

(No Model.)

3 Sheets—Sheet 1.

W. SHAW.

DROP BOX OPERATING MECHANISM FOR LOOMS.

No. 436,547.

Patented Sept. 16, 1890.

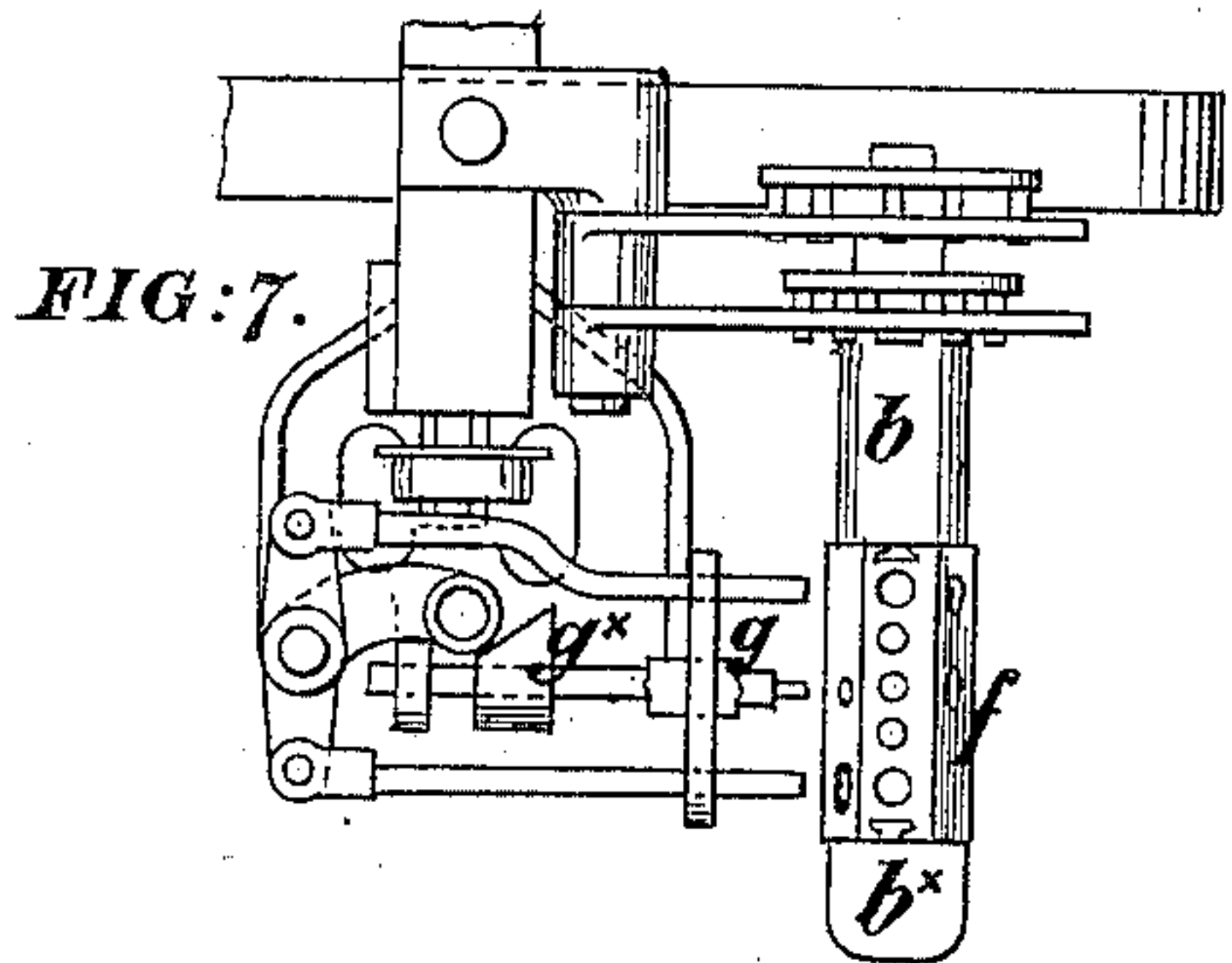


FIG:1.

