

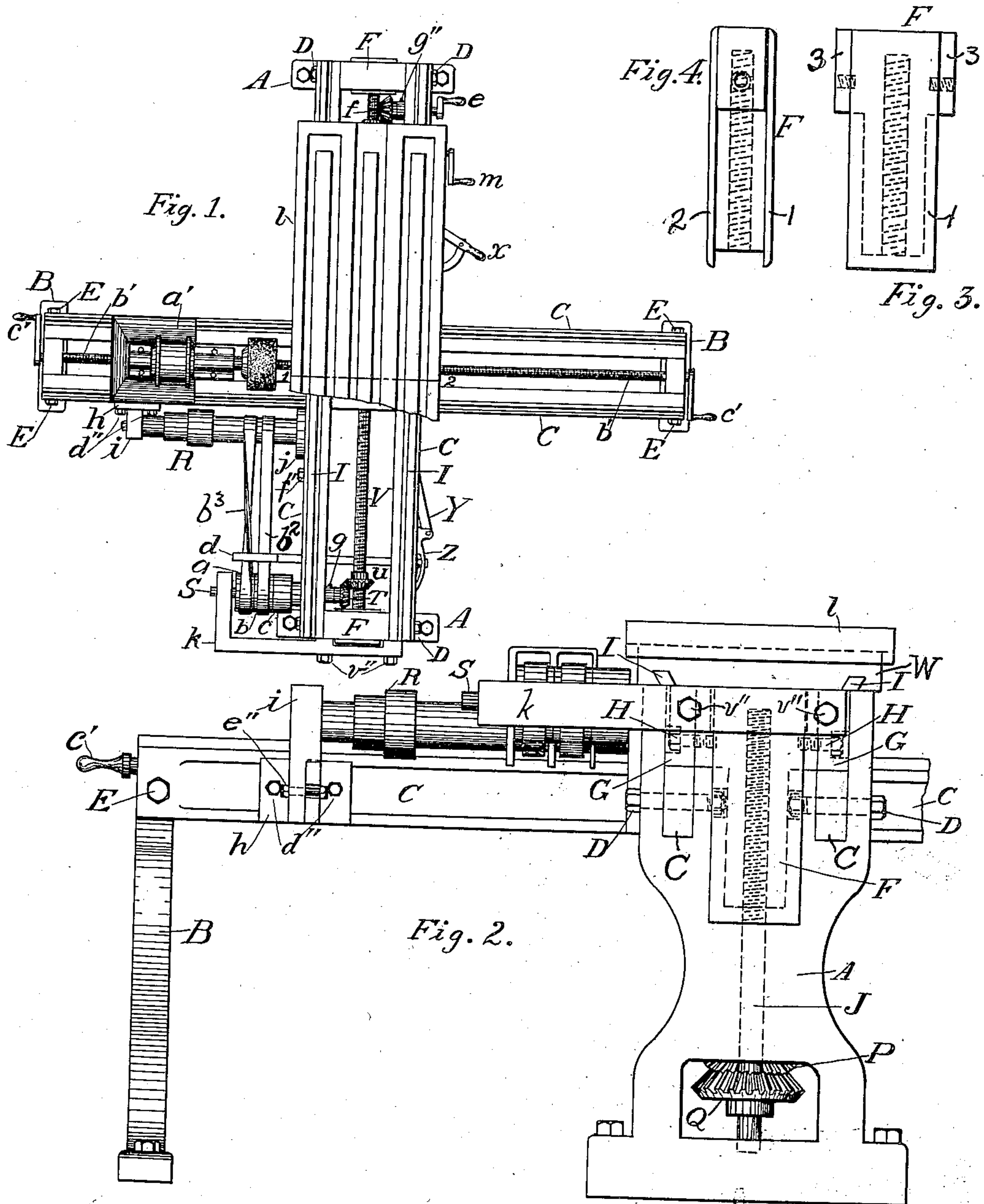
No. 898,353.

PATENTED SEPT. 8, 1908.

L. GIANNELLI.
MILLING MACHINE.

APPLICATION FILED MAR. 20, 1908.

3 SHEETS—SHEET 1.



WITNESSES:

Edward Maxwell
William J. Pike.

