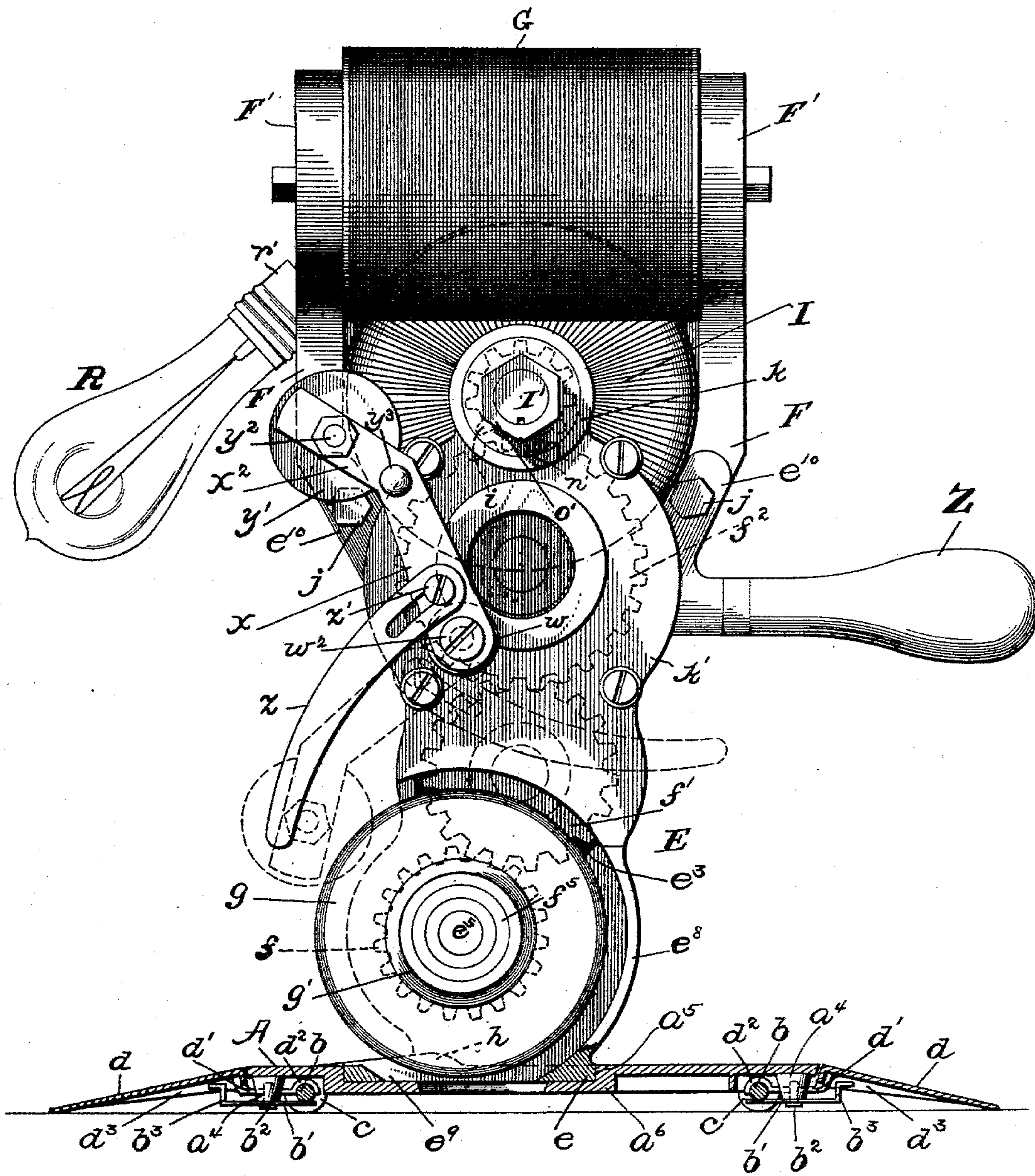


4 Sheets—Sheet 1.

No. 593,265.

Patented Nov. 9, 1897.

Fig. 1.



INVENTOR,

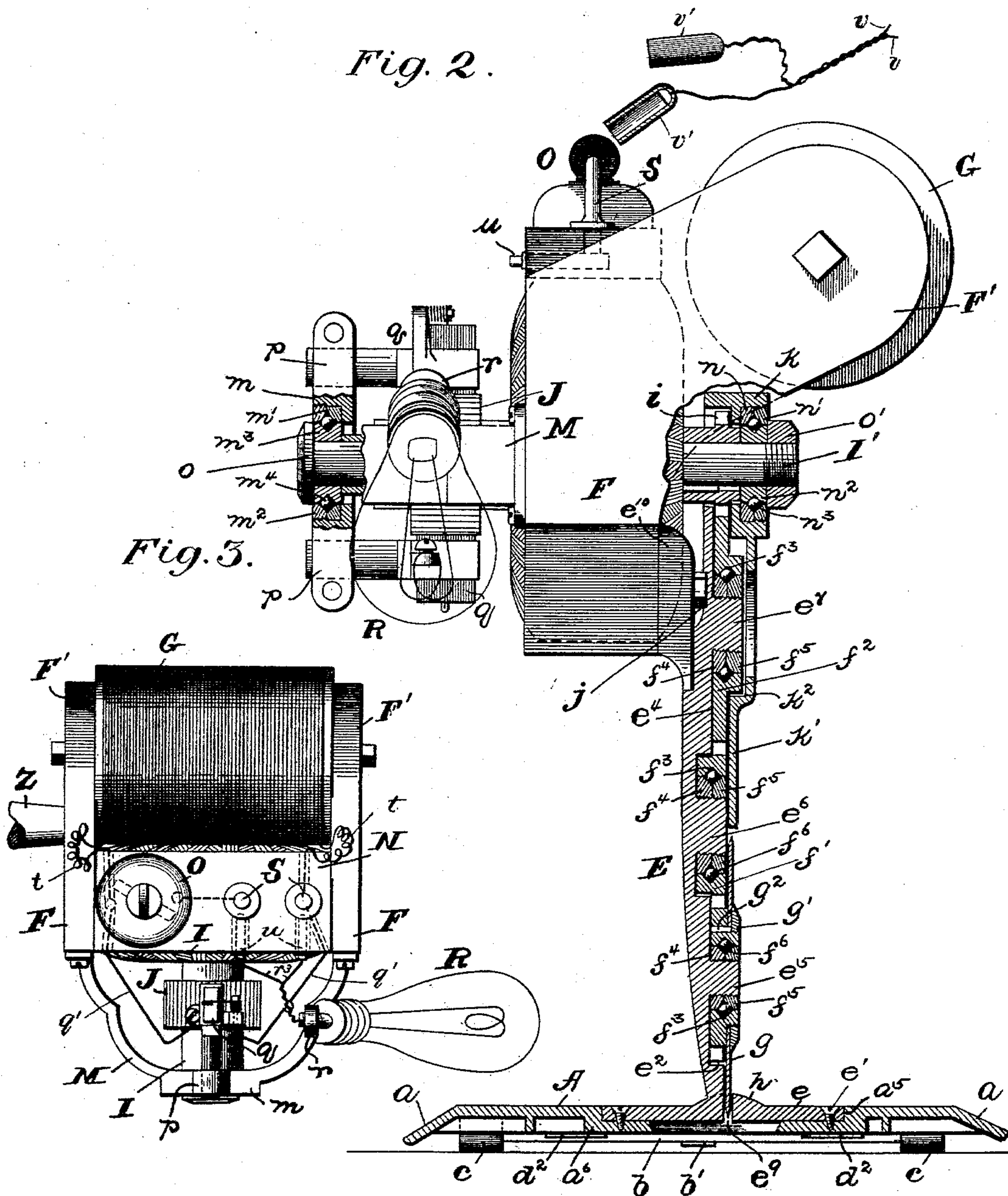
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4 Sheets—Sheet 2.

