

(No Model.)

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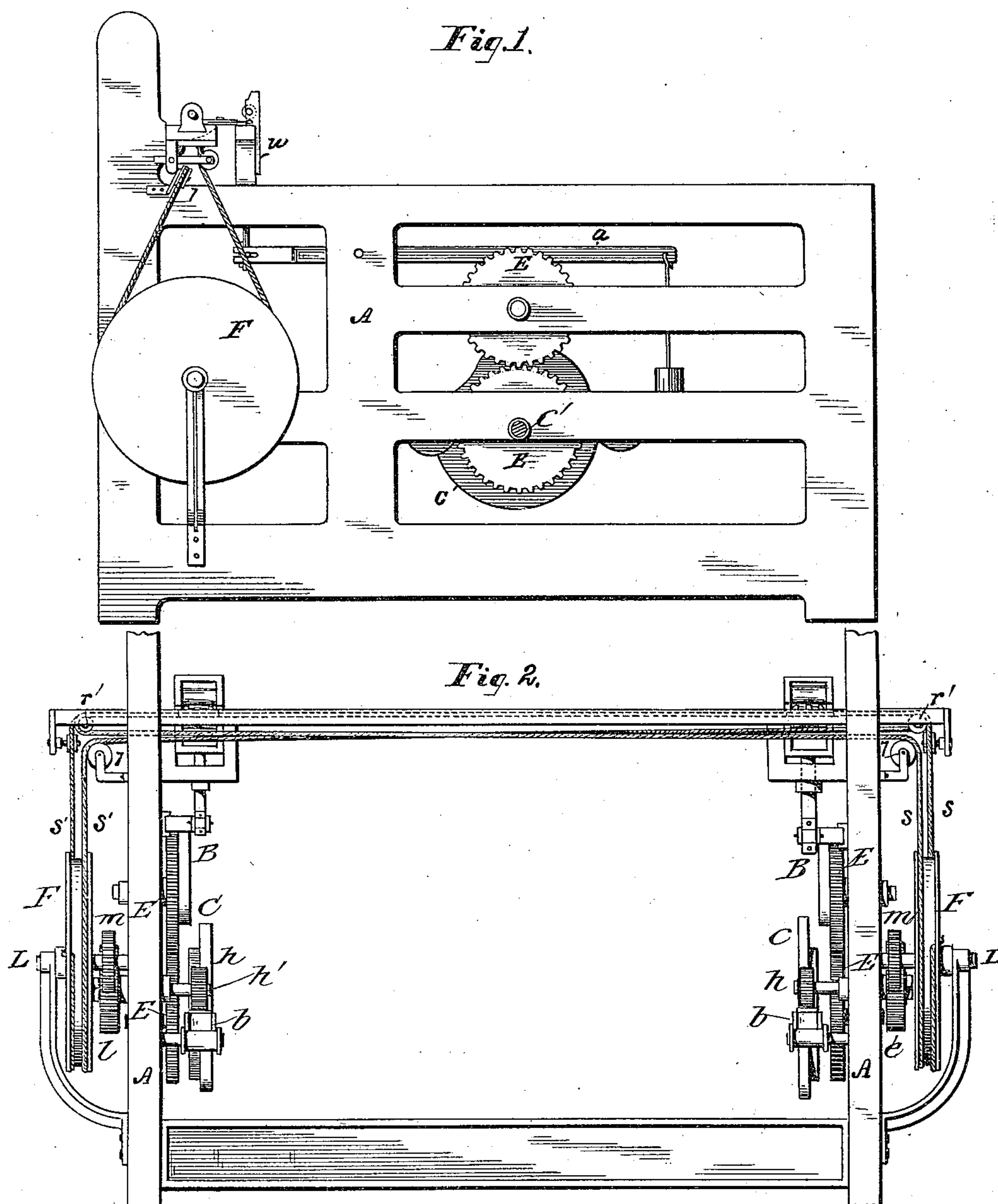
C. PEARSON, Dec'd.

M. PEARSON, Administratrix.

LOOM FOR WEAVING DOUBLE PILE FABRICS.

No. 356,011.

Patented Jan. 11, 1887.



WITNESSES:

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INVENTOR

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(No Model.)