INVENTOR.
Lorenzo Giannelli
BY
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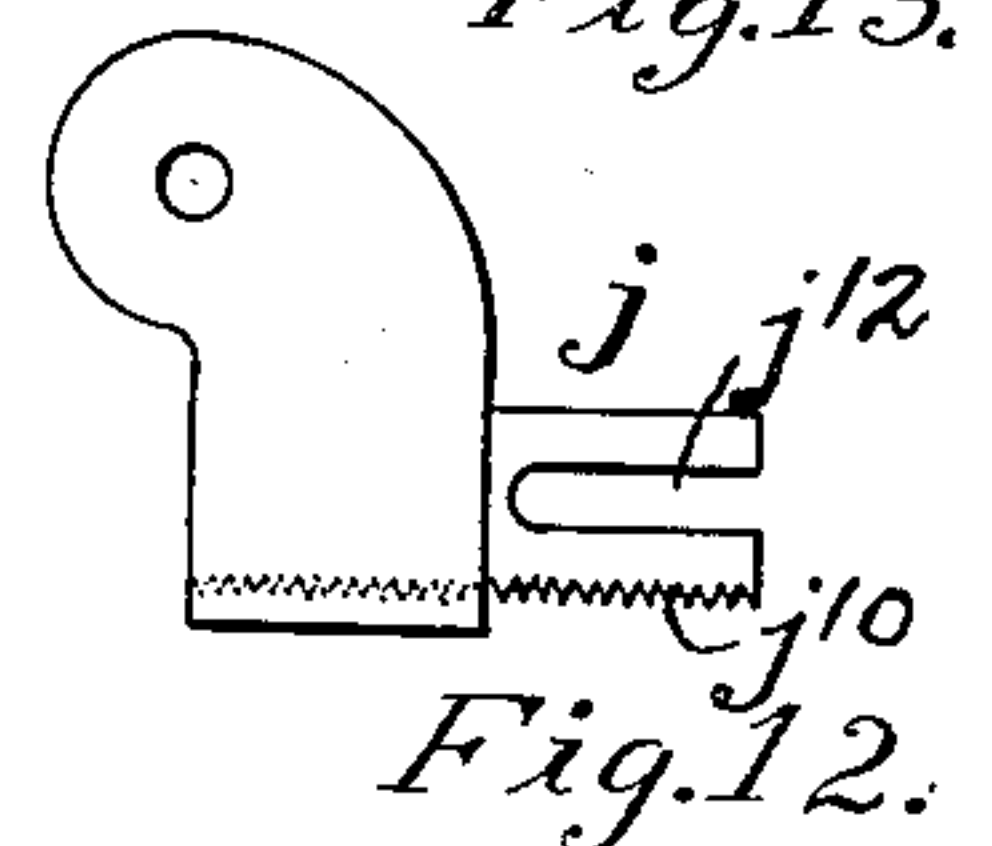
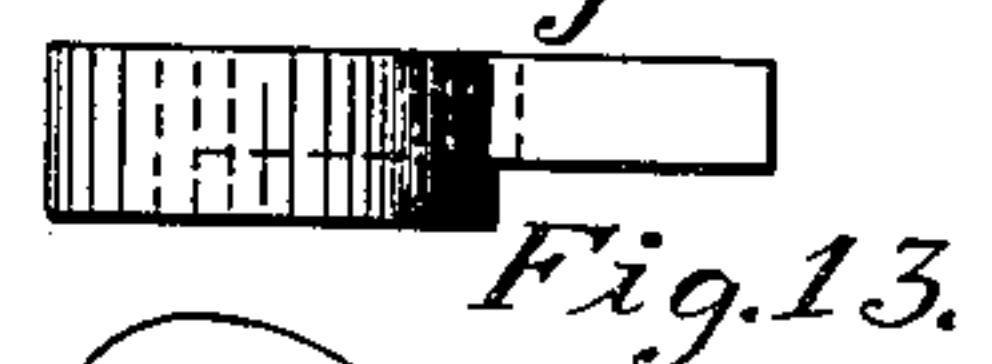
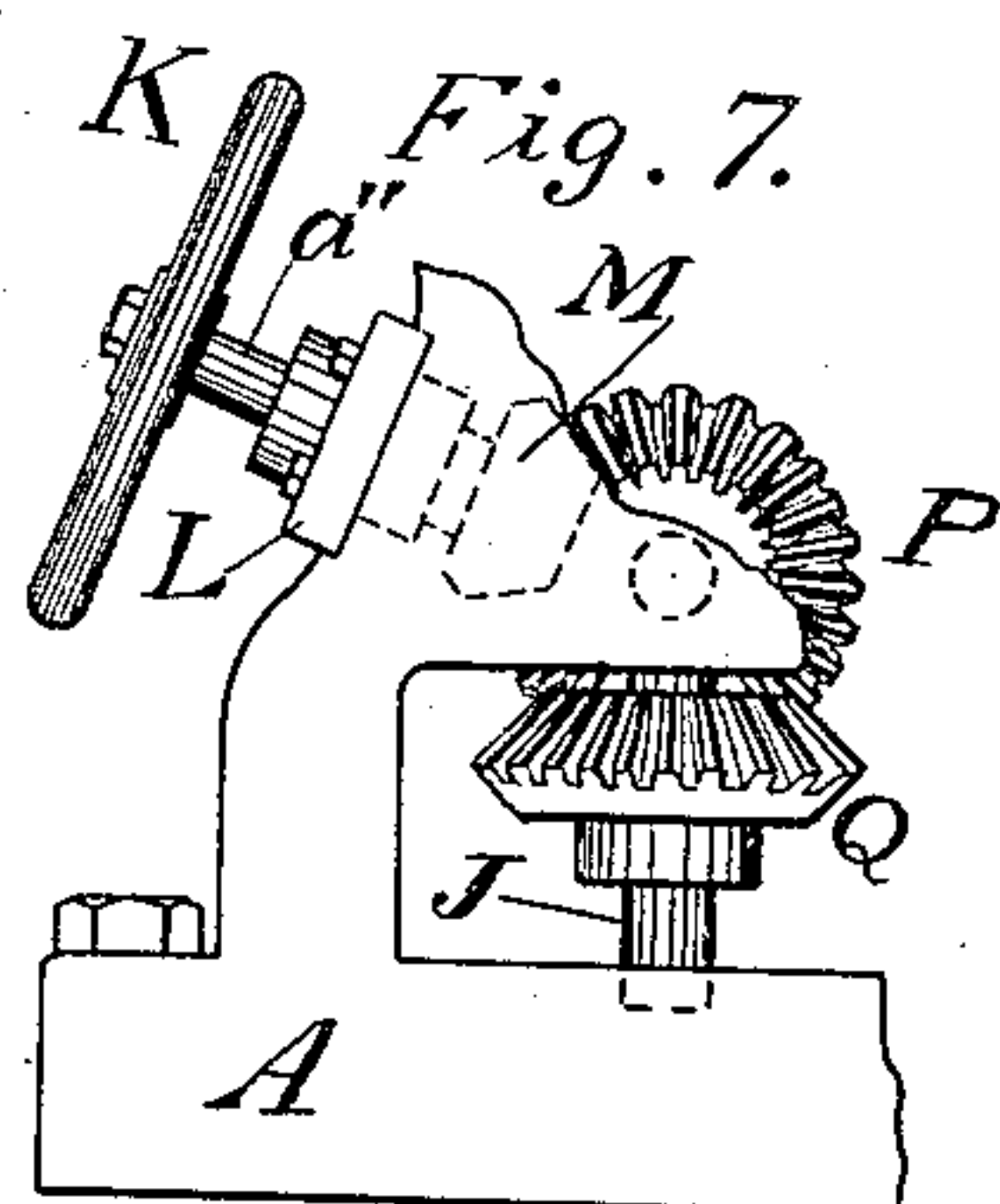
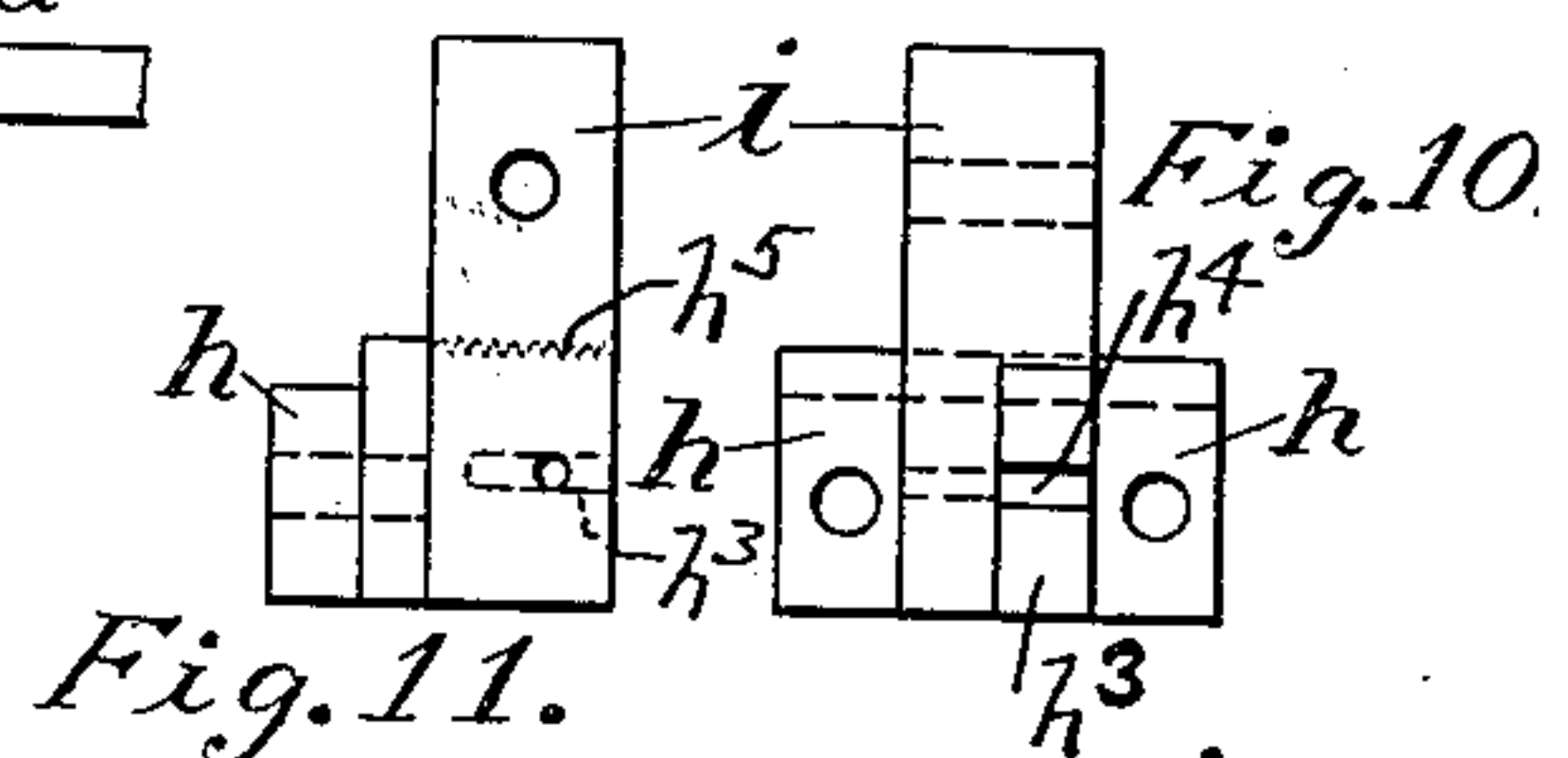