Patented Nov. 9, 1897.

Fig. 2.



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J. WOLF, Jr.
CLOTH CUTTING MACHINE.

No. 593,265.

Patented Nov. 9, 1897.

Fig. 4.

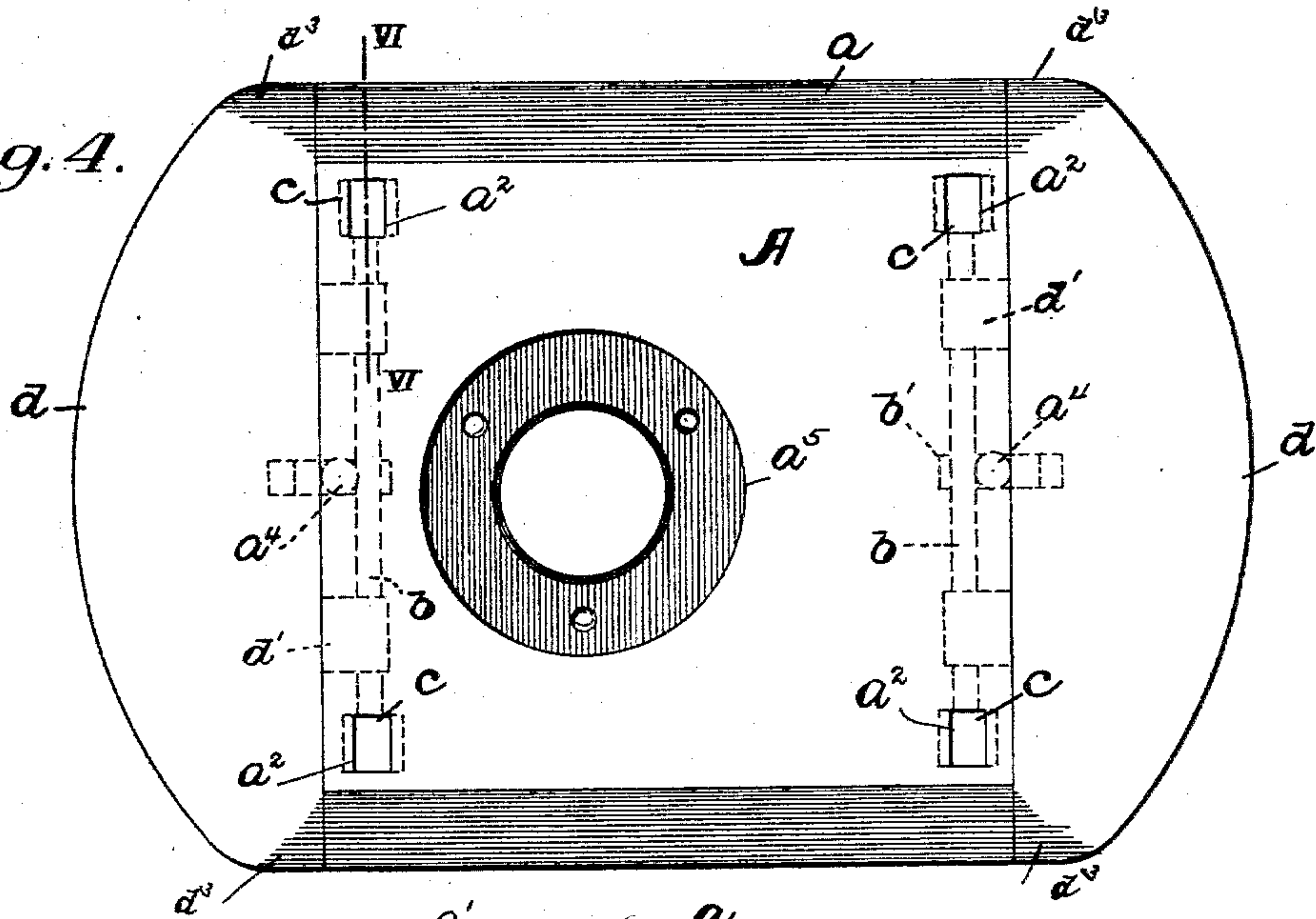


Fig. 5.