4 Sheets—Sheet 2.

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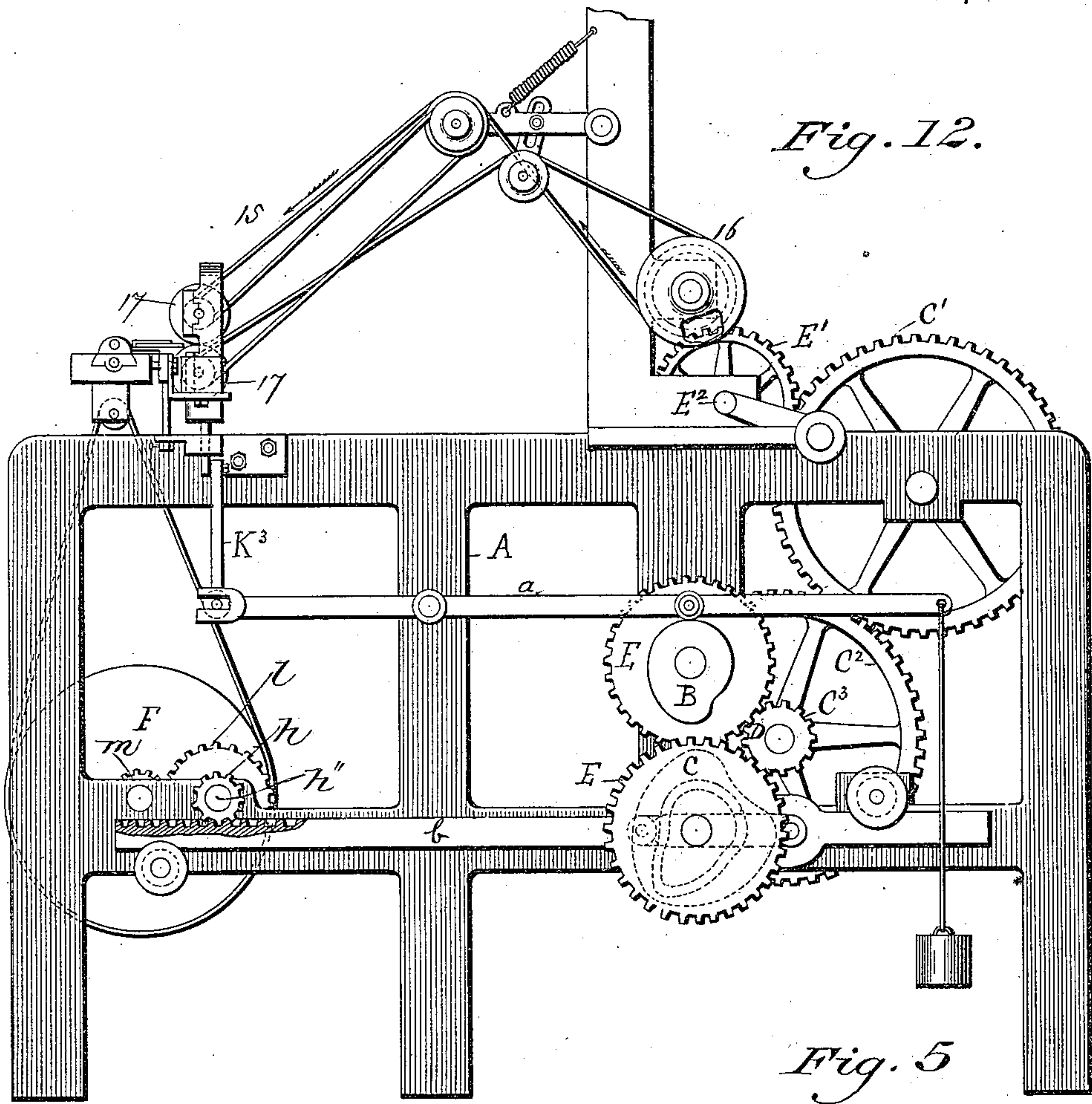
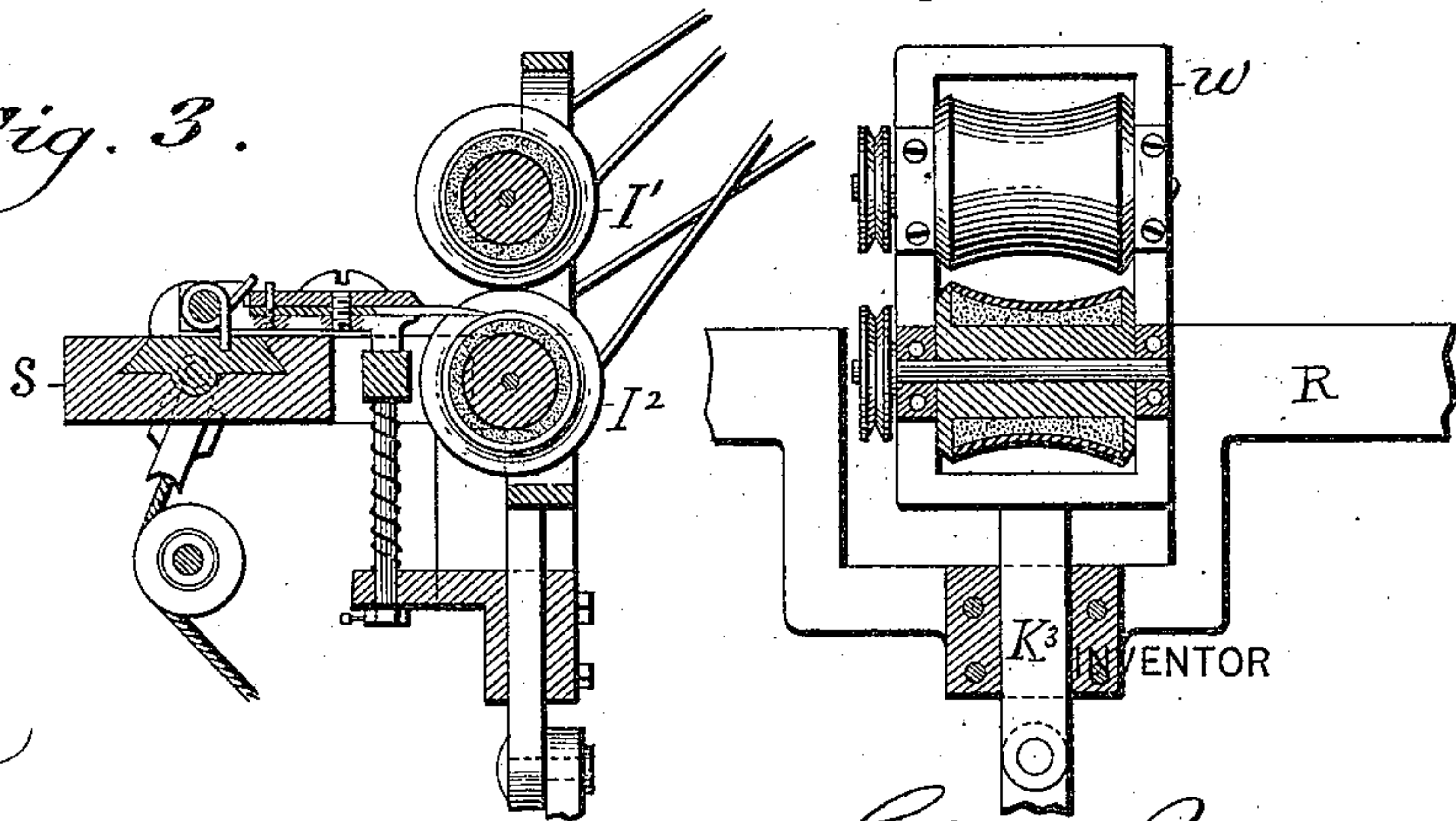


