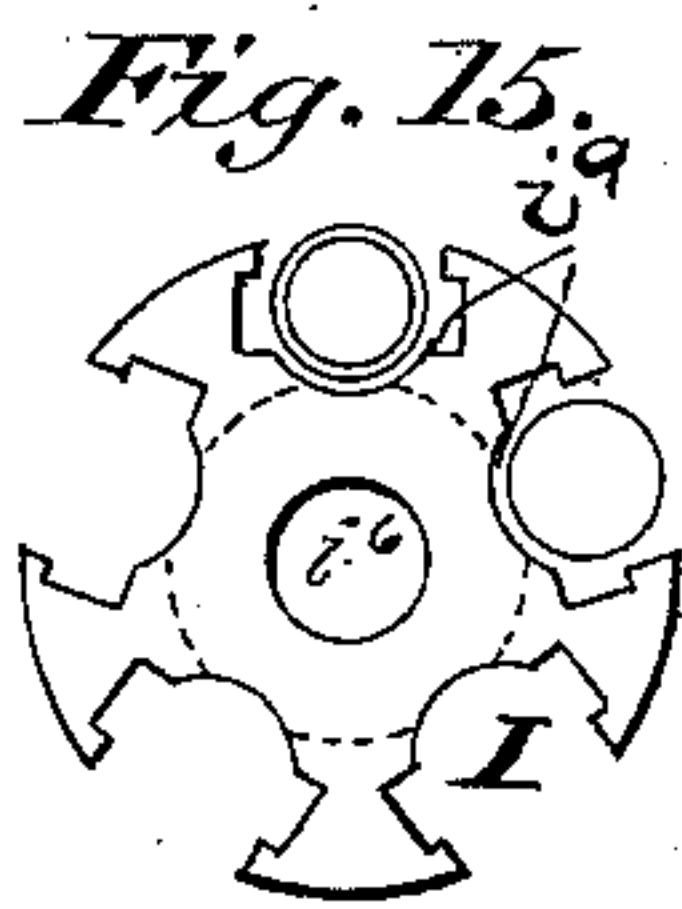
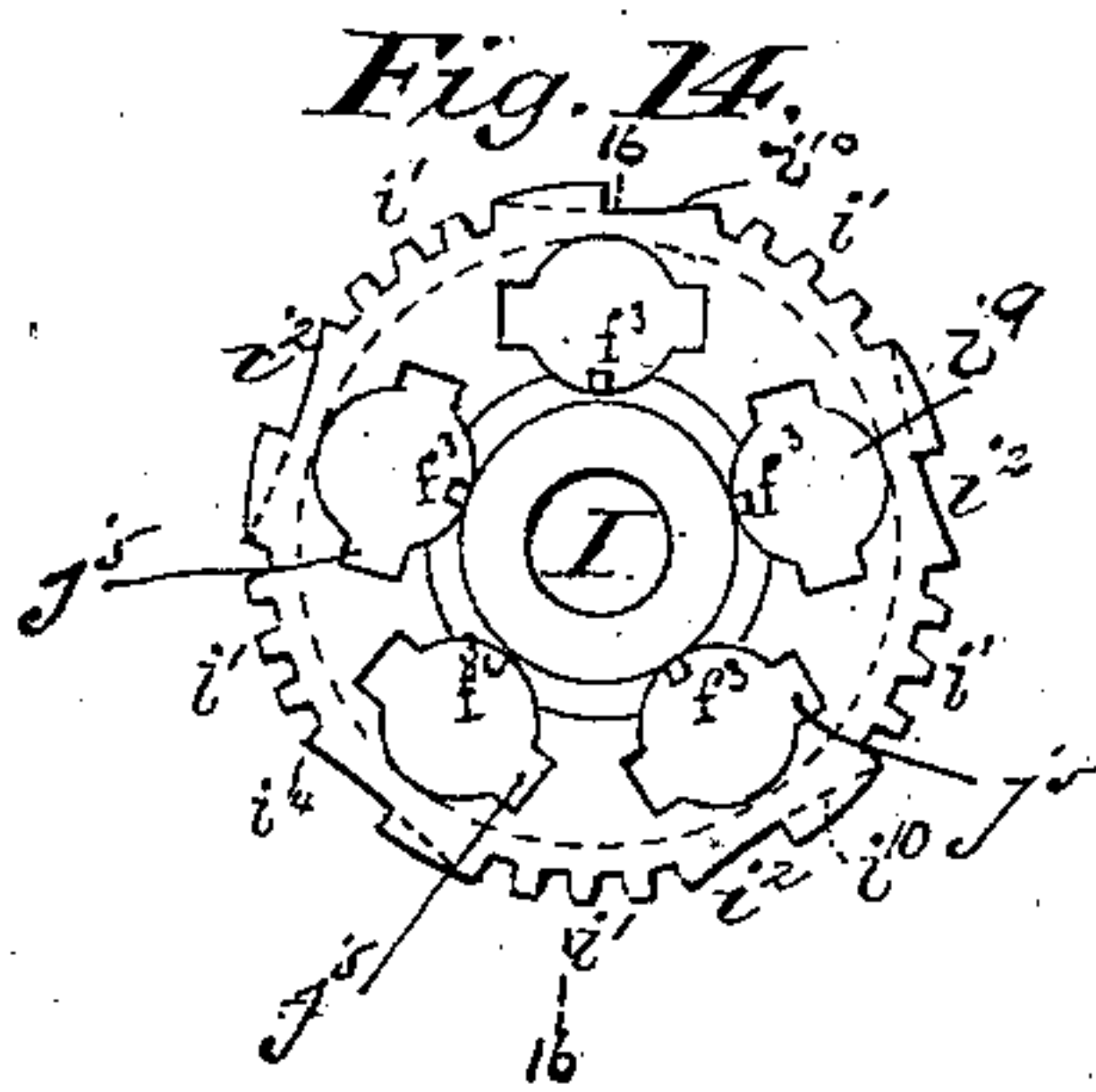
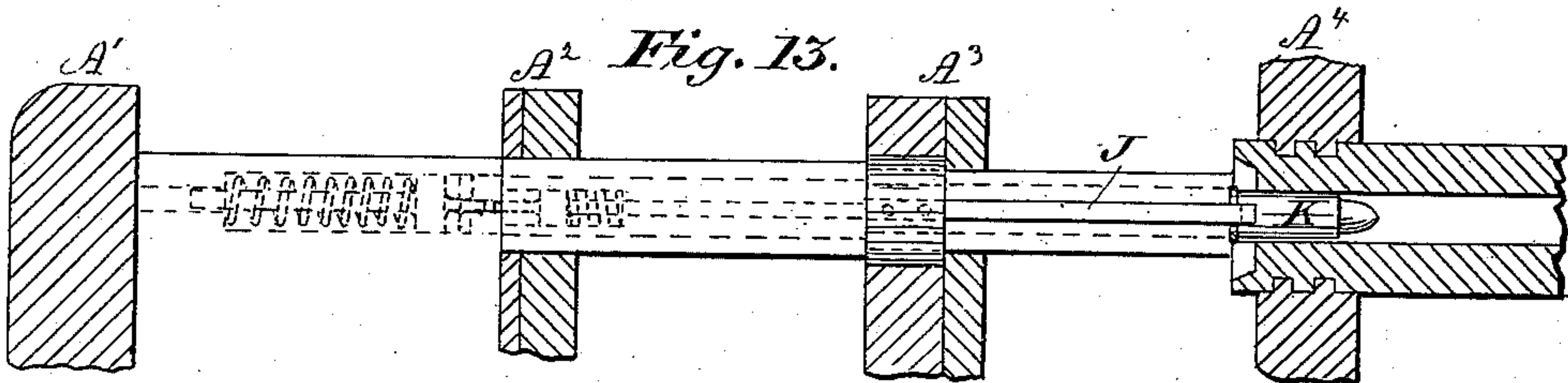
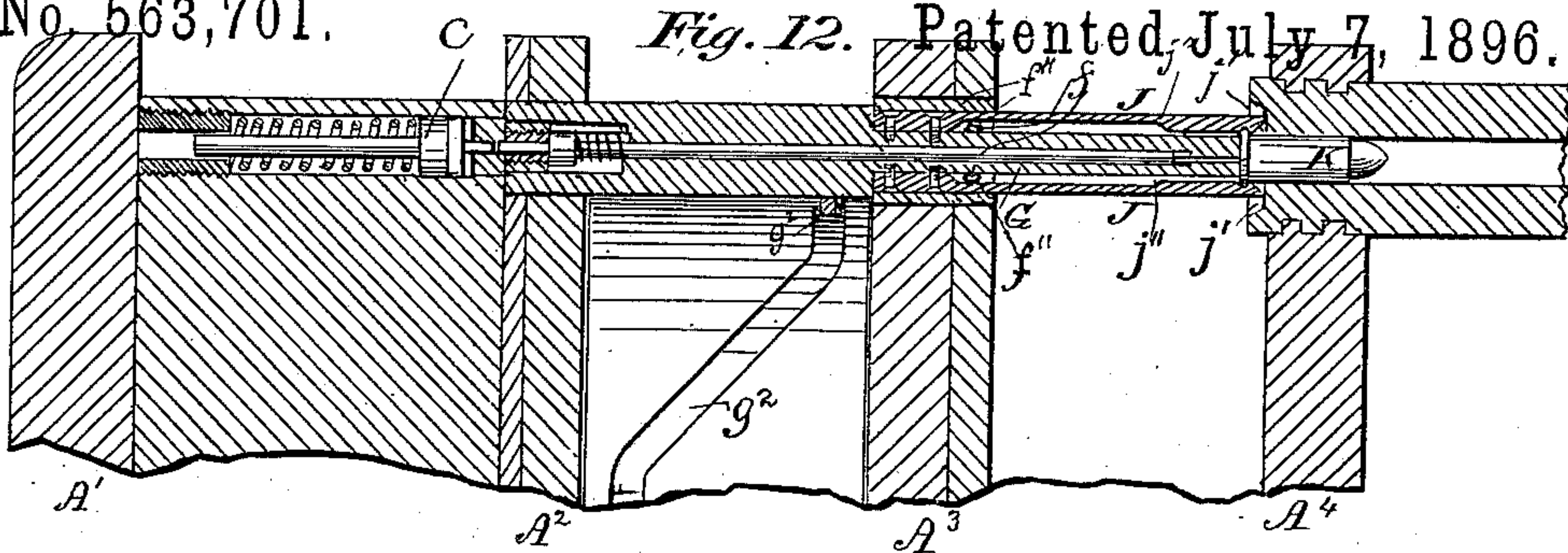
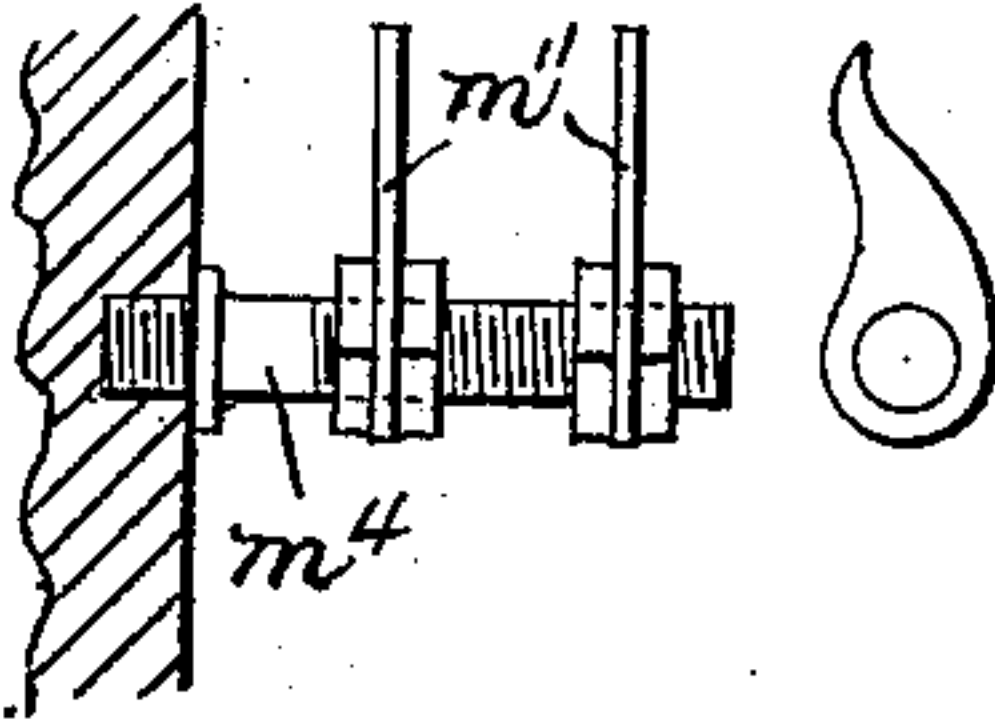


Fig. 18.



Witnesses:

W. H. Goods

Joseph Small

Inventor:

Elihu Wilder

Per W. R. Singleton

Attorney.

(No Model.)

9 Sheets—Sheet 4.

E. WILDER, Dec'd.

L. WILDER, Executrix.

MACHINE GUN.

No. 563,701.

Fig. 19 Patented July 7, 1896.