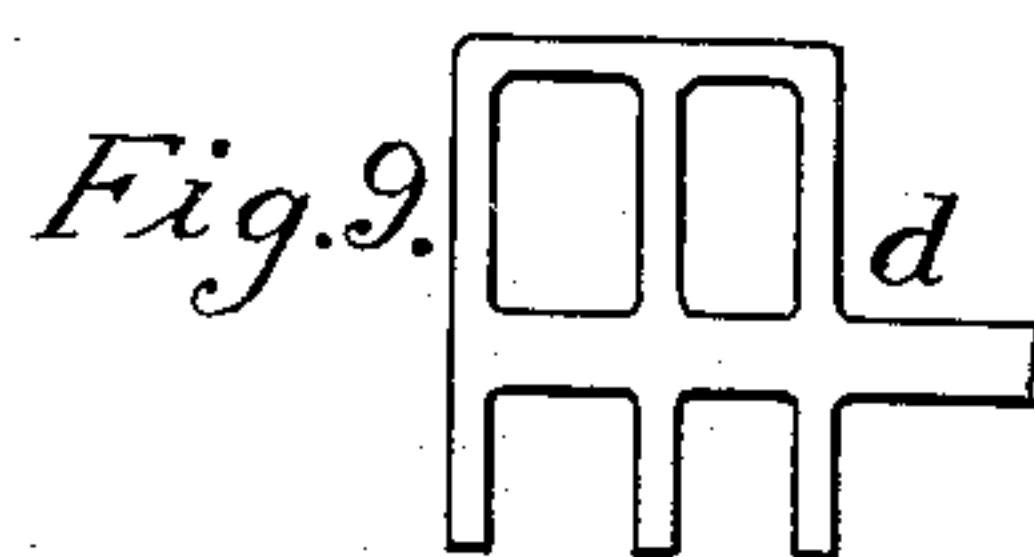
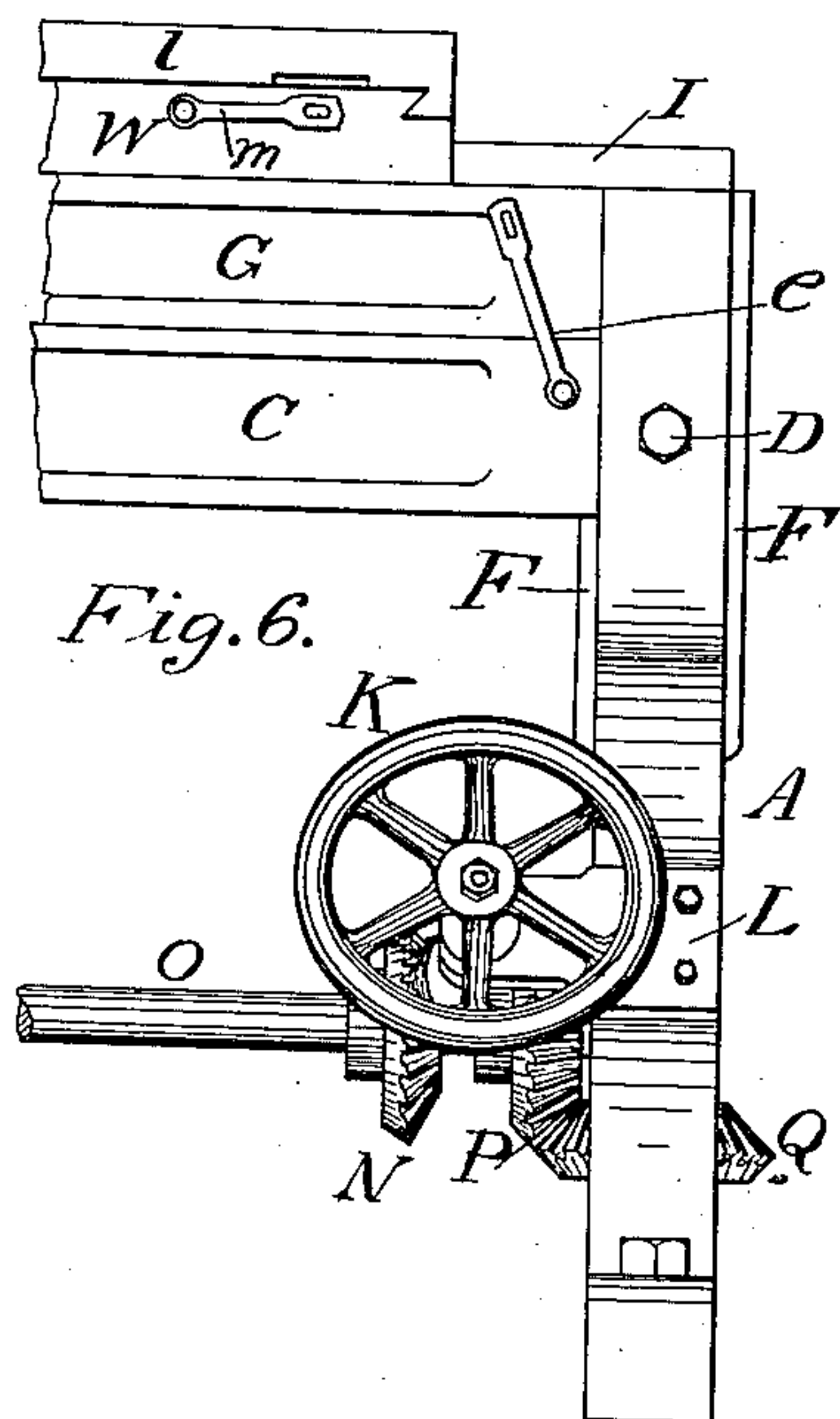
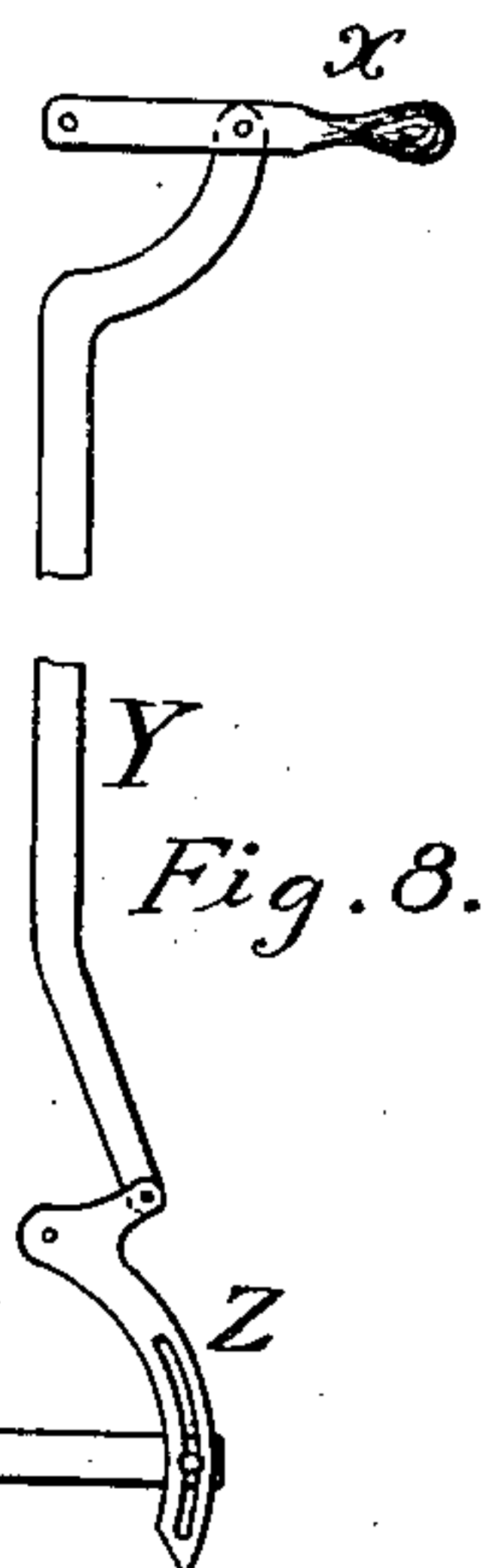
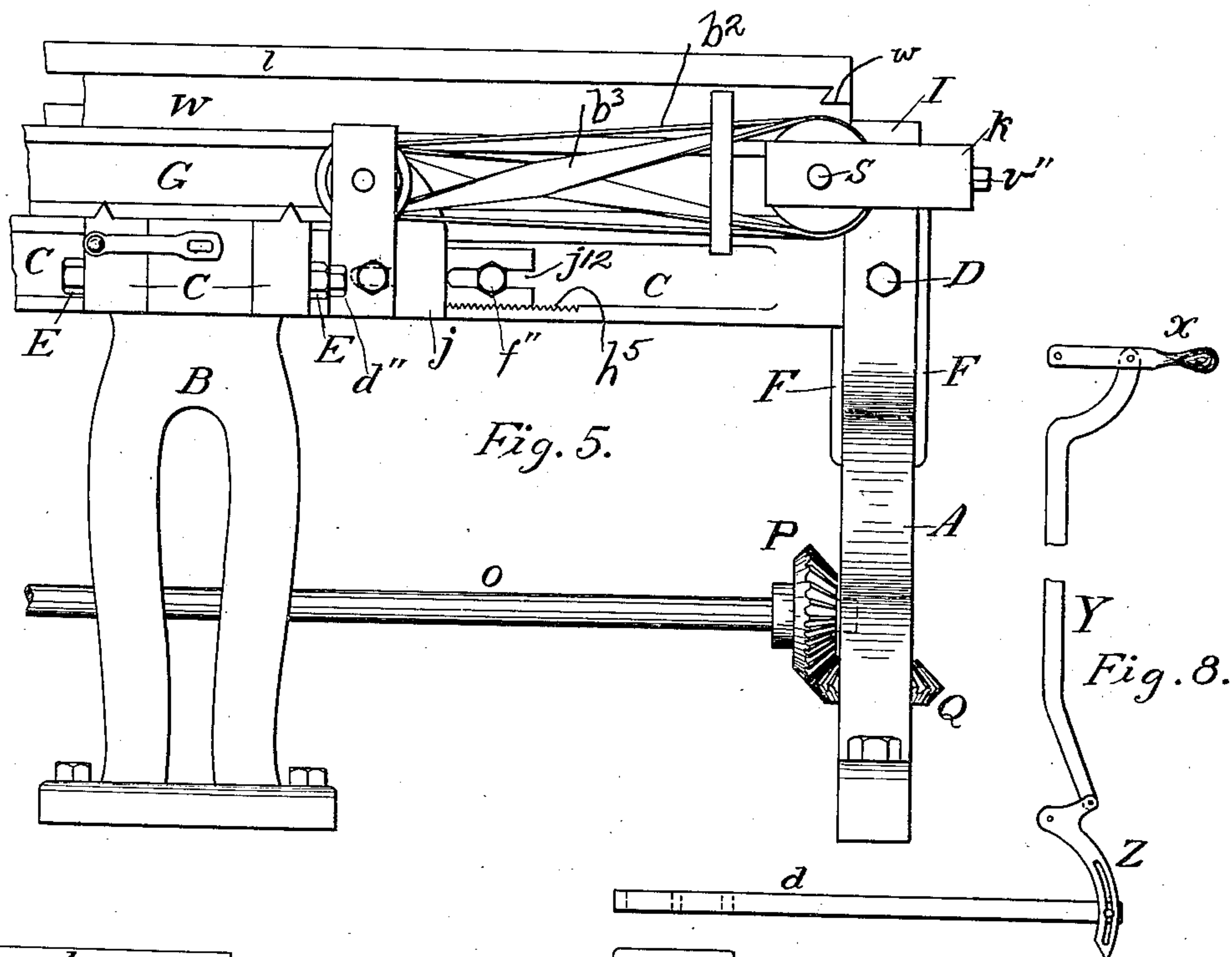
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.



