

No. 670,352.

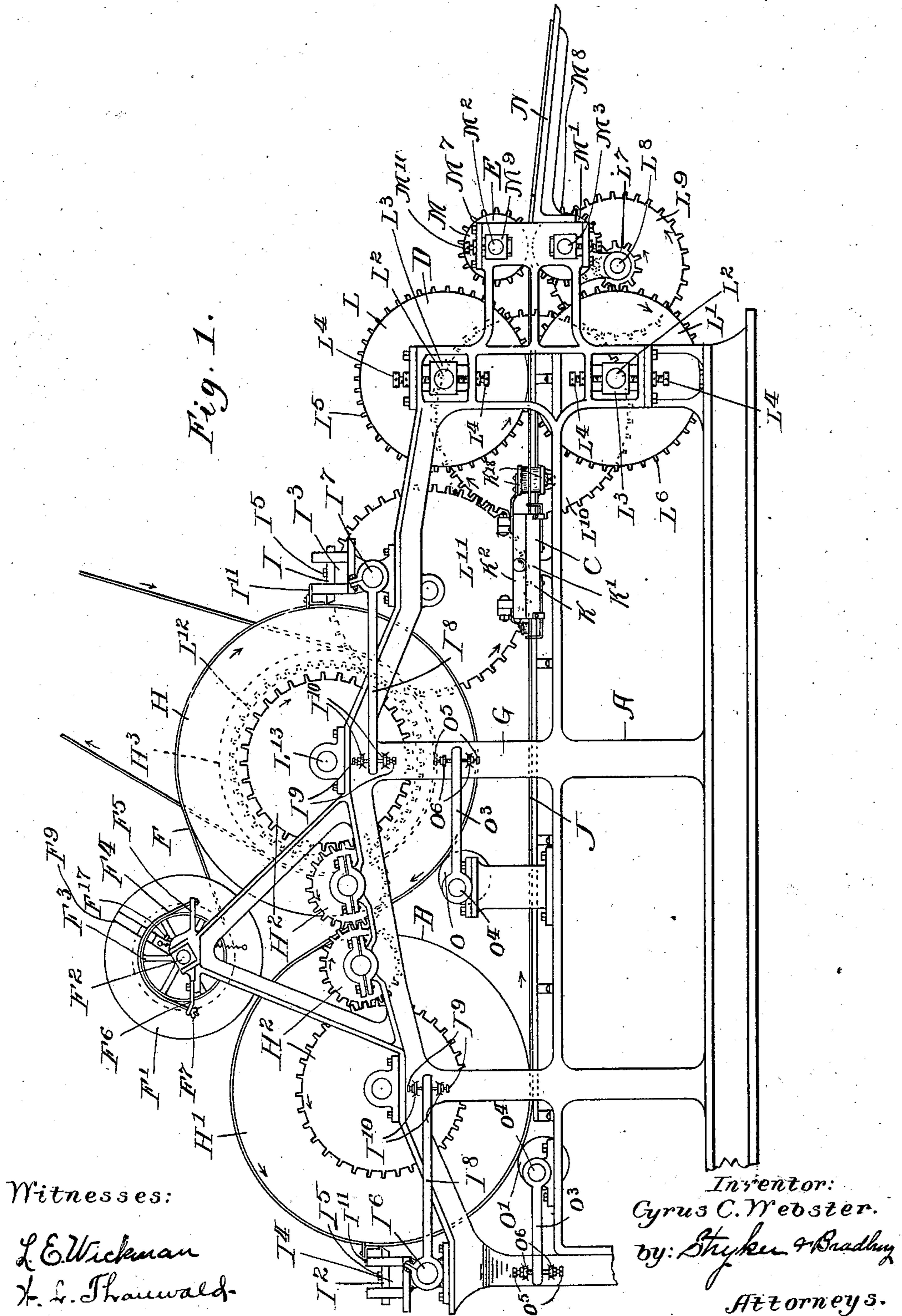
Patented Mar. 19, 1901.

C. C. WEBSTER.
STRIP METAL FINISHING MACHINE.

(Application filed Jan. 12, 1900.)

(No Model.)

12 Sheets—Sheet 1.



No. 670,352.

Patented Mar. 19, 1901.

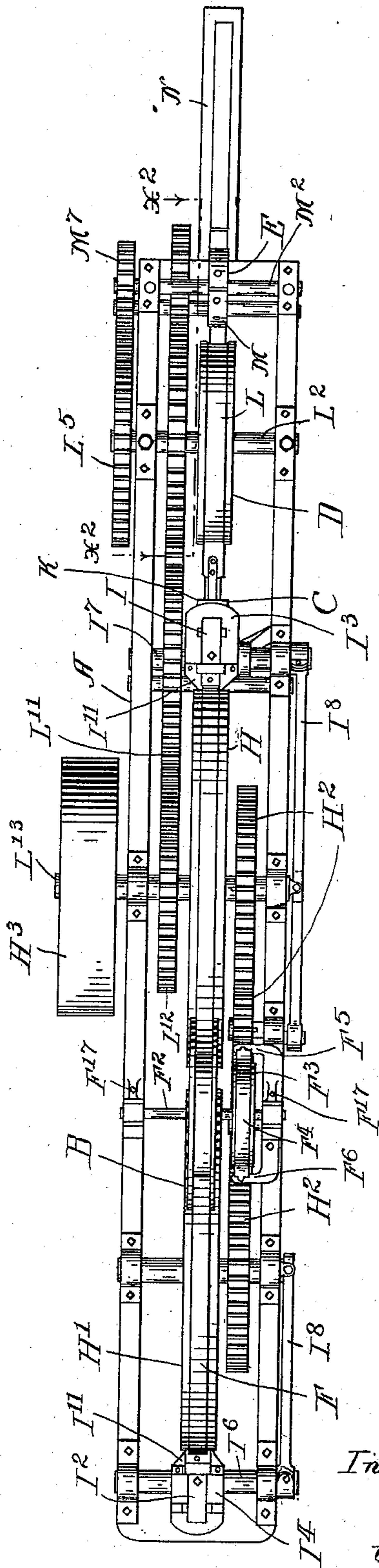
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12 Sheets—Sheet 2.

Fig. 2.



Witnesses:

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12 Sheets—Sheet 3.

Fig. 3.

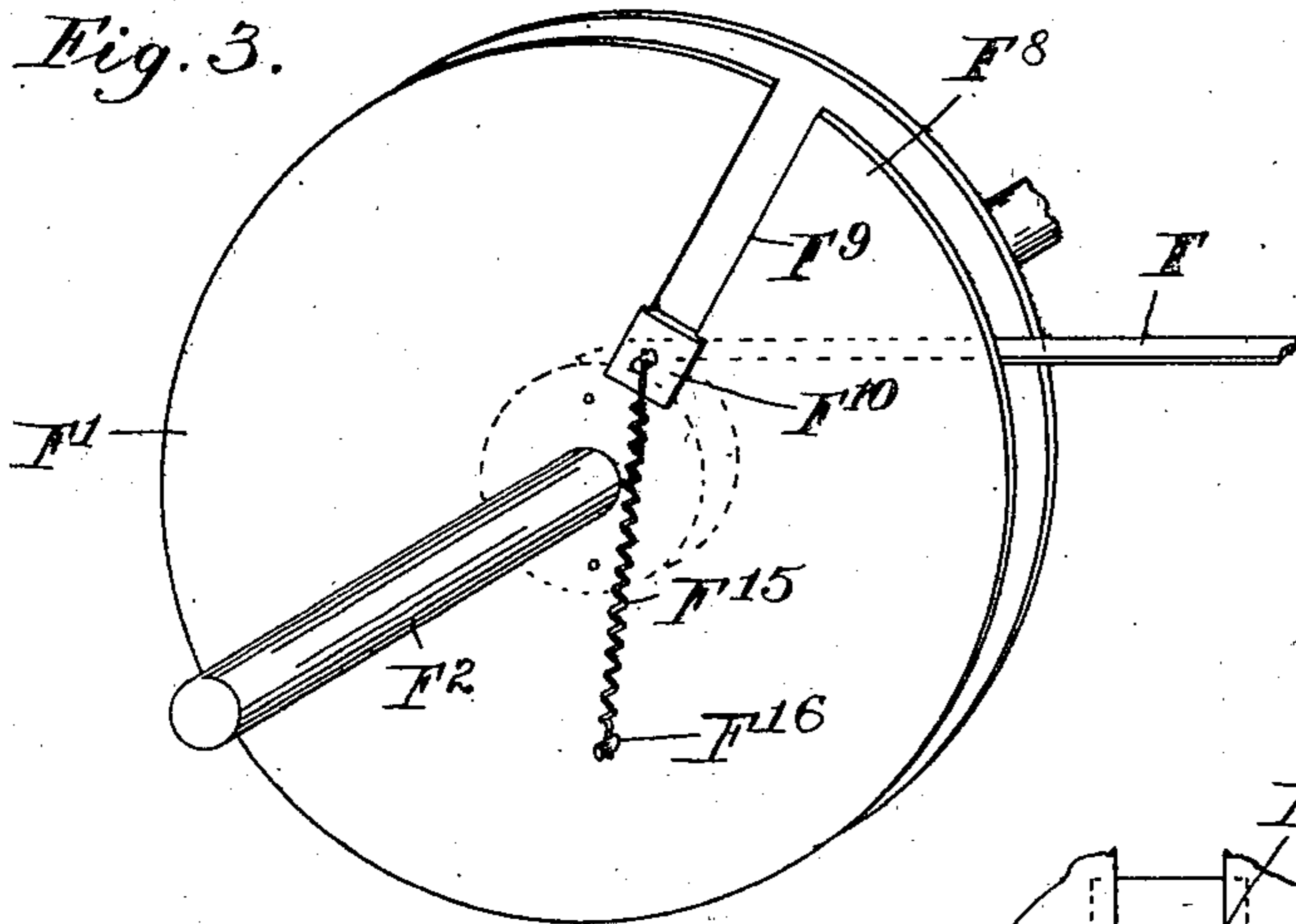


Fig. 4.

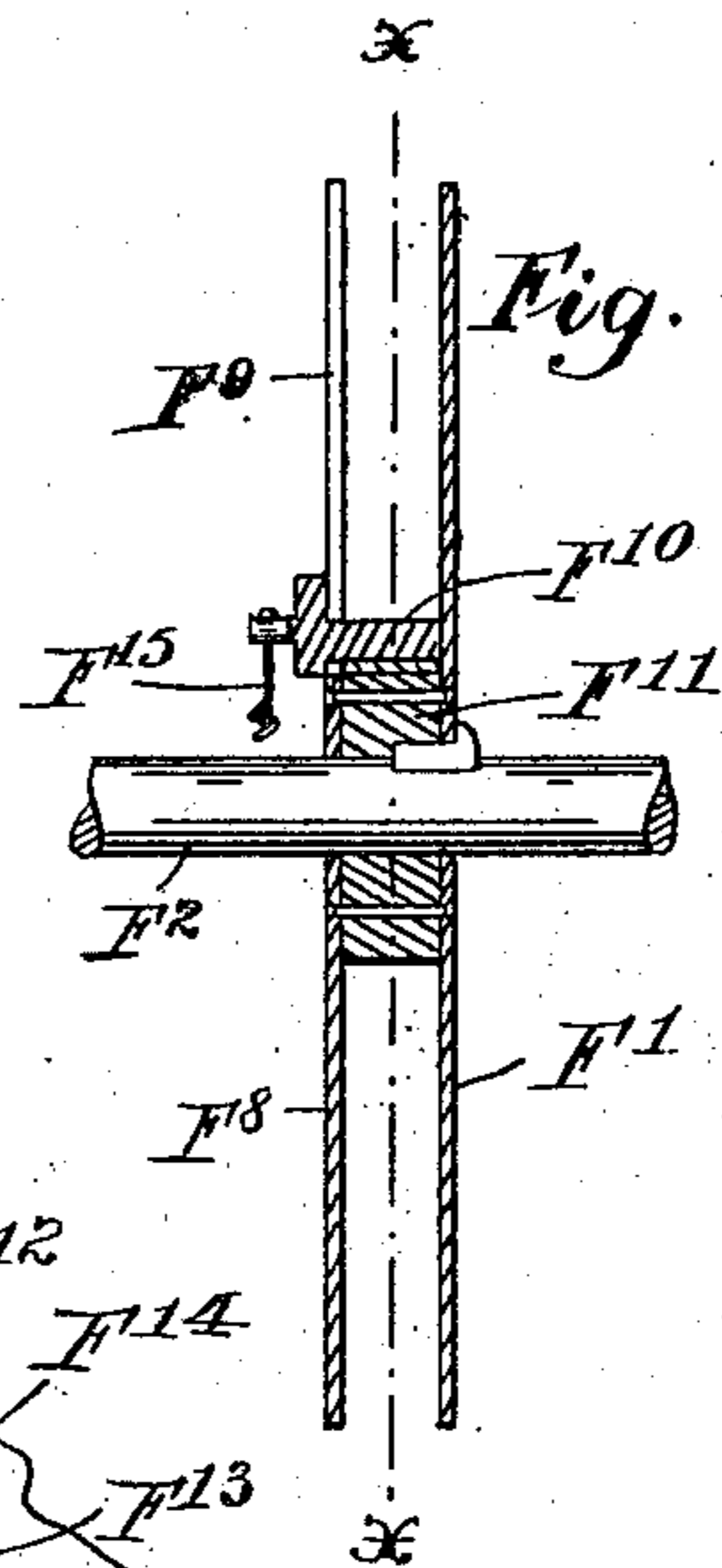


Fig. 5.