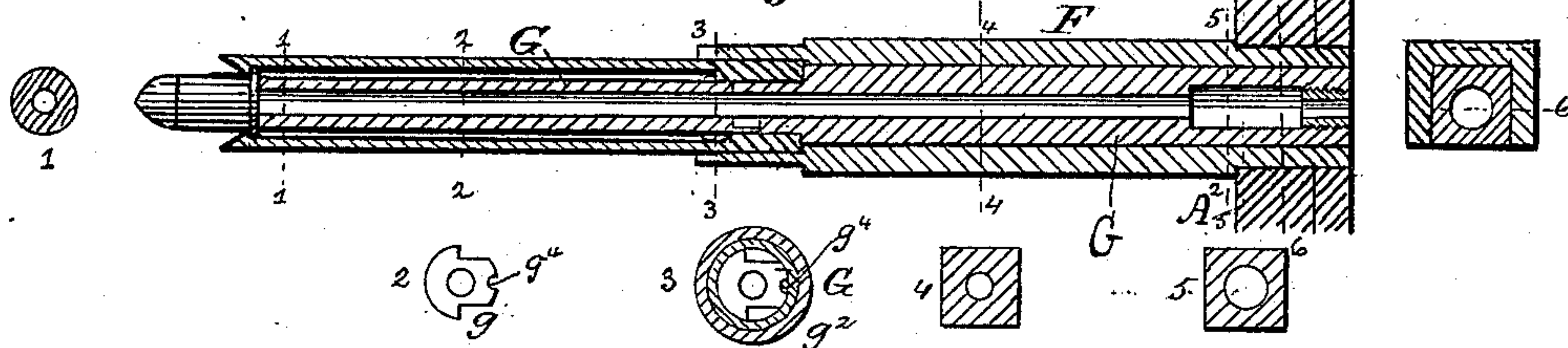


Fig. 20.



Fig. 21.

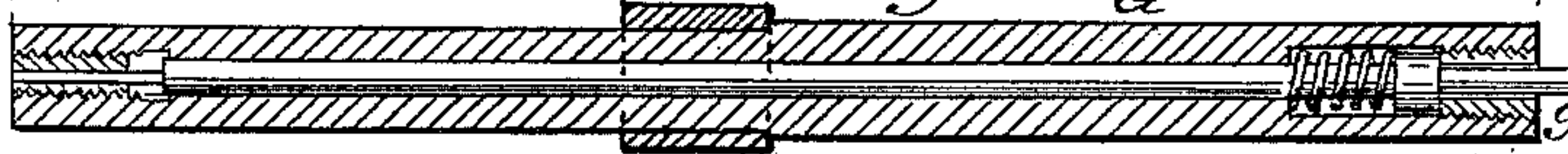


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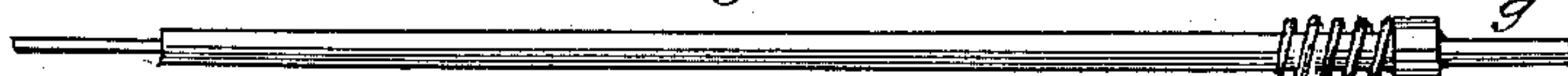


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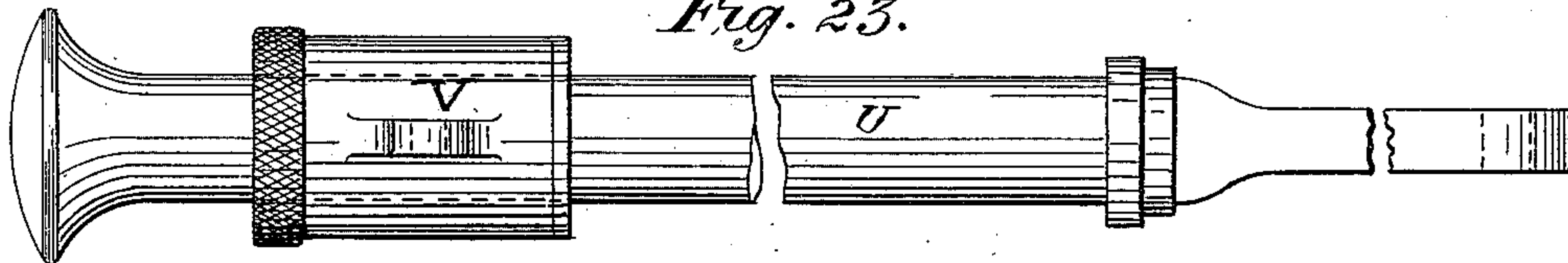


Fig. 24.

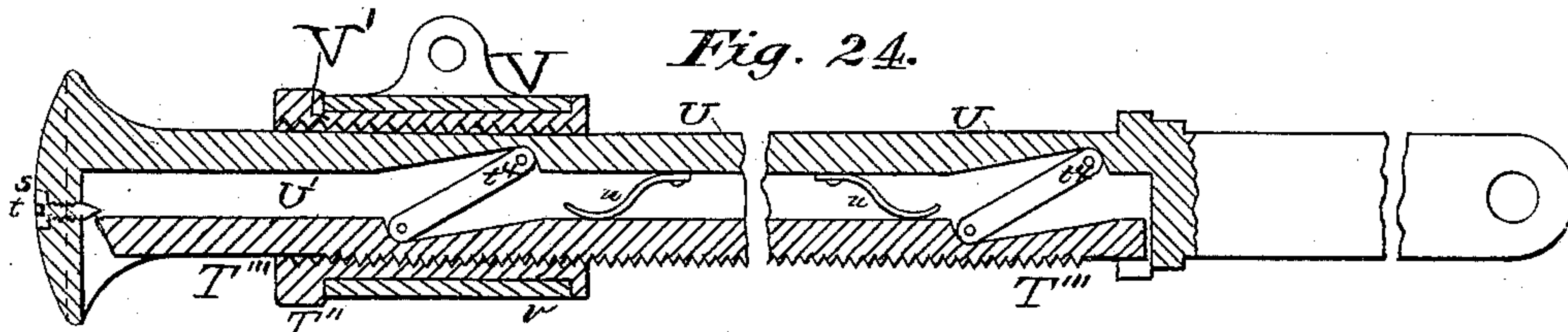
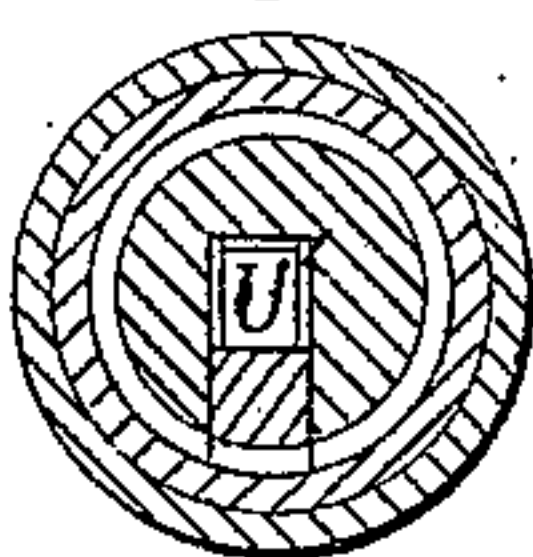
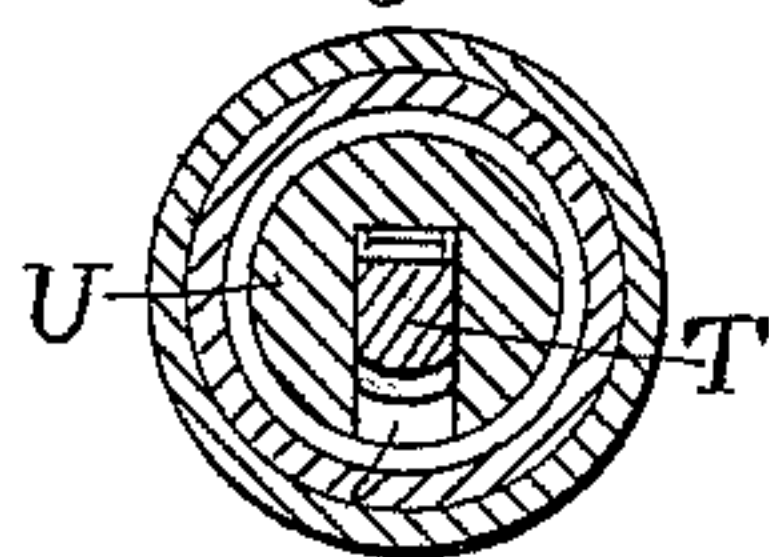


Fig. 25.

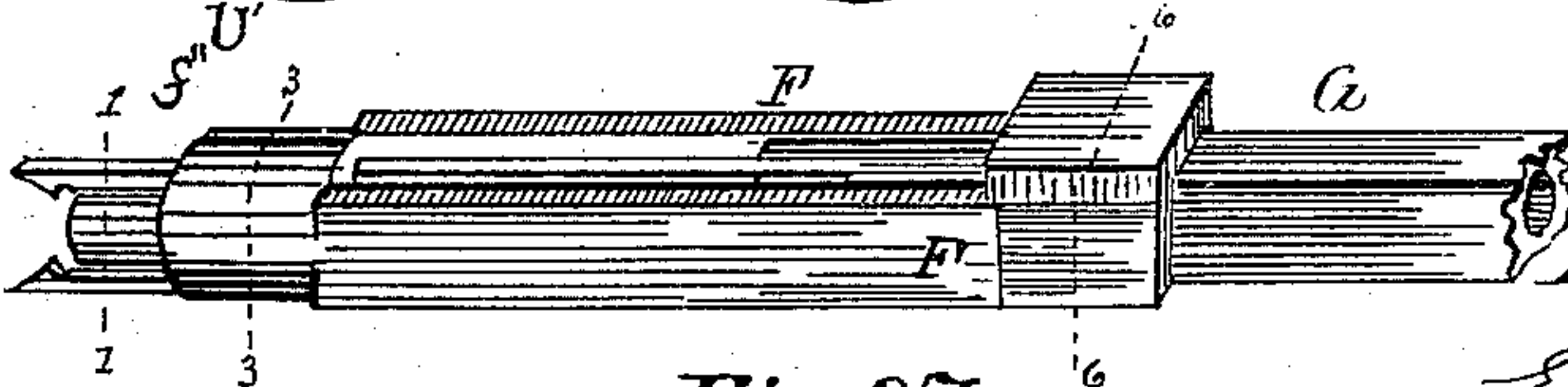
Fig. 26.



Witnesses:

J. S. & Co.
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Fig. 27



Inventor:

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E. WILDER, Dec'd.

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MACHINE GUN.

Patented July 7, 1896.

No. 563,701.
Fig. 31.

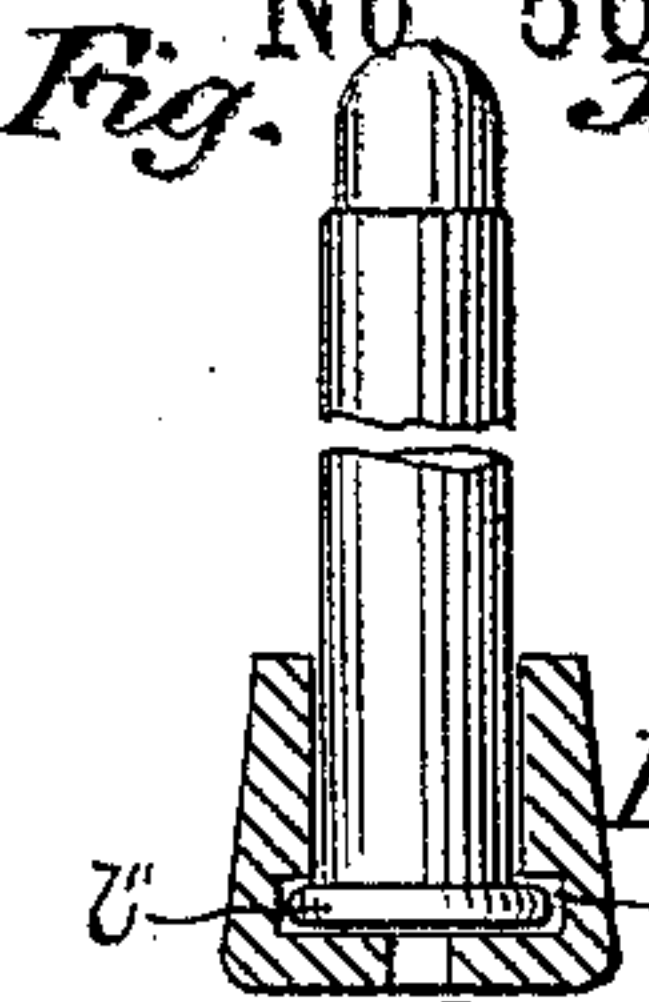


Fig. 29.