Fig. 5

Fig. 3.



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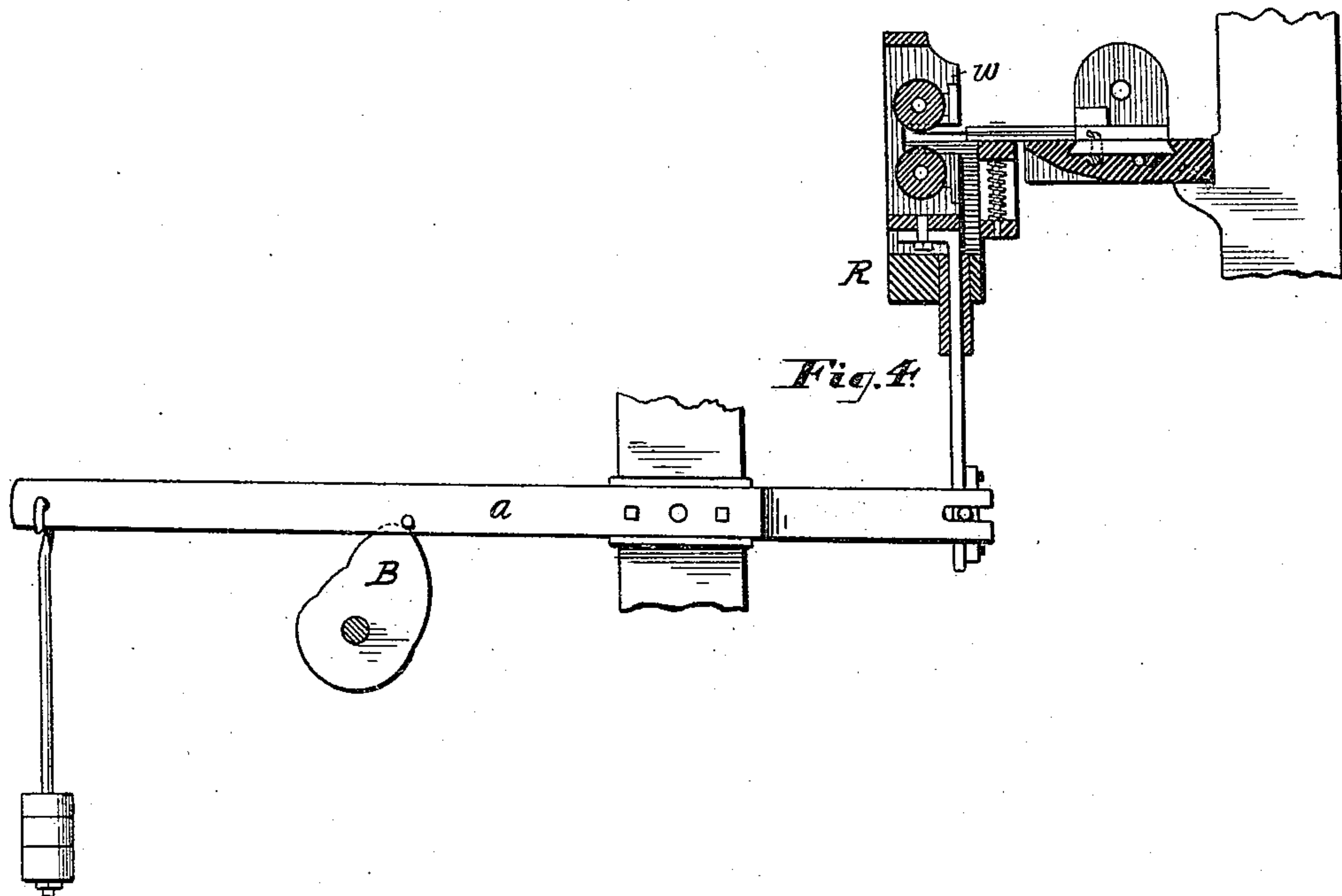