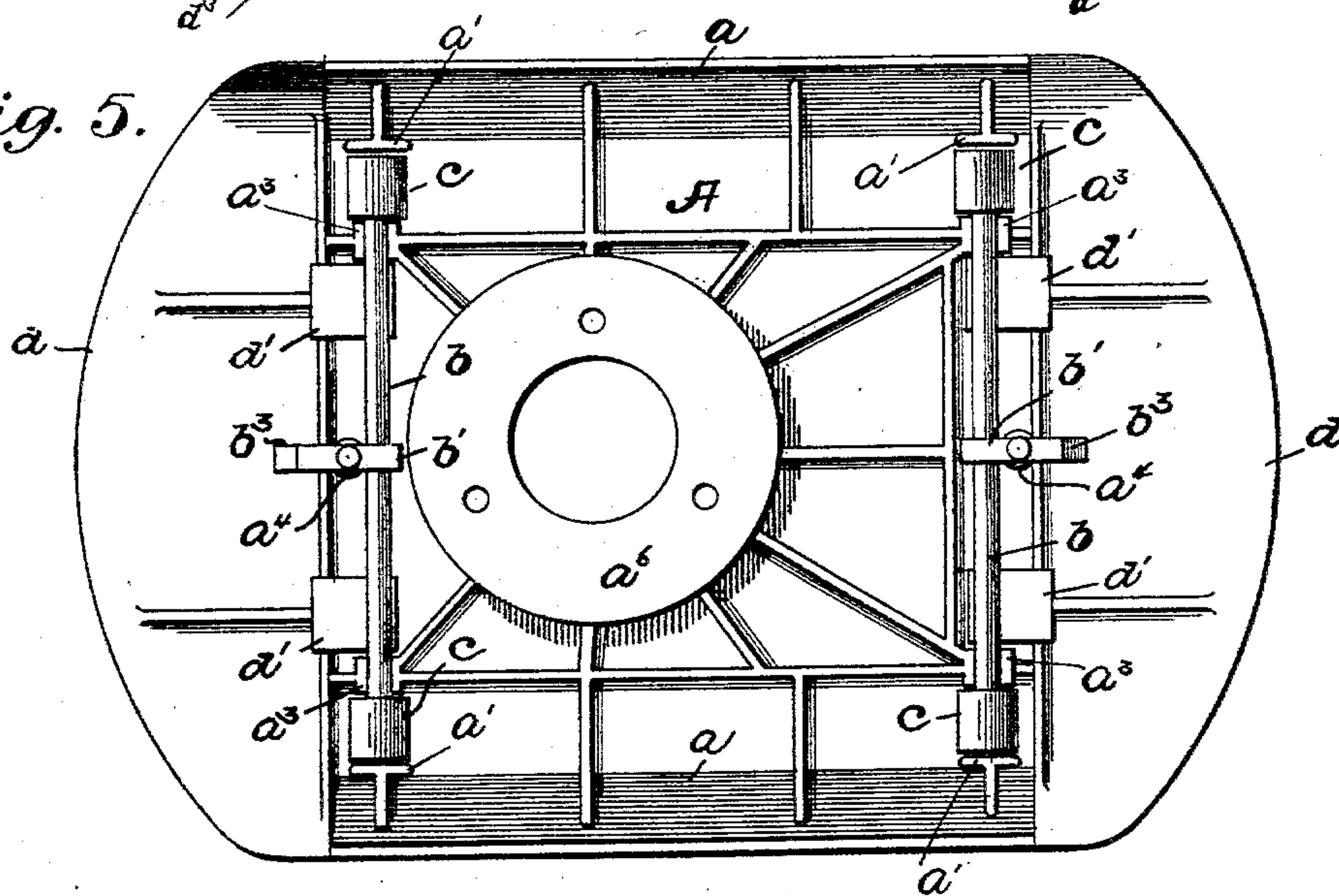
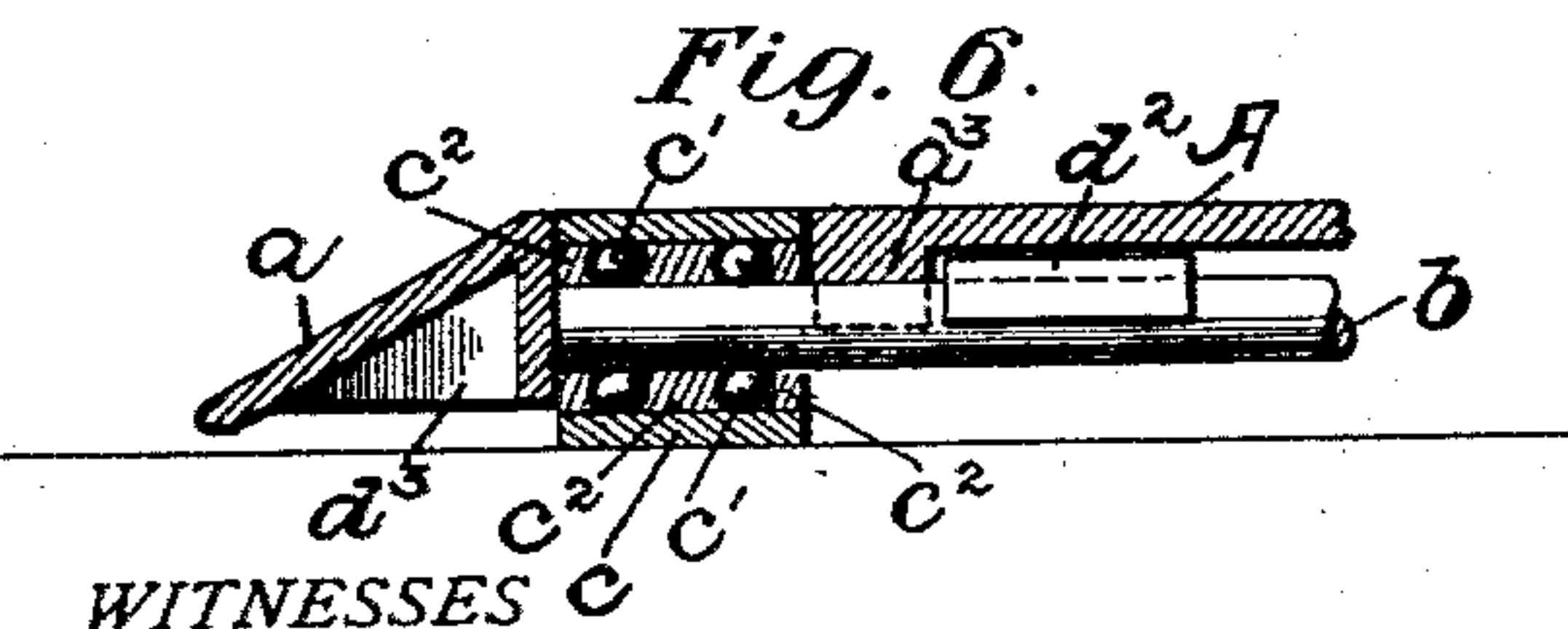


Fig. 6.



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(No Model.)