Fig. 14.

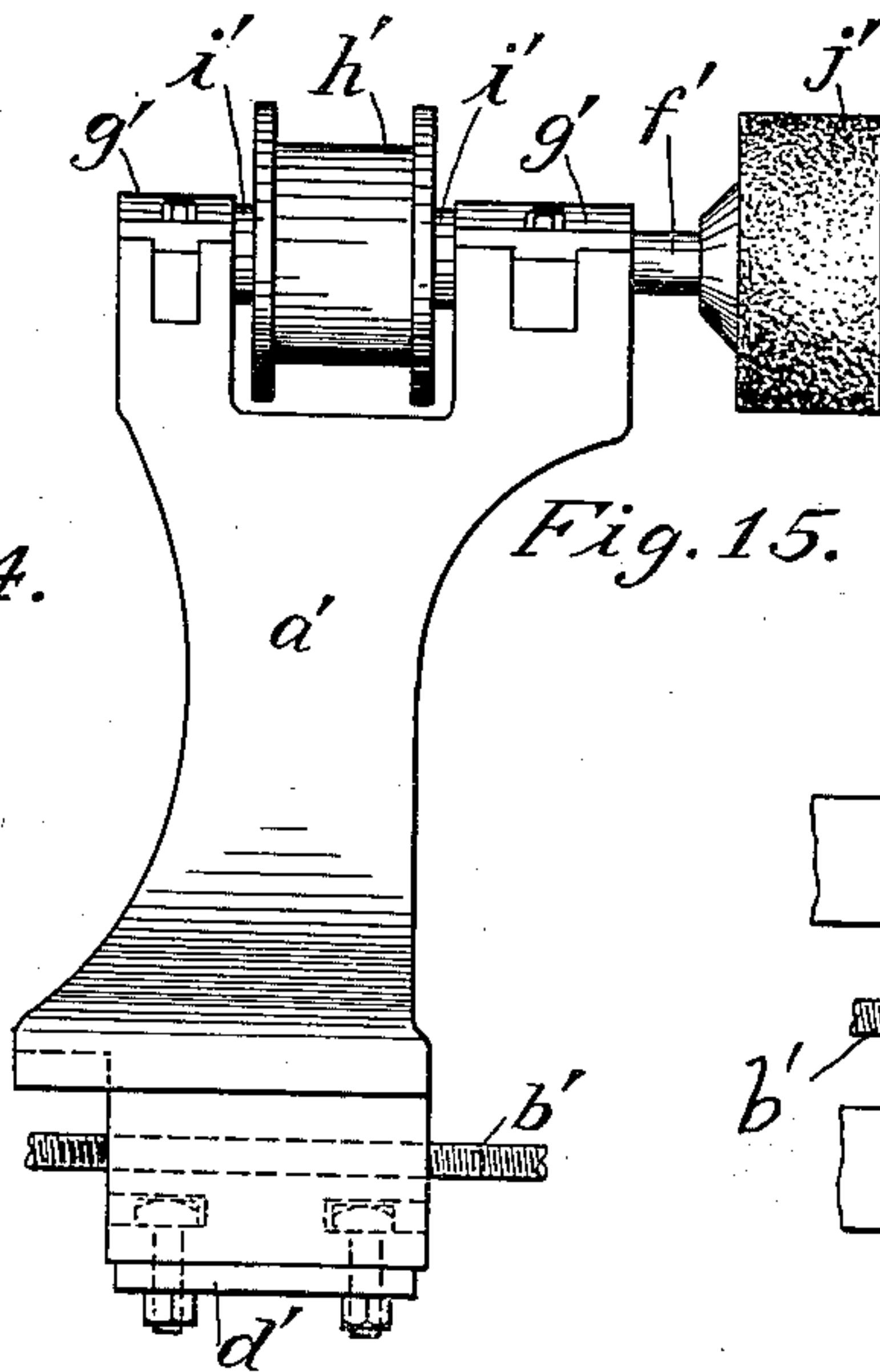


Fig. 15.

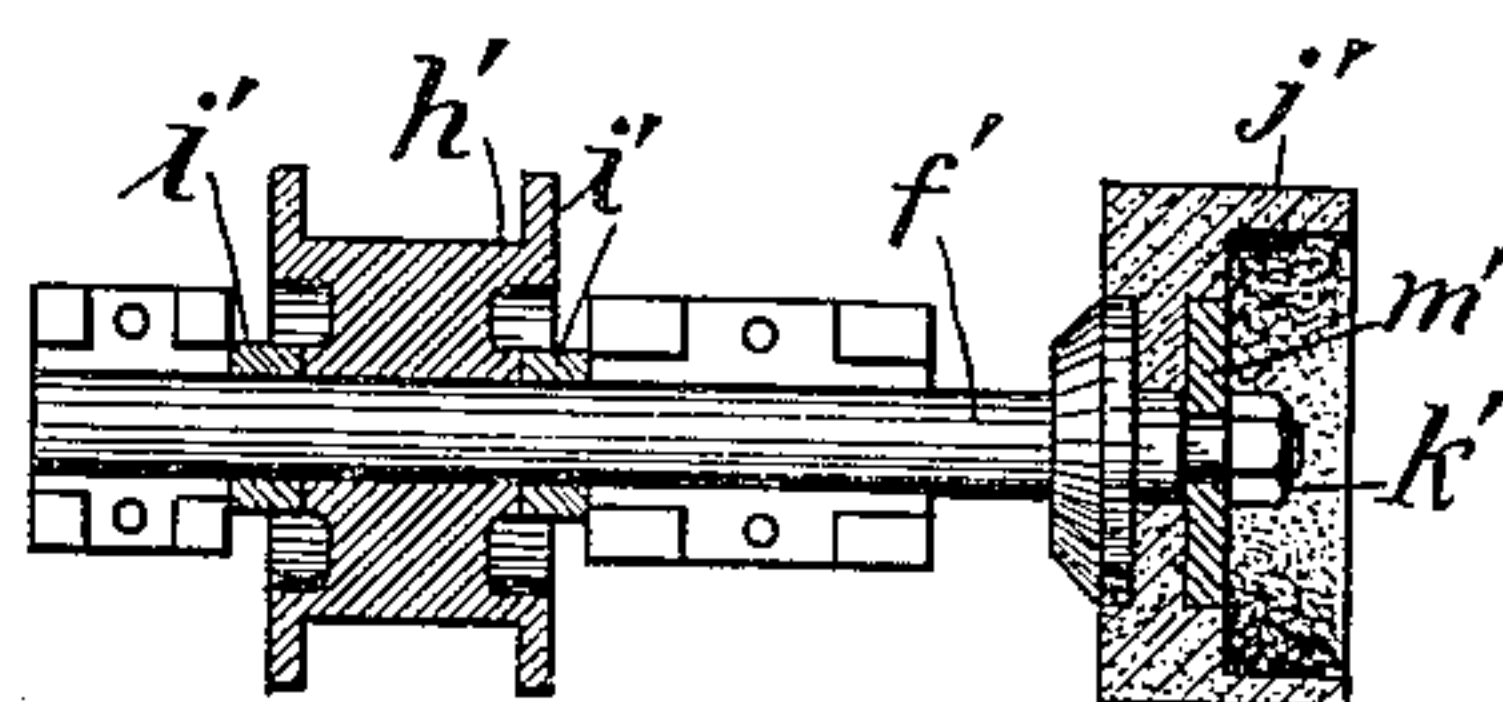


Fig. 16.