Fig. 6.

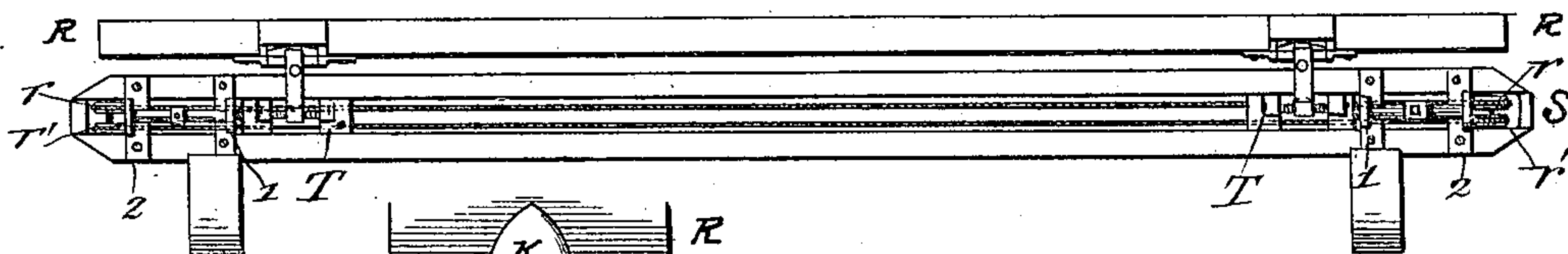
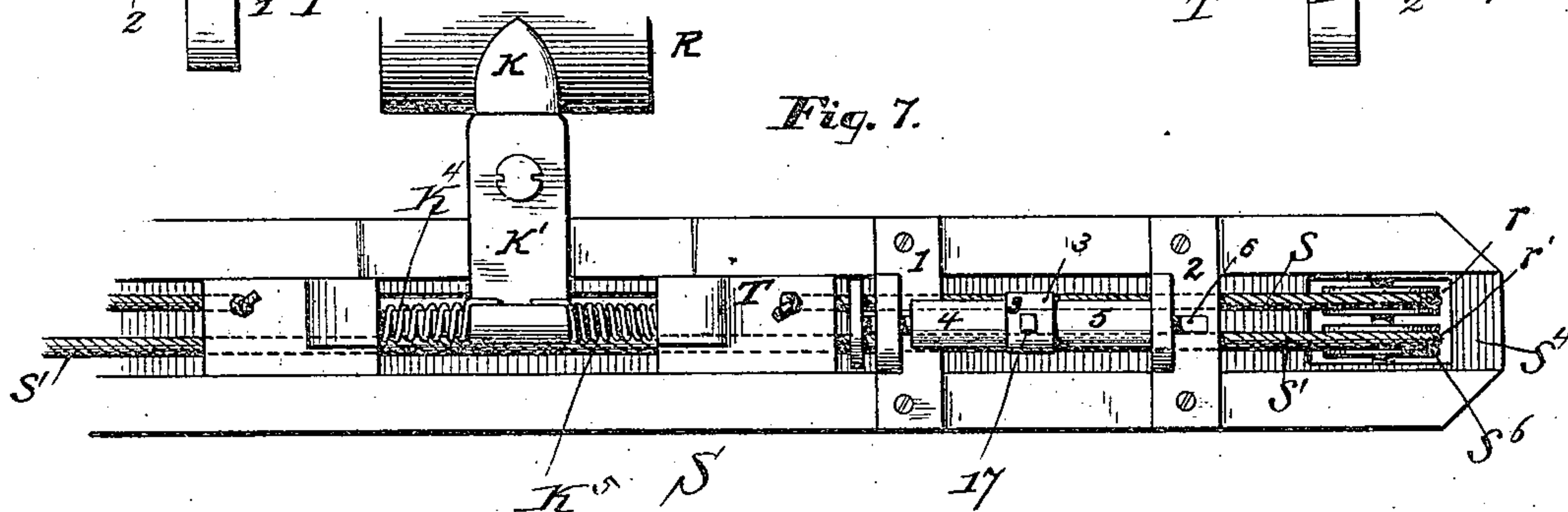


Fig. 7.



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(No Model.)