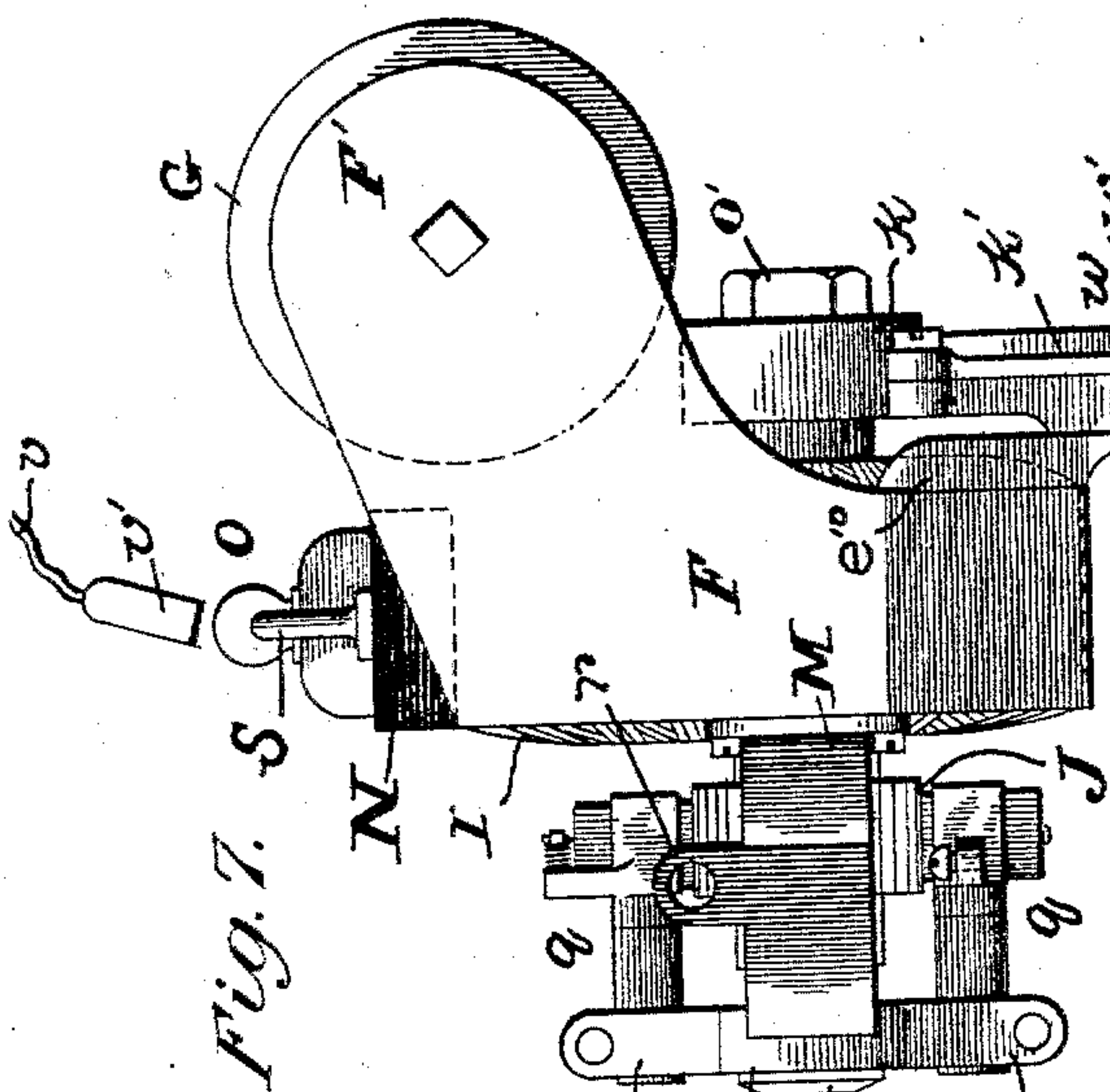
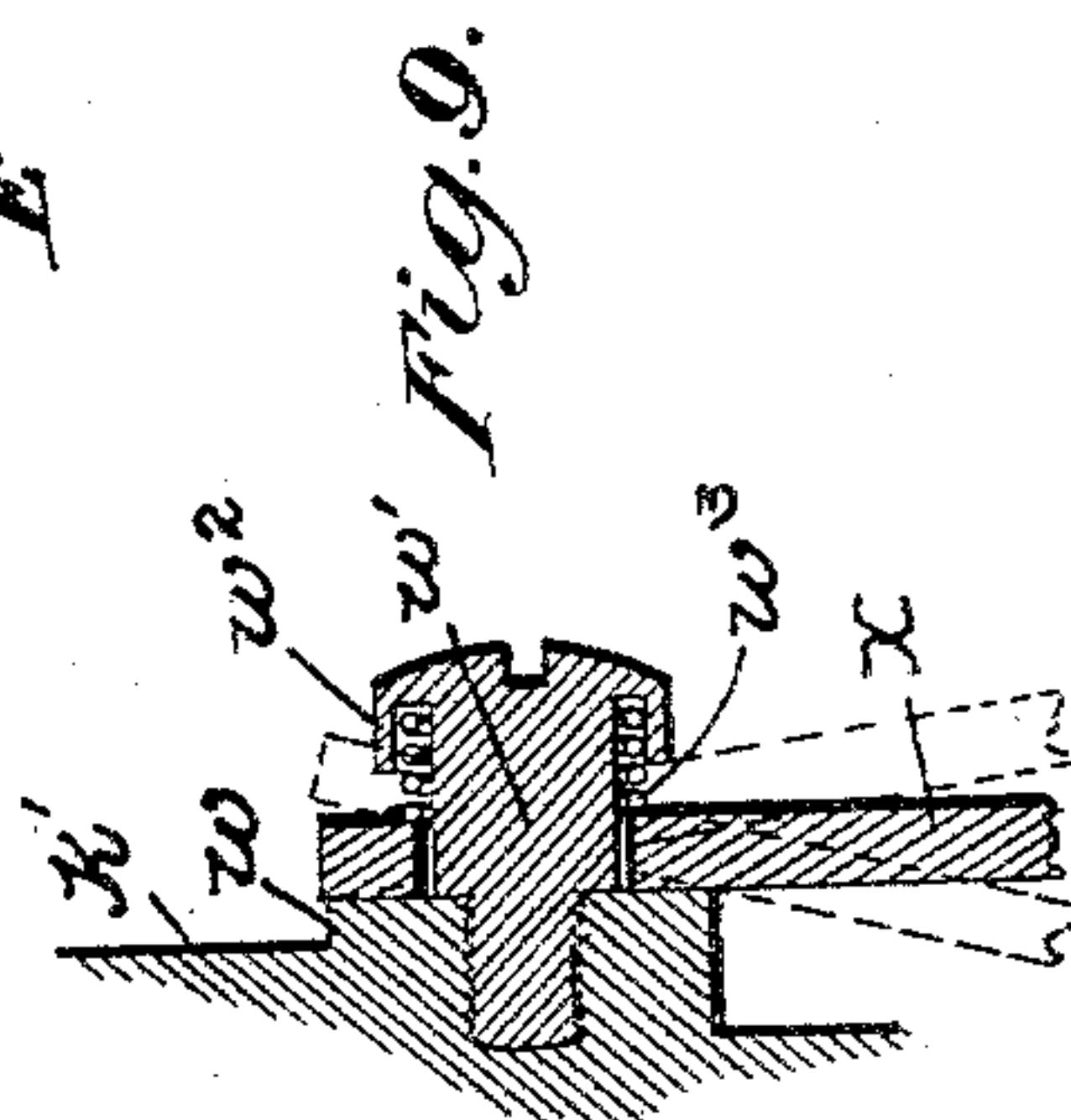
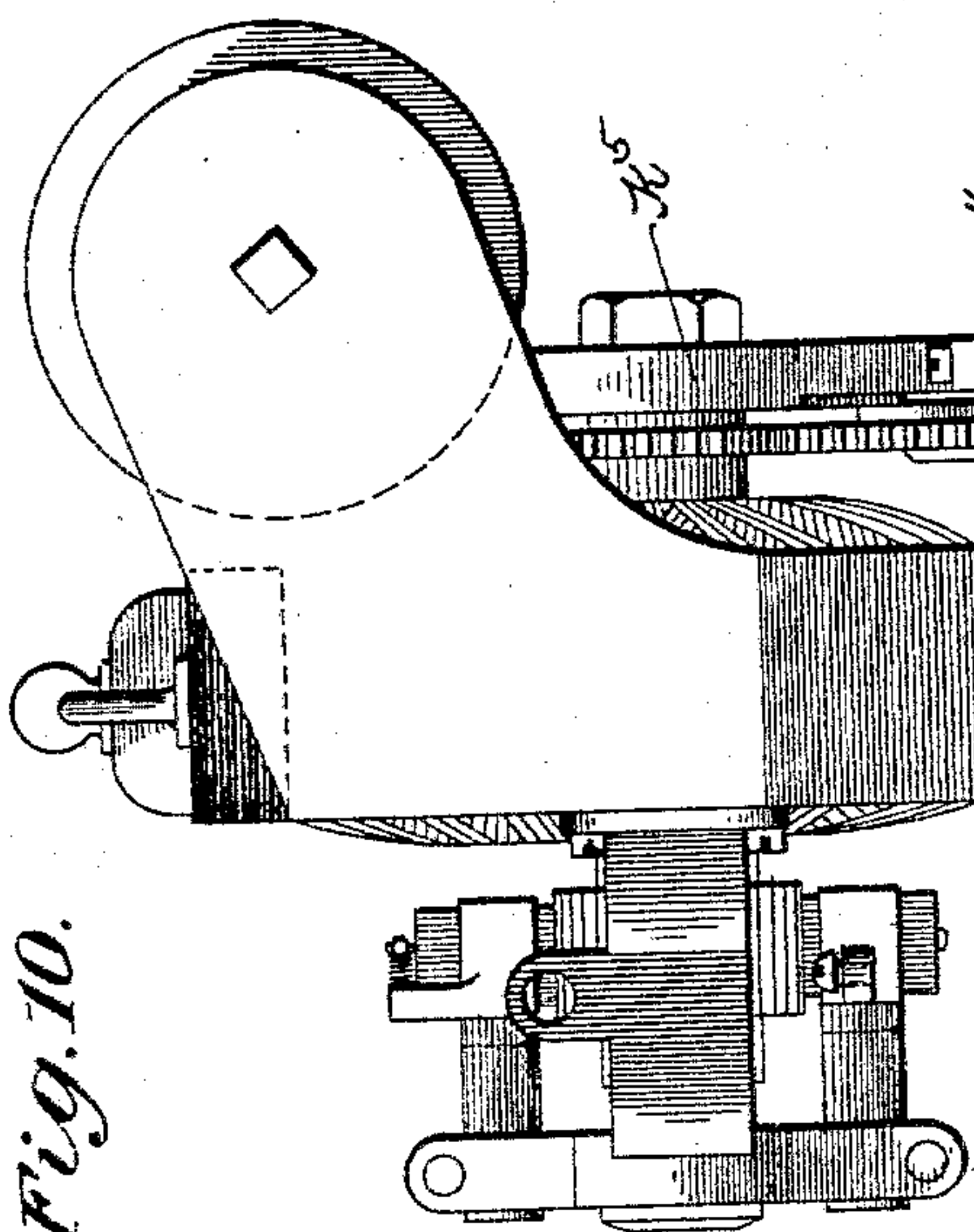
4 Sheets—Sheet 4.