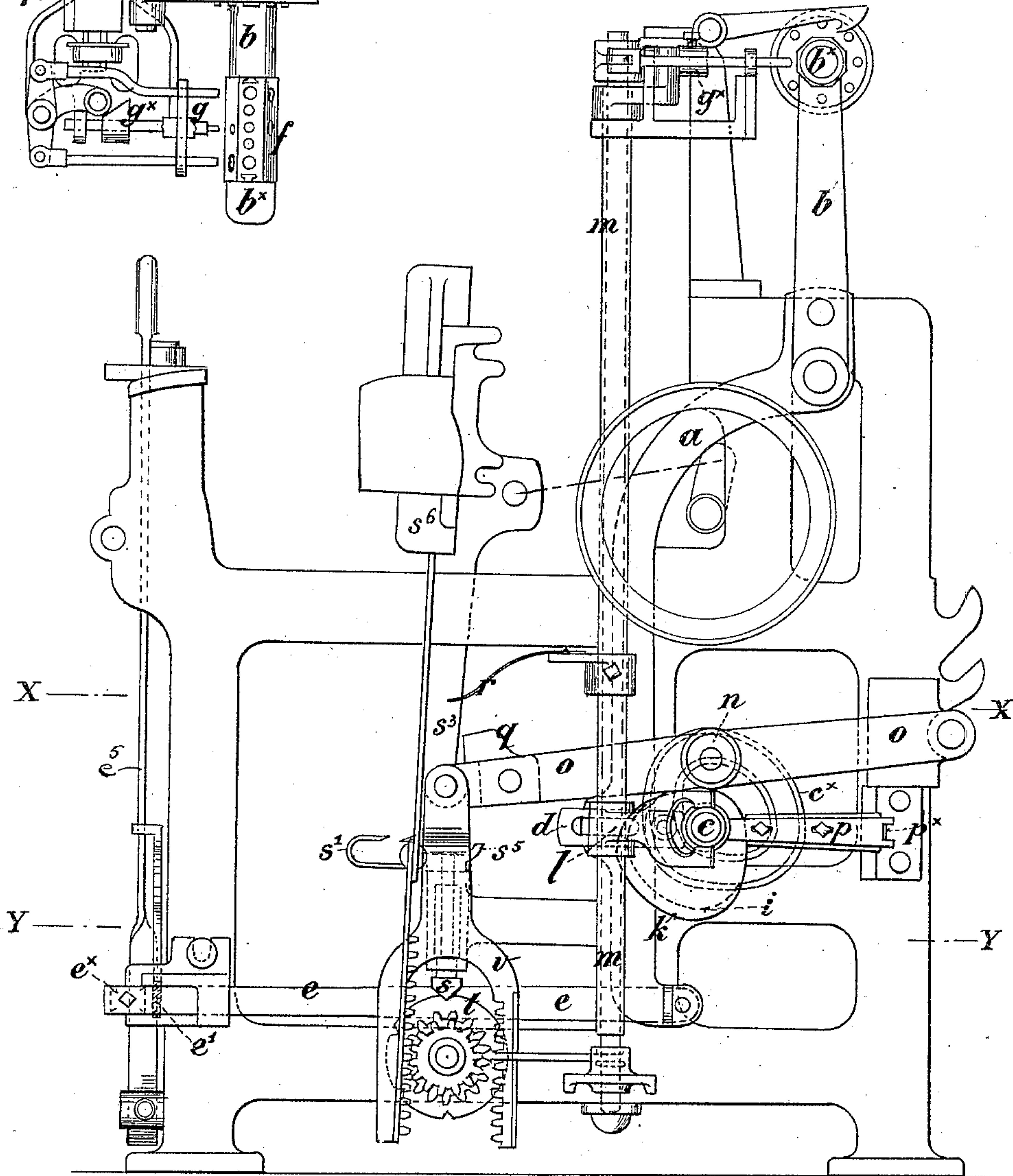