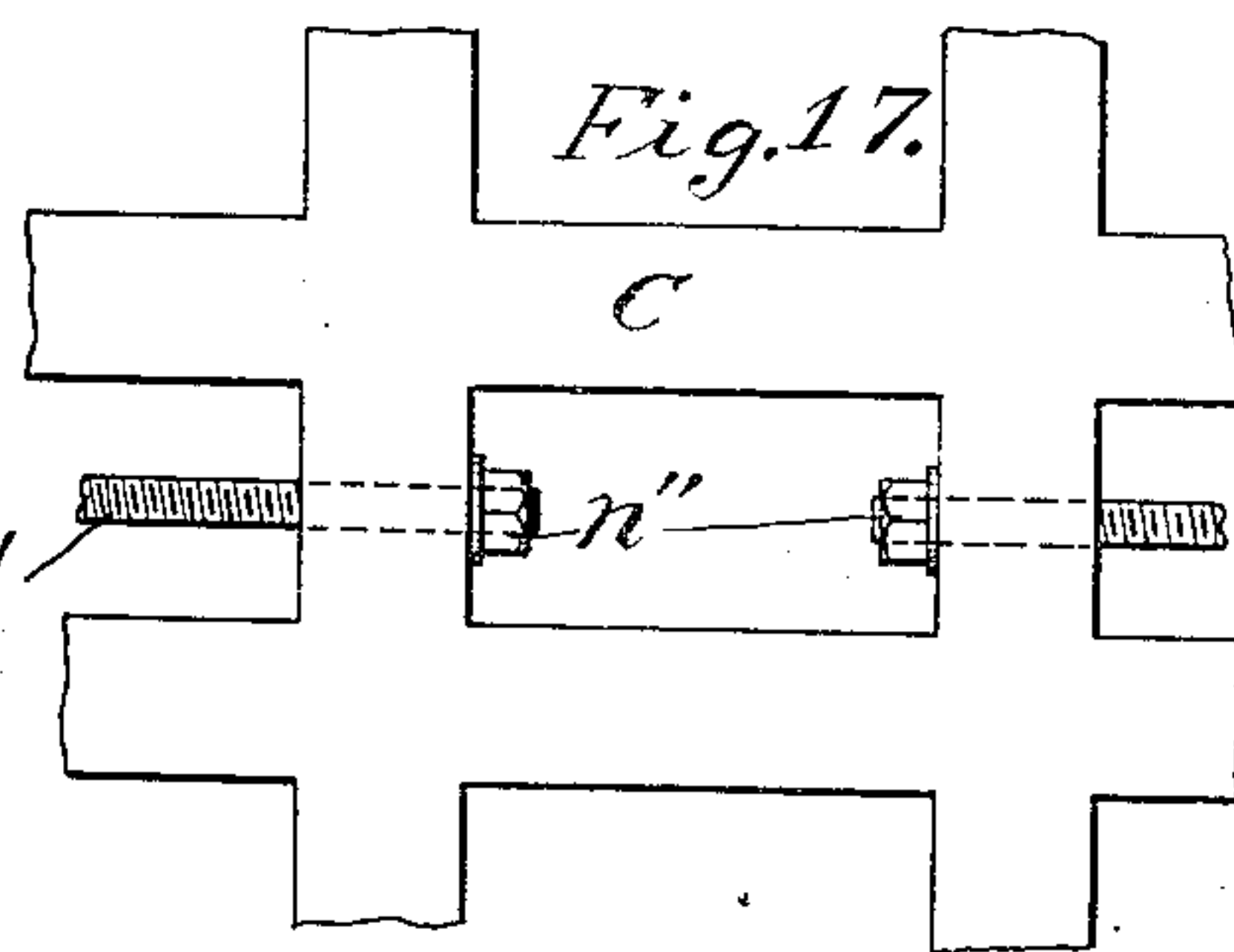


Fig. 17.

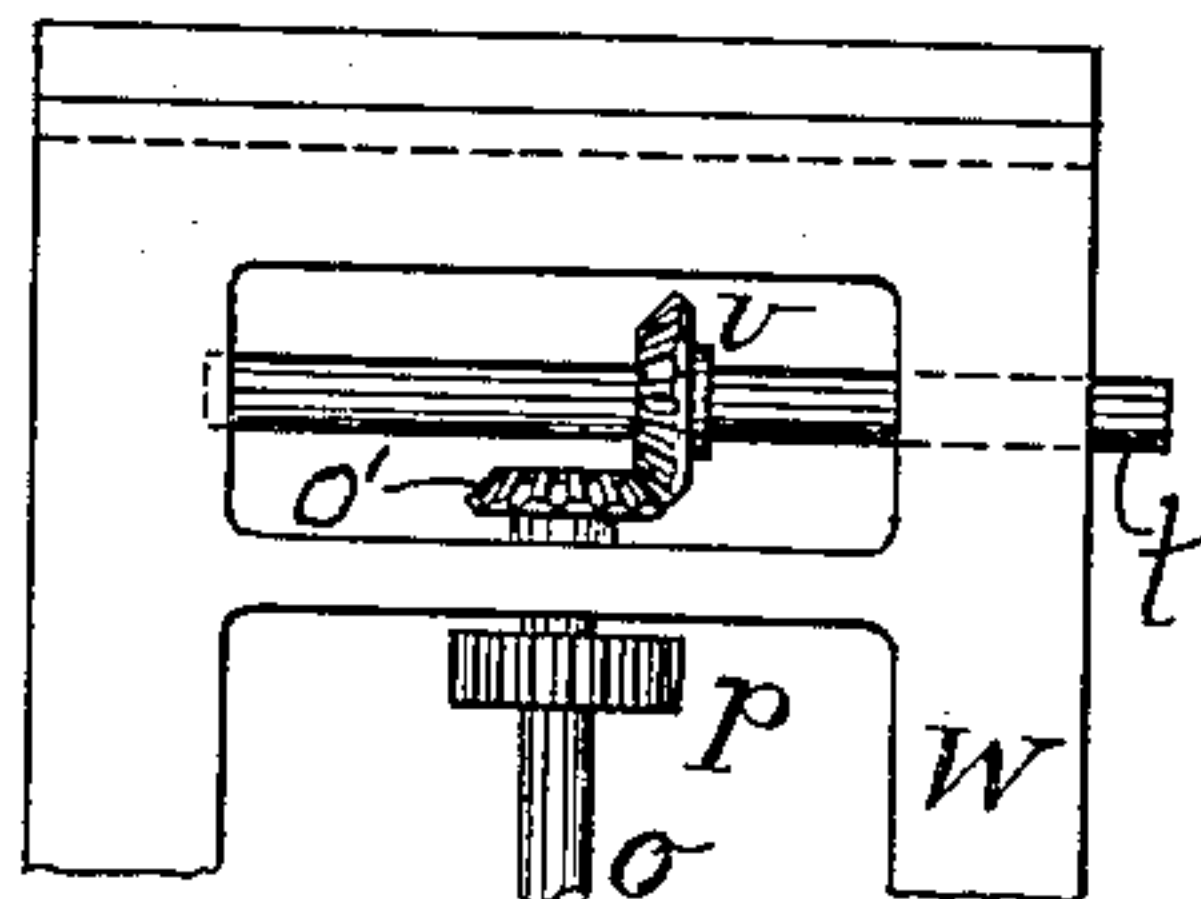


Fig. 18.