J. WOLF, Jr.
CLOTH CUTTING MACHINE.

No. 593,265.

Patented Nov. 9, 1897.

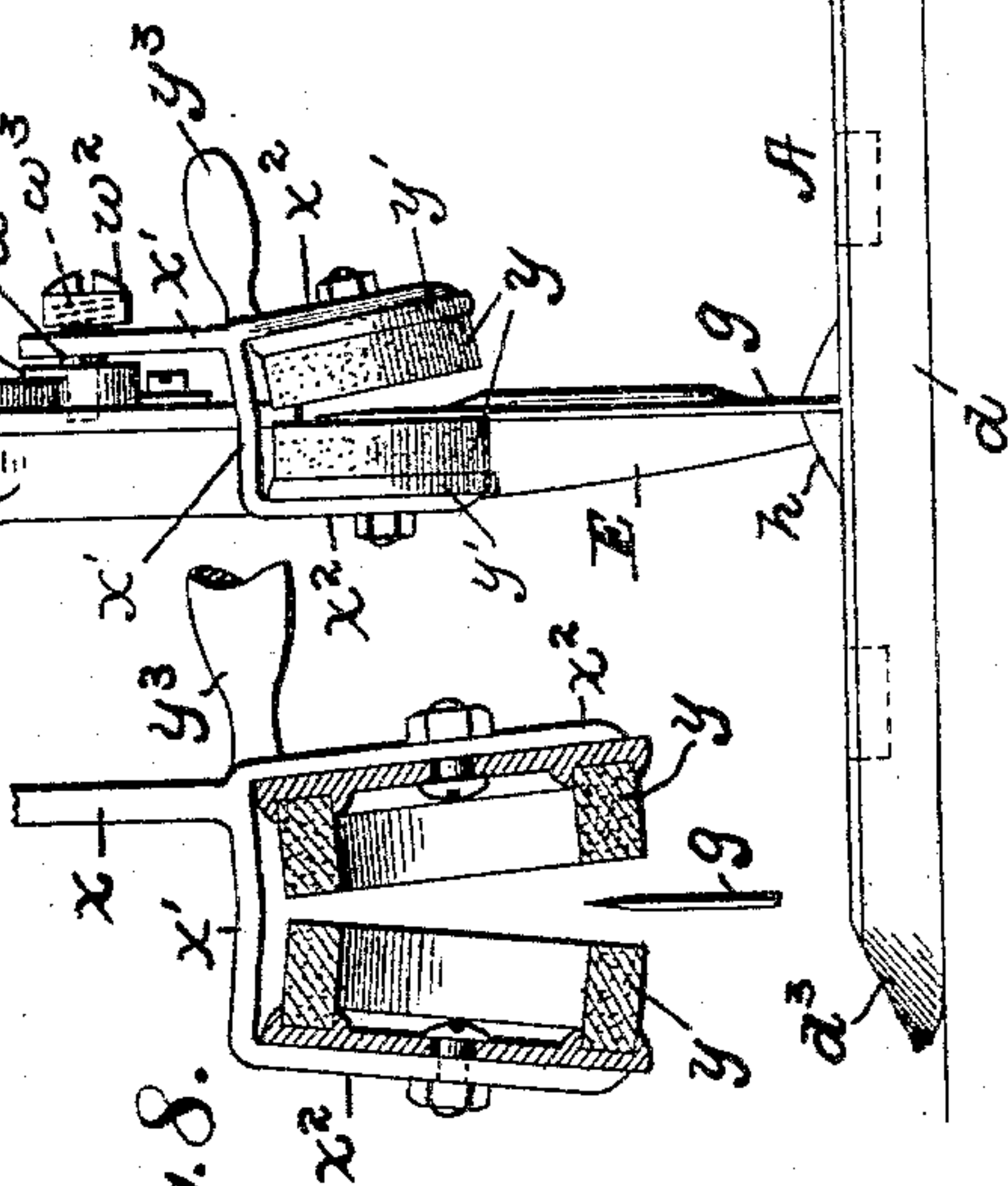
Fig. 10.



WITNESSES

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Fig. 8.



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UNITED STATES PATENT OFFICE.

JOHN WOLF, JR., OF CINCINNATI, OHIO, ASSIGNOR TO THE WOLF ELECTRICAL PROMOTING COMPANY, OF SAME PLACE.

CLOTH-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 593,265, dated November 9, 1897.

Application filed July 29, 1897. Serial No. 646,346. (No model.)

To all whom it may concern:

Be it known that I, JOHN WOLF, Jr., a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Cloth-Cutting Machines; 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 cloth-cutting machines of the class typified in certain prior patents. (See Nos. 505,689 and 505,690, dated September 26, 1893, and No. 528,217, dated October 30, 1894.) These machines are designed more particularly for cutting cloth for the manufacture of wearing-apparel, and the present invention has in view certain improvements calculated to better adapt the machine to this class of work.