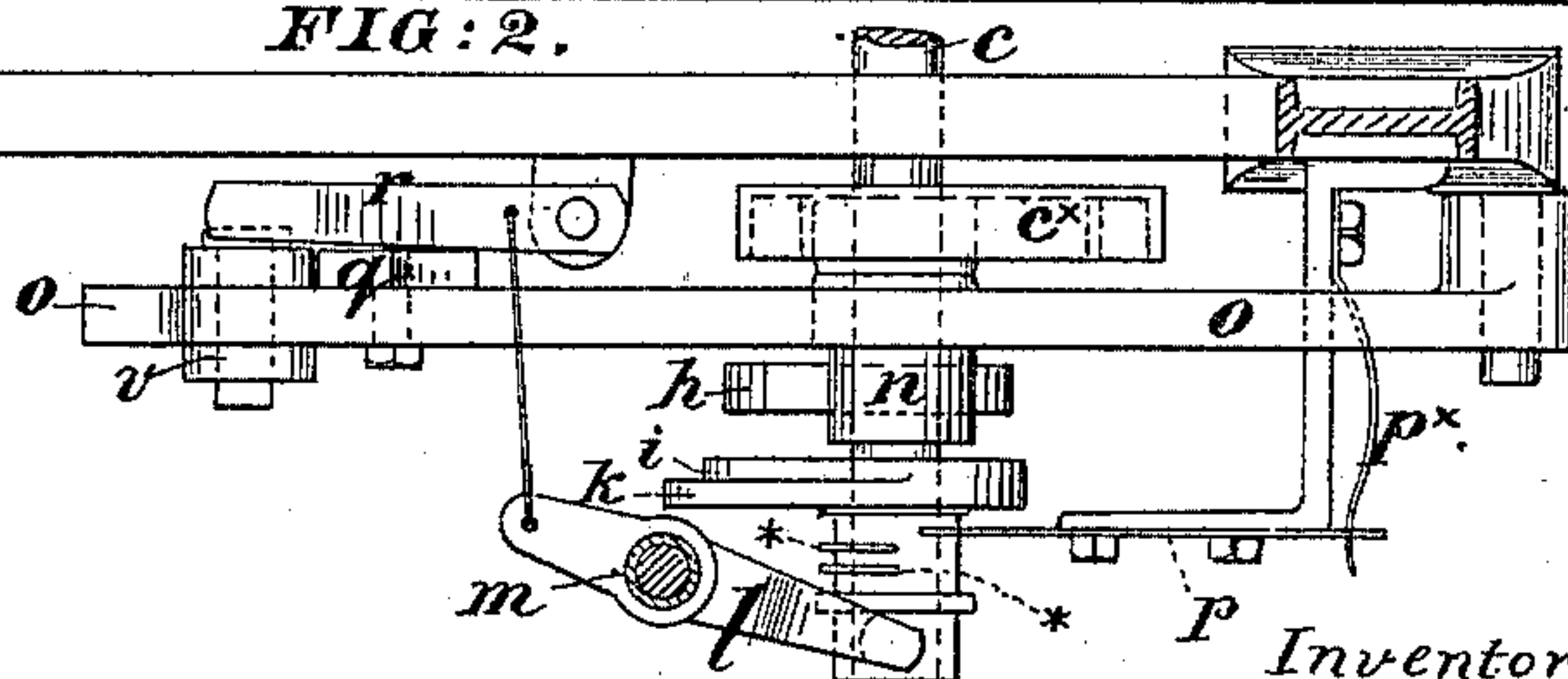