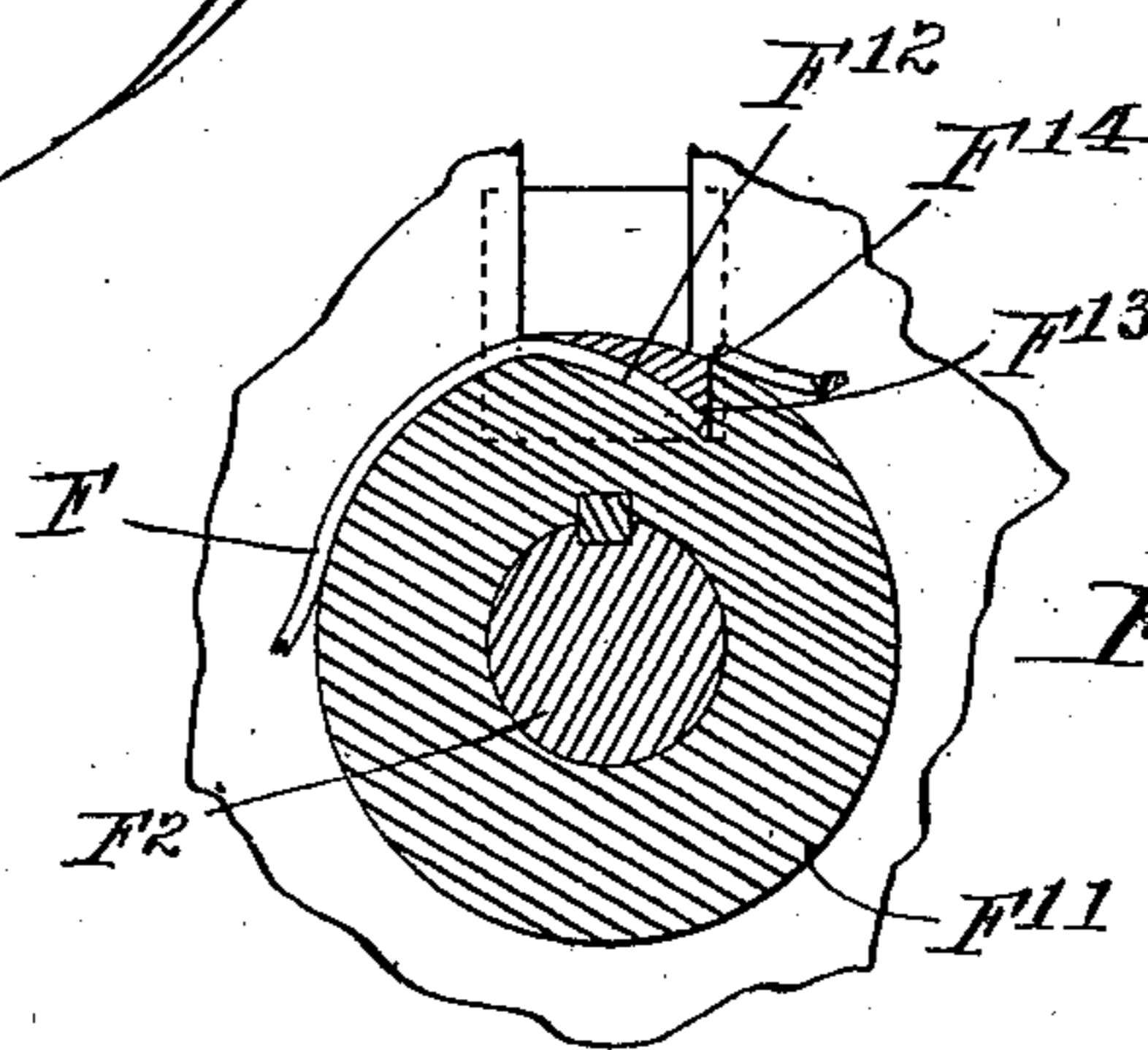
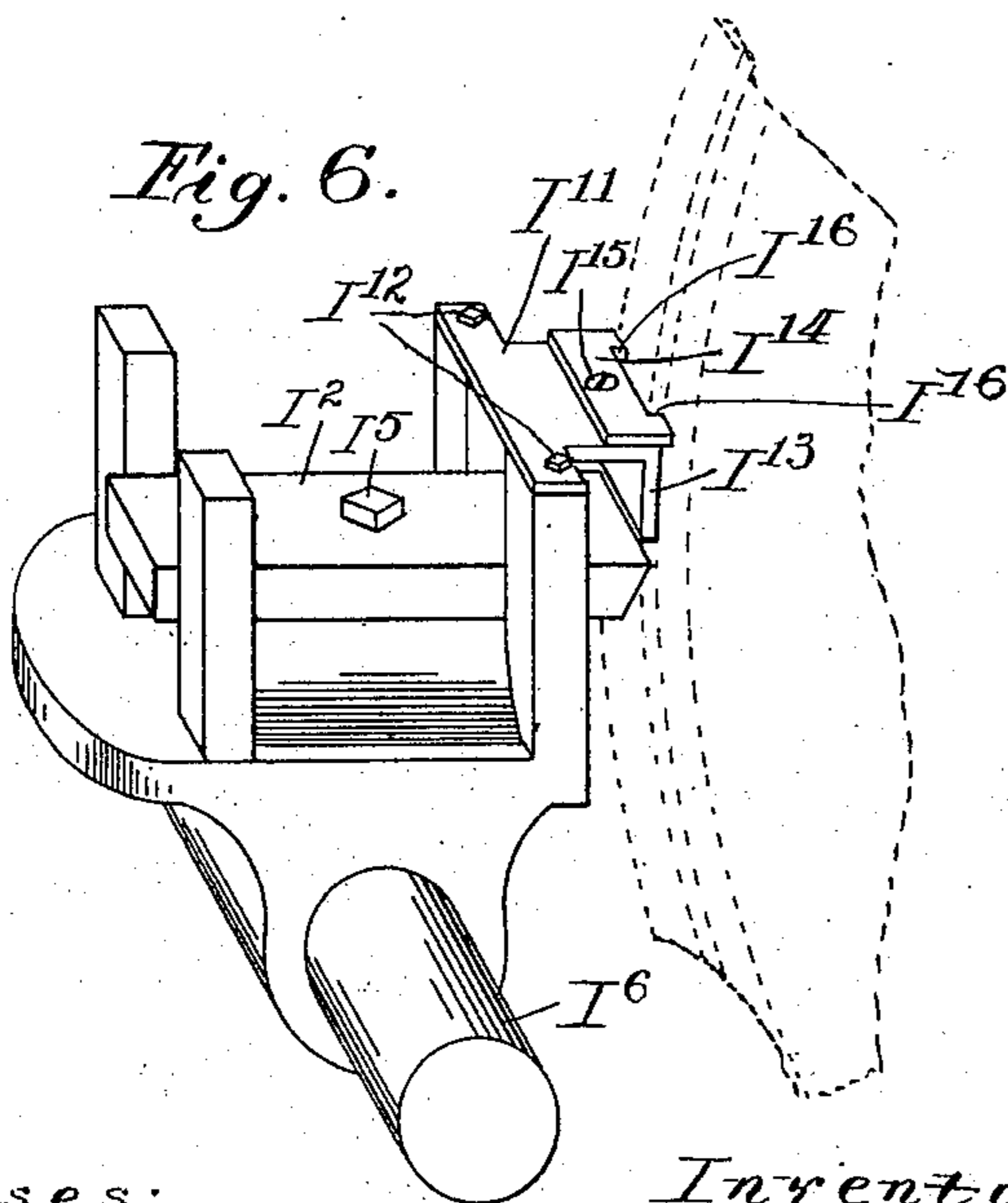


Fig. 6.



Witnesses:

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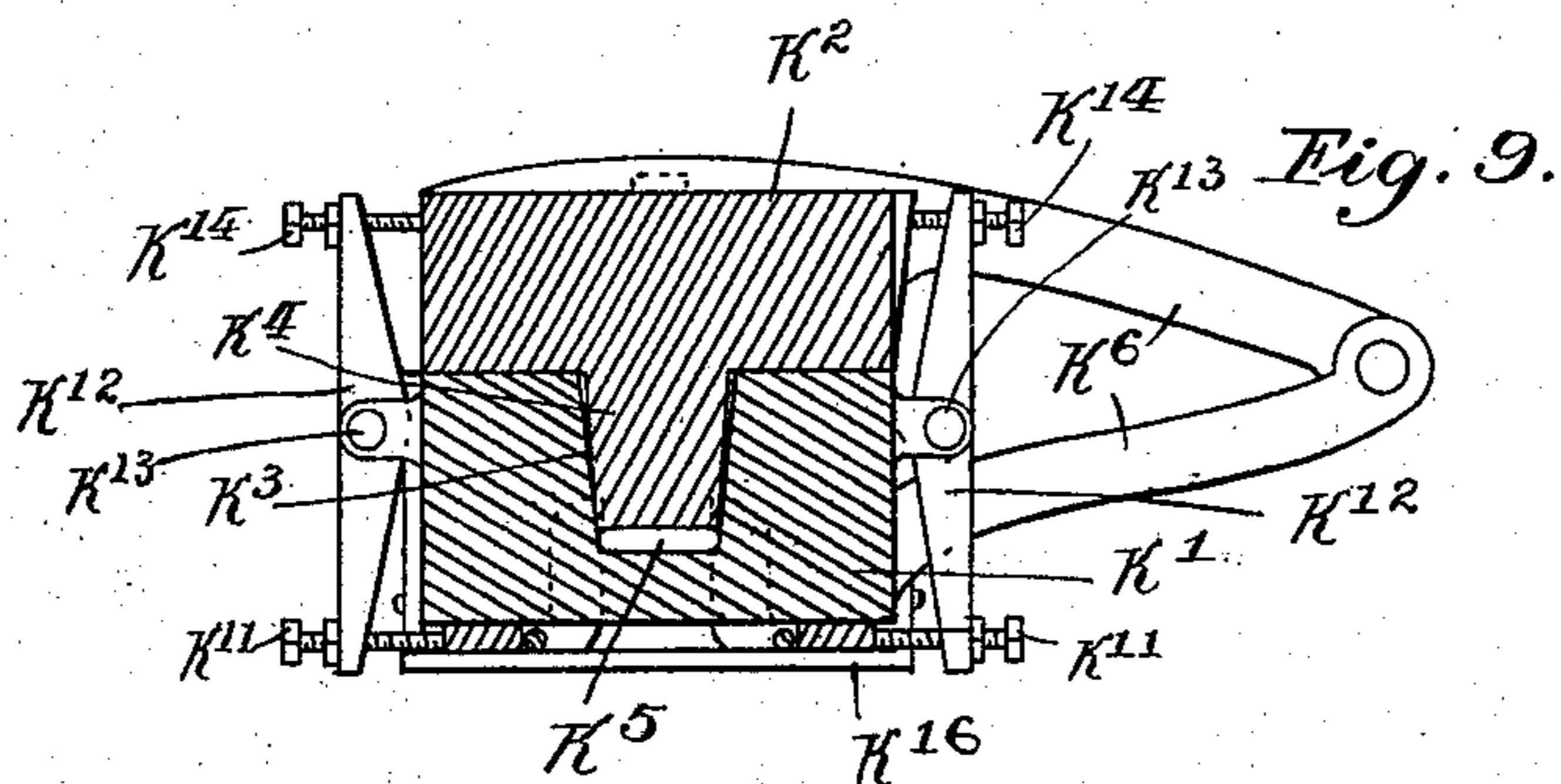
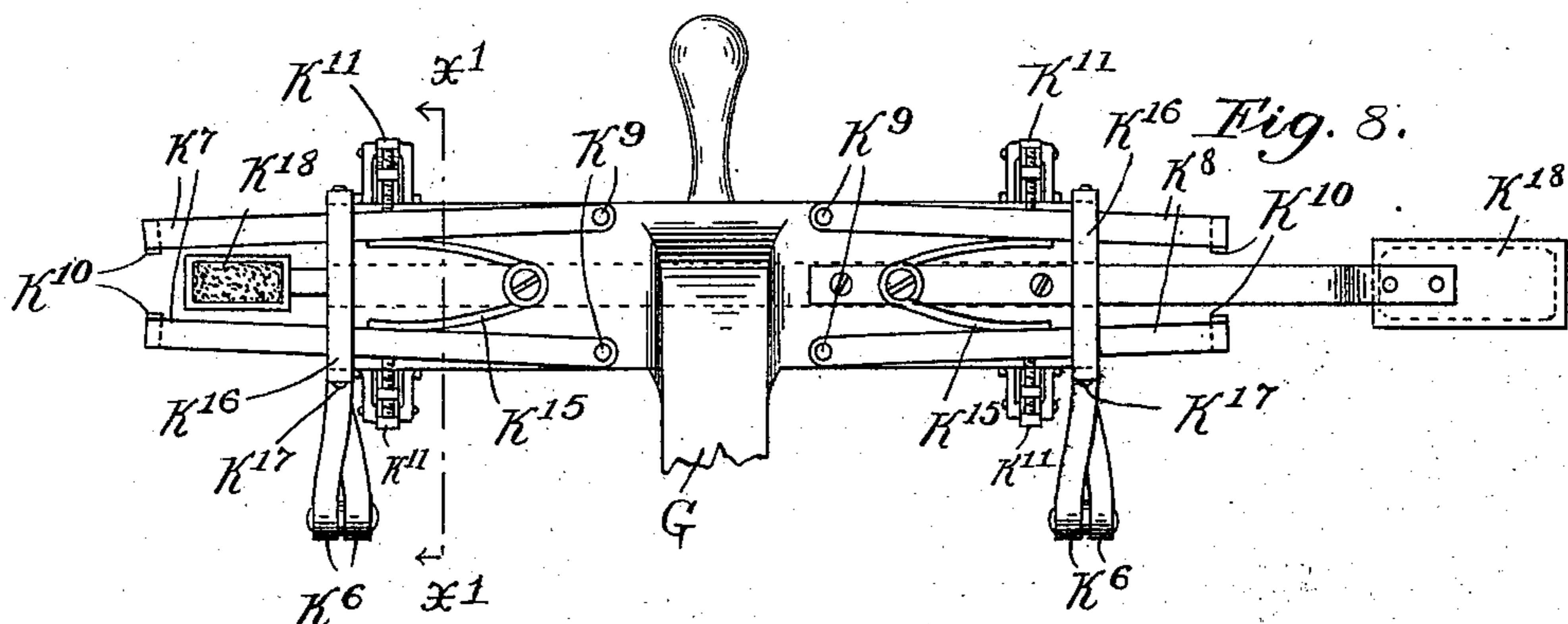
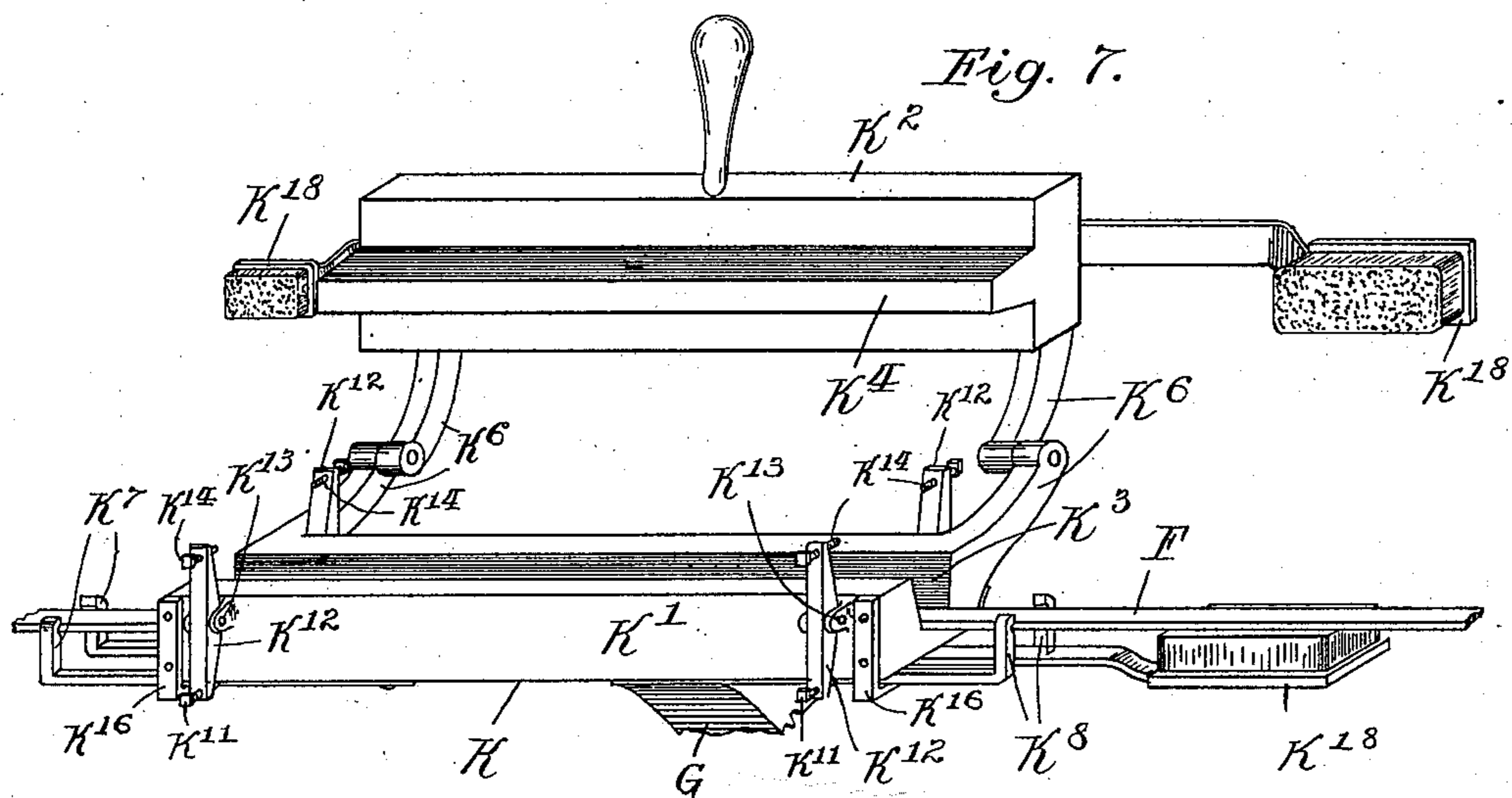
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(No Model.)