One specific object is to improve the equipment of the foot-plate, so that it can be moved about more easily, this being accomplished by reducing friction to the minimum.

Another object is to adapt the machine for cutting higher piles of material than heretofore, this being made possible by a remodeling of the framework and rearrangement of the gearing.

A third object is to provide simpler and more convenient knife-sharpening appliances and to arrange a knife-guard in connection therewith.

A fourth object is to accurately balance the weight of the parts above the standard or shank of the machine, so as to prevent undue lateral strain on said standard or shank and also to obviate a toppling tendency.

With the above-stated objects in view the invention consists in certain novel constructions, arrangements, and combinations of parts specifically described hereinafter and whose essential characteristics are recited in the appended claims.

Of the drawings which accompany and form part of this specification, illustrating embodiments of the invention, Figure 1 represents a side elevation of a machine embodying the invention with the foot-plate in central longitudinal section. Fig. 2 represents

a vertical cross-section looking from front to rear, with the most of the upper part of the machine in elevation. Fig. 3 represents a plan view of the upper part of the machine. Fig. 4 represents a top plan view of the foot-plate. Fig. 5 represents a bottom plan view of the same. Fig. 6 represents a section on line VI VI of Fig. 4. Fig. 7 represents a front elevation of the machine with the knife sharpener or grinder shown in acting position. Fig. 8 represents a detail sectional view of the grinding devices. Fig. 9 represents a detail sectional view of the supporting devices for the knife sharpener or grinder. Fig. 10 shows a front elevation of a modified form of the machine.

Similar letters of reference are applied to corresponding parts in the several figures of the drawings.

The foot-plate A (shown in Figs. 1, 2, 4, 5, 6, and 7) is formed with two sloping sides a and, on the under side at the junction of said sloping sides and the top, with shoulders or flanges a' , flush with the outer ends of rectangular openings a^2 , four of which are provided in the top of the plate at the four corners thereof. On the under side of the plate, at the inner ends of these openings, lugs a^3 are formed and grooved longitudinally in their lower faces, for a purpose which will presently appear. In further explanation of the formation of the foot-plate it is to be noted that rounded lugs a^4 are formed on its bottom at each end midway between the lugs a^3 and nearer the end of the foot-plate than the latter. The middle portion of the plate is cast with a circular depression a^5 and a boss a^6 , surrounding the same.

Reverting to the construction of the under side of the foot-plate at the ends thereof, the grooves in each pair of lugs a^3 receive a shaft b , whose ends lie behind the shoulders a' , which thus prevent endwise movement of the shaft. The latter is prevented from dropping by an arm b' , which is fastened by a screw b^2 to the lug a^4 and extends under the shaft, as clearly shown in Fig. 1. This arm also extends forward and upward, as shown at b^3 , for a purpose hereinafter explained.

The two shafts b are not intended to revolve, but they simply form journals on which

rollers c are mounted, the said rollers being confined between the shoulders a' and lugs a^3 and projecting into the rectangular openings a^2 , respectively. Two rows of balls c' are interposed between each roller and its journal, as shown in Fig. 6, the balls lying in raceways formed between retaining-rings c^2 , of which there are three. This feature of the invention is of much importance as greatly increasing the ease of manipulation of the machine.

The aggregate weight of the machine is considerable, but running on ball-bearing rollers, as above described, it can be moved about with the greatest ease. It is apparent that the roller-bearings might be in the form of rolls instead of balls.

The front and rear ends of the foot-plate have preferably associated with them cloth-lifters, each consisting of a plate d of substantially semi-elliptical contour, the straight edge fitting up against the end of the foot-plate and having formed with or secured to and projecting from it a pair of flat arms d' , which extend under the foot-plate and at their inner ends have a semitubular form, as shown at d^2 , so as to take over and pivot upon the shaft b . It will thus be seen that a gravitating pivotal cloth-lifter is provided, the curved edge of the cloth-lifting plate d resting by gravity on the surface traversed, so that irregularities in such surface cannot prevent the proper feeding of the cloth to the cutter.

The plate presents a sloping surface, rising from the surface traversed to the top surface of the foot-plate, and at each side of the cloth-lifting plate is inclined, as shown at d^3 , to conform to the inclination of the sides a of the foot-plate. It will thus be seen that with the two cloth-lifters in place the foot-plate presents sloping surfaces on all sides, so that in whatever direction the machine is moved the foot-plate passes smoothly under the cloth.

It is to be noted that while the foot-plate is provided with pivotal gravitating cloth-lifters a practical continuity in its sloping sides is preserved, a provision obviously well calculated to insure the best results in practice. Downward movement of the cloth-lifters is limited by the angular ends b^3 of the arms b' , which ends project up under the cloth-lifters. These stop-pieces come into play when the machine is lifted from the supporting-surface and when the cloth-lifters run beyond such surface.

While the two pivotal cloth-lifters, one at each end of the foot-plate, are of great advantage, the machine can be successfully run with but one cloth-lifter, that being at the front end of the foot-plate, and, in fact, cloth-lifters as separate devices can be dispensed with altogether, the foot-plate being inclined at front and back, as well as at the sides, as shown in Fig. 10.

Passing from the foot-plate the letter E

designates a standard, which is formed with a circular base e , occupying the depression a^5 in the foot-plate and securely fastened to the latter by a suitable number of screws e' .

The standard is preferably a casting, which is made as thin as consistent with the necessary strength and durability, and it has a series of circular recesses e^2 , e^3 , and e^4 in one side, one above another, and opening into each other, the said recesses being for the accommodation of intermeshing gear-wheels f , f' , and f^2 , which journal respectively upon studs e^5 , e^6 , and e^7 , formed on the standard at the centers of the recesses. These gear-wheels are mounted upon ball-bearings in the following-described manner: The hub of each gear-wheel is formed on its interior with an encircling groove f^3 , V-shaped in cross-section, and the stud of the standard is screw-threaded to receive a pair of rings f^4 and f^5 of frusto-conical form. A row of balls f^6 occupies the raceway formed between the sides of the groove f^3 and the tapered sides of the rings f^4 and f^5 , and it will be seen that a four-point bearing for the balls is thus provided, so that the gears will turn with the least possible friction.

The lowermost gear-wheel f carries the circular disk knife g , which fits over its hub and is clamped against the side of the gear by a collar g' , screwing onto a threaded portion of said hub. The knife is positively prevented from turning on said hub by a pin g^2 , which engages grooves or notches on the hub and knife. The knife lies close against the side of the standard and projects beyond the front of the same, while its rear edge is guarded by a curved flange e^8 , formed on the standard and clearly shown in Fig. 1. The base e of the standard is slotted, as shown at e^9 , the lower part of the knife working in said slot, and a rounded inclined hump h rises around this slot, said hump being preferably of hardened steel, secured to the foot-plate by brazing or in any other suitable manner, and merging into the latter at a point somewhat in advance of where the knife-edge leaves the base, the said hump rising gradually from that point to a point substantially in a central vertical line of the knife, whence it drops abruptly to the base. This hump is rounded transversely from end to end and its purpose is to prevent the cut edges of the cloth from being drawn in under the knife.