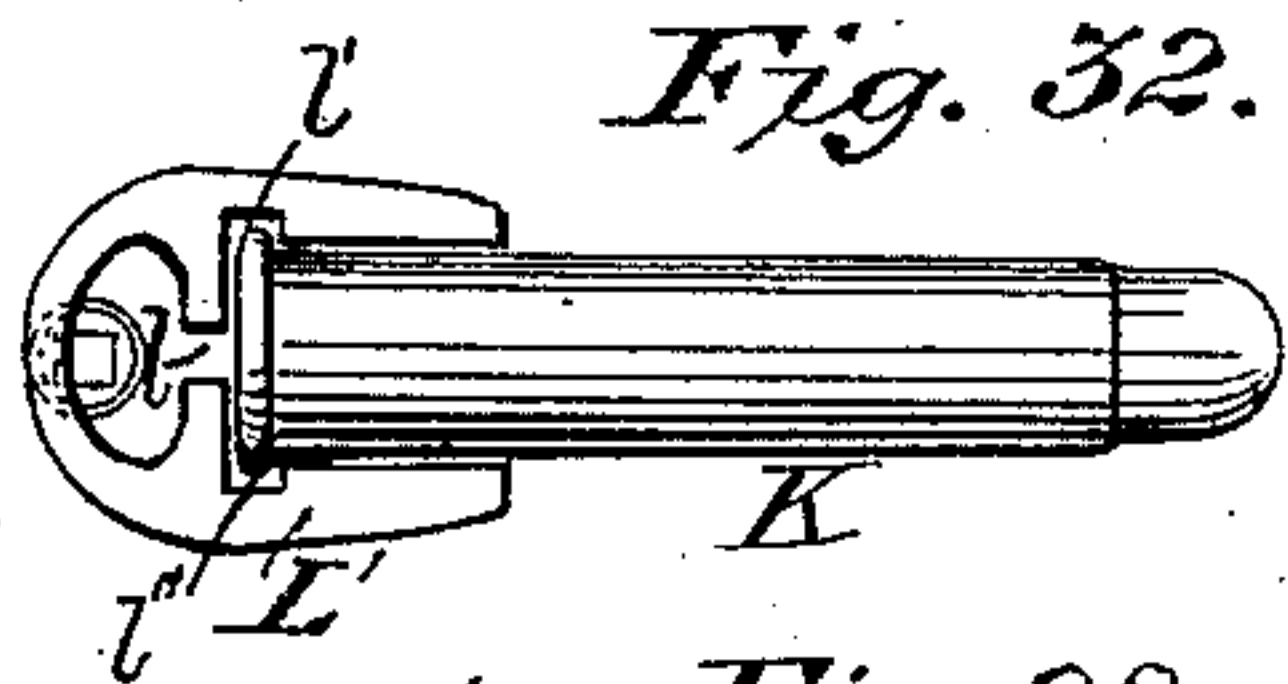
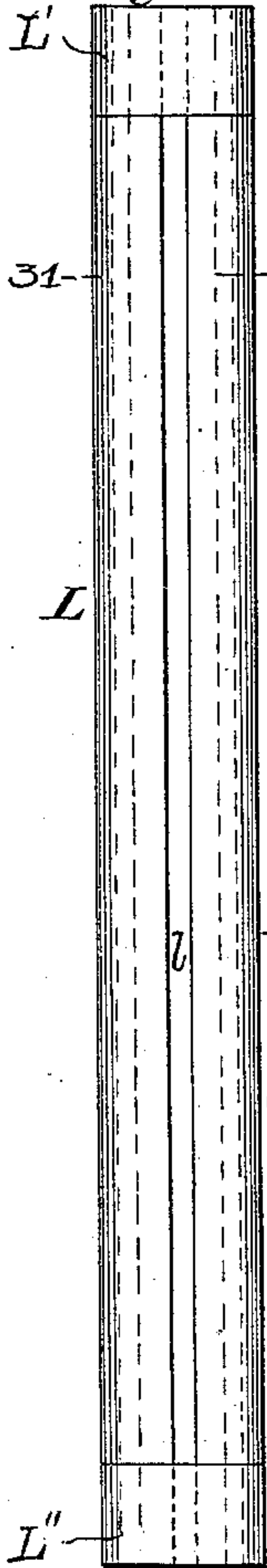


Fig. 32.

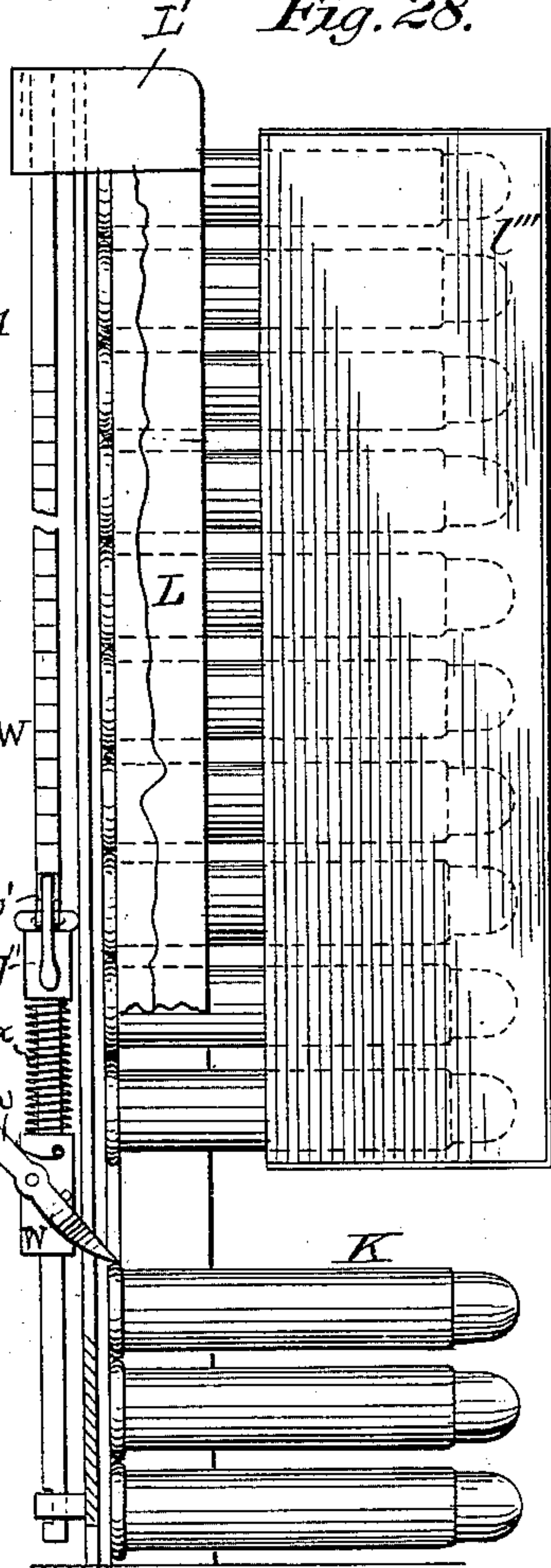
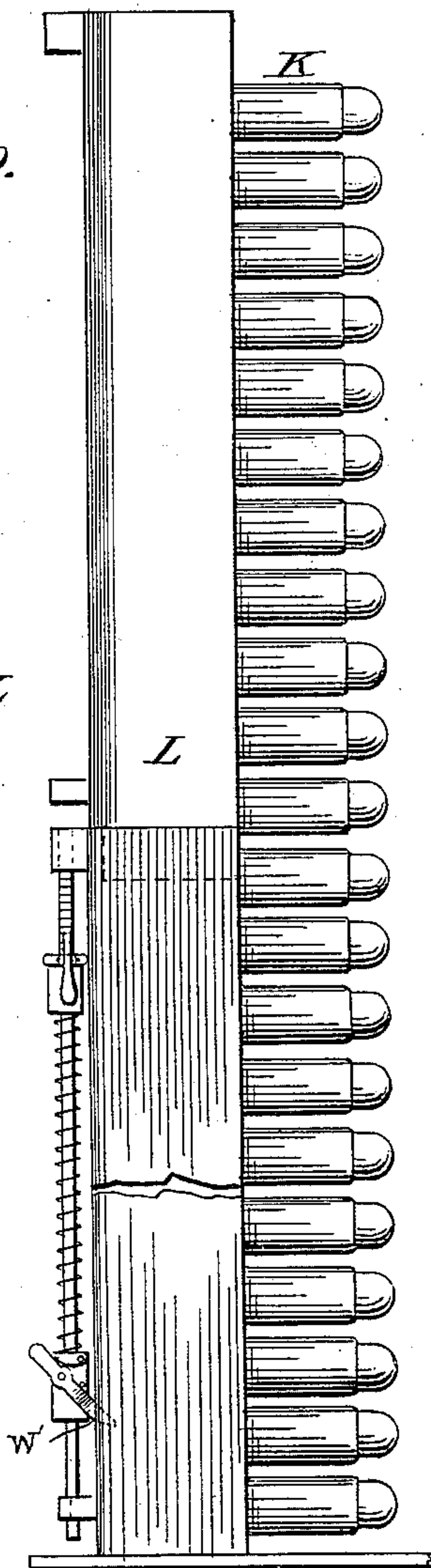


Fig. 28.

Fig. 30.

Fig. 33.



Witnesses:

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E. WILDER, Dec'd.

L. WILDER, Executrix.

MACHINE GUN.

No. 563,701.

Patented July 7, 1896.

Fig. 36.