FIG:2.



Witnesses
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Inventor:
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By his attorneys
Howson & Howson

(No Model.)

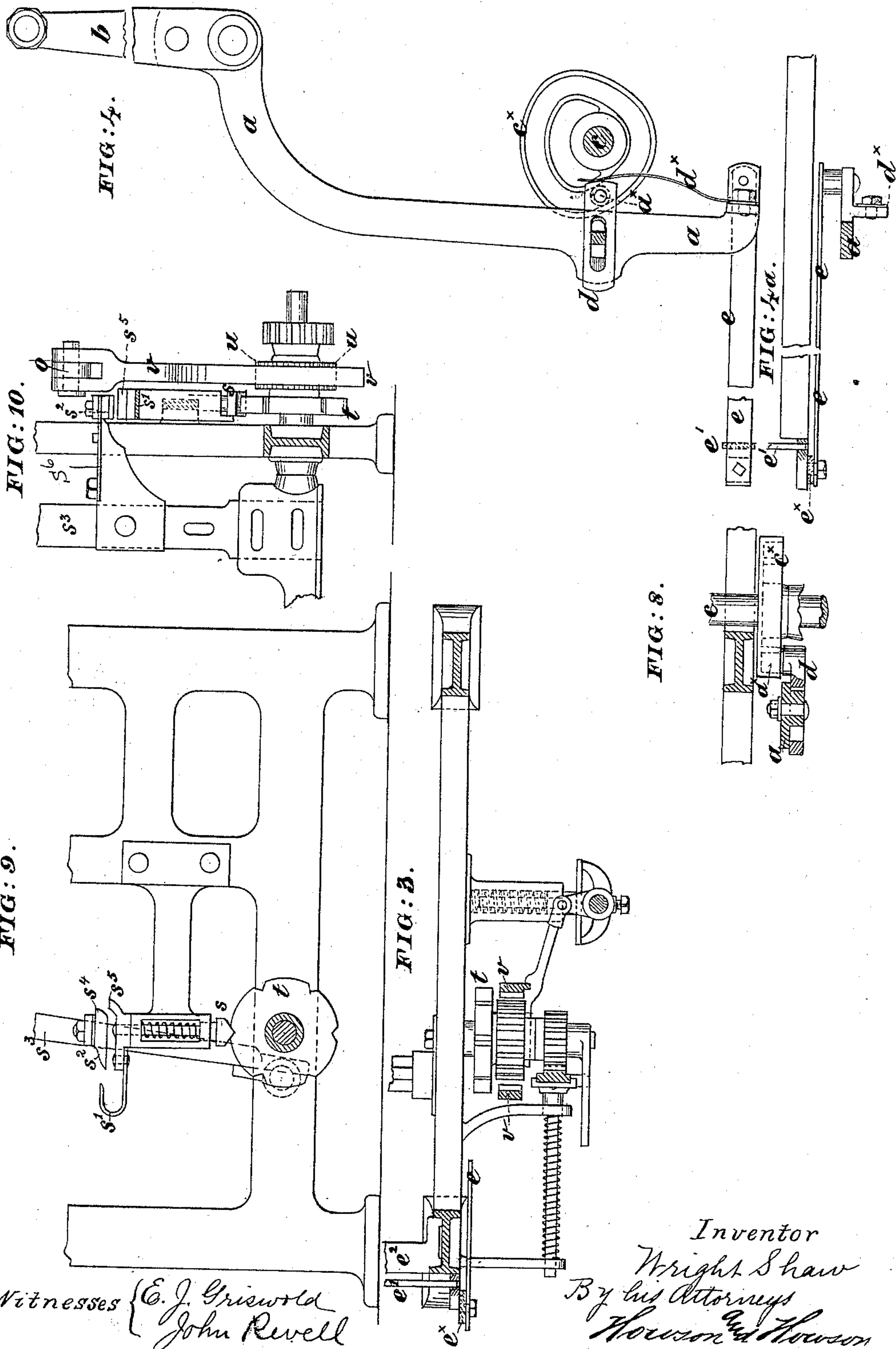
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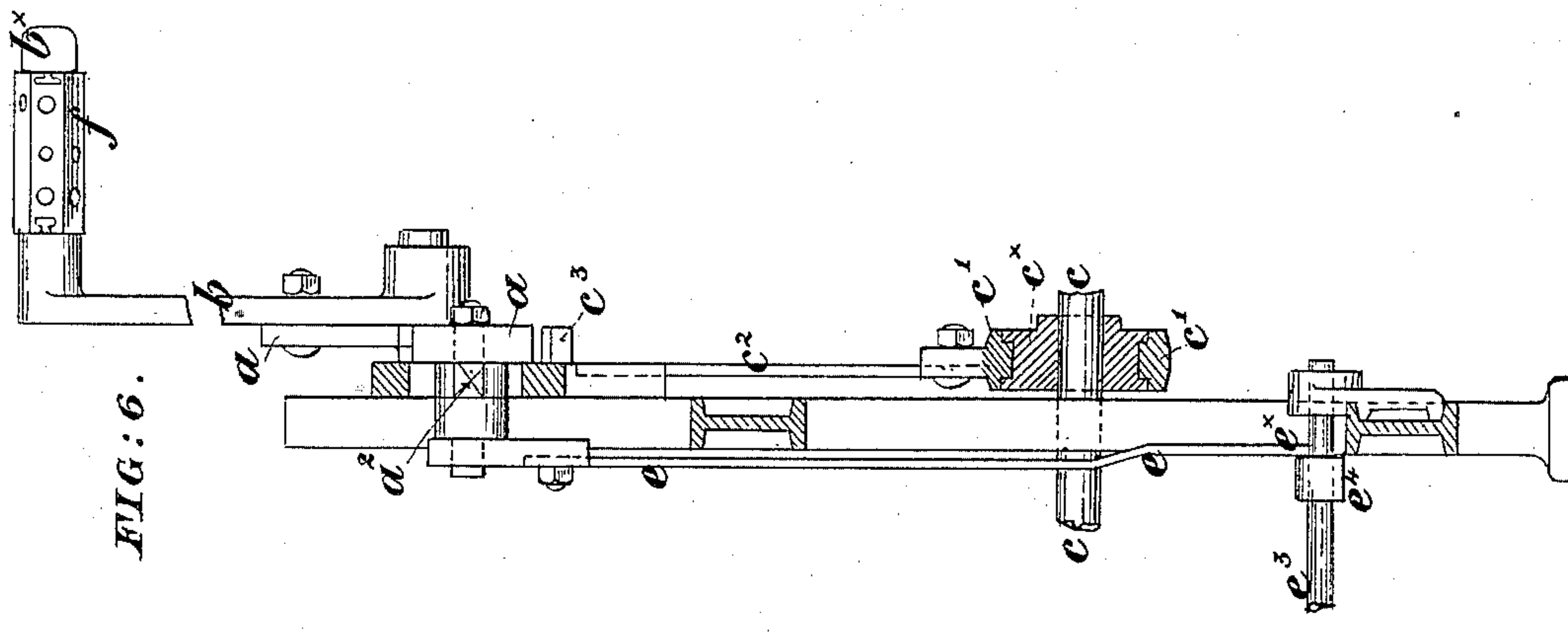