Proceeding next to a description of the motor and the means for supporting the same, with reference more particularly to Figs. 1, 2, and 3, it need first be explained that the standard E is formed near its upper end with a pair of outwardly-curved prongs or horns e^{10} on its side opposite that in which the knife is carried, and the pole-pieces F of an electric motor are fitted against these horns and secured to the same by the long screws j . The pole-pieces have angular extensions F' , which overhang the opposite or knife side of the standard and support between them the

field-coil G, whose weight, disposed at this side of the standard, counterbalances the weight of parts on the other side of the standard.

5 The reference-letter I designates the armature between the pole-pieces and on a shaft I', carrying keyed to it a pinion i in mesh with the uppermost gear f^2 of the train in the standard. The said armature-shaft is jour-
 10 naled in the following manner: One end projects over the top of the standard E and is embraced by a tubular bearing k at the upper end of a plate k' , the bearing and plate being preferably cast together in one piece.
 15 The plate is secured against the side of the standard and constitutes a cover for the upper portion of the gear f' and the whole of the gear f^2 , the said plate being recessed on the inner side, as shown at k^2 , to accommo-
 20 date the hub of said gear f^2 . The plate terminates above the knife and its lower edge forms a continuation of the guard-flange e^3 . The tubular portion k at the upper end of the plate is recessed to receive rings n and
 25 n' , one of which is simply slipped into the recess, while the other is exteriorly screw-threaded for engagement with interior screw-threads in the recess. These rings have beveled confronting faces, which, together with
 30 a V-shaped groove in a collar n^2 on the shaft I', form a raceway for a row of balls n^3 .

It will be observed that the tubular portion k extends over the pinion i , thus housing the same.

35 The opposite end of the shaft I' is supported in a bearing m , formed at the center of a yoke M, which is secured at its ends to the pole-pieces. The said bearing at the middle of the yoke is recessed to receive a plain and
 40 a screw-threaded ring m' and m^2 , having beveled confronting faces, forming, with a V-shaped groove in a collar m^3 on the shaft, a raceway for a row of balls m^4 . The shaft is formed at this end with an enlargement or
 45 head o , and at the other end is screw-threaded to receive a nut o' for the purpose of tying the parts together and preventing endwise movement of the shaft.

50 The yoke M is formed with lugs p above and below the bearing m to support the brushes q for the commutator J. Said yoke also has a lug r , supporting a lamp-socket r' for an incandescent lamp R.

55 The arrangement for electrical connections is as follows: A board N, of insulating material, is secured across the tops of the pole-pieces and upon it is mounted a switch O, and two pins or posts S, with which are connected the wires t , from the field-coil G, the
 60 one wire directly and the other through the switch. In similar connection with said posts are wires q' , leading to the commutator-brushes, respectively. Metallic tubes u , inserted in the insulation N and contacting
 65 with the said pins or posts, respectively, are designed to receive spring-wire ends of conducting-wires r^3 , leading to the lamp R. The

wires v from the source of electrical supply have sockets v' at their ends to fit over and make electrical connection with the pins or
 70 posts S, said sockets having covers of insulating material, so that they can be handled without danger. It will be understood that these wires v will be connected with some
 75 suitable take-up apparatus—such, for example, as shown in my Patent No. 505,741, granted September 26, 1893—so that the machine can be moved freely about while a connection with a source of electricity is main-
 80 tained.

It is desirable in machines of this kind to have a knife-sharpening equipment carried by the machine and adapted to be brought into action at any time, so as to keep the
 85 knife sharp whatever may be the character of the material being cut. This is provided for in the present case by the following-described construction, reference being had
 90 more particularly to Figs. 1, 7, 8, and 9. Into a lug w , formed on the gear-covering plate k' , is screwed a stud w' , which has a recessed head w^2 , housing a spiral spring w^3 . An arm
 95 x is pivotally mounted on said stud between the lug and the spiral spring, and the latter presses said arm against the face of the lug, normally holding it in a vertical plane, as
 100 shown in Fig. 9. The opening in the arm where it surrounds the stud is sufficiently enlarged to permit a lateral rocking or tilting of the arm in either direction against the
 stress of the spring w^3 , opposite edges of the
 lug w affording fulcra for the arm, as indicated by broken lines in Fig. 9 and also illustrated in Fig. 7.

105 The outer or free end of the arm x has a bifurcated head x' with divergent arms x^2 , which support rotary grinders y in the form of rings fitting in suitable holders y' , journaled upon studs y^2 on said divergent arms. The grinding-rings are thus obliquely set,
 110 and their confronting edges are designed to act upon opposite sides of the knife to grind the same on a double bevel. Normally the grinders are both out of the plane of the knife, as illustrated in Fig. 8. By means of
 115 a handle y^3 , fastened to the head x' , either grinder can be moved into contact with the knife by tilting the arm x in the manner hereinbefore described and will then partake of the rotary motion of the knife and sharpen
 120 the same by an abrading action. As before stated, the said arm x is pivoted to the stud w and hence can be moved in a vertical plane and thrown up to the full-line position shown in Fig. 1 to have the grinders out of
 125 the way when not in use. When the arm is in its lower position, (indicated by broken lines in Fig. 1,) the knife-edge is obviously guarded, but when thrown up to the full-line position this guard is removed, and
 130 hence an additional provision is made for guarding the knife-edge in the form of a curved arm z , which is adjustably secured to the arm x by means of a screw z' , passing

through a slot in said curved arm and entering the grinder-arm. This curved arm is secured at such an angle to the grinder-arm that with the latter thrown up to the full-line position shown in Fig. 1 the curved arm extends in front of the knife-edge. When the grinder-arm is brought down to the broken-line position, the guard-arm recedes to the position indicated by broken lines in Fig. 1.

Viewing Figs. 1 and 2, the absence of projections near the cutting-line will be noted and also the reduction in thickness of what may be termed the "shank" of the machine, both these features obviously enhancing the ease with which the machine passes through the cloth and the cleanness and accuracy of the cut, especially in following curves.

Of course the number of gear-wheels in the train leading from the armature-shaft to the knife may be varied, and many other changes can be made in the construction above described without departing from the spirit and scope of the invention.

In the modification shown in Fig. 10 a foot-plate A' is shown with sloping sides all around and no pivoted cloth-lifters. The standard E', instead of having prongs or horns against which the motor is fastened, is formed with a shelf E², on which the motor rests and to which it is fastened. The gear-covering plate k³ has its upper edge flush with the upper surface of said shelf, to which said plate is fastened by screws k⁴, passing through lugs formed on these parts. The bearing k⁵ for the end of the armature-shaft on the knife side of the standard is in this modification a separate piece from the gear-covering plate and is mounted upon and fastened to a ledge or shelf formed at the upper end of the latter. In this form of machine, as in the one before described, the parts of the motor are so disposed with respect to the median vertical line of the machine as to equally balance the weight and obviate any tendency of the machine to topple over as it is moved about.