12 Sheets—Sheet 4.



Witnesses:

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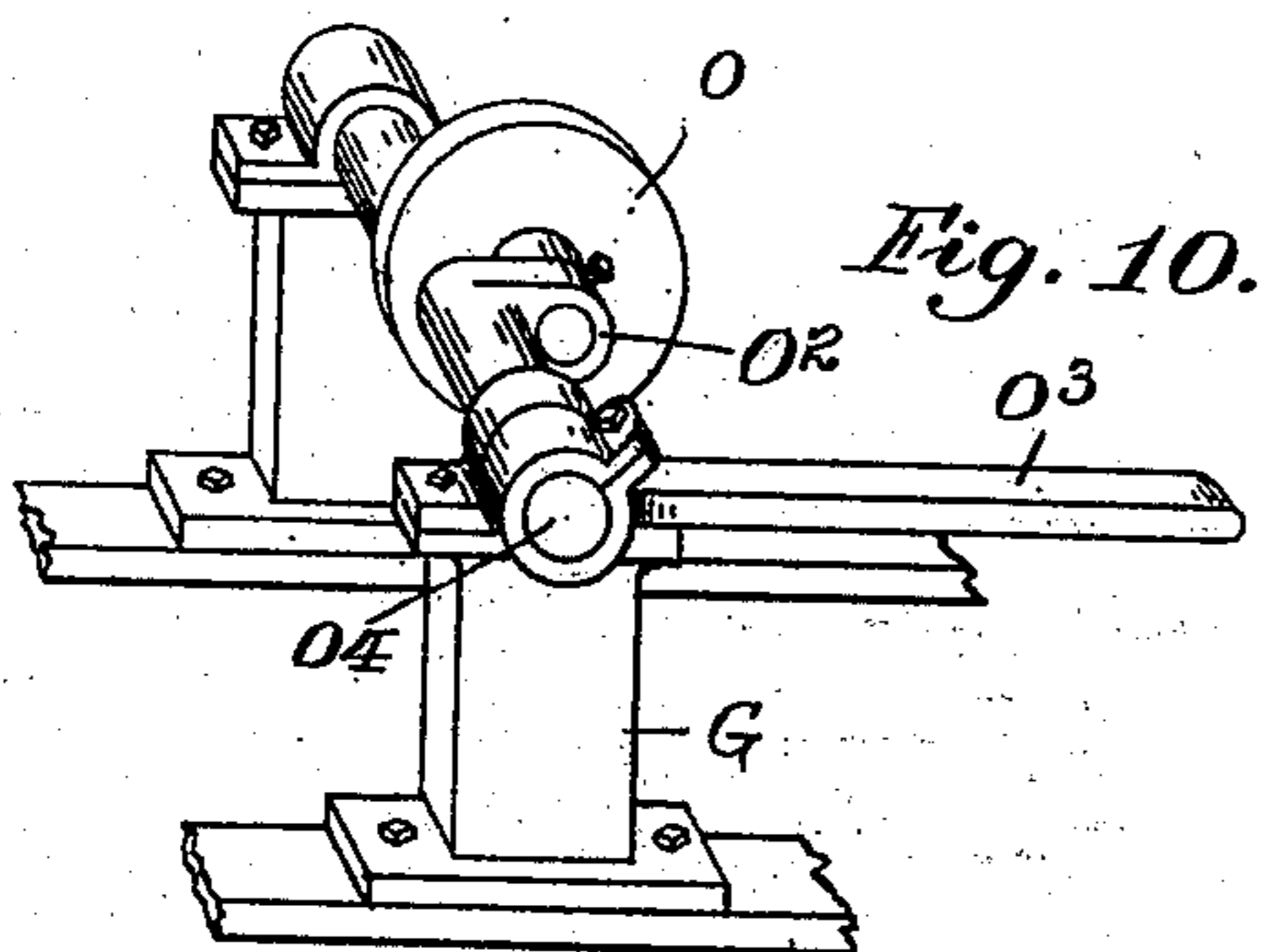
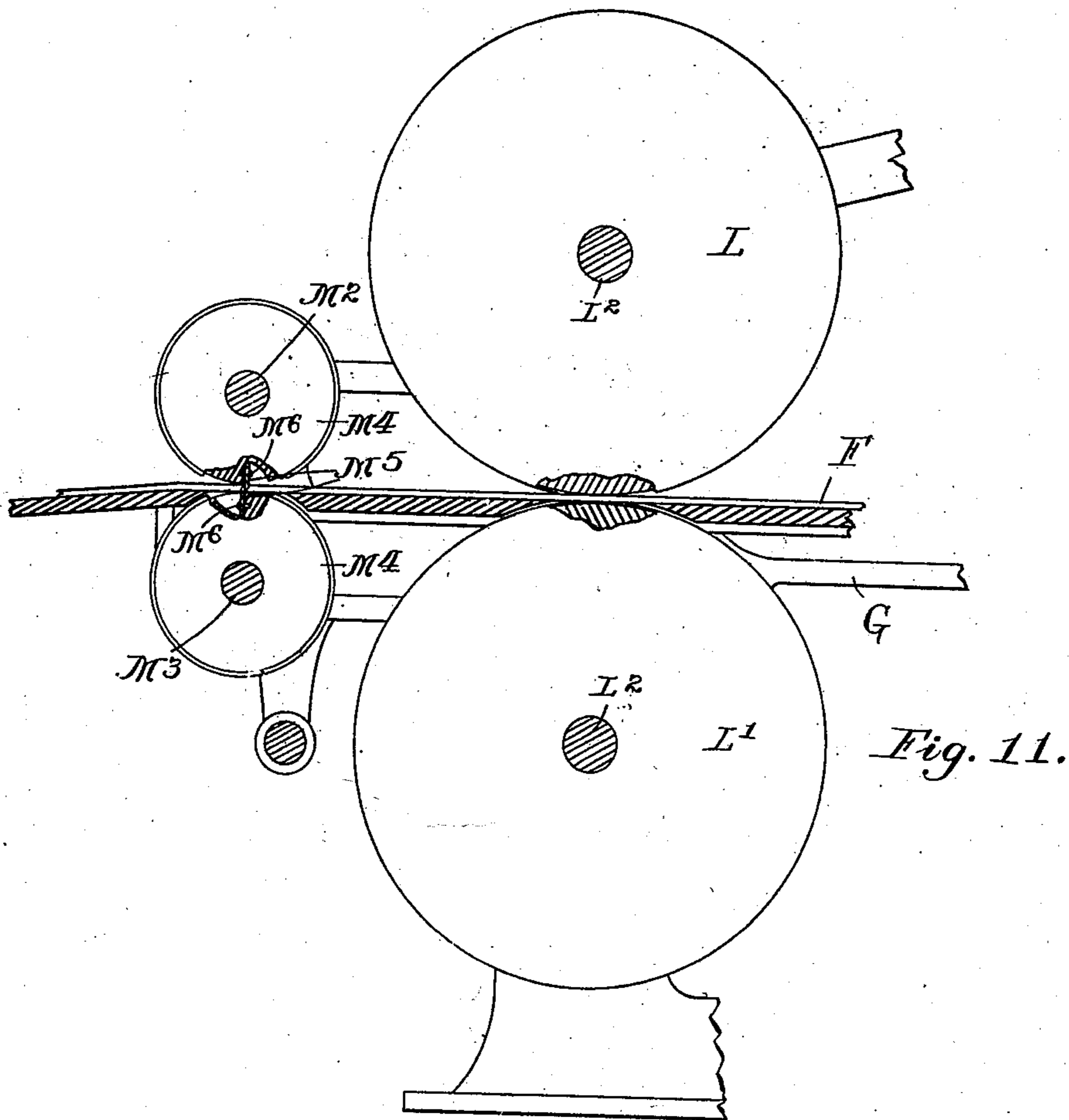
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(Application filed Jan. 12, 1900.)