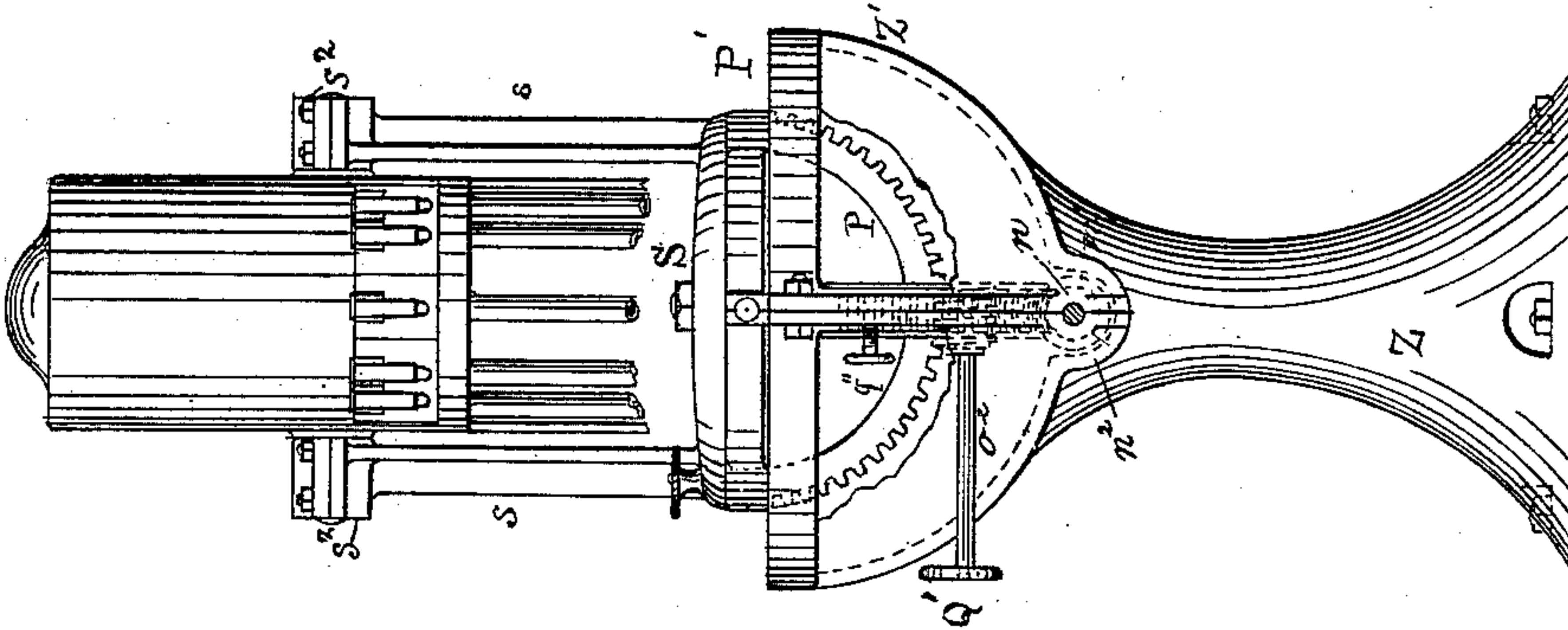


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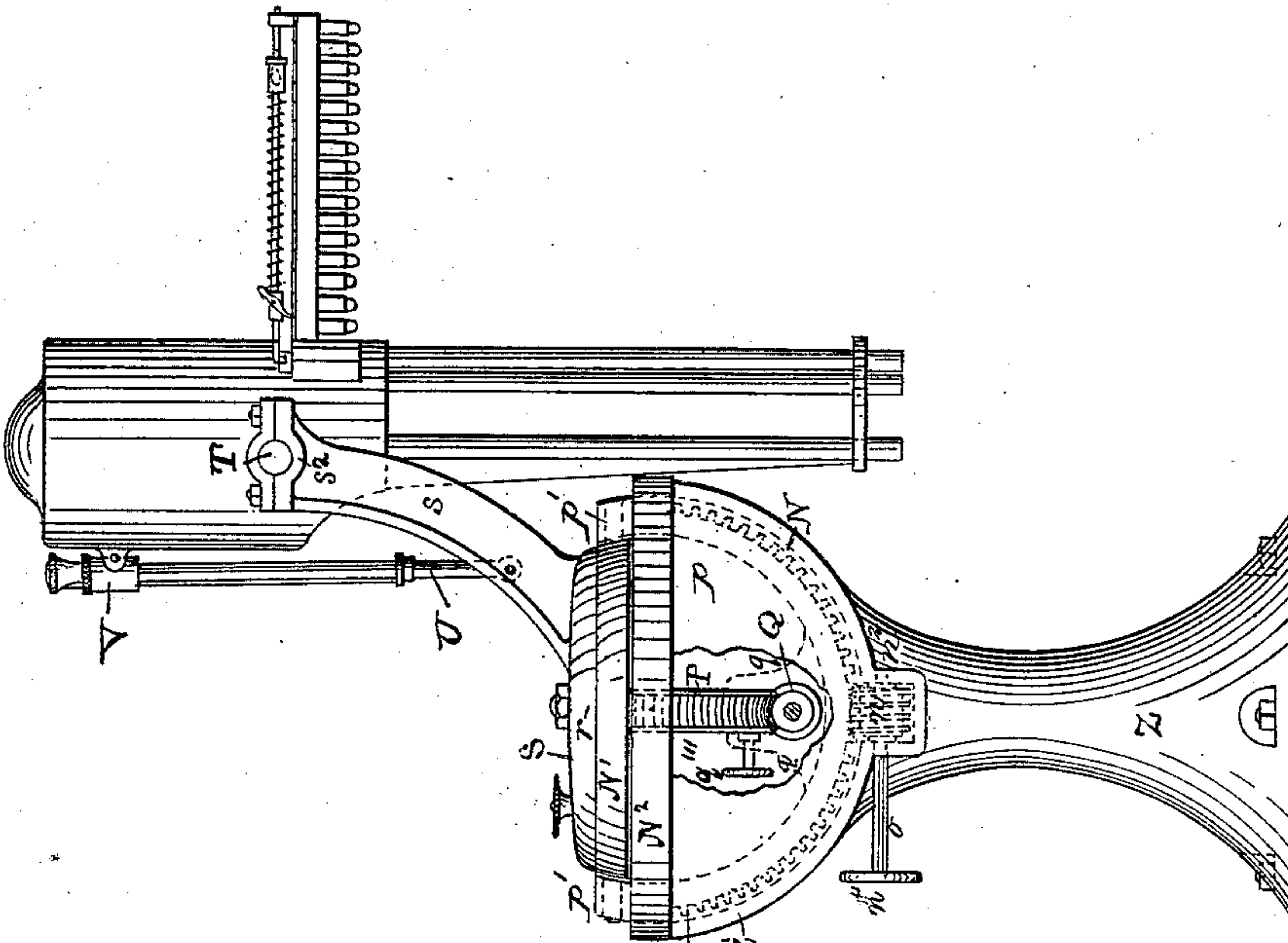
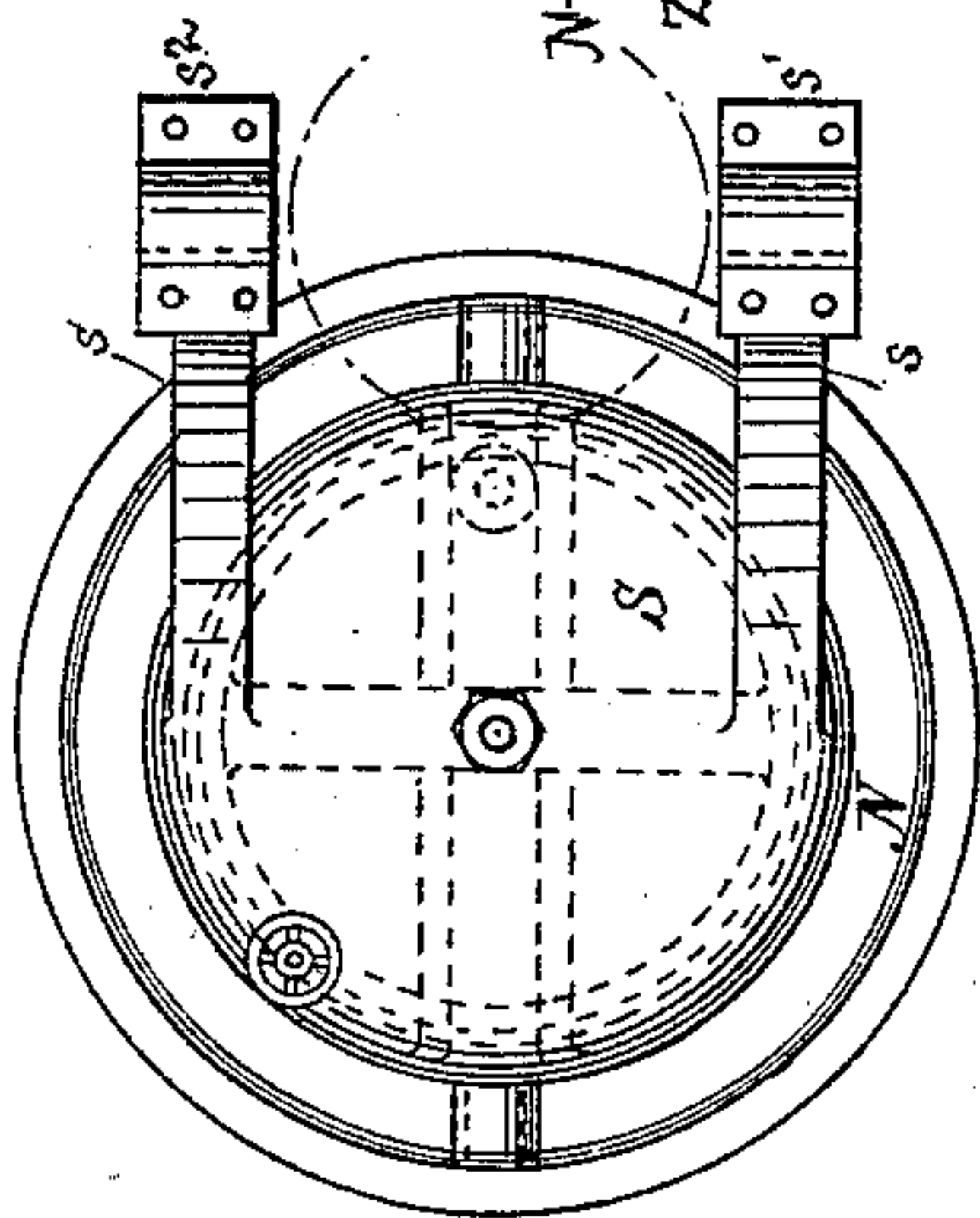


Fig. 34.



Witnesses:

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Inventor:

Elmer Wilder

Per W. R. Singleton

Attorney.

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9 Sheets—Sheet 7.

E. WILDER, Dec'd.

L. WILDER, Executrix.

MACHINE GUN.

No. 563,701.

Patented July 7, 1896.

Fig. 38.

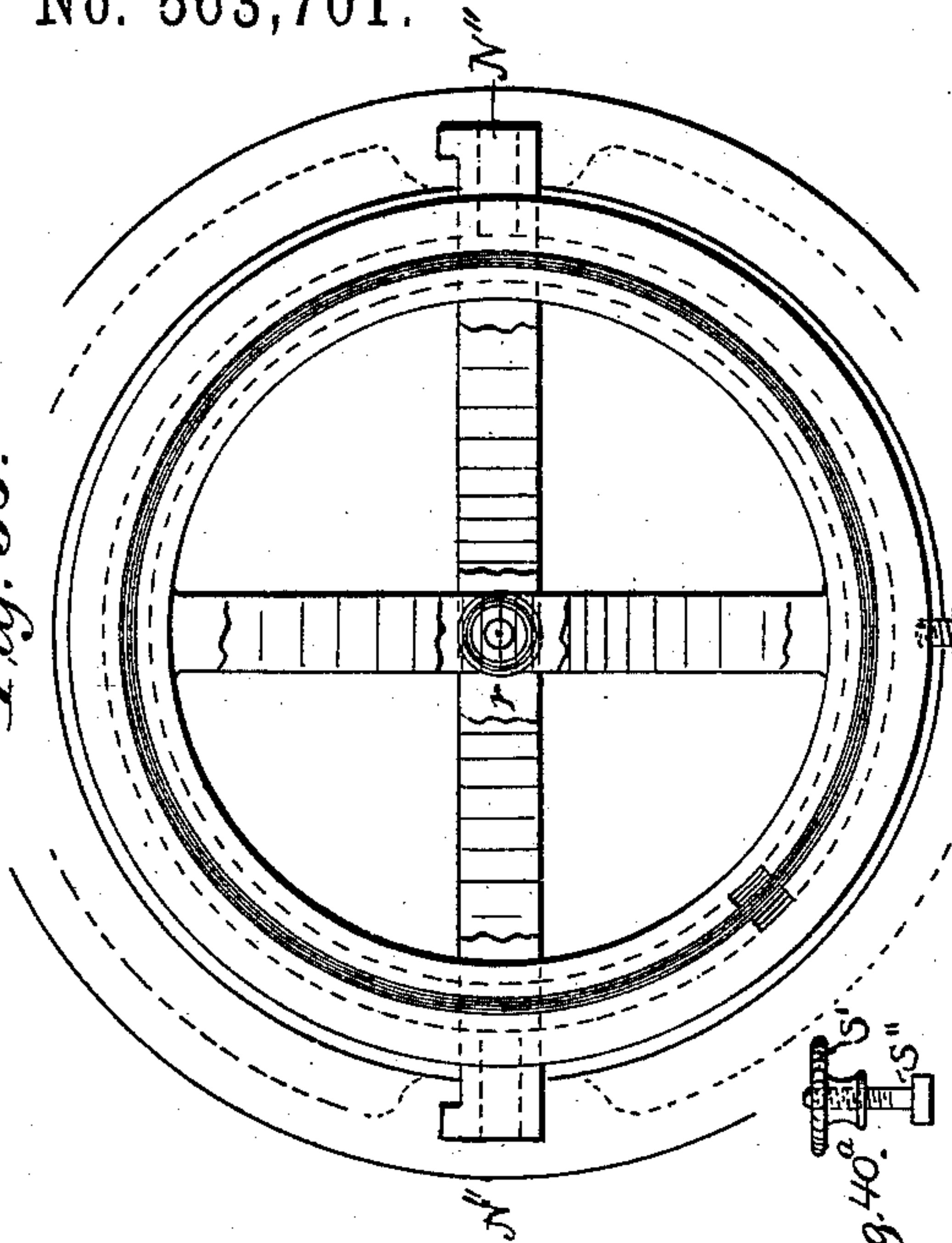


Fig. 40.

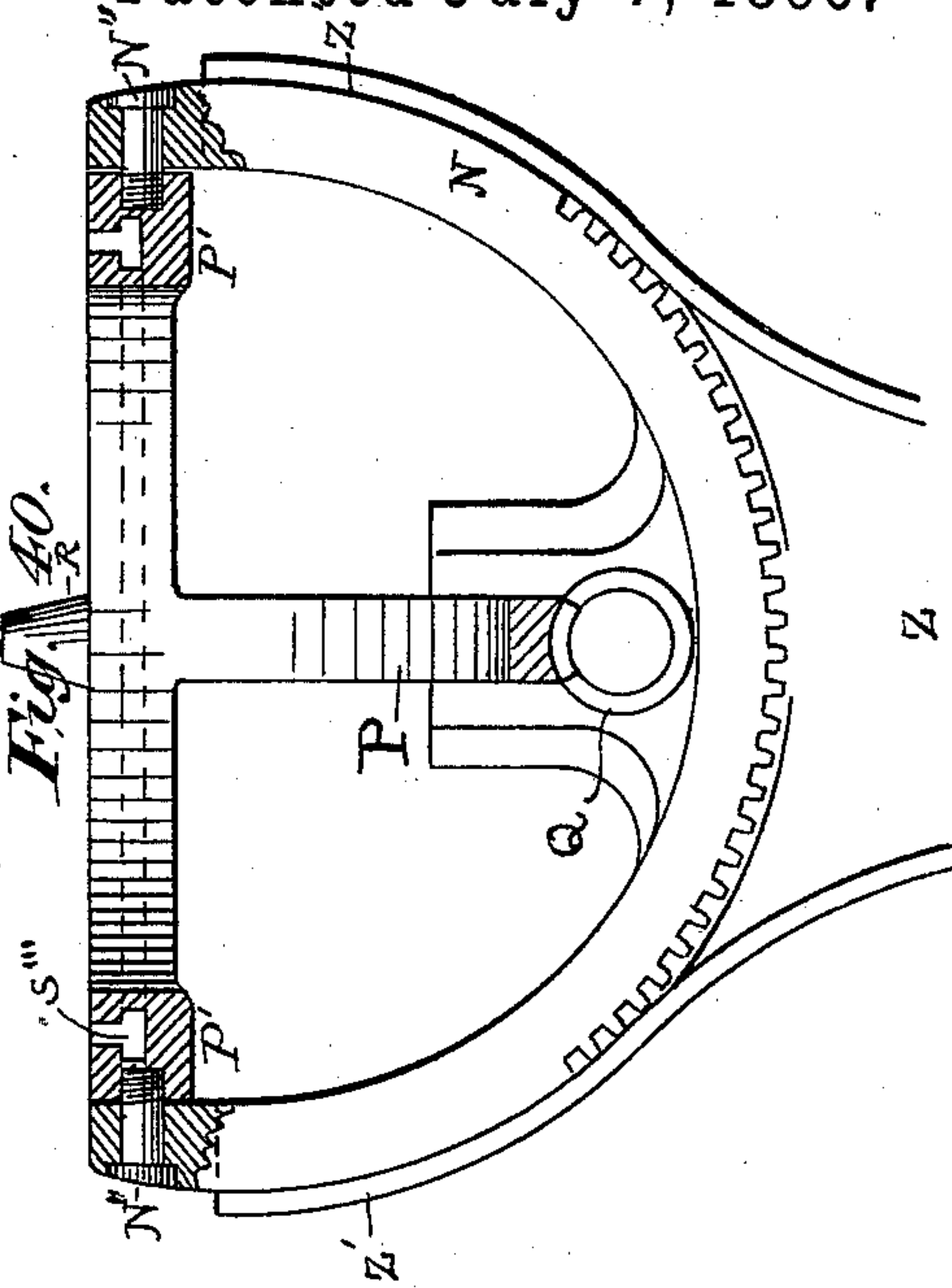


Fig. 40.