FIG: 6.

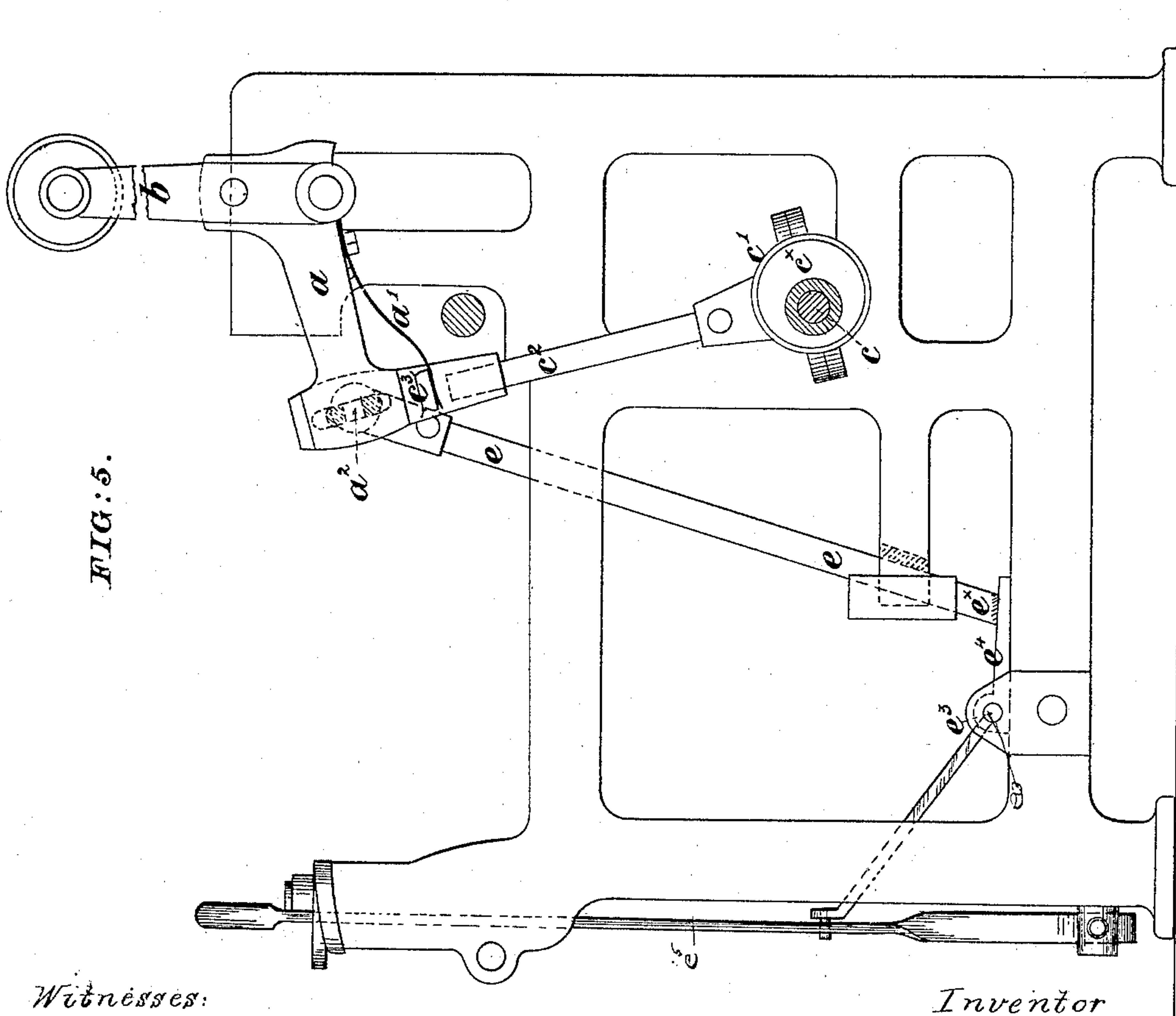


FIG: 5.

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UNITED STATES PATENT OFFICE.

WRIGHT SHAW, OF BREDBURY, ENGLAND.

DROP-BOX-OPERATING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 436,547, dated September 16, 1890.

Application filed August 31, 1889. Serial No. 322,560. (No model.) Patented in England January 29, 1889, No. 1,552; in Belgium August 21, 1889, No. 87,442, and in Switzerland October 10, 1889, No. 1,417.

To all whom it may concern:

Be it known that I, WRIGHT SHAW, a subject of the Queen of Great Britain and Ireland, residing at Bredbury, in the county of Chester, England, have invented Improvements in Drop-Box-Operating Mechanism for Looms for Weaving, (for which I have obtained Letters Patent in Great Britain, No. 1,552, dated January 29, 1889; in Belgium, No. 87,442, dated August 21, 1889, and in Switzerland, No. 1,417, dated October 10, 1889,) of which the following is a specification.

The principal object of this invention is to simplify and render more convenient and efficient the construction of looms for weaving, which formed the subject-matter of Letters Patent granted to me in the United States of America, No. 352,783, dated November 16, 1886. Part of my invention is, however, applicable to other kinds of looms.

Figure 1 in the annexed drawings, which form a part of this specification, is a side elevation of so much of a loom as is necessary to illustrate my invention. Fig. 2 is a sectional plan view of part of the same, the sections being taken through about the line X X of Fig. 1, the cylinder-bracket being removed. Fig. 3 is a similar view, the section being taken at about the line Y Y in Fig. 1. Fig. 4 is a detached elevation of the cylinder-bracket and cams, hereinafter described. Fig. 4^a is a plan view, partly in section, of the spring-lever and locking-bar, hereinafter described. Fig. 5 is an elevation (the cam-shaft being in section) of a modification, wherein an eccentric is used on the said cam-shaft instead of the cam. Fig. 6 is a sectional end elevation of the same modification. Fig. 7 is a plan view of the cylinder-cards and their adjuncts detached. Fig. 8 is a detached sectional plan of the cylinder-bracket lever and cam shown on Fig. 4, the section being taken through the sliding piece *d*. Figs. 9 and 10 are detached views (side and end elevations) of the means for locking the shuttle-box, hereinafter described.