12 Sheets—Sheet 5



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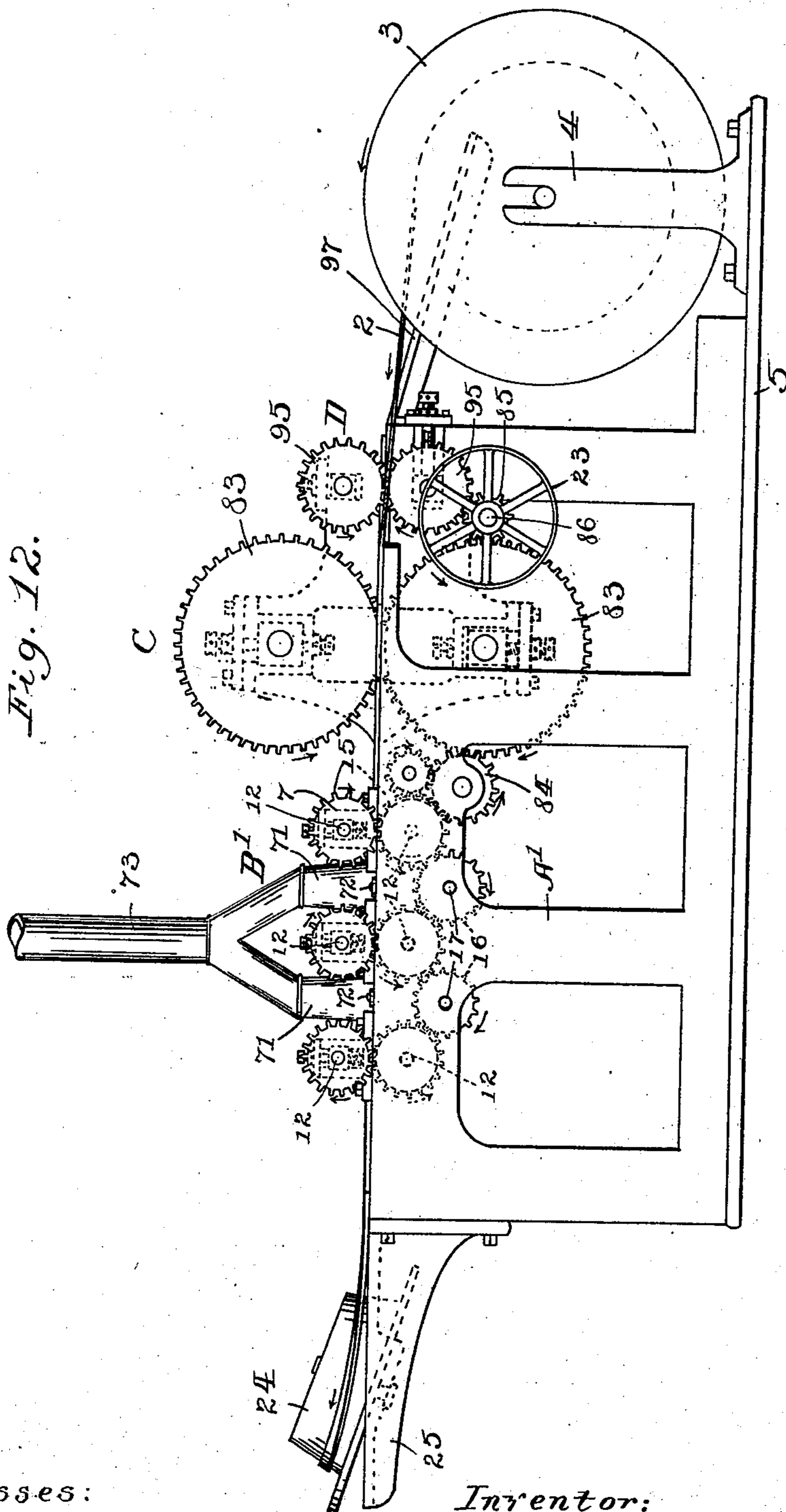
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C. C. WEBSTER.
STRIP METAL FINISHING MACHINE.

(No Model.)

(Application filed Jan. 12, 1900.)

12 Sheets—Sheet 6.



Witnesses:

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Patented Mar. 19, 1901.

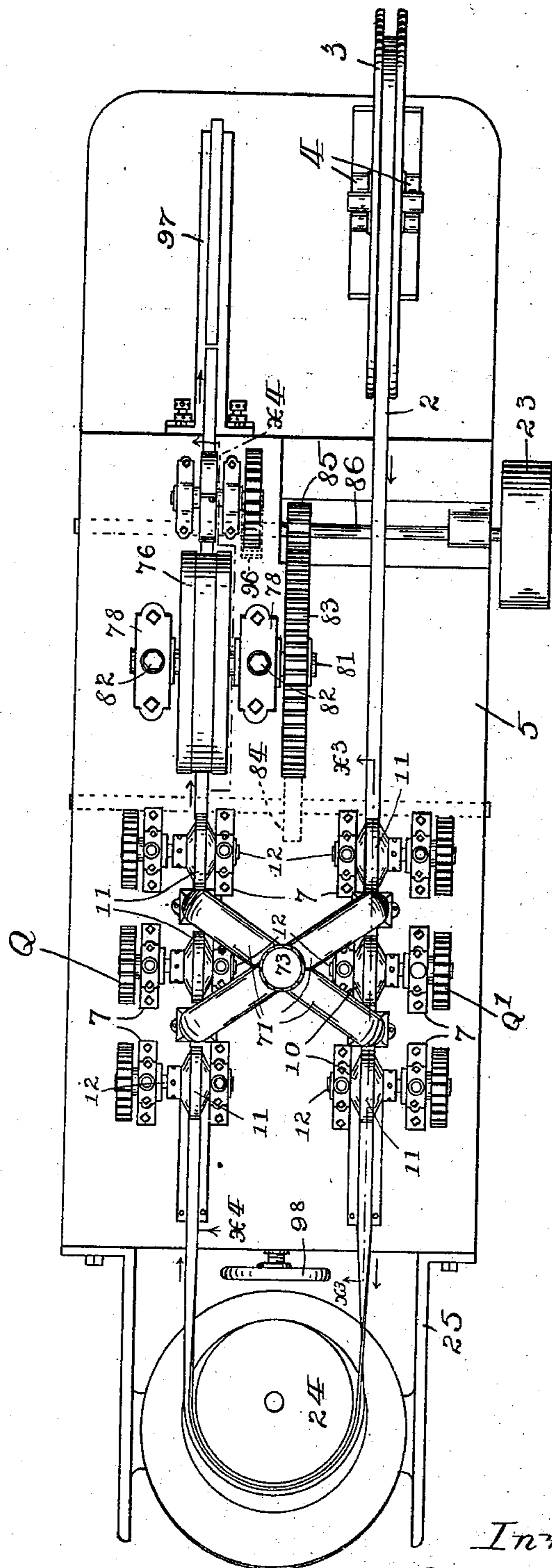
C. C. WEBSTER.
STRIP METAL FINISHING MACHINE.

(No Model.)

(Application filed Jan. 12, 1900.)

12 Sheets—Sheet 7.

Fig. 13.



Witnesses:

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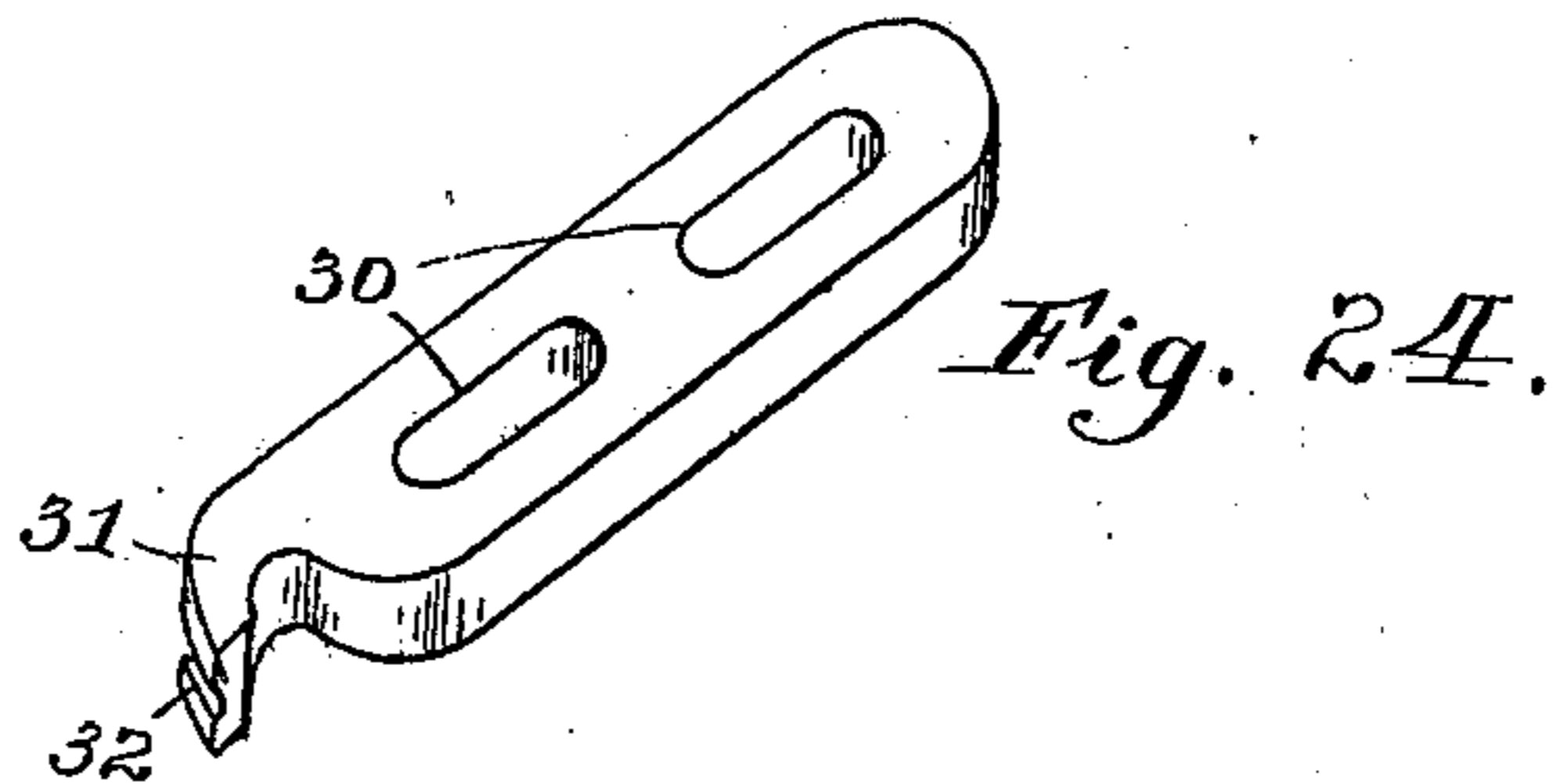
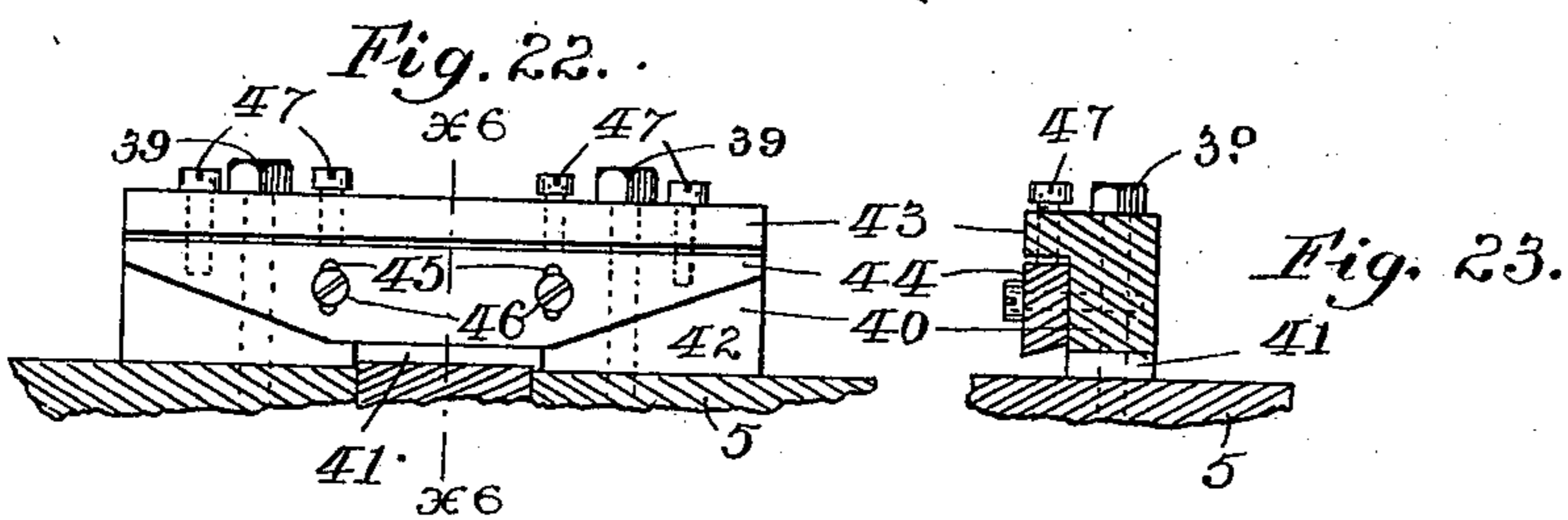
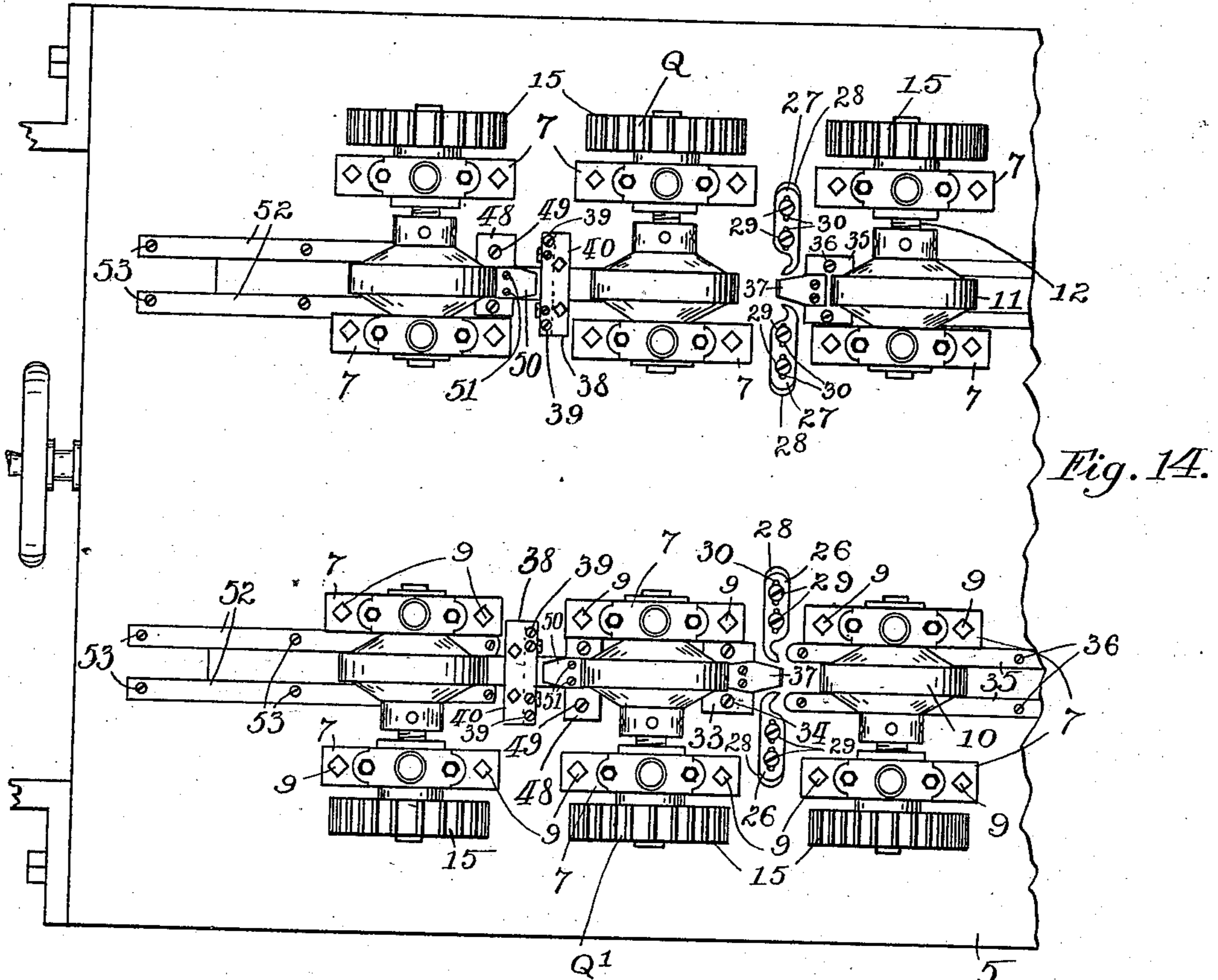
C. C. WEBSTER.