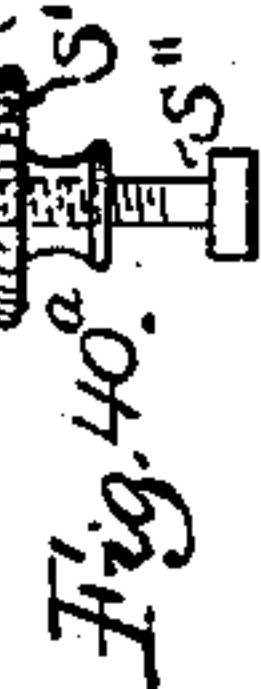
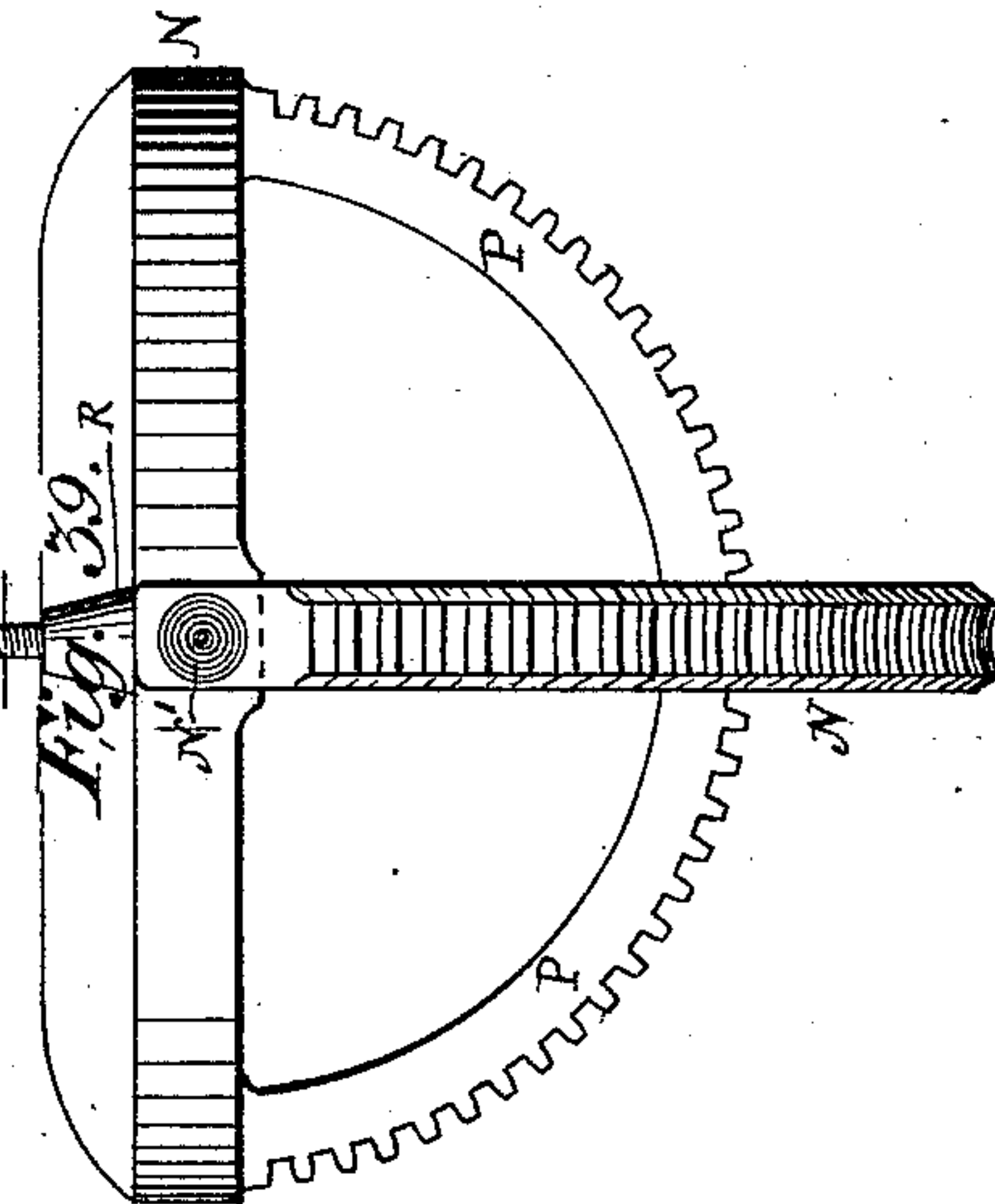
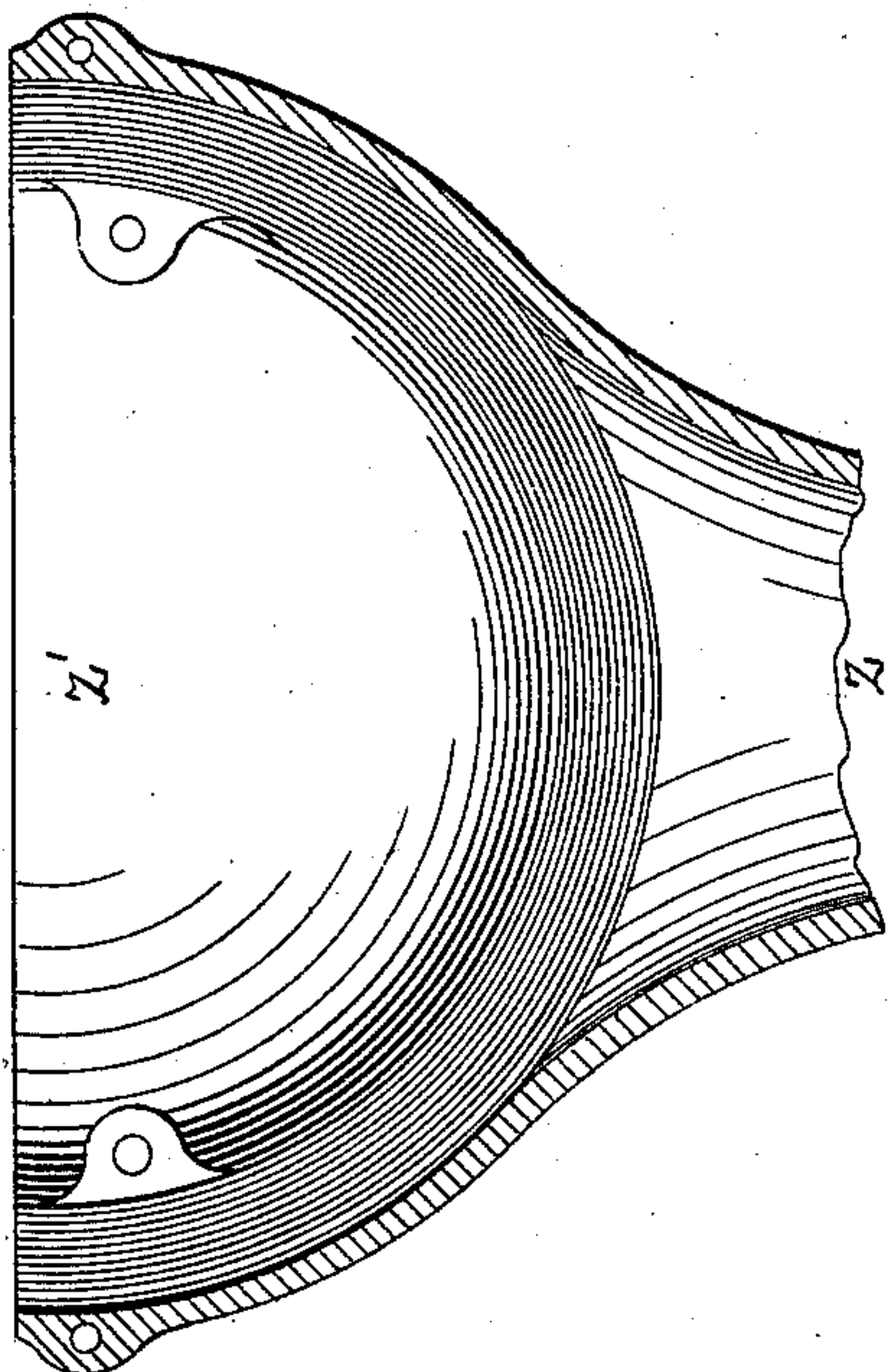


Fig. 37.



Witnesses:

W. H. Woods

Joseph Small

Inventor:

Elihu Wilder

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Attorney.

(No Model.)

9 Sheets—Sheet 8.

E. WILDER, Dec'd.

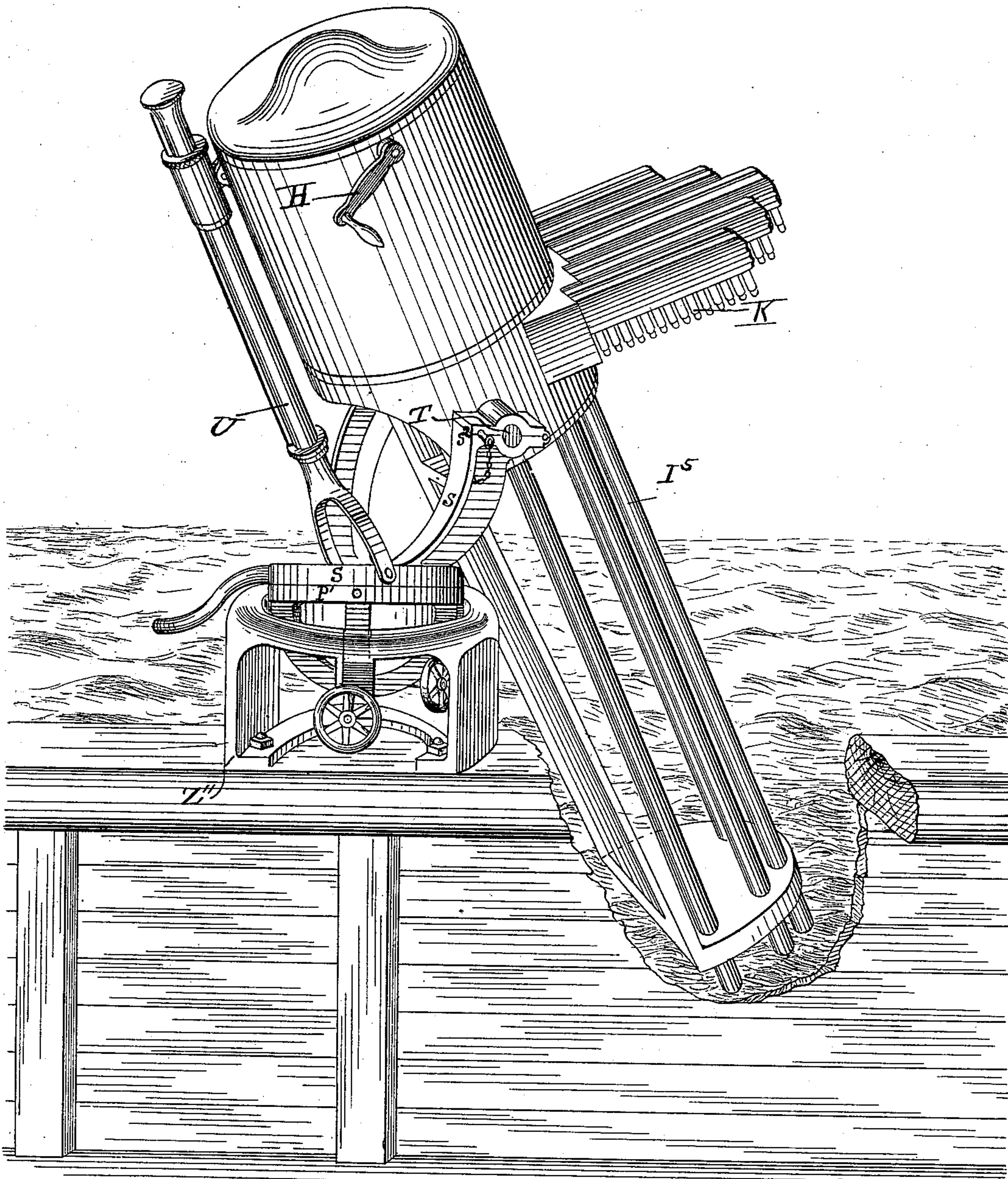
L. WILDER, Executrix.

MACHINE GUN.