In the first place, instead of actuating the cylinder-bracket by means of a cam actuating a spring-lever and a short shaft carrying an arm connected to the said bracket by a rod

or link, as hitherto, I dispense with the said shaft, which was inconveniently situated below the warp-beam, and I connect the said bracket directly with a cam or eccentric fixed on the tappet-shaft outside the framing of the loom. When a grooved cam is used, (see Figs. 1, 2, 4, 4^a, and 8,) I bring down the cranked end of the lever *a*, to which the cylinder-bracket *b* is fixed, past the said tappet-shaft *c*, and I mount the bowl *a*^x, which works in the grooved cam *c*^x, upon this end of the lever *a* in a sliding bracket *d*, (see also detached sectional view, Fig. 8,) which is so held by a spring *d*^x that it can yield when the bracket *b* is required not to beat up or only beat up part of its stroke. To the end of the aforesaid cranked lever *a* is attached a sliding bar *e*, which works to and fro in a horizontal direction as the cam *c*^x moves the lever *a*. (See Figs. 4 and 4^a.) Upon this bar is a stop or projection *e*^x, which, when the cylinder-bracket *b* is required to beat up, passes the end of a transversely-placed locking bar or rod *e*¹, situated by preference close to the bottom front rail *e*² of the loom. When the cylinder *b*^x is required to cease its action, this transverse locking bar or rod *e*¹ is caused to slide forward by means of a spring-handle *e*⁵, similar to the ordinary spring-handle of the loom, and, by coming in front of the projection *e*^x on the first-named sliding bar *e*, serves to lock the cylinder-bracket lever *a* and stop the action of the cylinder *b*^x.

When an eccentric *c*^x is employed on the tappet-shaft *c* to actuate the cylinder *b*^x, (see Figs. 5 and 6, Sheet 2,) the clip *c*¹ of the said eccentric *c*^x is connected by a suitable rod or link *c*² to the end of the cylinder-bracket lever *a* by a suitable spring-connection, which will yield when the motion of the cylinder *b*^x is arrested. The spring-connection (shown in the drawings, Figs. 5 and 6,) consists of a spring *a*¹ fixed to the lever *a* and bearing against the projection *c*³ on the end of the rod or link *c*², which is also provided with a slot in which the pin *a*² works. To the end of the said cylinder-bracket lever *a* is also connected (by the pin *a*²) an arm or projection *e*, extending downward, so that its end *e*^x or a catch thereon will rise and fall with

the said lever a in front of and just missing a sliding locking rod or bar e^3 , provided with a projection e^4 . When the cylinder b^x is required to cease its action, this rod or bar e^3 is caused to slide endwise in a similar manner to the action of the locking rod or bar e' before described, and by similar means, so that the projection e^4 will come into the way of the part e^x and arrest its downward motion. The lever a and bracket b will then be stopped, while the slotted rod or link c^2 will still move up and down with the eccentric, sliding on the pin a^2 , the spring a' yielding to its action.

In order to obtain an additional throw by means of the central holes in the cards f and peg or rod g , acted on by the pattern-cylinder b^x , and thus obtain a "four-box lift," I cut the said holes of two sizes, as required, and I form the center peg or rod g of two diameters, (see detached plan view, Fig. 7,) the smaller part being at the extremity. Thus if a blank card is presented to the peg or rod g , it will actuate the same in the usual way, and if a card with a small central hole is on the working-face of the cylinder b^x it will move the peg g part way only, as the shoulder formed by the enlarged diameter of the said peg or rod g cannot pass through the small holes although it is of such a size that it will pass through the larger holes.

On the tappet-shaft c (see Fig. 2) I mount three cams—one h as usual for the single-lift and the other two i and k by preference cast together and moved into or out of the working position, as required, by the fork l at the end of the tube m , which is acted upon, as usual, by the before-named central peg or rod g , the incline g^x thereon (see Fig. 7) being of course so formed as to bring one or other of the cams i or k beneath the bowl n , on the "boot-jack" lever o . Upon the boss of this double cam $i k$, I cast or fix projections, (shown at *, Fig. 2,) which form grooves part way round the said boss, and I mount a suitable catch or bolt p on the loom side, which fits into one or other of these grooves, and when the position of the double cam $i k$ is determined by the forked lever l , this catch or bolt p retains it there until the bowl n on the boot-jack lever o has reached its lowest position, and I thus avoid all jumping or sudden dropping of the said lever o from one cam to another, which is especially liable to occur when a four-box lift is required.