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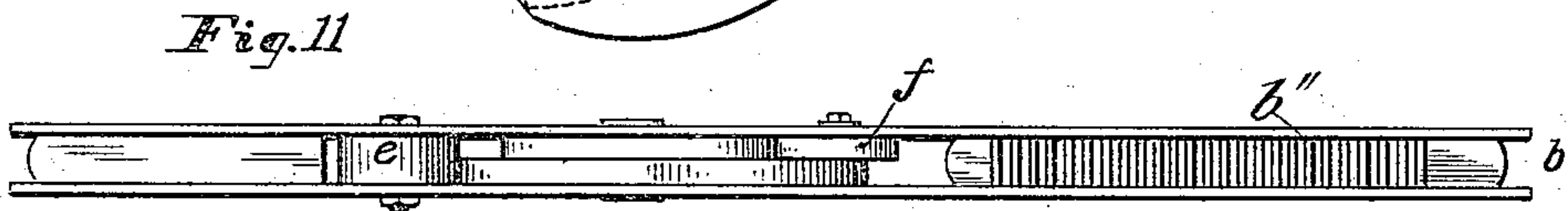
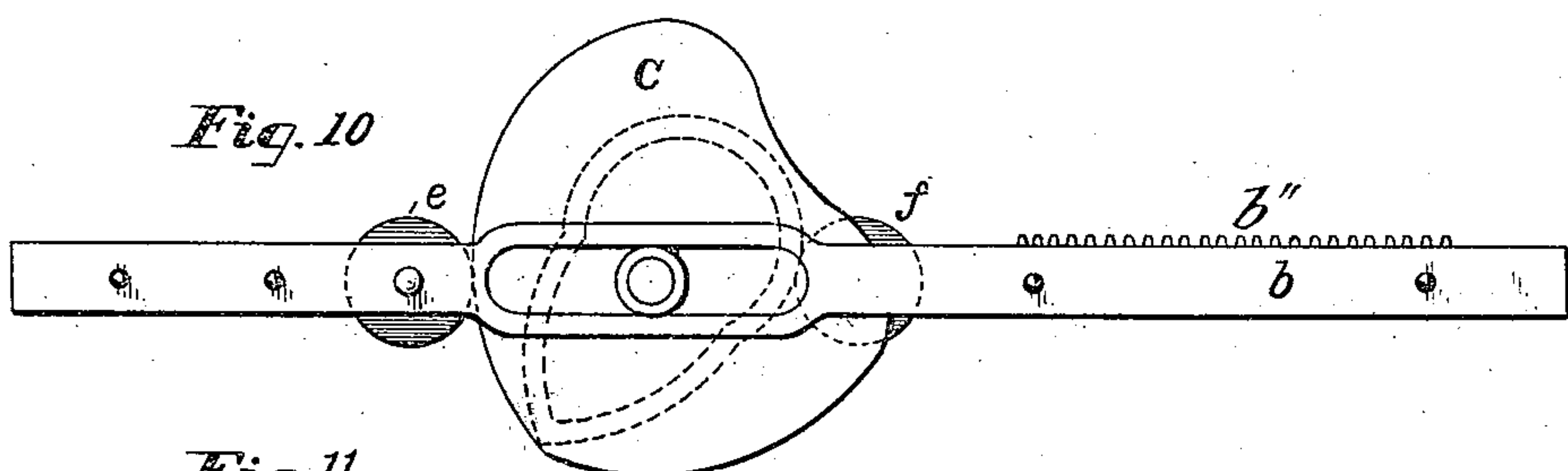
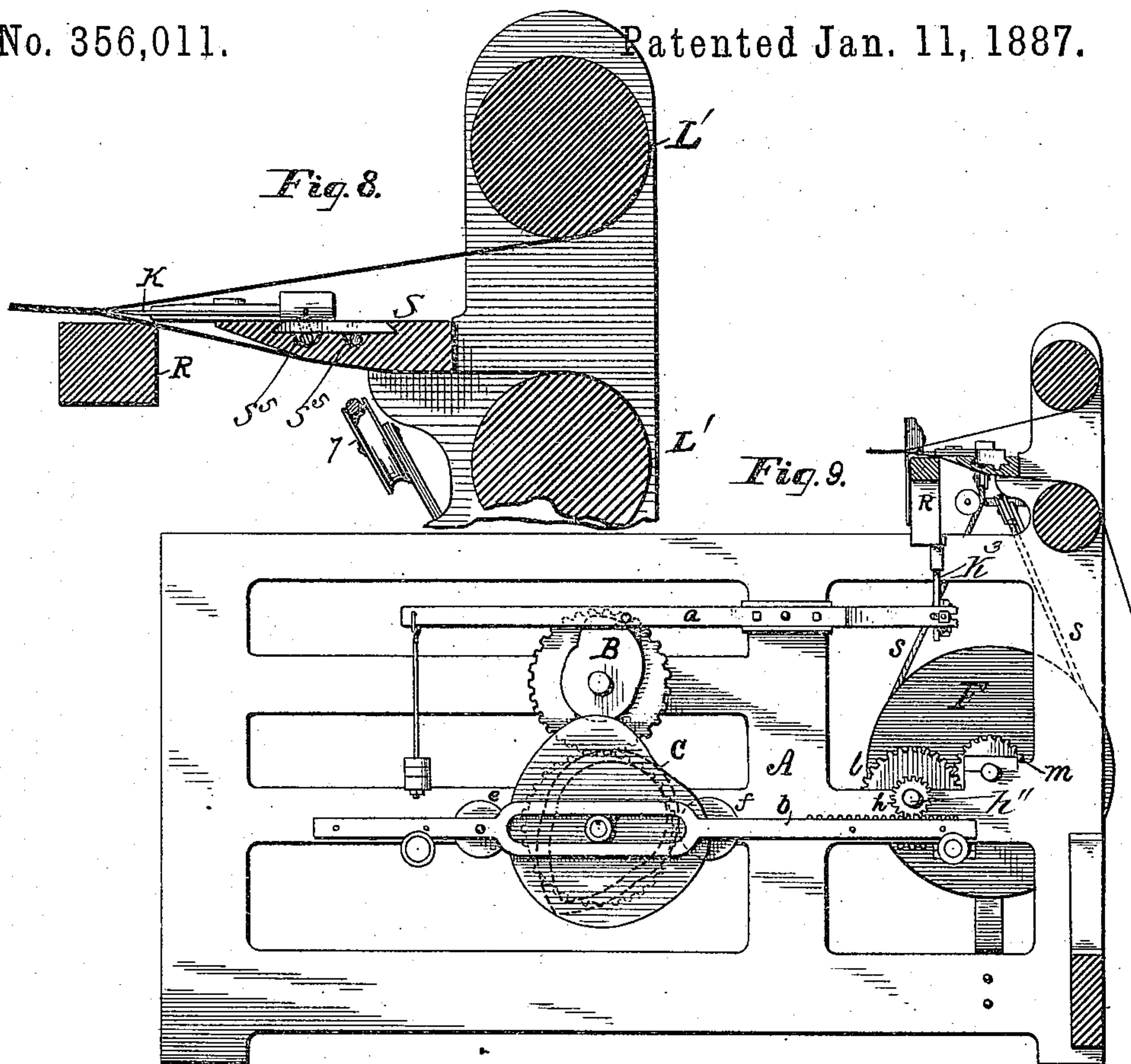
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UNITED STATES PATENT OFFICE.