STRIP METAL FINISHING MACHINE.

(No Model.)

(Application filed Jan. 12, 1890.)

12 Sheets—Sheet 8.



Witnesses:

L. E. Wickman
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Patented Mar. 19, 1901.

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STRIP METAL FINISHING MACHINE.

(No Model.)

(Application filed Jan. 12, 1900.)

12 Sheets—Sheet 9.

Fig. 15.

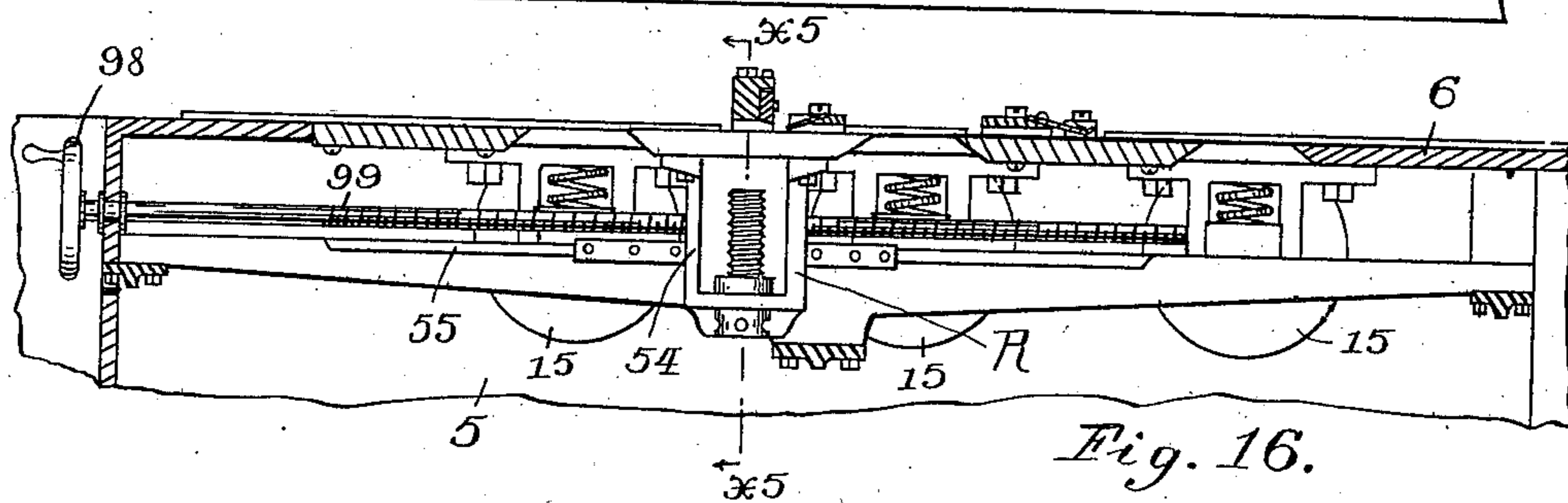
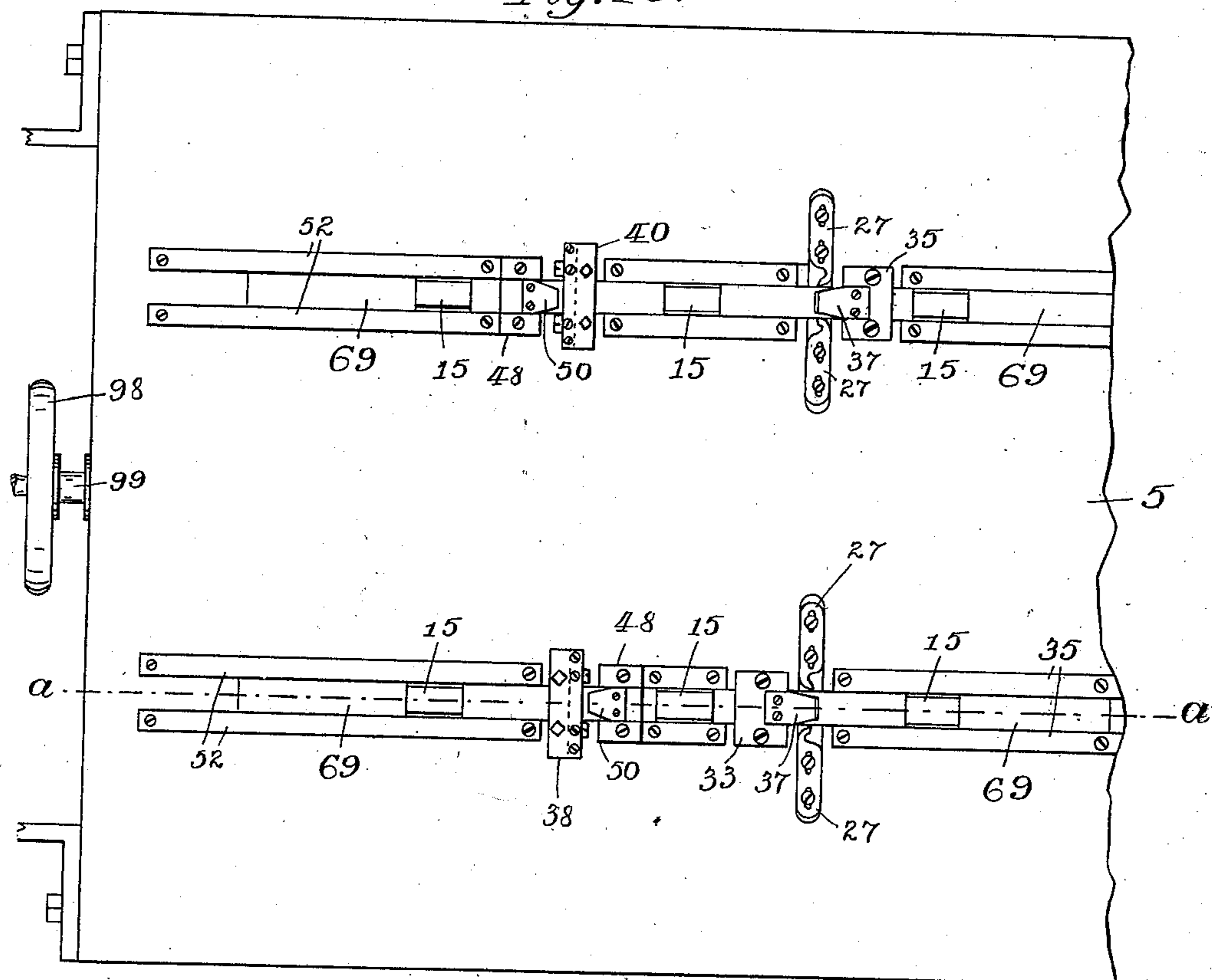


Fig. 16.

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(No Model.)

(Application filed Jan. 12, 1900.)

2 Sheets—Sheet 10.

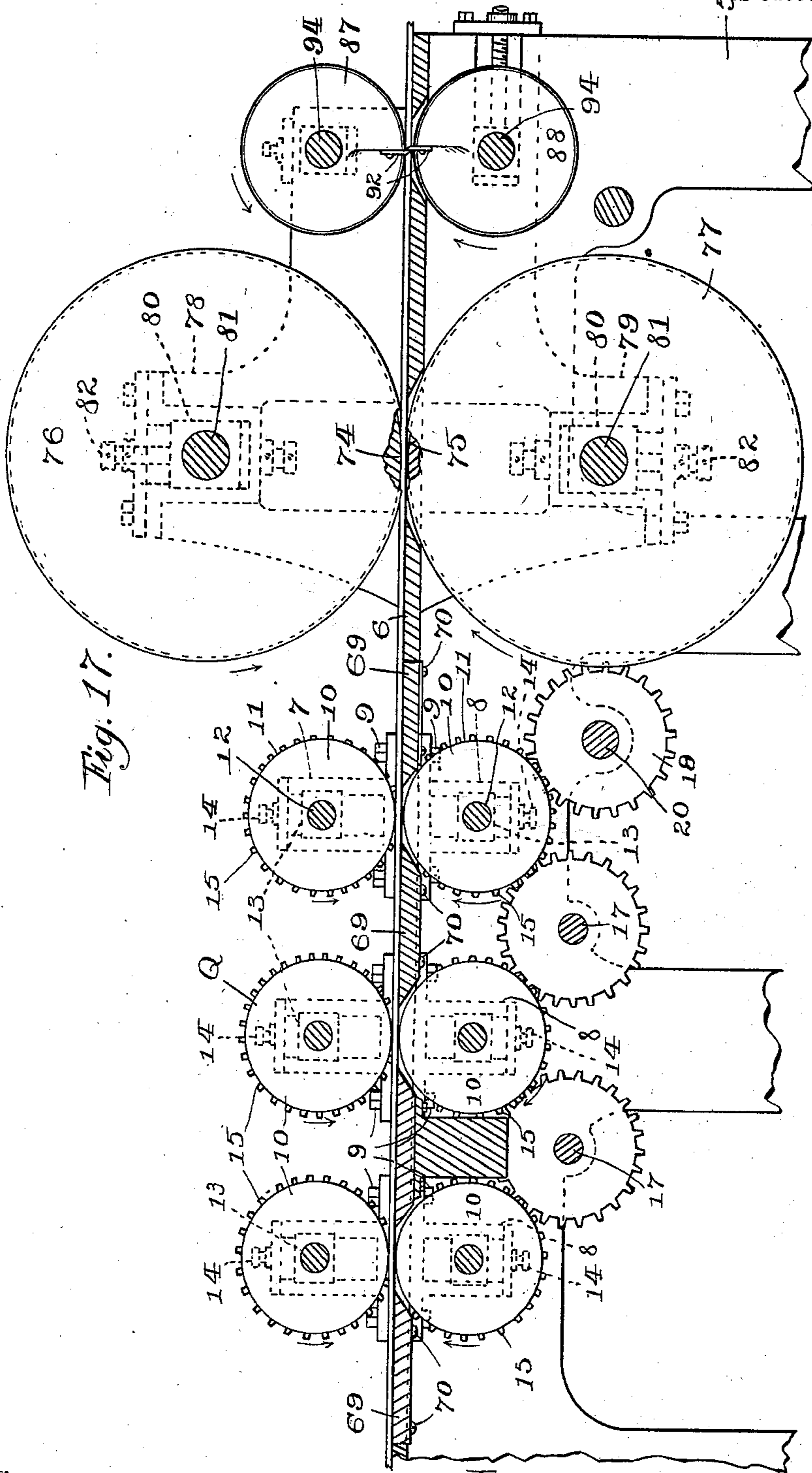


Fig. 17.

Witnesses:

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12 Sheets—Sheet II.