In each form of embodiment of the invention here illustrated a suitable manipulating-handle Z is fastened to a lug on the standard and projects rearwardly for the operator to grasp in the usual manner.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a machine of the character described, the combination of a foot-plate having supports for one or more shafts and angular openings in its upper side, shafts engaging said supports, rollers on said shafts and occupying the openings in the foot-plate, roller-bearings interposed between the shafts and the rollers, and retainers for said roller-bearings extending into the openings in the foot-plate and confined by the walls thereof.

2. In a machine of the character described,

a foot-plate having grooved lugs on the under side and shoulders confronting the outer ends of said lugs, a shaft occupying the grooves of the said lugs with its ends behind the said shoulders, means for retaining the shaft in such position, and rollers on the shaft.

3. In a machine of the character described, a foot-plate having grooved lugs on the under side, and shoulders confronting the outer ends of said lugs, a shaft occupying the grooves of said lugs with its ends behind the said shoulders, means for retaining the shaft in such position, and rollers on the shaft between the lugs and the shoulders.

4. In a machine of the character described, a foot-plate having grooved lugs on the under side and shoulders confronting the outer ends of said lugs, a shaft occupying the grooves of the said lugs with its ends behind the said shoulders, means for retaining the shaft in such position, rollers on the shaft between the lugs and the shoulders, and roller-bearings interposed between the rollers and the shaft.

5. In a machine of the character described, a foot-plate having grooved lugs on the under side and shoulders confronting the outer ends of said lugs, a shaft occupying the grooves of the said lugs with its ends behind the said shoulders, means for retaining the shaft in such position, rollers on the shaft between the lugs and the shoulders, and balls and retaining-rings interposed between the rollers and the shaft.

6. In a machine of the character described, a foot-plate having a roller-equipped shaft and a gravitating cloth-lifter pivotally engaged with and supported by said shaft.

7. In a machine of the character described, a foot-plate having a roller-equipped shaft, a gravitating cloth-lifter pivotally engaged with said shaft, and a shaft-confining and cloth-lifter-movement-limiting piece fastened to a suitable part of the foot-plate and adapted to engage the shaft and the cloth-lifter, for the purpose described.

8. In a machine of the character described, a foot-plate having a roller-equipped shaft, a gravitating cloth-lifter pivotally engaged with said shaft, and a shaft-confining and cloth-lifter-movement-limiting piece fastened to a suitable part of the foot-plate and extending under the shaft and cloth-lifter.

9. In a machine of the character described, the combination of a substantially rectangular foot-plate with sloping sides, and gravitating cloth-lifters pivoted to the ends of the foot-plate and inclined at their sides to correspond with the sloping sides of the foot-plate, the cloth-lifters extending entirely across the foot-plate and presenting therewith a practically continuous sloping marginal portion, substantially as described.

10. In a machine of the character described, a foot-plate having pivotally connected therewith at each end a gravitating cloth-lifter ex-

tending entirely across it, and means for limiting downward movement of the same when the foot-plate is raised.

11. In a machine of the character described, 5 a foot-plate having on its under side grooved lugs and a centrally-located lug, a shaft occupying the grooves of the lugs, rollers on said shaft, a gravitating cloth-lifter fitting up against the end of the foot-plate and having 10 arms which pivot on said shaft, and an angular piece fastened to the centrally-located lug and extending under the shaft to confine it in place and under the cloth-lifter to limit its downward movement when the foot-plate is 15 raised.

12. In a machine of the character described, the combination of a foot-plate, a standard rising therefrom and recessed for a train of gearing and formed with a curved flange along 20 the lower part of its rear edge, gears in the recesses, a knife associated with the lowermost gear with its back edge guarded by said curved flange of the standard, a gear-covering fastened to the standard over its recesses above 25 the knife, the lower edge of the said covering forming a continuation of the knife-guarding flange, and a suitable motor in gear with said train of gearing.

13. In a machine of the character described, 30 the combination of a foot-plate, a standard rigidly attached thereto and rising therefrom and recessed for a train of gearing, gears journaled on said standard and occupying said recesses, a circular knife fastened to the low- 35 ermost gear, a motor associated with the uppermost gear, and a gear-covering fastened to the standard and having formed with it and projecting above the standard a bearing for one end of the motor-shaft.

14. In a machine of the character described, 40 the combination with a standard and a knife thereon, of a knife-sharpener comprising an arm carrying a grinder and pivoted to the standard to swing substantially in the plane 45 of the knife into and out of position for grinding, said arm also laterally movable to carry the grinder into and out of contact with the knife.

15. In a machine of the character described, 50 the combination with a standard and a knife thereon, of a knife-sharpener comprising an arm carrying a grinder and pivoted to the standard to swing substantially in the plane of the knife into and out of position for grind- 55 ing, said arm also arranged to rock laterally on its pivot to carry the grinder into and out of contact with the knife, and a spring to hold the arm in a central position.

16. In a machine of the character described, 60 the combination with a standard and a knife thereon, of a knife-sharpener comprising an arm pivoted to swing in a plane parallel with the knife and also laterally movable, and a

pair of obliquely-set rotary grinders on said arm. 65

17. In a machine of the character described, the combination with a standard and a knife thereon of a knife-sharpener comprising an arm pivoted to swing toward and from the knife and a grinder carried by said arm; and 70 a knife-guard fastened to the grinder-arm and projecting therefrom whereby it is adapted to extend in front of the knife when the grinder-arm is moved away from the knife.

18. In a machine of the character described, 75 the combination of a foot-plate, a standard rising therefrom, a train of gearing supported by said standard, a disk-knife secured to the lowermost gear, an electric motor whose pole- 80 pieces are secured to the standard on one side thereof, said pole-pieces having extensions overhanging the opposite side of the standard, an armature-shaft in gear with the said train of gearing and carrying its armature on one 85 side of the standard, a field-coil between the pole-piece extensions on the opposite side of the standard, and suitable electrical connections, substantially as described.

19. In a machine of the character described, the combination of a standard having a lug in 90 one side and a pivot-pin fastened in said lug, a knife mounted on said standard, an arm loosely mounted on the said pivot-pin so as to be capable of rotary movement in substan- 95 tially the plane of the knife and also of lateral movement substantially at right angles thereto, opposite edges of the lug affording fulcrums for said arm in its lateral movements; a spring pressing the arm against the lug, and grinding means carried by the arm for 100 acting against the knife, substantially as described.

20. In a machine of the character described, the combination of a standard having a lug on one side, a knife mounted on said standard, 105 a pivot-pin fastened in said lug and having a recessed head, an arm pivotally mounted on said pin with provisions for lateral play, a spiral spring surrounding the pin between its recessed head and the arm and pressing the 110 latter against the lug, and one or more obliquely-set grinding-disks on said arm and adapted to be alternately brought in contact with the knife, substantially as described.

21. In a machine of the character described, 115 the combination of a foot-plate, a gravitating cloth-lifter pivoted thereto, and a stop-piece fastened to the foot-plate and extending under the cloth-lifter to limit downward move- 120 ment thereof, substantially as described.

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

JOHN WOLF, JR.

Witnesses:

JAMES GUNNING,

JAMES NUGENT.