In case the bolt or catch p should come against one of the projecting sides of the grooves, I so mount it that it can yield slightly, by means of the spring p^x , and I bevel its end and the ends of the said projecting sides of the grooves to insure the entry of the bolt or catch p into the grooves.

Instead of using the lever and springs, as marked $x y z$, upon Fig. 2 of the drawings accompanying the specification of United States Letters Patent No. 352,783, of November 16, 1886, I form or fix a suitable projec-

tion q on the boot-jack lever, above which the spring r is moved if a three-shuttle lift is required. This will cause the boot-jack lever o to meet the spring r rather sooner for the greatest lift, as the difference between the lifts of the cams i and k at this point of the lever is greater than the height of the projection q .

For a four-shuttle lift, the spring r will be moved away from the projection q and above the lever o (or above a smaller projection of suitable height thereon.) For the single lift the spring r is not reached by the said lever, as it is not required.

Another part of my invention relates to the motion which locks the shuttle-box in position when raised or depressed by the boot-jack. This motion or apparatus consists of a vertical spring-actuated bolt or catch s , (see Figs. 9 and 10, Sheet 3,) which takes into one of a number of notches formed in a disk t , which revolves with the pinion u , actuated by the said boot-jack v . I fix or form upon the upper end of the said bolt or catch s a suitable hook-shaped plate s' , which (when the bolt s is raised by the boot-jack v , causing the pinion u and disk t to revolve,) comes into such a position that a plate s^2 , (or other suitable piece,) projecting from the lathe-sword s^3 , will come beneath it and (for a time) lock it in the raised position and prevent the spring-actuated bolt s from bearing against the said disk t until the latter has been almost completely acted upon by the boot-jack v , when the bolt s will be released to lock the shuttle-box s^6 . Thus the said bolt or catch s will be prevented from rattling over the notches of the disk t as it is rotated. When the spring-actuated bolt has dropped into one of the notches on the disk t the under side of the piece s^2 is brought over the other end of the plate s' and locks the bolt in position, s^2 and s' being provided with inclines s^4 and s^5 , as shown at Fig. 9. The piece s^2 is mounted on a spring-plate s^6 , that it may be capable of slight yielding action in case it should come in contact with the incline s^5 before the bolt s is in the notch.

I claim as my invention—

1. In a loom, the combination of the cylinder-bracket and a lever connected thereto, with a reciprocating link, means to operate the link, a spring to normally hold one end of the link and the lever together, but capable of yielding when the lever is stopped, a bar attached to the lever, and a locking-bolt, substantially as and for the purposes set forth.

2. In a loom, the combination of a cylinder-bracket and a lever connected thereto, with a reciprocating link, the tappet-shaft carrying an eccentric to operate the said link, a spring to normally hold one end of the link and the lever together, a bar connected to the bracket-lever, and a locking-bolt to arrest the movement of the bar, substantially as and for the purposes set forth.

3. In looms, the combination of a tappet-shaft provided with movable cams, with a peg adapted to be operated by a pattern-card having different-sized holes, the said peg having two diameters, the smaller one at the extremity and provided with an inclined portion, and devices actuated by the incline to move the cams on the tappet-shaft, as and for the purposes set forth.

10 4. In looms, the combination of a boot-jack lever having a raised projection with a spring adapted to be moved into a position at one time above the lever and again above the projection thereon to check the rise of the boot-jack lever, substantially as set forth.

15 5. The combination of shuttle-boxes, and

boot-jack mechanism for operating the same, with a lock to hold the boxes in position, consisting of a notched disk rotating with the pinion operated by the boot-jack, a spring-actuated bolt provided with a hooked plate, and a plate on the lathe-sword to engage the hooked plate for holding the said bolt in or out of engagement with the notches of the disk, substantially as set forth.

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

WRIGHT SHAW.

Witnesses:

JNO. HUGHES,
J. E. HUGHES.