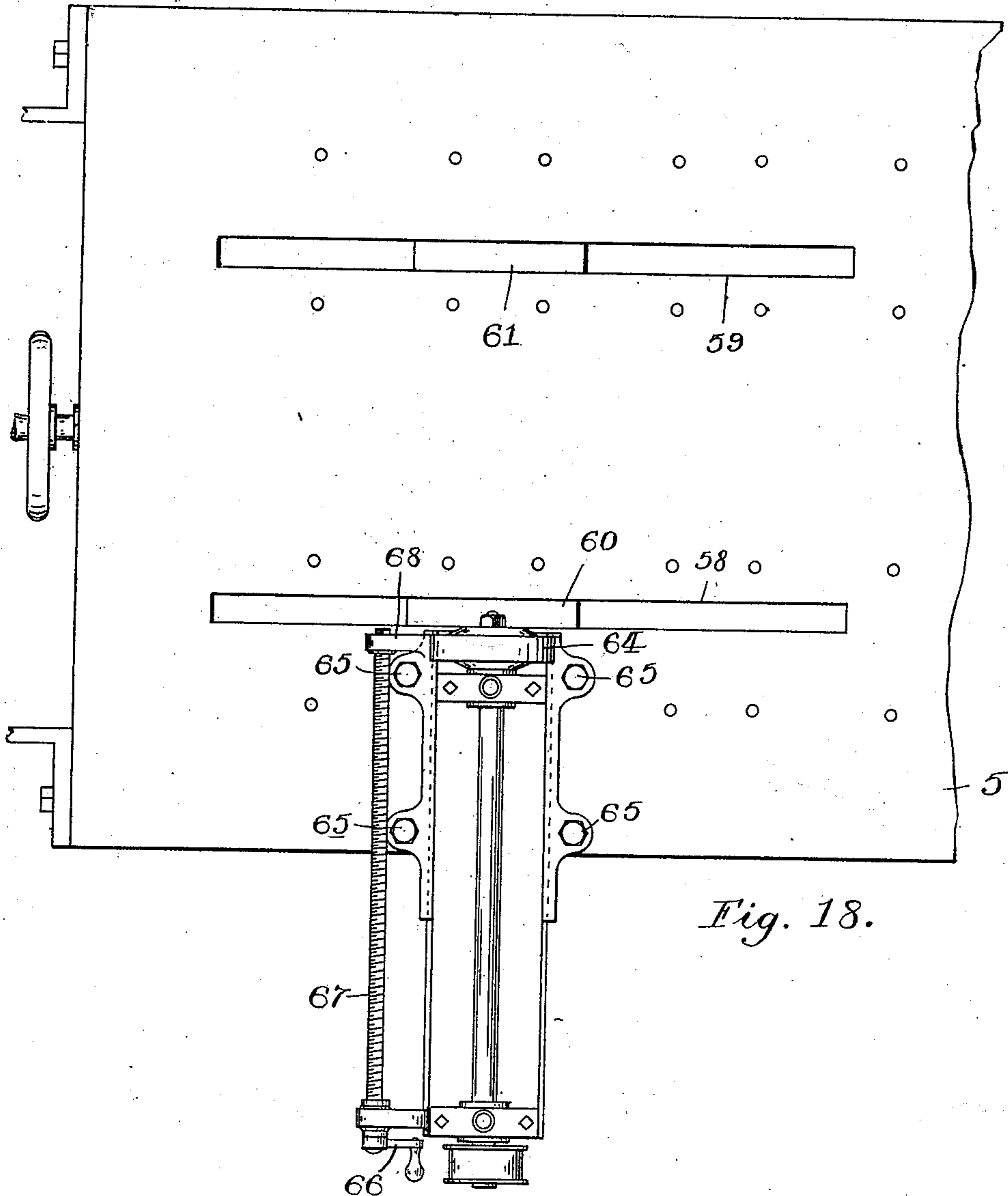


Fig. 18.

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Patented Mar. 19, 1901.

C. C. WEBSTER.
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(Application filed Jan. 12, 1900.)

(No Model.)

12 Sheets—Sheet 12.

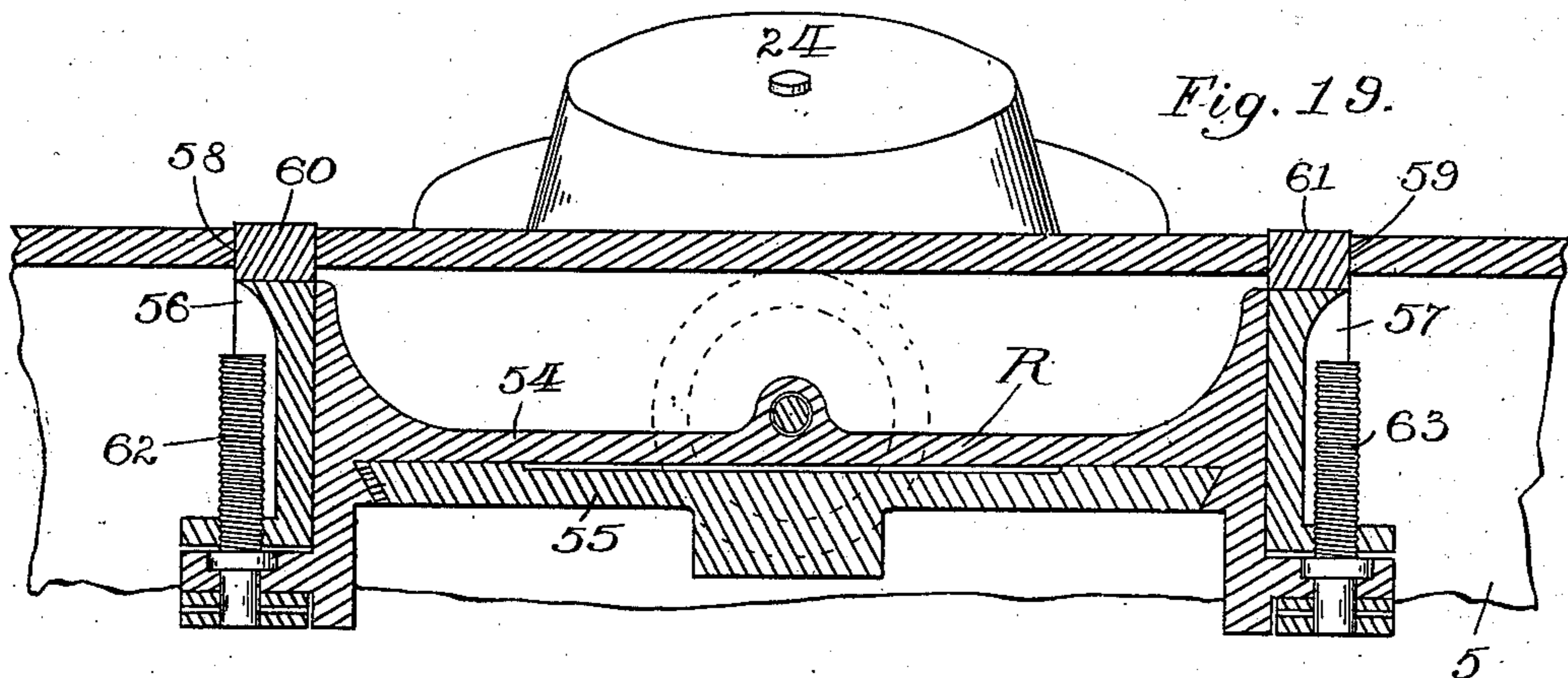


Fig. 19.

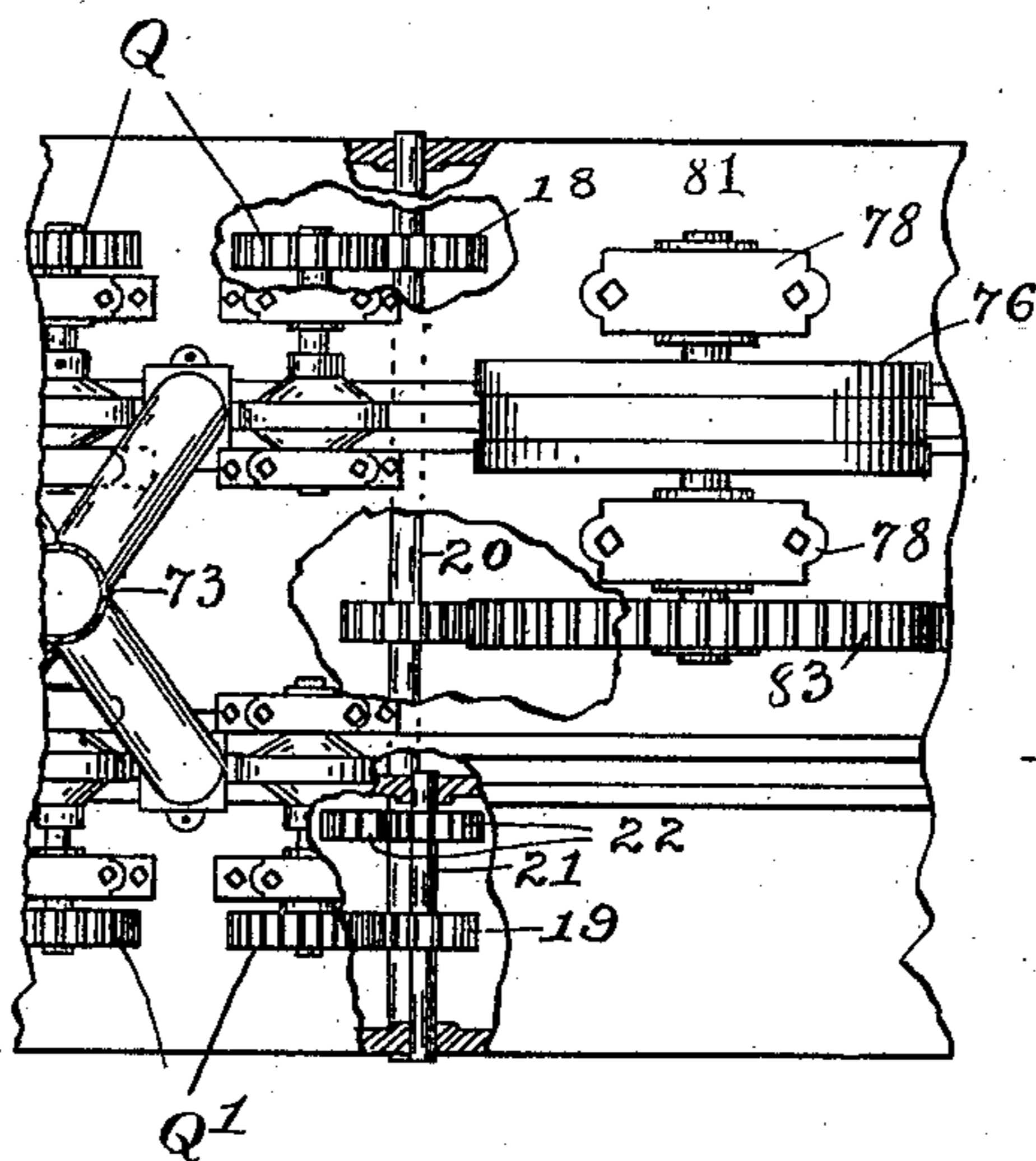


Fig. 20.

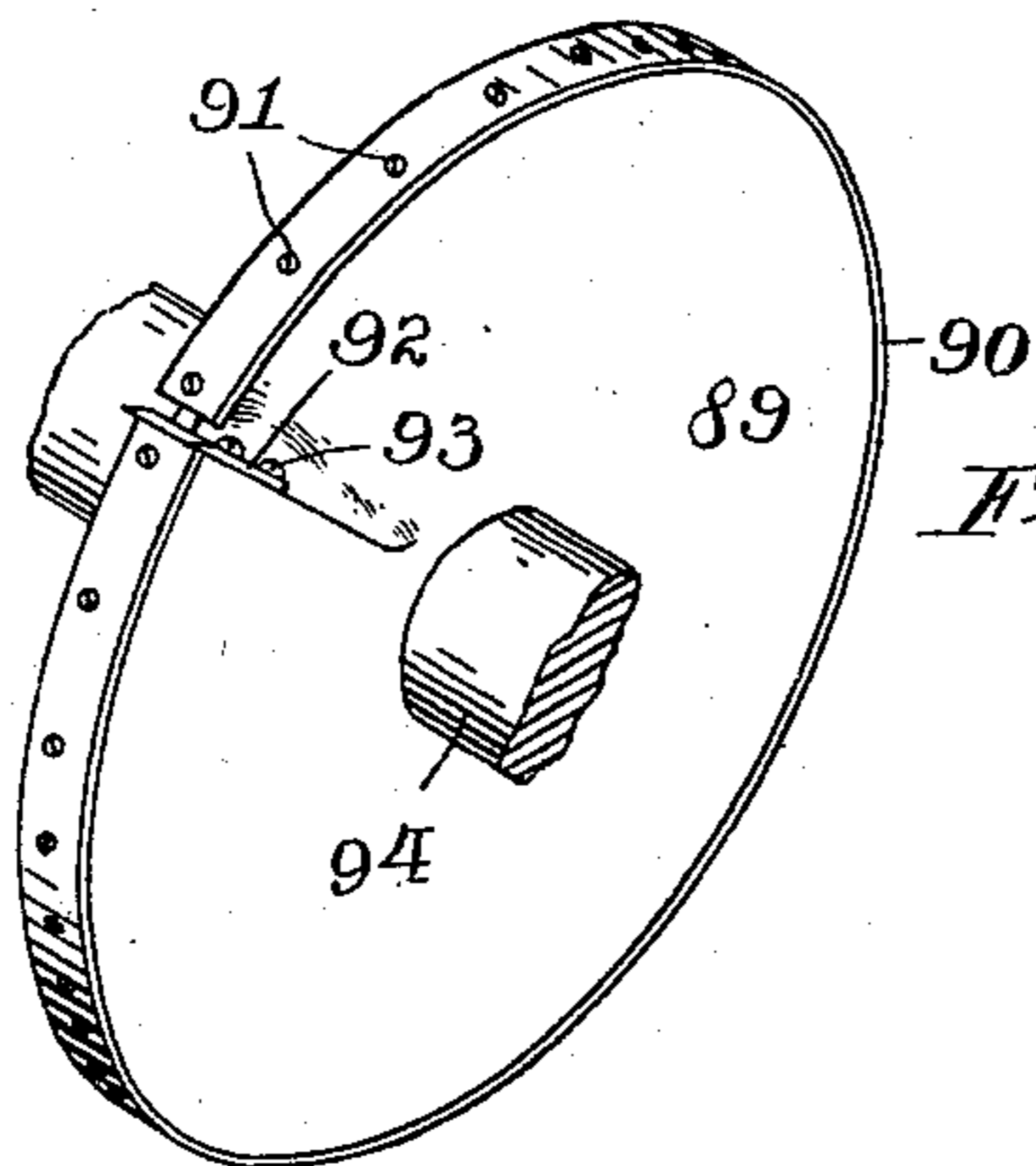


Fig. 21.