No. 563,701.

Patented July 7, 1896.

Fig. 41.



Witnesses:

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Joseph Small

Inventor:

Elihu Wilder
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(No Model.)

9 Sheets—Sheet 9.

E. WILDER, Dec'd.

L. WILDER, Executrix.

MACHINE GUN.

No. 563,701.

Patented July 7, 1896.

Fig. 42.

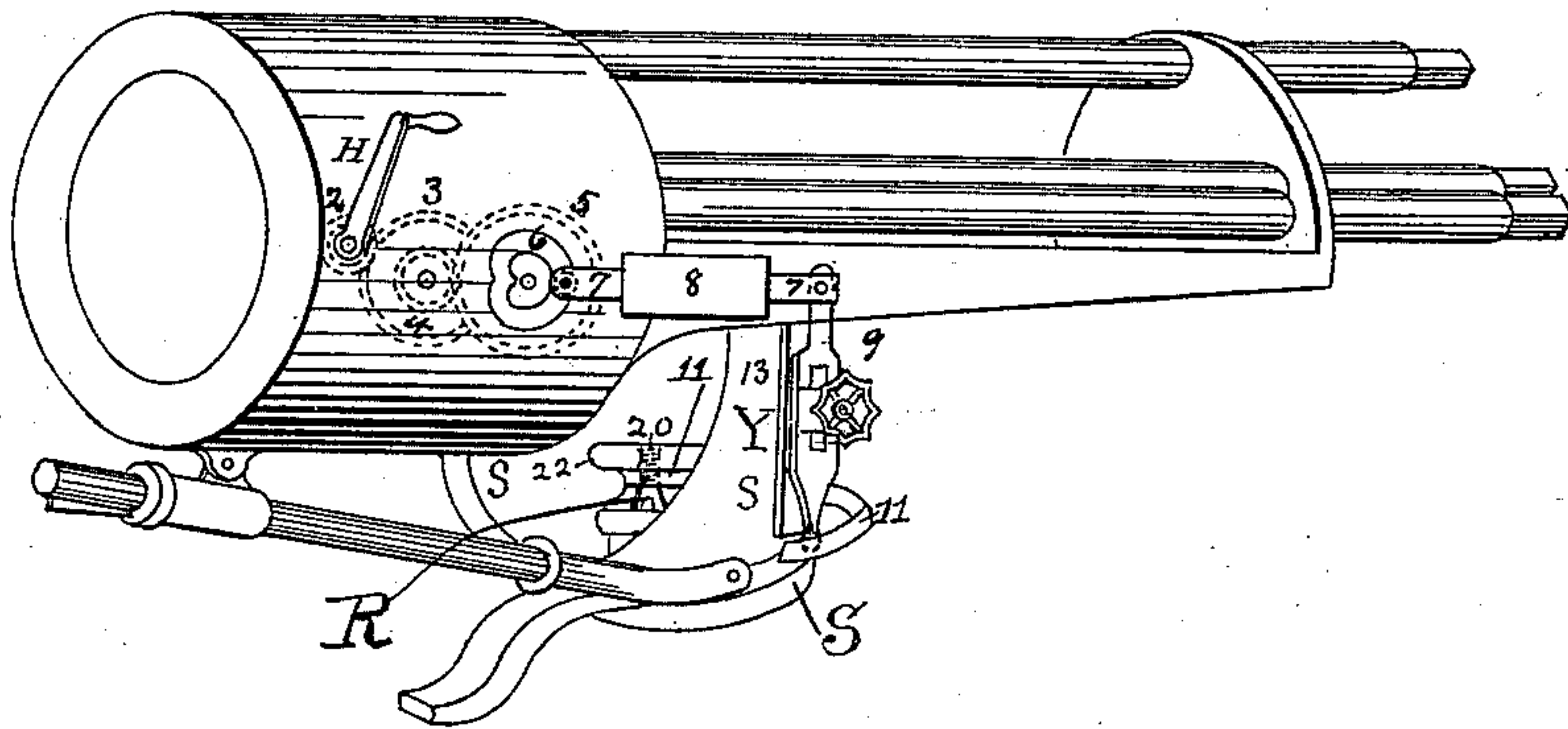


Fig. 43.

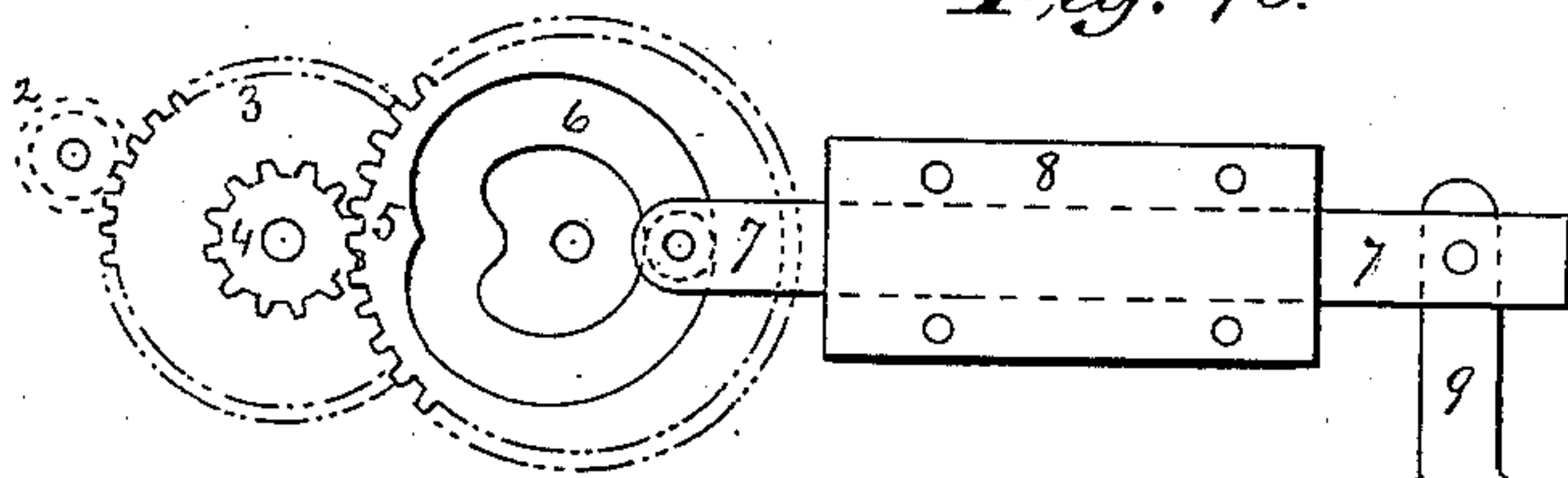


Fig. 44.

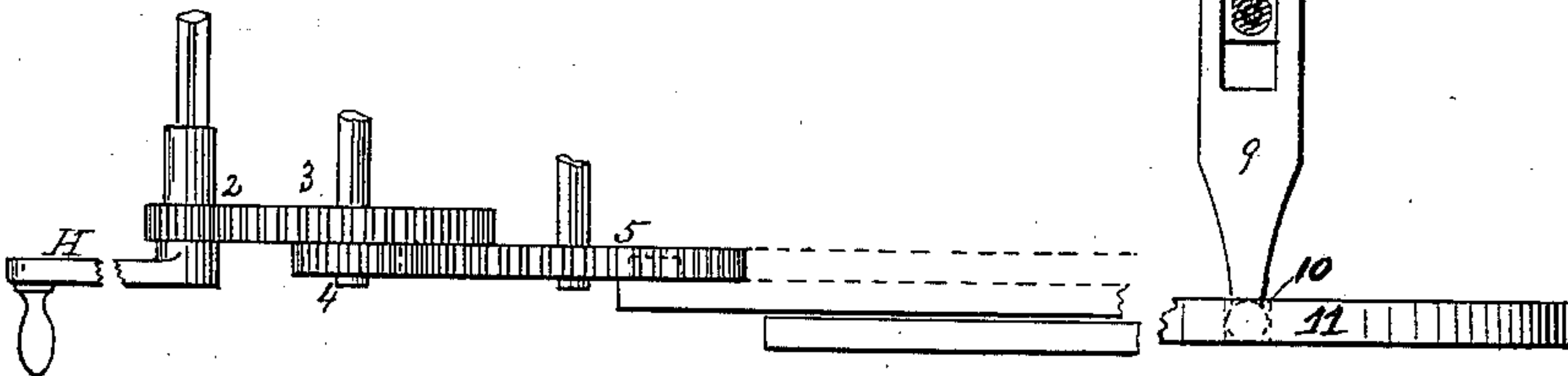
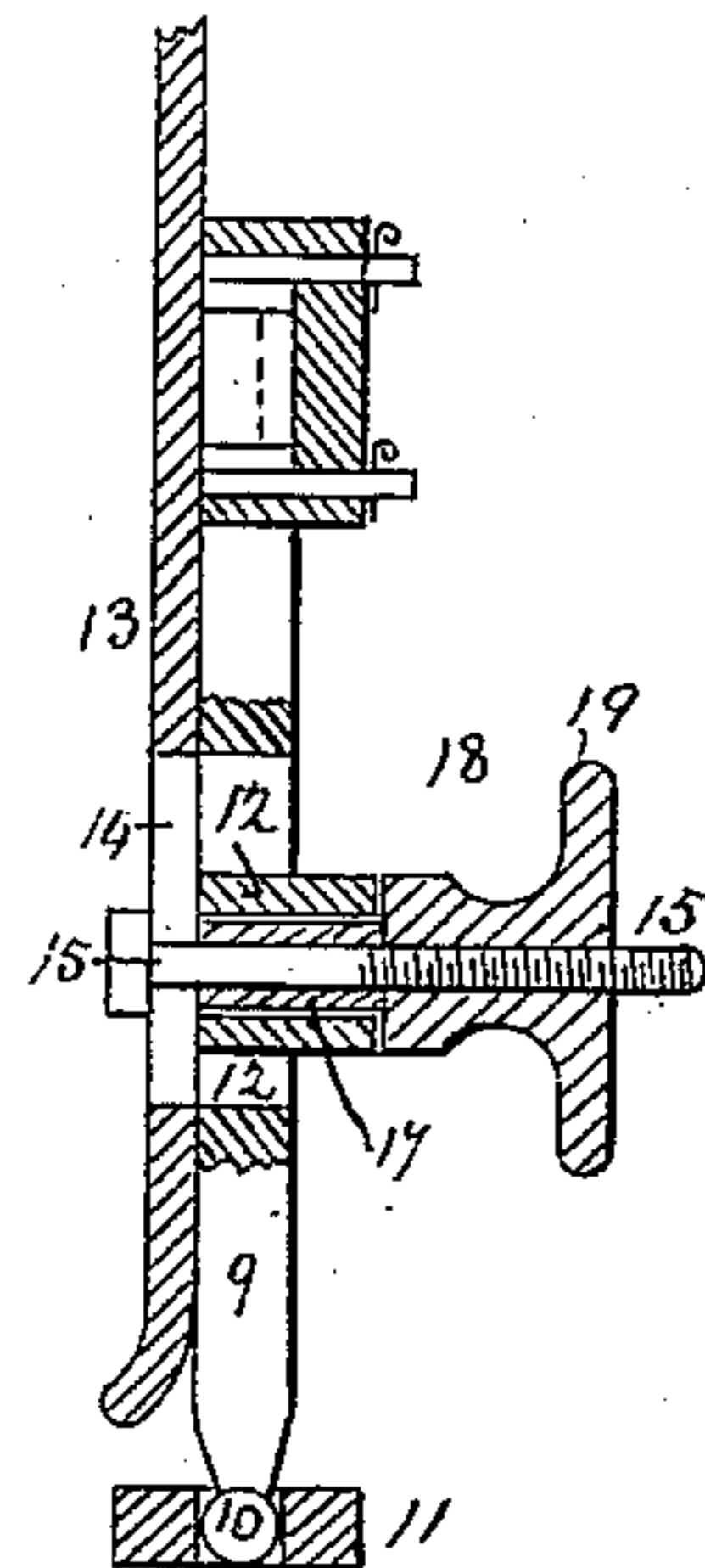
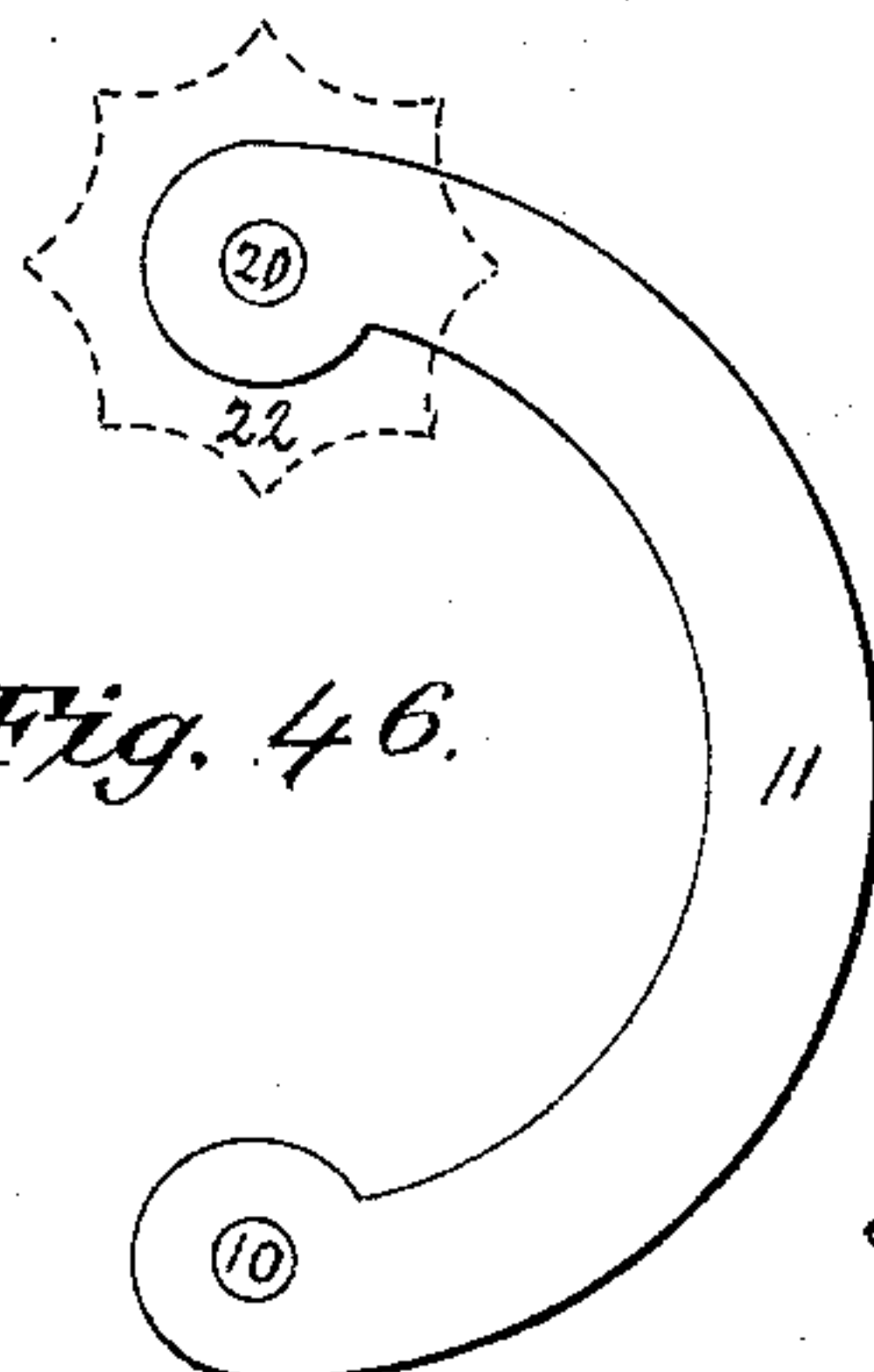