CHARLES PEARSON, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO JOHN DOBSON AND JAMES DOBSON, BOTH OF SAME PLACE; MARY PEARSON (ADMINISTRATRIX OF SAID CHARLES PEARSON, DECEASED) ASSIGNOR OF REMAINING HALF TO SAID JOHN DOBSON AND JAMES DOBSON.

LOOM FOR WEAVING DOUBLE PILE FABRICS.

SPECIFICATION forming part of Letters Patent No. 356,011, dated January 11, 1887.

Application filed December 9, 1884. Serial No. 149,903. (No model.) Patented in England April 17, 1885, No. 4,768.

To all whom it may concern:

Be it known that I, CHARLES PEARSON, a subject of the Queen of Great Britain, at present residing in the city of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Looms for Weaving Double Pile Fabrics, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to looms for weaving velvet and other pile fabrics in which two cloths or backings with connecting pile-threads between them are woven and delivered to the front of the loom and the pile-threads there severed by laterally-reciprocating cutting mechanism, so as to produce two pieces of velvet, delivered face to face, at one operation; and my improvements are designed, principally, to overcome the difficulty experienced with such mechanism in producing a velvet of even surface and regular length of pile, owing to the knife losing its sharpness before completing its lateral travel from edge to edge of the fabric.

To this end my invention consists of cutting mechanism in which two pile-severing knives are arranged, and which are caused to travel laterally each a distance only half the width of the pile fabric in a transverse guide-plate or race, as hereinafter fully described.

My invention also consists in the combination and arrangement of two double cams, two reciprocating rack-bars, pulley-wheels, cog-gearing connecting the said racks with said pulleys, and actuating-cords, whereby the cutting-knife mechanism is reciprocated; and, lastly, in the combination, with the double-grooved transverse guide-plate and laterally-reciprocating knife-carriages, and mechanism, hereinafter described, to actuate the same, of a stopping device at each end of said grooved guide-plate for the knife-carriages, respectively.

In the accompanying drawings, in which similar letters of reference denote like parts in the several views, Figure 1 is a side eleva-