Witnesses:

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UNITED STATES PATENT OFFICE.

CYRUS C. WEBSTER, OF MINNEAPOLIS, MINNESOTA.

STRIP-METAL-FINISHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 670,352, dated March 19, 1901.

Application filed January 12, 1900. Serial No. 1,205. (No model.)

To all whom it may concern:

Be it known that I, CYRUS C. WEBSTER, a citizen of the United States of America, and a resident of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Strip-Metal-Finishing Machines, of which the following is a specification.

My invention relates to improvements in strip-metal-finishing machines, the object being to provide means for smoothing the surfaces and edges, for reducing to even thickness and width, and cutting into even lengths continuous strips of printer's lead or other metal or substances with a minimum amount of labor and expense.

In this my invention the metal strip is carried by rollers past surface-trimming knives and between edge-trimming knives, also between reduction-rollers for finishing the surfaces of the strip and between knives for cutting the strip into equal lengths.

By the use of my improved machine printers' leads and strips of metal are produced which are uniform in width and thickness to within one-thousandth part of an inch.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of my improved finishing-machine. Fig. 2 is a plan view of the same. Fig. 3 is a perspective view of the spool used with my improved machine. Fig. 4 is a diametral cross-section of Fig. 3. Fig. 5 is a detail cross-section of Fig. 4, taken on the line X X. Fig. 6 is a perspective view of one of the surface-trimming knives and its adjustable supporting-frame. Fig. 7 is a perspective view of the edge-trimming knives and the guide for the strip, which is shown open. Fig. 8 is a view looking at the bottom of the edge-trimming knives and the guide, which is shown closed. Fig. 9 is a cross-sectional view taken on the line X' X' of Fig. 8. Fig. 10 is a perspective view of one of the strip-tension rollers. Fig. 11 is a sectional view of the finishing and cutting rollers taken on the line X² X² of Fig. 2. Fig. 12 is a side elevation of an alternate construction of my improved finishing-machine. Fig. 13 is a plan view of Fig. 12. Fig. 14 is an enlarged plan view of a detail portion of the alternate construction. Fig. 15 is a similar view showing the upper

carrying-rollers removed. Fig. 16 is a sectional view of Fig. 13, taken on the line X³ X³, with one of the lower and both of the upper sets of carrying-rollers and the operating-gears removed. Fig. 17 is a detail sectional view in elevation, taken on the line X⁴ X⁴ of Fig. 13, with the air-pipes removed. Fig. 18 is a detail plan view of the alternate construction with the rollers removed, showing an emery-wheel attached to the frame for trimming the working-surface blocks of the carriage. Fig. 19 is a detail cross-section, taken on the line X⁵ X⁵ of Fig. 16, with surface-trimming knives removed and looking in the direction of the arrows. Fig. 20 is a detail plan view of the alternate construction, showing parts of the frame broken away to more clearly show the gearing for operating the rollers. Fig. 21 is a perspective view of one of the cutting-wheels used with the alternate machine. Fig. 22 is a front elevation of one of the surface-trimming knives used with the alternate construction, shown attached to the frame of the machine. Fig. 23 is a cross-section taken on the line X⁶ X⁶ of Fig. 22. Fig. 24 is a perspective view of one of the edge-trimming knives used with the alternate construction.

In the drawings let A represent my improved finishing-machine; B, that part of the machine for trimming the surfaces of the metal strips; C, that part for trimming the edges; D, that part for smoothing and reducing its surfaces to the desired size, and E that part for cutting it into equal lengths.

The unfinished strip F is wound upon the spool F', which is journaled upon the frame G. This frame is a skeleton of suitable shape for supporting all the working parts of the machine. A pair of wheels H and H' are journaled upon the frame with their peripheral faces in diametral alinement. The purpose of these wheels is to draw the strip from the spool, and they are continuously revolved in opposite directions by the gears H² and the drive-pulley H³. The spool is positioned above the carrying-wheels, and the strip is passed around the wheel H and over the wheel H'. These wheels are revolved in the direction of the arrows, as shown in Fig. 1. The spool is mounted upon shaft F², which carries the friction-pulley F³, over which the band F⁴

passes. One end of the band is fixed to the arm F⁵ of the frame and the other end to the arm F⁶ by the adjusting-nut F⁷. The spool is thus held under tension to keep the strip even upon the surface of the carrying-wheel H when the machine is in operation.

The side F⁸ of the spool is formed with the radial slot F⁹, in which is slidably mounted the clamp F¹⁰. The spool is formed with hub F¹¹, which has recess F¹². The clamp is formed so as to fit the recess and is provided with cutting edge F¹³, which coöperates with the shoulder F¹⁴ of the recess, so as to cut the strip in two when the clamp is forced into depressed position, as shown in Figs. 3 and 5, in which position it clamps the strip to the spool by means of the tension-spring F¹⁵, so as to form an even lap when the spool is wound. The ends of this spring are fixed to the clamp and to the lug F¹⁶ on the side of the spool.

The knives I I² are planing-tools adapted to smooth the faces of the metal strip and are hereinafter designated the "surface-trimming" knives. They are positioned with their cutting edges facing the wheels H H' and are fastened to the carriages I³ and I⁴ by bolts I⁵. These carriages are mounted on shafts I⁶ and I⁷, which are movably mounted in the frame G. To each shaft a lever-arm I⁸ is fixed, which may be raised and lowered, so as to adjust the cutting edges of the knives to the strip, by means of bolts I⁹, which pass through the ears I¹⁰ of the frame and bear against the ends of the levers. It is evident that the cutting edges of the knives admit a very delicate adjustment. A plate I¹¹ is also mounted on each of the carriages and fastened by bolts I¹². Each plate is formed with the depending spring-tongue I¹³, which is positioned adjoining the cutting edge of the knife, so as to bear against the strip and keep the same from chattering when the machine is in operation. A guide I¹⁴ is mounted on each of the plates I¹² by screws I¹⁵ and is provided with shoulders I¹⁶, which guide the strip past the cutting edge of the knife.

After the surfaces of the strip have been cut by the trimming mechanism B the strip is passed over the stationary apron J to the edge-trimming mechanism C. This mechanism consists of the block K, which is formed with the lower and upper sections K' and K². The lower section contains the channel K³, into which the rib K⁴ projects, so as to form the guide-opening K⁵, through which the strip is carried. The two sections of the block are provided with hinges K⁶, so that they may be opened and closed for convenience in inserting the strip into the machine. The pairs of knives K⁷ and K⁸ are pivotally mounted upon the lower section of the block by pins K⁹, with the cutting edges K¹⁰ toward the edges of the strip. These knives are arranged so that the pair K⁷ will reduce the width of the strip and the pair K⁸ deliver the finish cut. The knives are adjusted in position by the set-bolts K¹¹, which are carried by the levers K¹². These le-

vers are pivoted to the lower frame by pins K¹³ and extend so as to carry the adjustable bolts K¹⁴. The upper section K² is formed so that its sides are adapted to impinge against these bolts and swing the levers, thereby shifting the edge-trimming knives into working position when the block is closed. When the block is open, the expansion-springs K¹⁵, which are mounted between the knives upon the block, swing the knives from working position. The knife-guides K¹⁶ are fastened to the lower block by bolts K¹⁷. It is thus seen that the knives are automatically swung into and out of working position when the block is closed and opened. The block is rigidly mounted upon the frame G. Brushes K¹⁸ are attached to the block and positioned so as to sweep the shavings from the strip and prevent the clogging of the working parts of the machine.

After leaving the edge-trimming mechanism C the strip enters the finishing part D. This part of the machine consists of two reduction-rollers L and L', which are positioned with their grooved peripheral faces adjoining. These rollers are mounted on shafts L², which are vertically journaled one above the other in journal-blocks L³. The blocks slide in the frame and are adjustable by means of bolts L⁴. The peripheral faces of the reduction-rollers are adjusted so as to bear upon the surfaces of the strip and reduce its thickness. The rollers are provided with gears L⁵ and L⁶, which are mounted upon shafts and mesh together. The lower gear connects with the drive-pulley by the intermeshing pinion L⁷, mounted on the shaft L⁸, carrying the gear L⁹. The gear L⁹ meshes with the gear L¹⁰, which in turn meshes with gear L¹¹, and that with gear L¹². The latter gear is mounted on the drive-shaft L¹³, which carries the pulley H³. It is thus seen that the reduction-rollers revolve in the direction of the arrows shown in Fig. 1 and operatively connect with the drive-pulley. From the reduction-rollers the strip passes between the cutting-knives M and M', which are mounted on shafts M² and M³. These knives consist of the disk-frame M⁴, the peripheral faces of which are positioned so as to carry the strip between them. The circumference of each disk is equal to the desired length of the strip to be severed. The cutting-blades M⁵ are fastened to the frames by screws M⁶ and are adapted to cooperate and clip the strip each revolution of the disks. The knives are revolved by the intermeshing gears M⁷ and M⁸, which are mounted on the shafts carrying the cutting-knives. The gear M⁸ meshes with the pinion L⁷. It is thus seen that the knives are connected with the drive-shaft and are operated by the same train of gearing which operates the reduction-rollers. From the cutting-knives the lengths of finished strip pass onto the delivery-frame N.

My machine is provided with tension mechanism consisting of friction-rollers O and O',

of rubber or other suitable material, which bear upon the strip as it passes between them and the peripheral faces of the carrying-wheels H and H'. Each roller is journaled
 5 on a crank O², which is movably mounted on the frame A. A lever-arm O³ is fixed to the crank-shaft O⁴ and is held by adjusting-bolts O⁵, which pass through the lips O⁶ on the frame. By turning the bolts the levers may
 10 be raised and lowered and the pressure of the friction-rollers adjusted on the strip.

Before starting the machine the parts are adjusted as to speed, tension, and cutting contact by the mechanism already described
 15 in detail.

In operation, the unfinished strip metal having been wound upon the spool, the latter is slipped upon the shaft F², which is fastened to the machine-frame by bolts F¹⁷. The
 20 strip passes first around the wheel H, between the roller O and said wheel, then over the wheel H' and between it and the friction-roller O', through the guide-block K, then between the reduction-rollers, and finally be-
 25 tween the cutting-knives. In the alternate construction the unfinished strip 2, wound upon the spool 3, is introduced into the machine A' by journaling the spool upon the standards 4, which are fastened to the frame
 30 5. The frame is formed with a bed-plate 6, upon the upper and lower faces of which, respectively, the pairs of upper and lower journal-bearings 7 and 8 are mounted and fastened by means of bolts 9. Each pair of jour-
 35 nals carries rollers 10, which are positioned in vertical alinement and spaced so as to carry the strip when revolving. Each roller is provided with a frictional disk 11, composed of leather, rubber, or other suitable material,
 40 which is substantially equal in thickness to the width of the strip. Each roller is mounted on a shaft 12, which is passed through the sliding block of the journal. This sliding block 13 is adjustable in height by means of
 45 bolts 14. Each shaft carries a gear 15, all of equal size, and the upper gears mesh with the lower gears, so as to operate the carriage-rollers at a uniform speed and in the direc-
 50 tion indicated by the arrows. A double train of three pairs of rollers, which are arranged in alinement and closely adjacent, is placed on each side of the bed-plate, the train on one side being parallel to that on the other. The intermediate gears mesh with each of the
 55 lower gears and are journaled on the counter-shafts 17, which are journaled on the frame. Each train of rollers is operated by the driving-gears 18 and 19, which mesh, respectively, with the trains of gears Q and Q', as shown in Fig. 20. The gear 18 is mounted
 60 on shaft 20, which extends across and is journaled in the frame. The gear 19 is mounted on the counter-shaft 21, which is operatively connected to the shaft 20 by intermeshing
 65 gears 22. The shaft 20 is operatively connected to the drive-pulley 23 by means to be hereinafter described. The metal strip is

carried from the spool by the first, second, and third pairs of rollers successively of the train Q', as shown in Fig. 13, around the in- 70
 clined idle pulley 24, which is journaled on the extension 25 of the frame. The rollers of train Q then return the strip toward the end of the machine at which it entered. Be-
 75 tween the first and second upper rollers of train Q' and between the second and third upper rollers of train Q are positioned, respectively, the pairs of edge-cutting knives 26 and 27, which are fastened adjustably in
 80 the recessed grooves 28 of the bed-plate by means of bolts 29, passing through the slots 30 of each knife. The trimming-knife is formed with the nose 31, having a groove 32. Each pair of knives is positioned with the
 85 cutting edges toward the approaching strip and adjusted to trim the same. Guide-blocks 33 are fastened to the bed-plate of the frame by screws 34 and guide-bars 35 by means of screws 36. The guide-blocks are provided
 90 with pressure-springs 37, which are adapted to bear upon the face of the strip and, with the bars, guide and keep the strip firmly in position when moving. Between the second
 95 and third upper rollers of train Q' and the first and second upper rollers of train Q are respectively fastened the strip-surface-trimming knives 38 by means of bolts 39, passing into the bed-plate. These knives consist of
 100 blocks 40, (shown in Figs. 22 and 23,) formed with grooves 41, (through which the metal strip travels,) the forward face 42, and the overhang 43. The knife-blade 44 is provided with slots 45, through which the screws 46
 105 pass. Adjusting-screws 47 pass through the overhang 43 for the purpose of adjusting the height of the cutting edge of the knife, which is positioned so as to shave or trim the face of the strip. The strip guide-blocks 48 are
 110 fastened to the bed-plate by screws 49 and are provided with bearing-springs 50, fastened by screws 51, and the guide-bars 52 are fastened to the bed-plate by screws 53. These guide-bars, with the guide-blocks, serve a similar purpose in guiding the strip as
 115 those above described for use with the edge-trimming knives. The strip 2 upon emerging from the train of rollers Q' and passing around the idle pulley 24 makes a half-turn, which reverses the faces of the strip, so that the surface-trimming knife cuts the opposite
 120 face in train Q to that which was cut in train Q'. A false bed-plate R is positioned between the second and third pairs of rollers of train Q', and the first and second of Q provide a true surface for the strip to travel
 125 over below the surface-trimming knives. This false bed-plate consists of the frame 54, which is gibbed upon the track 55 of the frame 5 and is formed with vertical side T's 56 and 57, which are positioned, respectively,
 130 below the slotted openings 58 and 59 in the bed-plate. The steel surface-bars 60 and 61 are adapted to slide in the openings 58 and 59. These bars are mounted upon the car-