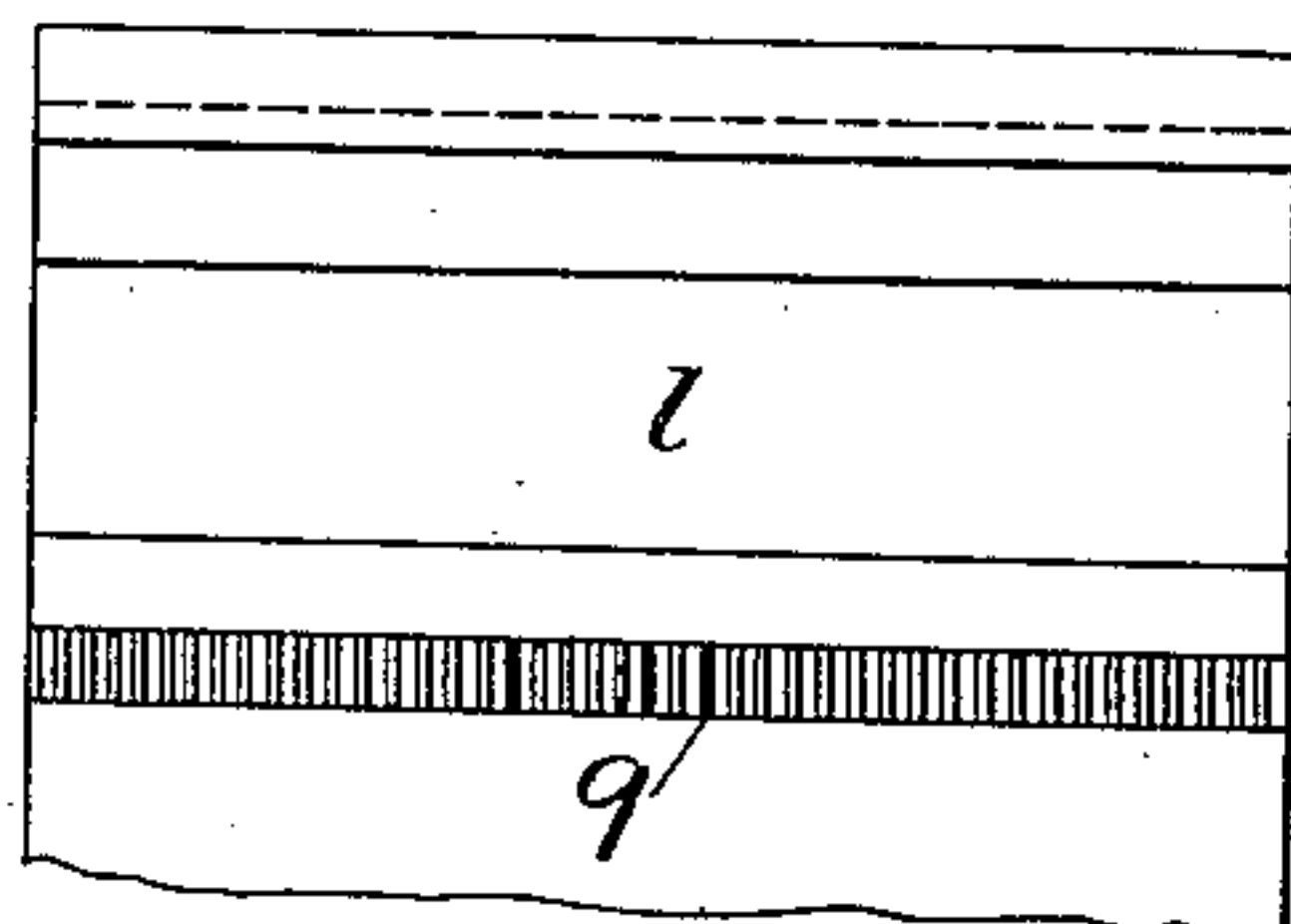


Fig. 19.

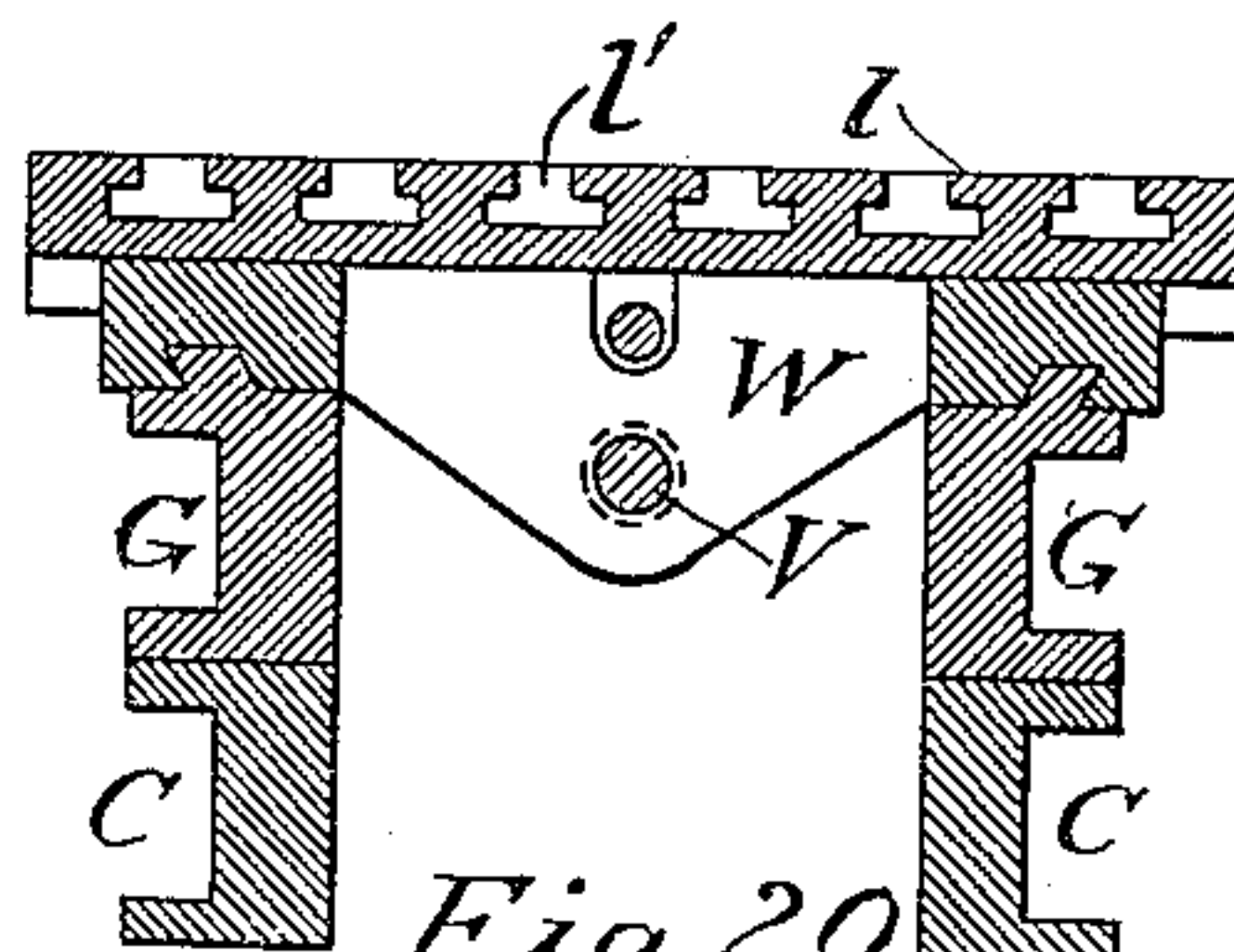


Fig. 20.