tion of part of a loom for weaving double pile fabrics, illustrating one of the knife-carriages and its actuating mechanism and part of the sharpening mechanism adjacent to such knife-carriage and part of its actuating mechanism. Fig. 2 is a front view of part of the loom. Fig. 3 is a transverse vertical section of the grooved race-bar, one of the cutting-knives mounted in its carriage, and one set of the sharpening-rollers with its frame or housing. Fig. 4 is a side view, partly in section, of a pair of sharpening-rollers and the frame or housing in which they are supported, a section of one of the knife-carriages with its knife resting flat between said rollers, and the actuating mechanism, whereby the housing containing said rollers is vertically reciprocated, so as to bring the upper and under surfaces of said knife alternately against the sharpening-rollers, respectively. Fig. 5 is a partly-sectional front view of a pair of the sharpening-rollers mounted in their frame and a portion of the velvet-rail or cutting-bar. Fig. 6 is a top view of the transverse grooved guide-plate or race-bar in which the knife-carriages are reciprocated and the parallel supporting-bar in which the fabric is cut by the laterally-traveling knives. Fig. 7 is an enlarged view of the parts at one end of Fig. 6, showing the transverse grooved race-bar, a knife-carriage with its knife, and the stopping mechanism in the race-bar. Fig. 8 is a view in cross-section of the velvet-delivering rollers, one of the pile-severing knives, and the supporting-bars, showing the relative position of these several parts. Fig. 9 is a view in transverse section from the inside of that part of the loom shown in Fig. 1 from the outside. Figs. 10 and 11 are enlarged side and top views, respectively, of one of the double cam and rack bars at each side of the loom, whereby the pulley-wheels actuating the knife-carriages are partially revolved, as hereinafter described; and Fig. 12 is a transverse sectional view of the loom, showing the location and arrangement of the crank-shaft and connecting-gearing, one of the pulley-wheels, and the sharpening

mechanism with its actuating mechanism for one of the knives.

The frame-work of the loom supports on each of the sides A A a single cam, B, and a double cam, C, actuated by a pair of cogs, E E, Fig. 1. The upper cogs, E, gear with a small cog, C³, mounted on the horizontal shaft D, (see Fig. 12,) which shaft supports a large gear-wheel, C², which in turn is engaged by gear-wheel C', that is driven by the gear E', mounted on the end of the crank-shaft E². The single cam B operates to raise and lower a weighted lever, *a*, one end of which is connected by an upright rod, *k*³, to the sharpening mechanism. The lower double cam, C, secured to the shaft of its actuating cog-wheel, operates to give reciprocating motion to the bar *b* by bearing alternately against the friction-rollers *e f*. The bar *b* is provided with a cog-rack, *b''*, on the upper surface of one of its ends, which gears with a small cog, *h*, secured to the same shaft; *h''*, as the cog *e*, which in turn drives a cog-wheel, *m*, secured to a shaft, L, extending out from one side of the loom, (see Fig. 2,) on which is also supported a pulley-wheel, F. Like mechanism as thus described and shown in Fig. 9 is arranged on the opposite side of the loom.

By means of the double cam C, operating the rack-bar and cog-gearing, as described, alternate partial revolutions in each direction are given to the pulley-wheel F, to which are secured two cords or bands, the other end of each of which is attached to the knife-carriage, one cord on one side and one on the other side thereof, so as by the alternate partial revolutions of the pulley-wheel in opposite directions to pull the carriage backward and forward transversely along the grooved guide-plate or race of the loom. A similar set of cords and a knife-carriage are provided for each side of the loom, both knife-carriages moving in the same guide-plate alternately, each only about half the distance across, and each alternating in its lateral travel from side to center of the race-plate.

Transversely across the frame of the loom are arranged two bars or rails, R and S, their relative positions being as shown in Fig. 6, the former being merely a bar or rail supporting the double pile fabric while it is being severed in two through the pile by the laterally-moving cutting-knives, said bar R being recessed near each of its ends (see Figs. 5 and 6) to admit of the insertion and support therein of the housings for the sharpening-rollers, and so that the upper and lower sharpening-rollers alternately shall come in contact with the upper and lower sides, respectively, of the knife-blade, as shown in Figs. 3 and 4 of the accompanying drawings.

The bar S is a grooved transverse guide-plate recessed at each of its ends at S⁵, to hold two sets of friction-rollers, *r r'*, over which the knife-actuating cords pass to the corresponding pulley-wheel F, and having one wide groove its entire length, serving as a race for

the knife-carriages T T. At the bottom of this groove are two smaller parallel grooves, S⁵, extending to the recesses at each end of the plate, and within which the knife-cords are moved. Two cross-bars, 1 and 2, are secured to the bar S at each end, supporting a guide-rod, 6, having an enlarged inner end, which serves as a stopper for the knife-carriage, and upon the rod 6 are placed two pieces of india-rubber tubing, 4 and 5, and between them a metal band, 3, which may be slipped along the rod against the tubing and fastened tight at any point thereon by a set-screw, 17. By this arrangement the rubber tubing acts as an elastic cushion for the stopper-rod and in turn for the knife-carriage. The movable metal band also permits of lateral adjustment of the stopper-rod, thereby producing a variation in the resistance encountered by the knife-carriage. This mechanism is shown in detail in Figs. 6 and 7, the latter showing only one end of the bar S, the other end containing similar mechanism for the other knife-carriage. This stopping mechanism described, however, forms the subject in part of a separate application for patent filed by me December 5, 1884, and is not intended to be herein claimed separately.