riage and are vertically adjustable by means of threaded bolts 62 and 63. The slots 58 and 59 are of sufficient length so that the steel plates can be moved past an emery-wheel 64 by means of the handle 98, carrying a rod 99, which is threaded to the carriage for truing these surfaces when so desired. This emery-wheel is removable from the frame by unscrewing the bolts 65, which fasten it, and can be shifted over either of the steel bars by means of the hand-wheel 66, carrying the screw 67, which is threaded to the carrier-frame 68. When the machine is in operation, the emery-wheel is removed from the frame of the machine and the steel bars are positioned as shown in Fig. 17 and false strips 69 inserted in the open portion of the slot, so as to present a true surface below the trimming-knives for the strip to pass over. The false strips are fastened by means of screws 70. For convenience in removing the shavings from the machine air-suction pipes 71 (fastened to the bed-plate by screws 72) are placed above the surface and edge trimming knives. These suction-pipes connect with a common delivery-pipe 73, leading to an exhaust-fan. (Not shown.) The strip upon emerging from the second train of rollers passes between the grooved faces 74 and 75 of the rollers 76 and 77, which are in alinement with train Q of rollers. These rollers 76 and 77 are journaled one above and one below the surface of the bed-plate in pillow-blocks 78 and 79, which are formed as integral parts of the frame of the machine and are adjustable by means of journal-blocks 80, through which the shafts 81, carrying the reduction-rollers, are mounted and adjusted by bolts 82. The peripheral faces of the reduction-rollers are adjusted so as to smooth the surfaces of the strip and reduce to even thickness. The shafts 81 are provided with gears 83, which intermesh. The lower gear 83 connects with the gear 84, which is mounted on the shaft 20, to operate the portion B' of the machine. The lower gear also meshes with the pinion 85, carried by the shaft 86 of the driver 23. After leaving the reduction-rollers the strip passes between the cutting-knives 87 and 88, which are journaled in the pillow-blocks. These knives consist of the disk rollers 89, as shown in Fig. 21, carrying on their peripheral faces the friction-strips 90, which are fastened by screws 91 or other suitable means. To these rollers the knife-blades 92 are fastened by screws 93. The disks are positioned so that the knife-blades mesh and cut the strip in two. It is obvious that the circumference of the disks are equal to the desired length of the strips to be cut. The disks are mounted on the shafts 94, which carry the intermeshing gears 95. The lower gear meshes with the driving-pinion 96, mounted on the drive-shaft 86. From the cutting-knives the finished sections of the strip pass onto the delivery-way 97, from which they are removed

by hand or by a mechanically-operated conveyer. (Not shown.)

Having described my invention, what I claim as new, and desire to protect by Letters Patent, is—

1. In a strip-metal-finishing machine, a pair of reduction-rollers, a severing-knife attached to a disk supported by journal-bearings, carrying-wheels, driving mechanism for simultaneously transmitting power to said parts, a plurality of stationary planing-tools, and adjusting mechanism; said parts being operatively mounted upon a horizontal frame.

2. A strip-metal-finishing machine, consisting in combination of driving mechanism for imparting motion to the strip and reversing the same, trimming-knives facing each surface of the strip, reduction-rollers between which the strip is passed, and a supporting-frame for said parts.

3. A strip-metal-finishing machine, consisting in combination of driving mechanism for imparting motion to the strip and reversing the same, trimming-knives facing each surface of the strip, reduction-rollers between which the strip is passed, mechanism for adjusting said parts and guiding the strip, and a supporting-frame for said parts.

4. A strip-metal-finishing machine, consisting of a frame, edge and surface trimming knives mounted upon said frame, reduction-rollers by which the strip is carried and reduced to even thickness, means for cutting said strip into equal lengths, and means for moving and guiding said strip.

5. A machine of the class described, consisting of means for carrying the strip, knives for trimming the edges and surfaces of said strip, reduction-rollers and apportioning-knives, having means for driving the same, and a suitable supporting-frame; said parts being operatively arranged.

6. A machine for finishing metal strips, consisting of a series of journaled carrying-rollers, stationary edge and surface trimming knives, journaled reduction-rollers, mechanism for guiding and cutting said strip into equal lengths, driving mechanism for moving said strip, and a frame carrying said parts.

7. In a machine of the class described, the combination of trains of rollers and gears, a pair of reduction-rollers, and stationary surface and edge trimming knives, all mounted upon a frame; whereby strips of metal are drawn through said machine and successively planed upon both faces and edges, its faces smoothed and the strips cut into desired lengths.

8. In a machine of the class described, the combination with a frame and means for reversing the strip, of carrying-rollers, edge and surface trimming knives, reduction-rollers, revoluble knives, and means for operating said parts and moving the strip; said parts being arranged on said frame so that the strip will first move in contact with the cutting

edges of the edge and surface trimming knives, then between the reduction-rollers, and finally between the revoluble knives.

9. In a machine of the class described, a series of carrying-rollers, suitable guides, edge-trimming knives, surface-trimming knives, reduction-rollers and knives for cutting the strip into equal lengths, in combination with a suitable frame upon which all of said parts are mounted and operatively arranged, and driving means whereby the strip is moved and its edge and surface trimmed and finished, as shown, and for the purposes specified.

10. The combination in a machine of the class described, of a suitable frame, having a bed-plate, stationary edge and surface trimming knives adjustably mounted upon said bed-plate, for respectively truing the edges and surfaces of the strip, means for reversing the strip, the knives for cutting the strip into equal lengths and driving means for operating said parts.

11. The combination with the frame, carrying edge and surface trimming knives, reduction-rollers, means for cutting the strip into equal lengths and means for moving and guiding said strip, of longitudinal bars 60 and 61 positioned in slots 58 and 59 of said bed-plate, having means of vertical adjustment, a carriage for said bars having reciprocating means, and false strips for closing a portion of said slots, as shown, and for the purposes specified.

12. In a strip-finishing machine the combination of the planing-tools I and I², a pair of reduction-rollers L and L', severing-knives M and M', carrying-wheels H and H', guides I¹⁴, adjusting mechanism for said parts, all of which are operatively mounted upon a frame 40 B and the driving mechanism whereby the strip is moved, for the purposes specified.

13. In a machine of the class described, the combination of a feed-spool, trains of rollers and gears, a journaled pulley arranged to reverse the strip, stationary surface and edge trimming knives, and severing-knives attached to revoluble disks, mounted upon a frame; whereby a strip of metal is drawn through said machine, successively trimmed 50 and smoothed upon its faces and edges, and then cut into desired lengths.

14. In a machine of the class described, the combination of a supporting-frame, mechanism for carrying and reversing the strip, a train of edge and surface trimming knives, and drive mechanism; said parts being arranged on said frame so that the strip will move successively past each of the surface-trimming knives and the pairs of edge-trimming knives.

15. In a machine of the class described, the combination of a plurality of rollers, for carrying and reversing the strip, edge and surface trimming knives for the strip, mechanism for reducing the size and finishing the surfaces of the strip, mechanism for cutting

the strip into equal lengths, and drive mechanism for imparting motion to the strip; said parts being operatively carried by a frame.

16. In a machine of the class described, the combination of a plurality of edge and surface trimming knives, reduction mechanism for finishing the surfaces of the strip, cutting mechanism for apportioning the strip into lengths, carrying-rollers, tension mechanism, 75 consisting of resilient rollers directed against the strip as it is carried by the carrying-rollers, drive mechanism for imparting motion to the strip and a frame upon which said parts are operatively arranged. 80

17. A machine of the class described, consisting of a plurality of carrying and tension rollers, mechanism for trimming the surfaces and edges and reducing the strip to finished size, and drive mechanism for imparting motion to the strip. 85

18. A machine of the class described, consisting of a pair of surface-trimming tools, a pair of rollers arranged to carry the strip and reverse the same, said tools being directed respectively against each surface of the strip, a guide-block for the strip carrying a plurality of edge-trimming tools arranged to reduce the width of the strip, mechanism for adjusting the surface and edge trimming tools, reduction-rollers for finishing the surfaces of the strip, cutting-knives for apportioning the strip into equal lengths, tension mechanism for the strip, drive mechanism for imparting motion to the strip, and a frame upon which 100 all of said parts are operatively arranged.

19. A machine of the class described, consisting of a plurality of wheels in diametral alinement, arranged to carry and reverse the strip, a spool positioned above the wheels from which the strip is fed, a plurality of edge and surface trimming knives, tension-rollers with mechanism for adjusting the same, a pair of reduction-rollers, cutting-knives for apportioning the strip into equal lengths, drive 110 mechanism consisting of a train of gears, operatively connected to said wheels, and cutting-knives; said parts being operatively arranged upon a carrying-frame.

20. A machine of the class described, consisting in combination of a pair of wheels arranged to revolve in opposite directions and to carry the strip upon their perimeters, surface-trimming knives directed against each surface of the strip as it is carried upon said 120 wheels, mechanism for adjusting said knives, a guide-block adjoining said wheels in diametral alinement therewith, edge-trimming knives carried by said block, mechanism for cutting the strip into equal lengths, drive 125 mechanism for carrying the strip, and a supporting-frame for said parts.

21. A machine of the class described, consisting in combination of a plurality of wheels journaled in diametral alinement upon a 130 frame and adapted to revolve in opposite directions, cutting-knives directed against each

surface of the strip, a feed-spool journaled in diametral alinement above said wheels, tension mechanism for said spool, a guide-block positioned in diametral alinement below said
 5 carrying-wheels, a plurality of edge-trimming knives carried by said block, mechanism for adjusting said edge-trimming knives, brushes adjoining the edge-trimming knives for removing the shavings from the strip, a pair of
 10 yielding reduction-rollers in diametral alinement with said carrying-wheels, mechanism for adjusting the reduction-rollers, a pair of cutting-knives for apportioning the strip into lengths, and drive mechanism for the strip;
 15 said strip being adapted to pass, from the spool around the perimeters of the carrying-wheels, past the surface-trimming knives, through the guide-block, past the edge-trimming knives, between the reduction-rollers
 20 and finally between the apportioning-knives.

22. A machine of the class described, consisting in combination of a pair of carrying-wheels, surface and edge trimming knives, a pair of reduction-rollers, knives for cutting
 25 the strip into lengths, a spool in diametral alinement with the carrying-wheels, having a friction-pulley and band for applying tension to the strip as it is passed around the carrying-wheels, drive mechanism for the
 30 strip adapted to revolve the carrying-wheels in opposite directions, a skeleton frame for supporting the working parts of the machine; said surface-trimming knives being mounted upon carriages which are journaled in the
 35 frame, having levers and set-bolts for adjusting the position of the knives, and spring-tongues adjoining the cutting edges of the knives so as to bear against the strip.

23. A machine of the class described, consisting of a pair of journaled carrying-wheels in diametral alinement, driving mechanism for revolving the wheels in opposite directions, said wheels being adapted to carry the strip upon their perimeters past trimming
 45 mechanism, supported by a stationary frame.

24. A machine of the class described, con-

sisting of carrying, tension, surface-trimming, reduction and driving mechanisms, of a plurality of edge-trimming knives, a guide consisting of a grooved, sectional block, having
 50 its sections hinged together, one of the sections carrying said knives to which they are pivoted, springs for throwing the knives from operative position when the block is opened, mechanism for returning the knives when the
 55 block is closed, and a supporting-frame for said parts.

25. In a machine of the class described, the combination of pairs of carrying-wheels, reduction-rollers and surface-cutting knives,
 60 all of which are journaled in diametral alinement upon a skeleton frame, an apron adjoining the carrying-wheels, drive mechanism for revolving the journaled mechanisms, pivoted carriages for the surface-trimming
 65 knives having lever-arms and set-bolts for adjusting the knives to the strip, a spool journaled above the carrying-wheels in diametral alinement therewith upon the frame, a pulley carried by the spool, a tension-band
 70 passing over the pulley and connected to the frame, and a plurality of edge-trimming knives stationary upon said frame; said carrying-wheels being adapted to revolve in opposite directions and to carry the strip upon
 75 their perimeters.

26. The combination of feed-wheels arranged to reverse the strip, pivoted surface-trimming knives, with means for adjusting the same, stationary edge-cutters, tension
 80 mechanism for the strip with means for adjusting the same, brushes carried by the frame for cleaning the strip, yielding reduction-rollers and apportioning-knives, a supporting-frame, and driving mechanism.
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In testimony whereof I affix my signature, in presence of two witnesses, this 8th day of December, 1899.

CYRUS C. WEBSTER.

Witnesses:

H. W. BOCKHAUS,

H. L. HASEY.