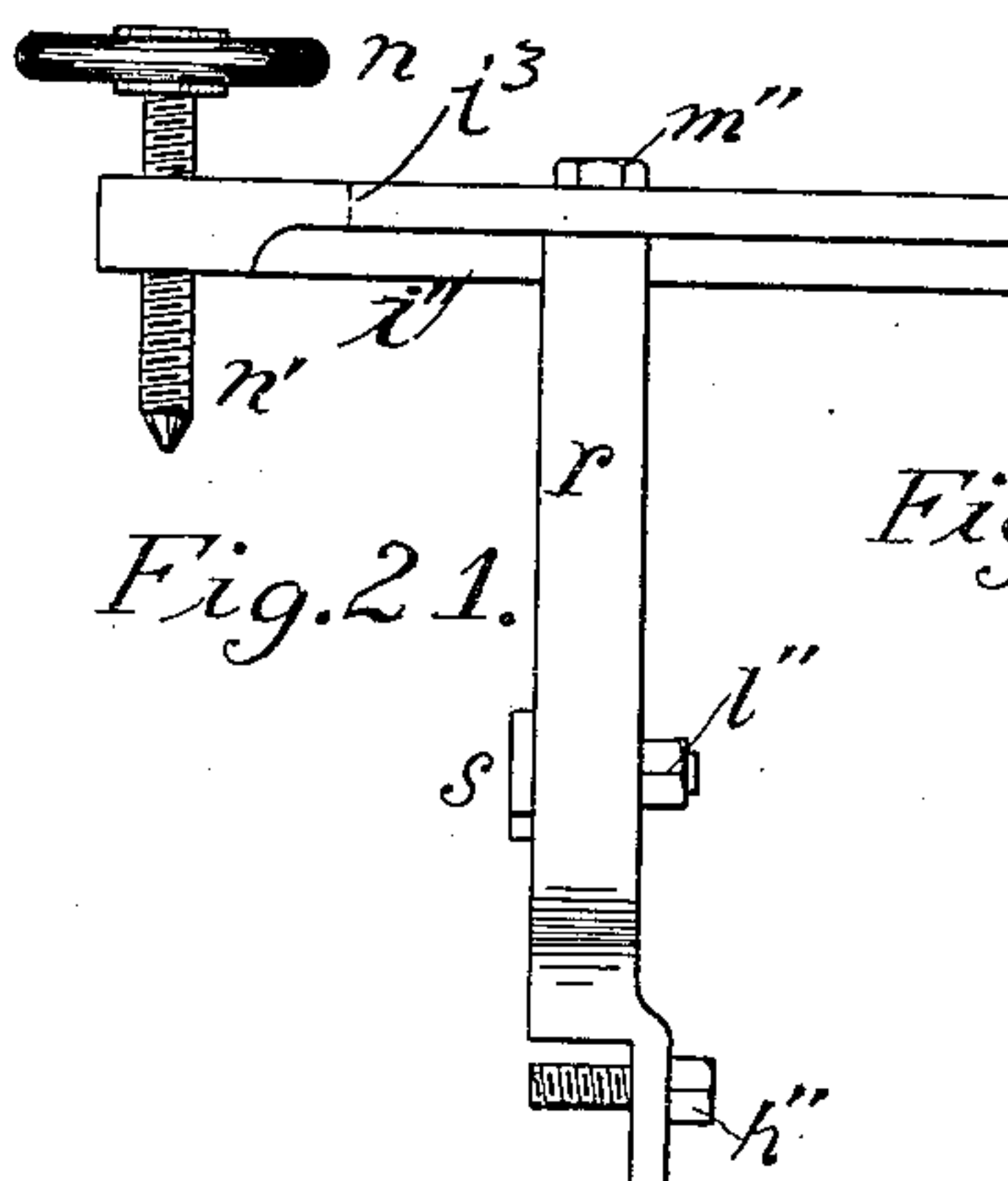
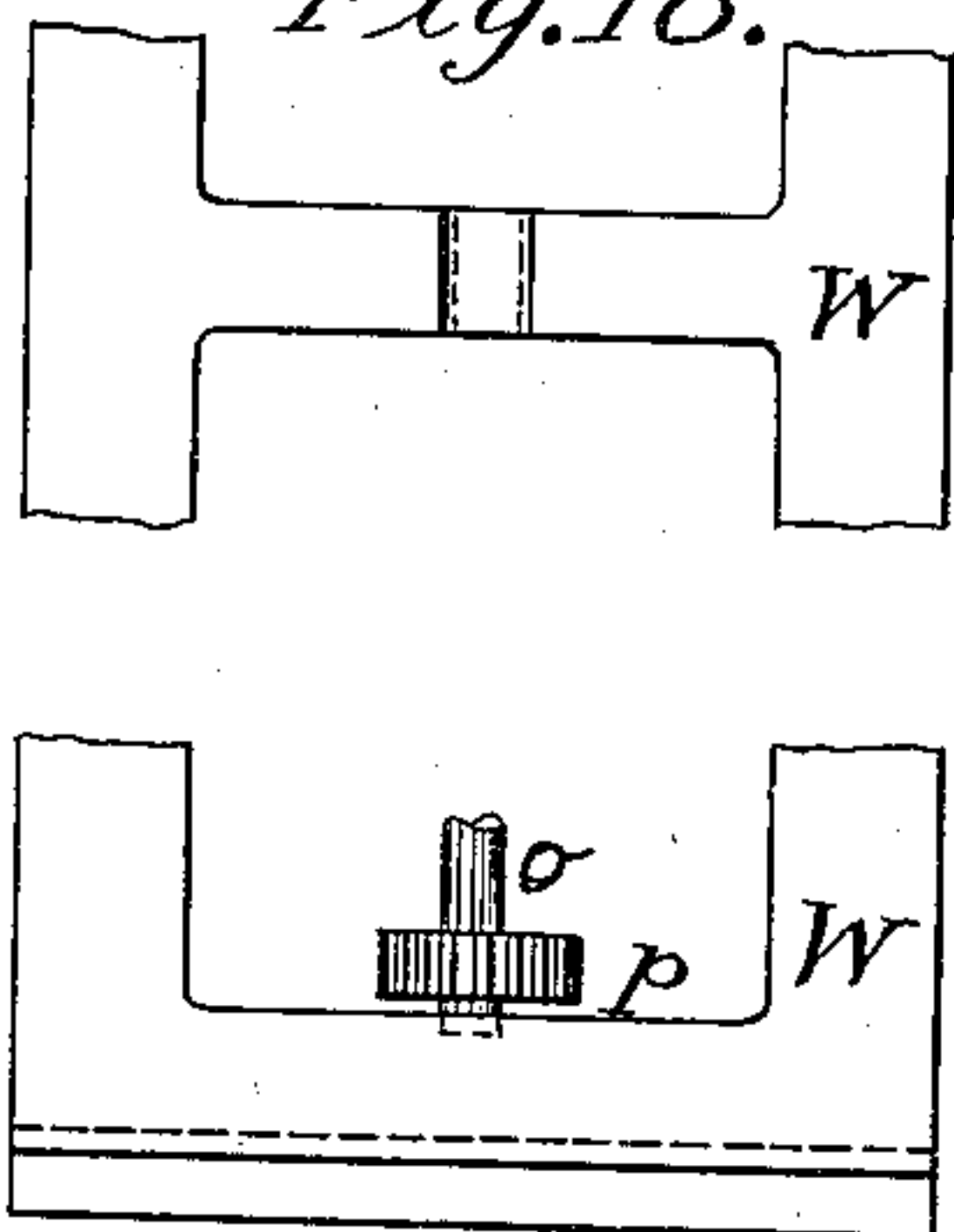


Fig. 22.

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UNITED STATES PATENT OFFICE.

LORENZO GIANNELLI, OF BOSTON, MASSACHUSETTS.

MILLING-MACHINE.

No. 898,353.

Specification of Letters Patent.

Patented Sept. 8, 1908.

Application filed March 20, 1908. Serial No. 422,267.

To all whom it may concern:

Be it known that I, LORENZO GIANNELLI, a subject of the King of Italy, and resident of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Milling-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention is primarily intended for extremely heavy work, such particularly as dressing marble.

The main features of my invention, together with the constructional details, will be pointed out at length in the following description, reference being made to the accompanying drawings, in which I have shown one embodiment of the invention.

In the drawings, Figure 1 is a plan view of the machine, partly broken away and parts omitted for clearness of illustration; Fig. 2 shows the same in front elevation, one end being broken away to permit showing the same on a slightly enlarged scale; Figs. 3 and 4 are front and edge elevations of one of the slide blocks; Fig. 5 is a fragmentary end elevation, looking at Fig. 2 from the left; Fig. 6 is an enlarged side elevation of one end of the table supporting portion of the machine, showing the lifting or height adjusting mechanism; Fig. 7 is a fragmentary view in front elevation of the last mentioned mechanism; Figs. 8 and 9 show in elevation and plan details of the shipping mechanism; Figs. 10 and 11 show in front and side elevation portions of the adjustable brackets for supporting the driving mechanism; Figs. 12 and 13 show in front elevation and plan the remaining portions of the adjustable brackets; Figs. 14 and 15 show respectively, in end and side elevation the head stock; Fig. 16 is a horizontal sectional view of the tool and mounting thereof over the head stock; Fig. 17 is a fragmentary view showing the arrangement of the main frame at the center of the machine; Fig. 18 is a broken plan view of the bottom or lower table; Fig. 19 is a fragmentary inverted plan of one end of the upper table; Fig. 20 is a vertical cross section taken on the line 1—2, Fig. 1; and Figs. 21 and 22 show in side and end elevation the rest to hold the work in place on the table.

The main frame of the machine is arranged in the shape of a cross, supported at two ends

by legs A and at its other two ends by legs B, the former being bolted to the horizontal beams C by bolts D, and the latter to the beams C by bolts E. In the upper ends of the legs or standards A are slide blocks F and the ends of track bars G, which occupy recesses or guideways formed therefor in the standards A and are held unyieldingly together by bolts H. Projecting obliquely from the track bars G and extending lengthwise along the top thereof are tracks or guides I along which the lower table W takes its longitudinal motion. Blocks F are provided with flanges 1, 2 which overlap the adjacent sides of the standards A and serve to guide the blocks F in their vertical motion, said blocks being further provided with opposite wings or extensions 3 against which the track bars G are immovably bolted and the entire frame F, G and superposed parts are vertically movable in the standards A. For this purpose I provide in the standards A vertical screws J turning in the blocks F fast on which screws are beveled gears Q driven by gears P' fast on a shaft O, which is provided also with a gear N driven by a beveled pinion M on a shaft *a''* operated by a hand wheel K and mounted in a bracket L, as best shown in Figs. 6 and 7. Thus by turning the hand wheel K the vertically movable frame F G and the superposed parts can be raised and lowered in parallelism to themselves. The lower table W, as already stated, is arranged to move longitudinally on the frame F G, and on this lower table is an upper table or work support *l* capable of being moved transversely of the table W in slideways *w*. The table *l* is provided with usual longitudinal slots *l'* to receive ordinary work-holding dogs (not shown) such as are commonly used in this art, and in addition thereto a rest is provided which can be bolted to the middle of the upper end of the table, and consists of an upright post *r*, see Figs. 21 and 22, adapted to be secured in position by bolts *h''*. A face plate *f* is bolted by bolts *l''* to the post *r*, being vertically adjustable in slots *r'*. At the top of the post is a crosshead *i''* held in place by bolts *m''* passing through slots *i'* for longitudinal movement, said crosshead being provided with a screw *n'* at its outer end, operated by a hand wheel *n*. The work is placed on the table *l* and is pushed against the plate *s* and then held down by the screw *n'*. The work and upper table *l* which supports it are moved