Fig. 45.

Fig. 46.



Witnesses:

Wm. H. Goods

Joseph Small

Inventor:

Elihu Wilder

Per Wm. R. Singleton

Attorney.

UNITED STATES PATENT OFFICE.

ELIHU WILDER, OF CAMBRIDGE, MASSACHUSETTS; LAURAETTA WILDER, EXECUTRIX OF SAID ELIHU WILDER, DECEASED, ASSIGNOR TO H. O. MOSES, OF LYNN; MASSACHUSETTS.

MACHINE-GUN.

SPECIFICATION forming part of Letters Patent No. 563,701, dated July 7, 1896.

Application filed February 18, 1892. Serial No. 422,042. (No model.)

To all whom it may concern:

Be it known that I, ELIHU WILDER, a citizen of the United States, residing at Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Machine-Guns; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain improvements in that class of firearms known as "machine-guns," wherein the loaded cartridges are supplied from a hopper and forced directly into the breech end of separate barrels and fired from them by the needles operated by a rotary apparatus, which apparatus also rotates the cartridge receivers or carriers, all of which are worked by a crank-handle, as will hereinafter be more fully explained and pointed out.

These improvements are made upon the machine-gun patented to me in the United States Patent Office September 26, 1876, and numbered 182,729, and are represented by sheets of drawings, in which—

Figure 1 is a horizontal longitudinal section. Fig. 2 is a partial vertical longitudinal section. Fig. 3 is an end view of the lock-block wheel which is seen in section in Fig. 1. Fig. 4 is a substantially vertical section through one of the magazines and one of the cartridge-carriers, showing their coöperative relation. Fig. 5 is an end view of the apparatus for operating the cartridge carriers or receivers. Fig. 5^a is a detail section on line 5^a 5^a, Fig. 5. Fig. 5^b shows side and edge views of a portion of one of a certain set of levers seen in Fig. 5. Fig. 6 is a top view of the chamber where the cartridge-carriers are placed and a section of the operative mechanism. Fig. 7 is a horizontal section of the cartridge-hoppers on line *xx* of Fig. 8. Fig. 8 is a diagrammatic illustration of the cartridge receivers or carriers. Figs. 9 and 10 show mechanism for forcing the cartridge along the feed case or hoppers. Fig. 11 is an end and edge view of the plate which supports the guides of the plungers at one

end. Fig. 12 is an enlarged section showing the position of the lock, plunger, needle, and extractors. Fig. 13 shows a top view of the same parts. Figs. 14, 15, and 16 are details showing the construction of the cartridge carriers or receivers, Fig. 14 being a rear-end view, Fig. 15 a cross-section, and Fig. 16 a longitudinal section. Fig. 17 is a vertical longitudinal section showing the breech of a gun-barrel, the plunger, and a cartridge to be forced by the latter into the barrel. Fig. 18 shows a detail of means for removing the empty shells when the gun is in a vertical position. Fig. 19 is a longitudinal section of one of the plungers and appurtenances, together with a number of cross-sectional views taken at points indicated. Figs. 20 and 21 show, respectively, an elevation and a longitudinal section of the plunger and needle. Fig. 22 shows the needle detached. Figs. 23 and 24 show, respectively, an elevation and a longitudinal section of an aiming apparatus. Figs. 25 and 26 are cross-sections of the same. Fig. 27 is a perspective view of the plunger and its guide. Fig. 28 is a sectionalized side elevation of a feed case or hopper and feed mechanism. Fig. 29 is a rear end elevation of said feed-case. Fig. 30 is a front end elevation of the same, with a section of the feed-port of the gun. Fig. 31 is a cross-section on line 31 31 of Fig. 29. Fig. 32 is a top view of the feed-case. Fig. 33 shows two feed-cases fitted together. Fig. 34 shows a top plan view of a transit for supporting the gun. Fig. 35 shows a side elevation of the same, partially broken away and with the gun mounted upon it. Fig. 36 shows a front elevation of these parts, represented as broken away at some places. Figs. 37, 38, 39, 40, and 40^a are details of the transit, showing the construction of the gearing for its several movements. Fig. 41 is a perspective view of the gun mounted on the rail of a ship. Fig. 42 is a perspective view of a gun, showing underneath the traversing apparatus. Figs. 43, 44, 45, and 46 are the several details, enlarged, of the traversing apparatus.

A is the gun frame or stock, in which all the working parts are secured. This frame is cast or forged in one piece of metal, and is made

of such dimensions as will secure the requisite strength for the support of the gun-barrels, as well as to insure the necessary resistance to strain from constant use and field operations. The frame may also be made of separate parts and properly fastened together. This frame A has, at its rear end, a strong breech-plate A', through which is a center hole a for an interior operating-shaft B. Parallel with breech-plate A' is a transverse plate A², and between these plates is the space for the rotary lock block or wheel C, which is fitted to a hollow shaft B', in which works the first shaft B above mentioned. The wheel C has within it, at the rear end, a beveled gear-wheel c' , and the shaft B carries a similar gear-wheel b^2 , and a third gear-wheel c^3 meshes with both the gears c' and b^2 and is fastened to a crank-shaft c^4 , passing radially through the breech-plate and having on its outer projecting end an operating-crank H. On the plate A² is a notched segment C², (detailed in Fig. 11,) having ratchets or cams c'' on the side next to the lock-wheel C and notches c^2 between the cams. The cams c'' rise gradually from the surface of the plate to the notches c^2 , and the ends form perpendiculars to the plate, and these cams coact with spring-pressed hammers c , substantially as shown and described in my former patent above referred to the said hammers being arranged to move longitudinally in bores in the wheel C, and caused by rotation of the latter, through the means described, to ride over the cams, whereby the said hammers are retracted until they reach the high ends of the cams, when they snap past the same and through the notches c^2 , to impinge against the firing-needles g , hereinafter referred to. It is to be understood that there is but a single one of these hammers to operate against all the firing-pins successively; but as I intend to discharge each barrel twice in one complete cycle of operation of the gun I have shown two hammers at diametrically opposite sides of the wheel C. The wheel carries what I term "lock-blocks" c^5 of segmental form, which are designed to fill in the space between the plates A' and A² solidly throughout the area of the gun-barrels, so that during the firing the recoil will be carried directly back to the strong breech-plate A'. Ball-bearings c^6 are interposed between the wheel C and the said breech-plate to prevent friction in the recoil, such as to obstruct turning of the wheel. It will be understood that by each hammer c running over the inclines c' the barrels are discharged successively.

In plate A² are as many rectangular notches $a^2 a^2$ as there are gun-barrels, and said notches receive the rectangular rear ends of guides F for the plungers G, (see Figs. 19 and 27,) which are rectangular where they slide in the guides F to prevent their turning when in action. A³ is another transverse plate placed farther forward in the gun-frame and having a series of circular holes a^3 to correspond with

the rectangular holes or notches $a^2 a^2$ in the plate A² to sustain the circular bushings f'' on the ends of the guides.

There is, in advance of plate A³, a plate A⁴, which is cast or forged solid with the gun-frame A, and into which are removably secured the breech ends of the gun-barrels I'', in exact line with the centers of the rectangular notches $a^2 a^2$ in plate A² and the circular holes $a^3 a^3$ in plate A³.

A⁵ is a front plate of the gun-frame A, and may be cast or forged solid with it, and in which the front ends of the gun-barrels are sustained.

That part of the gun-frame A extending from the rear end or breech plate A' to plate A³ is a hollow semicylinder—i. e., the shell is only a half-ring on the under side, forming, from the breech-plate A' to plate A³, one piece of metal, cast or forged whole, and which is continued on each side to the front end plate A⁵, of sufficient depth to make the whole frame substantial. All these parts may be made separate and securely fastened together. The top of the gun-frame from A' to A³ is covered by a removable cap.

For the purpose and convenience of fitting all the various parts of the gun, the plates A² and A³ are made separately from the frame, and are properly fitted in grooves in the sides of the frame A, but may be cast with it. All the other plates and sides are made in one piece with the frame A.

The plungers G are reciprocated in their guides F in substantially the same manner as shown and described in my former patent referred to, the hollow shaft B' carrying between the plates A² and A³ a cam-wheel E, whose groove g^2 receives and coacts with projections g^3 on the plungers. On each side of the circular part of the plunger G is secured a metal spring-piece J, (see Figs. 12, 13, and 17,) extending forward somewhat beyond the end of the plunger and having notches j just deep enough to catch the bead on the head of the cartridge K, (see Fig. 12,) the projecting ends beyond being beveled inside to slide readily over the bead of the cartridge when the plunger G is forced forward. The end of the barrel is slightly recessed, as shown at j' , to receive the ends of the extractors J. The extractors are opened by coaction of inside bevels j'' , somewhat back from their ends, with stationary pins f .

The shaft B, hereinbefore referred to, is extended forward through the plate A³ and carries a small cog-wheel b beyond the outer side of the plate A³, which meshes with a similar cog-wheel d' on the hollow side of a wheel D, journaled on a shaft d , extending from plate A³ and through plate A⁴ and screwed up by the nut a outside of plate A⁴. On the periphery of the wheel D there is a suitable number of cogs $i^3 i^3 i^3$, placed in groups, opposite to each other, for the purpose of engaging with the groups of cogs $i'' i'' i''$ on the ends of the cartridge-receivers I, Fig. 5.

The cartridge-receivers (here shown as five in number, corresponding with the number of barrels) are arranged around the upper side of the wheel D and centrally journaled on studs projecting from the plate A³. Each receiver has five places i^3 (see Figs. 14 to 16) for cartridges, which are dropped into it, one at a time, from the cartridge case or hoppers L, as seen in dotted lines, Fig. 5. One end of these cartridge-receivers is divided into ten equal sections. Five of them, alternately, have the same number of cogs i' as there are cogs i^3 in the groups on the periphery of the wheel D, and which mesh with them. Between these cogged spaces on the receivers there are blank spaces i^{10} , having the curvature of the circumference of wheel D, so that when D is rotating, and its cogs not meshed with the cogs of the receivers, the receivers cannot rotate until the first cog i'' of the wheel D carries the receiver into gear, when it will only rotate the given distance of the cogs. The time of the rest of each receiver is sufficient to allow the cartridge by action of the plunger to be forced into the barrel and fired and then extracted, all of which must take place before another movement of the receiver. The cog i'' is a lug which extends only half-way of the face of the periphery of wheel D, and on each receiver there are five lugs i^4 , with which i'' engages as wheel D rotates. The plungers G pass into and through the recesses of the receivers to force the cartridges into the barrels. The openings in the receivers through which the plungers pass have side recesses j^5 to accommodate the extractors J, and stop-pins f^3 project into the openings and are accommodated in grooves in the plungers, said pins acting to prevent the cartridges from being withdrawn too far when extracted.