The knife K, to cut the connecting pile laterally between the two backings, is secured in a holder, K', mounted in a carriage, T, moving laterally in the large groove of the race-bar S backward and forward half the length of the bar, from about its center to its either end, by means of the pulley and cords hereinbefore mentioned. The end of the knife-holder K' swings upon a cross-bar, K⁴, passing through it and having its bearings in the carriage T, and a spring, K⁵, is coiled around this cross-bar on either side, with its ends fastened to the carriage, so that the tendency is to press the knife-blade down upon the supporting-bar R, or upon the velvet resting thereon, and cause the knife to travel in its reciprocating motion in a straight line and cut the pile evenly.

Each knife-carriage is provided with two pulley-cords—*s s* for one carriage, and *s' s'* for the other carriage, fastened one at each end thereof, one cord *s* passing from the right-hand carriage over the friction-roller *r* at that end of the bar S to and partially around the pulley wheel F in one direction, and has its end knotted in the periphery thereof. The other cord *s*, fastened to the other end of the knife-carriage, passes along one of the small grooves in the bar S to the other or left-hand end thereof, where it passes over a similar friction-roller, *r*, and back under the bar S to another friction-roller, 7, and thence to and partially around the pulley-wheel F, (in an opposite direction from the other cord,) to which it is fastened. A like set of cords, *s' s'*, for the other or left-hand knife-carriage are arranged and operate in the same manner at the other end of the bar S, moving in the other small groove in said bar and over the friction-rollers *r'*. These are delineated in Figs. 2, 6, and 7 of the

drawings. This arrangement causes the knife-carriages to be moved backward and forward in the carriage-race when and as the pulley-wheels wind up either cord successively as the said wheels are turned by means of the mechanism operated by the cam C.

Upper and lower velvet-rollers L L, suitably mounted in the frame of the loom, take up the two pieces of pile fabric cut apart through the connecting pile by the laterally-reciprocating knives K, and draw forward the uncut double pile fabric up to the traveling knives as it is delivered over and upon the velvet-rail or cutting-bar R. These rollers L L are geared together and actuated by a worm, to which motion is communicated from the picking-shaft or by other appropriate means; or any other suitable actuating mechanism may be employed that will give a continuous slow revolving motion to the take-up rollers—for instance, that shown in English Patent No. 1,117 of 1871. This take-up motion, however, is well known in the art, and is not of my invention.

The sharpening devices for each knife consist of two cylindrical rollers, I' I², covered with leather or otherwise prepared to produce a fine and sharp edge on the knife, mounted one above the other in a housing or frame, w, supported in a recess in the bar R, as shown in Fig. 5, with appropriate mechanism for revolving these rollers, and also for bringing them alternately to bear against the upper and lower sides, respectively, of the knife-blade. The construction and operation of sharpening mechanism applicable to looms of this character are, however, well known in the art, and form the subject of several Letters Patent for that and other improvements in looms for weaving double pile fabrics—for example, English patent to George Davies, No. 2,429 of 1858, and English Patent No. 470 of 1868. In Figs. 3, 5, and 12 are shown, however, a pair of sharpening-rollers, I' I², mounted in their frame or housing w, and the belts and pulleys I⁶ I⁷, by which they are driven. The housing or frame is reciprocated vertically to bring the upper and lower rollers alternately against the knife-blade, as hereinbefore mentioned, by means of the upright rod or standard K³, connected at one end to the weighted lever a, that is moved by the cam B, as hereinbefore described.

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

1. The combination, with the frame A of the loom, of two double cams, C, with rack-bars b, arranged on opposite sides of the frame, two pulley-wheels, F, arranged in like manner, and cog-gearing connecting the said rack-bars, two knife-carriages, T, with their knives, transverse grooved race-bar S, and two sets of pulley-cords, each set connecting one of the knife-carriages T to its appropriate pulley-wheel F, whereby the pile of the woven fabric is severed laterally each half of its width by each knife moving from side to center of the race-bar alternately, substantially as described.

2. The combination, with the frame A of the loom and mechanism to present double pile fabric to be severed to form two pieces of pile fabric, of the cutting mechanism herein described, consisting of two knife-carriages, T, with knives K K, two sets of cords, s s', and two pulley-wheels, F F, arranged on opposite sides of the supporting-frame, mechanism to partially revolve the said wheels in opposite directions alternately, and thereby wind and unwind successively the cords s s' on one side of the loom, and in like manner the cords s' s' on the other side of the loom alternately, and a transverse grooved guide-plate or race-bar, S, said parts being constructed, combined, and arranged in order that said double fabric shall be severed laterally by said laterally-reciprocating knives, each moving in said race-bar alternately from side to center thereof, substantially as described.

3. The combination, with the frame A of the loom, of the race-bar S, having one large and two smaller lateral grooves parallel with each other, two knife-carriages moving in said larger groove, and two sets of actuating-cords, s s s', with mechanism for winding and unwinding the same successively, as described, and a stopping device at each end of said race-bar, consisting of cross-bars 1 2, guide-rod 6, rubber sleeves 4 5, set-screw 17, and band 3, the said parts being constructed, combined, and operating substantially as set forth.

In testimony whereof I have hereunto affixed my signature this 21st day of November, A. D. 1884.

CHARLES PEARSON.

Witnesses:

FRANCIS S. BROWN,
H. T. FENTON.