laterally of the under table W by the engagement of pinions *p* with racks *q*, see Figs. 18 and 19, the pinions *p* being driven by a shaft *o* having a beveled gear *o'* meshing with a gear *v* actuated by a crank *m*, see Fig. 1, on the end of its shaft *t*. The work is moved longitudinally by moving the under table W and all the superposed parts, and for this purpose I provide in the frame F, G a screw V whose beveled gear *u* is driven by a corresponding gear T on a shaft S provided with pulleys *a*, *b*, *c* adapted to be engaged by an open belt *b*² and a cross belt *b*³ from a countershaft R, which in turn is driven from an overhead or any other driving belt (not shown). The head stock *a'* rests on the guides of the main frame C, see Fig. 1, and is moved toward and from the work by a screw *b'*, preferably one at each end of the frame for handling two head stocks if desired, operated by cranks *c'*. The head stock is shown in detail in Figs. 14 and 15, where it will be seen that its lower end fits within the frame C and is slidingly secured by a plate *d'* bolted in place, and at its upper end it carries a shaft *f'* secured by journal caps *g'* and driven by a pulley *h'*, said shaft being provided with washers *i'* to take the end thrust, and at its projecting end is shown an emery wheel *j'* secured by a nut *k'* and washer *m'*. The screws *b'* are provided at their inner ends with holding nuts *n''*. The driving belts *b*², *b*³ are shifted by a belt shipper *d* operated by cranks and levers X, Y, Z, pivoted to the frame of the machine in position to permit the shifting of the belt from the rear side, see Fig. 1. Adjacent the lever X I provide also a crank *e* for operating a beveled pinion *f* to actuate the longitudinal feed or screw V when it is desired to actuate the same by hand. Split rings *g*, *g''* are provided, so that upon removal of one or the other, the gear T or the gear *f*, as the case may be, may be moved back out of mesh with the adjacent bevel gear of the shaft V.

To compensate for the extreme upward movement or position of the tables W, I, I have specially mounted the belt shaft R so that it can be moved forward away from the adjacent portion of the frame C. To this end a bracket *h* is secured to the frame C by bolts *D''*, said bracket having a projecting portion *h*³ slotted at *h*⁴, and having serrations or notches *h*⁵ in its top edge. Fitting against the part *h*³ is a journal block *i* which supports the adjacent end of the shaft R, being adjustably bolted thereto by a bolt *e''* passing into the slot *h*⁴, see Figs. 2, 10 and 11. The opposite end of the shaft R is similarly supported, see Figs. 2, 5, 12 and 13, excepting that the serrations are provided directly on the frame C as shown at *h*⁵ Fig. 5, and a block *j* is correspondingly serrated at *j*¹⁰ and slotted at *j*¹² to receive a bolt *f''*. The shaft S at the opposite ends of the driving belt is sup-

ported in a bracket *k* secured to the bars G by bolt *v''*.

My machine is specially intended for working marble although adapted to dress other kinds of stone and other materials. If for instance it is desired to cut and dress heavy marble floor tiles such as are used in public buildings and the like, a circular saw is put in place of the emery wheel and the marble slabs are sawed into the desired shape, whereupon grinding and polishing wheels are then substituted for the saw and the tiles are ground down quickly and with absolute uniformity. When working, a small stream of water should be permitted to run onto the tool, as *j'*, to prevent undue heating. The process of dressing marble is usually very slow and laborious, whereas by my machine it is greatly facilitated, the machine having a range of movements such that a considerable extent of surface may be treated, and the construction being such that there is no liability of the frame springing or chattering, or the parts getting out of order.

Having 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 kind described, a main frame C in the form of a cross, having its four projecting portions alined in oppositely extending pairs, and each provided at its outer end with a depending leg or standard, the standards of one of said pairs having longitudinal slots at their upper ends, a vertically movable frame having longitudinally extending track bars at the sides thereof and transverse end blocks depending between and beyond said side track bars and fitting centrally the slots of said end supports, a table mounted on said vertically movable frame, and means engaging said blocks for simultaneously and uniformly raising them and thereby raising said table.

2. In a machine of the kind described, a main frame C in the form of a cross, having its four projecting portions alined in oppositely extending pairs, and each provided at its outer end with a depending leg or standard, the standards of one of said pairs having longitudinal slots at their upper ends, a vertically movable frame having longitudinally extending track bars at the sides thereof and transverse end flanged blocks depending between and beyond said side track bars and fitting centrally the slots of said end supports, a table mounted on said vertically movable frame, and means engaging said blocks for simultaneously and uniformly raising them and thereby raising said table, the flanges of said blocks overlapping the edges of the guiding slots provided therefor and projecting laterally on the opposite sides of the standard.

3. In a machine of the kind described, a main frame C in the form of a cross, having

its four projecting portions alined in oppositely extending pairs, and each provided at its outer end with a depending leg or standard, the standards of one of said pairs having longitudinal slots at their upper ends, a vertically movable frame having longitudinally extending track bars at the sides thereof and transverse end blocks depending between and beyond said side track bars and fitting centrally the slots of said end supports, a table mounted on said vertically movable frame, and means engaging said blocks for simultaneously and uniformly raising them and thereby raising said table, said track bars having longitudinal tracks inclined obliquely away from each other along the top edges of the bars, and said table having correspondingly shaped grooves fitting said tracks for longitudinal movement thereon.

4. In a machine of the kind described, a main frame C in the form of a cross, having its four projecting portions alined in oppositely extending pairs, and each provided at its outer end with a depending leg or standard, the standards of one of said pairs having longitudinal slots at their upper ends, a vertically movable frame having longitudinally extending track bars at the sides thereof and transverse end blocks depending between and beyond said side track bars and fitting centrally the slots of said end supports, a table mounted on said vertically movable frame, means engaging said blocks for simultaneously and uniformly raising them and thereby raising said table, said track bars having longitudinal tracks inclined obliquely away from each other along the top edges of the bars, and said table having correspondingly shaped grooves fitting said tracks for longitudinal movement thereon, and a top table mounted on said table and provided with means permitting it to move transversely of the under table.

5. In a machine of the kind described, a main frame C in the form of a cross, having its four projecting portions alined in oppositely extending pairs, and each provided at its outer end with a depending leg or standard, a vertically movable frame mounted on one of said alined pairs, a table mounted to move longitudinally on said vertically movable frame, means for simultaneously moving vertically the opposite ends of said movable frame, means for moving said table longitudinally on its frame, a top work support carried by said table, means to move said work support transversely of said table, tool carrying means mounted in the other of said alined pairs, and mechanism for moving said tool carrying means toward and from the work support.

6. In a machine of the kind described, a main frame C in the form of a cross, having

its four projecting portions alined in oppositely extending pairs, and each provided at its outer end with a depending leg or standard, a vertically movable frame mounted on one of said alined pairs, a table mounted to move longitudinally on said vertically movable frame, means for simultaneously moving vertically the opposite ends of said movable frame, power driven means for moving said table longitudinally on its frame, a top work support carried by said table, means to move said work support transversely of said table, tool carrying means mounted in the other of said alined pairs, mechanism for moving said tool carrying means toward and from the work support, a power shaft mounted on one of the portions of the main frame extending transversely to said movable frame, driving mechanism carried by said movable frame for engaging and driving said power driven means, and connections from said power shaft to said driving mechanism for driving the latter forward and for reversing the same.

7. In a machine of the kind described, a main frame C in the form of a cross, having its four projecting portions alined in oppositely extending pairs, and each provided at its outer end with a depending leg or standard, a vertically movable frame mounted on one of said alined pairs, a table mounted to move longitudinally on said vertically movable frame, means for simultaneously moving vertically the opposite ends of said movable frame, power driven means for moving said table longitudinally on its frame, a top work support carried by said table, means to move said work support transversely of said table, tool carrying means mounted in the other of said alined pairs, mechanism for moving said tool carrying means toward and from the work support, a power shaft mounted on one of the portions of the main frame extending transversely to said movable frame, driving mechanism carried by said movable frame for engaging and driving said power driven means, connections from said power shaft to said driving mechanism for driving the latter forward and for reversing the same, said power shaft being provided with supporting means adjustable toward and from said driving mechanism for accommodating said shaft to the changing vertical positions of said driving mechanism as said movable frame is moved up and down.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

LORENZO GIANNELLI.

Witnesses:

FRANK LEVERONI,
VICTOR J. GALLENE.