It may be well to here state briefly the general operation of the parts of the machine thus far described.

As wheel D is made to revolve, and as cogs i^3 on the same come into mesh with the cogs i' on the receiver I, the latter is carried around just far enough for the cartridge, which has been dropped into its top recess, to be brought immediately in line with the gun-barrel, and then by the action of the cam-wheel E the plunger G immediately forces the cartridge into the chamber of the barrel, and just so soon as the cartridge is forced home the lock-bolt or hammer c, which had been forced back against its spring by the cam c' , is released by reason of its passing the end of said cam, and the lock-bolt is thrown with great force against the needle g, and the latter is driven upon the cartridge-cap and the same is exploded. The cam-wheel E then withdraws the plunger G, and with it the empty cartridge-shell, into its receiver, and by another revolution of the latter the shell is carried to the under side and drops out by gravity, while another cartridge is moved to its proper place in rear of the gun-barrel. The extractors

release their hold in the shell when it has been drawn into the receiver, and then continue backward out of the receiver, in order not to obstruct rotation of the latter.

The diagram shown in Fig. 8 illustrates the relation of the centers of the wheel D and the main shaft, the former being a little below and to the left of the center of the latter. The centers of the several receivers are all embraced in a circle described about the center of the wheel D, (designated as d^x ;) and to make this clear I have dotted in the circle and drawn radii in full lines. The center of the main shaft (designated as b^x) is the center of the circle embracing the centers of the corresponding chambers of the receivers alining with the gun-barrels, and I have drawn radii in dotted lines of this circle. Thus, when the wheel D imparts movement to the several receivers, it causes them to carry the cartridges received on top downward to their true positions of alinement with the barrels.

When the gun is used in a vertical position, pointing downward, means are provided for preventing the empty shells from dropping endwise out of the receivers and for ejecting them sidewise. I have illustrated in Figs. 5, 5^a, 5^b, and 6, and Figs. 16 and 18 means for accomplishing the above-stated objects. Referring first to Figs. 5 to 6, it will be observed that the wheel D carries a pair of disks M and M', having cam projections m and m' . Curved levers k are pivoted to the plate A⁴ and extend between said plate and the receivers, and at their inner ends have short divergent arms k' k'' to coact with the cam projections m and m' . When the exploded shell is withdrawn into the receiver, it is apparent that with the gun pointing downward said shell would drop back into the barrel when released without some provision to prevent. When the firing takes place, the lever k stands clear of the barrel and the alining chamber of the receiver, but when the empty shell is withdrawn into the receiver the lever is moved over in front of it by the action of the cam projection m' against the arm k'' . The action of the cam projection m against the other lever-arm k' again moves the lever to one side of the barrel. The cams will be properly timed to bring about these operations, and it will be seen that they act successively on the different levers.

For the purpose of ejecting the empty shells, there are fastened to the plate A⁴ a number of abutment-fingers m'' , which stand in position to meet the shells as they are carried around by the receivers, the latter being slotted, as shown at m''' in Fig. 16, to accommodate the fingers. There are preferably two of these abutment-fingers for each receiver, and they are screwed onto a stud m^4 , (see Fig. 18,) which stud screws into the plate A⁴.

Referring next to the feed mechanism detailed in Figs. 9 and 10 and Figs. 28 to 33,

the letter L designates a casing, preferably made in two parts, between which is left a slot l for a purpose to be presently explained, and in which are also provided grooves l' for receiving the flange l'' of the cartridge. The two sections of the case L are fastened at their ends to integral pieces L' and L'' , with grooves registering with those of the case. The cartridges K are stacked in the case with their flanges engaged with the grooves l' , and when the case stands upright they feed by gravity into the receivers. The hopper or feed-case slides into the feed-port O'' of the gun, and is held in by means of a spring-catch O' , which snaps over a catch O on the side of the casing of the feed-port.

On the back of the case L is an apparatus for forcing the cartridges down when the case is on or near a horizontal line. In Figs. 9 and 10, Sheet No. 2, is shown, enlarged, the notched bar W, on which is a sliding box W' , having a bifurcated spring-controlled pawl w . The lower end is to feed down the cartridges, as in Fig. 28. On the rod W is also another sliding box W'' , having a spring-controlled pawl w' , arranged in present case for convenience transversely to the other pawl. Between these two boxes is a coiled spring x .

Two feed-cases may be made to fit together end to end, as illustrated in Fig. 33, where a longer case is desired, to accommodate a greater number of cartridges in line.

The manner of mounting the gun is illustrated in Figs. 34 to 41. The base-standard may be in the form shown in Figs. 35 and 36, where it is designated Z, and it is designed to rest upon any suitable support, as the deck of a vessel, or it may be in the form shown in Fig. 41, where it is designated Z' , and designed for application to the rail of a ship. The top of the standard is formed with a semicircular guideway Z' , which receives a segmental rack N, engaged by a worm n , incased in a suitable box n^2 and operated by a handle n'' on its stem o . A set-screw q'' , entered through the side of the guideway Z' , is designed to bear against the segment and lock it at different positions.

A transit bed-plate N' has trunnions N'' , journaled in the top ends of the segment N and carrying a segmental rack P, engaged by a worm Q, journaled in suitable supports on the segment N and having a stem o^2 and handle Q' . A set-screw q''' is provided to hold the segment P at different adjustments, said screw being entered through a part of the segment N to bear against the segment P. A transit-plate S is centered on a conical stud R, rising from the center of the bed-plate N' , and may be set at different positions of rotary adjustment by means of a thumb-nut s' , screwing on a headed bolt s'' , which engages a groove s''' in the bed-plate P, said groove being T-shaped in cross-section. Arms s , rising from the plate S, have bearings s^2 at the top, receiving trunnions T on the gun-frame A.

It will be readily understood that by means

of the above-described mechanism any adjustment of the gun desired can be had.

The means employed to secure the aim by turning the gun on its trunnions T are of the following description, reference being had more particularly to Figs. 23, 24, 35, and 41. There is pivotally connected with the gun-supporting arms s a rod U, which, throughout the greater portion of its length, is grooved or slotted, as shown at U' , to receive a bar T''' , serrated along the outer edge to form portions of screw-threads. Said bar is connected with the rod U by radius-links t^4 , and is pressed outward by springs u , fastened to the bottom of the groove. The outer end of the rod U is enlarged to form a handle or knob, and the end of the serrated bar extends so that in grasping the rod said bar may be pressed inward. The bar may be locked in its outer position by means of a set-screw t^5 , entered through the end of the rod.

There is pivotally connected with the gun-frame on its under side a bushing V, in which is journaled an internally-screw-threaded sleeve V' for engagement with the serrated bar T''' , the rod and bar passing through the sleeve. The sleeve V' has a knurled head by which to turn it and thereby distend or contract the connection between the gun and its support, so as to bring the gun into aiming position. It will be readily seen that the rod is so adjustable in the sleeve as to accommodate any position to which the gun may be tilted, and the interlocking of the serrated bar and the sleeve will hold the gun against movement in either direction. These parts can be readily unlocked by pressing in the bar T''' .

In Figs. 42 to 46 I illustrate means whereby the gun may be caused to sweep through any angle desired, said means operated by the crank-handle H, hereinbefore referred to as being the means for operating the other parts of the gun. A train of gearing 2 3 4 5 is suitably mounted on the gun-frame A, in connection with the crank H, and the gear 5 is formed in one side with a heart-shaped cam-groove 6, occupied by a roller on the end of a bar 7, fitted to slide through a guide 8, suitably supported on the gun-frame. The bar 7 is jointed to the upper end of a lever 9, which is adjustably pivoted to a rigid arm 13, depending from the gun. Said pendent arm is slotted, as shown at 14, to receive through it a headed bolt 15, whose outer end receives a thumb-nut 19, having a reduced rounded portion 17, constituting the pivot and surrounded by a block or box 12, which fits a slot in the lever 9 and is longitudinally adjustable therein. It will now be seen that by loosening the thumb-nut 15 and then moving it lengthwise of the lever, the pivot of the latter is changed and may be fixed at any adjustment by tightening the said thumb-nut. The lower end of the lever is formed as a ball 10, which engages a socket in one end of a curved arm 11, which at its

opposite end is fastened on the stud R by means of a clamping-nut 22. This end of the curved arm being fixed, it will be seen that turning of the crank H will have the effect of swinging the gun horizontally. Adjustment of the pivot of lever 9 determines the extent of swing. The heart-shaped cam produces movement first in one direction and then in the opposite direction in the slide 7, which transmits motion to the lever. The lower end of the latter being engaged with a fixed support, the gun will of necessity be turned by the pressing of the bolt 15 against the sides of the slot 14, which is made in a part of the gun-frame.

The following is claimed as new:

1. In a machine-gun, the combination of a main or driving shaft, a mutilated gear-wheel journaled eccentrically to said shaft, gearing connecting the shaft and wheel, rotary cartridge-carriers having mutilated gears to mesh with the said wheel, and gun-barrels in the arc of a circle concentric with the driving-shaft.

2. In a machine-gun, the combination with a series of barrels arranged circularly, plungers to charge the barrels, and means for advancing and retracting the plungers, of a series of rotary cartridge-carriers each having a number of cartridge-holding recesses through which the plungers pass, and means for turning said carriers successively step by step to bring the cartridges in line with the barrels and the plungers.

3. In a machine-gun, the combination of driving-shaft journaled in the gun-frame and carrying a bevel-gear at the outer end, a tubular shaft around the driving-shaft and carrying a bevel-gear in juxtaposition to that on the latter, an operating crank-shaft carrying a bevel-gear in mesh with the bevel-gears on the two shafts, charging and firing devices operatively connected with the tubular shaft, and cartridge-carriers operatively connected with the driving-shaft.

4. In a machine-gun, the combination with a mutilated gear-wheel and means for continuously turning the same, the said wheel having smooth peripheral portions at the height of the teeth: of rotary cartridge-carriers arranged in the arc of a circle around the said wheel and each having a plurality of cog-sections for engagement with those of the wheel, and concave blank spaces between the cog-sections for engagement of the high peripheral portions of the wheel for locking purposes, substantially as described.

5. In a machine-gun, the combination with the gun-barrel, the rotary cartridge receivers, and means for intermittently turning the latter; of closures for the cartridge-holding chambers of the receivers, and means for moving said closures alternately into and out of closing position, substantially as and for the purpose described.

6. In a machine-gun, the combination with the gun-barrels, the rotary cartridge-carriers,

and means for intermittently turning the latter: of levers interposed between the carriers and the barrels, and devices connected with the carrier-turning means, for vibrating said levers to close and open communication between the carriers and the barrels, substantially as and for the purpose described.

7. In a machine-gun, the combination with the gun-barrels, the rotary cartridge-carriers having mutilated gears, and a mutilated gear-wheel arranged to engage the carrier-gears: of a set of levers interposed between the carriers and the barrels and having divergent arms at their inner ends, and cam-disks on the mutilated gear-wheel and coacting with said levers to vibrate the same, for the purpose described.

8. In a machine-gun, the combination of a plunger for charging the barrel; spring-tongues fastened at one end to said plunger and having catches at the opposite end adapted to take over the flange of the cartridge and beveled on the outer side, said tongues having inner bevels extending oppositely to the catch-bevels; and fixed abutments located between the tongues and the plunger for said inner bevels to encounter when the plunger is retracted.

9. In a machine-gun, the combination with a suitably-formed feed case or hopper, of means for feeding the cartridges therein, said means comprising a ratchet-bar, a pair of slides thereon, pawls on the slides, one to engage the ratchet-teeth and the other to engage the cartridges, and a spring between the slides.

10. In a machine-gun, the combination with a suitable support, and a gun-frame journaled therein; of an internally-screw-threaded sleeve journaled in a bearing pivotally connected with the gun-frame, and a rod pivotally connected with the gun-support and having a screw-like section passing through the sleeve and movable into and out of engagement with the screw-threads thereof.

11. In a machine-gun, the combination with a suitable support and gun-frame journaled therein: of a rod jointed to the support and longitudinally grooved, a bar fitting said groove and having a screw-cut outer edge, radius-links connecting said bar with the rod, springs pressing the bar outward, and an internally-screw-threaded sleeve pivotally connected with the gun-frame and embracing the rod and bar.

12. The combination with the gun-frame mounted to swing horizontally, and the crank-handle of the firing mechanism; of a lever on the gun-frame and engaged at one end with a fixed support, and connections between said lever and the said firing-crank whereby the lever is moved during the firing and the gun thereby caused to swing laterally substantially as described.

13. The combination with the gun-frame mounted to swing horizontally, and the crank-handle of the firing mechanism; of a lever on the gun-frame having an adjustable pivot and

engaged at one end with a fixed support, and connections between said lever and the said firing-crank whereby the lever is moved during the firing and the gun thereby caused to
5 swing laterally substantially as described.

14. In a machine-gun, the combination with a gun-frame mounted on a transit-plate and a crank for operating the firing apparatus of the gun: of a fixed arm extending radially of
10 the transit-frame, a lever engaged with the outer end of said arm, a slide connected with

said lever, and a train of gearing connected with the operating-crank and having associated with it a cam in engagement with the said slide, for the purpose described. 15

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

ELIHU WILDER.

Witnesses:

JOSEPH SMALL,

H. GATES O'NEAL.