

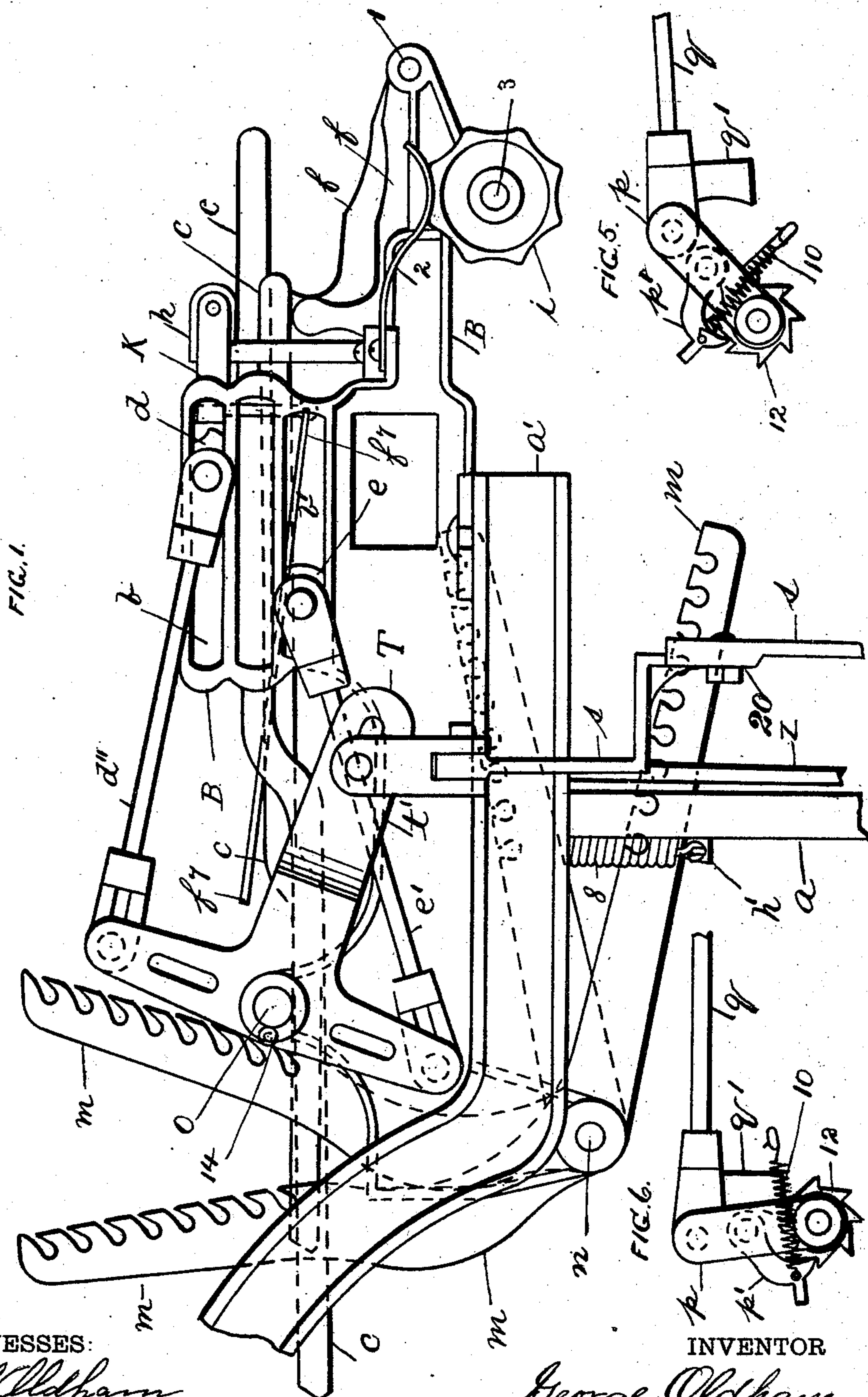
(No Model.)

4 Sheets—Sheet 1.

G. OLDHAM.  
SHEDDING MOTION FOR LOOMS.

No. 572,711.

Patented Dec. 8, 1896.



WITNESSES:

Sam'l Eldham  
Jacob P. Deturles

INVENTOR

George Oldham.  
by Lewis F. Broussard  
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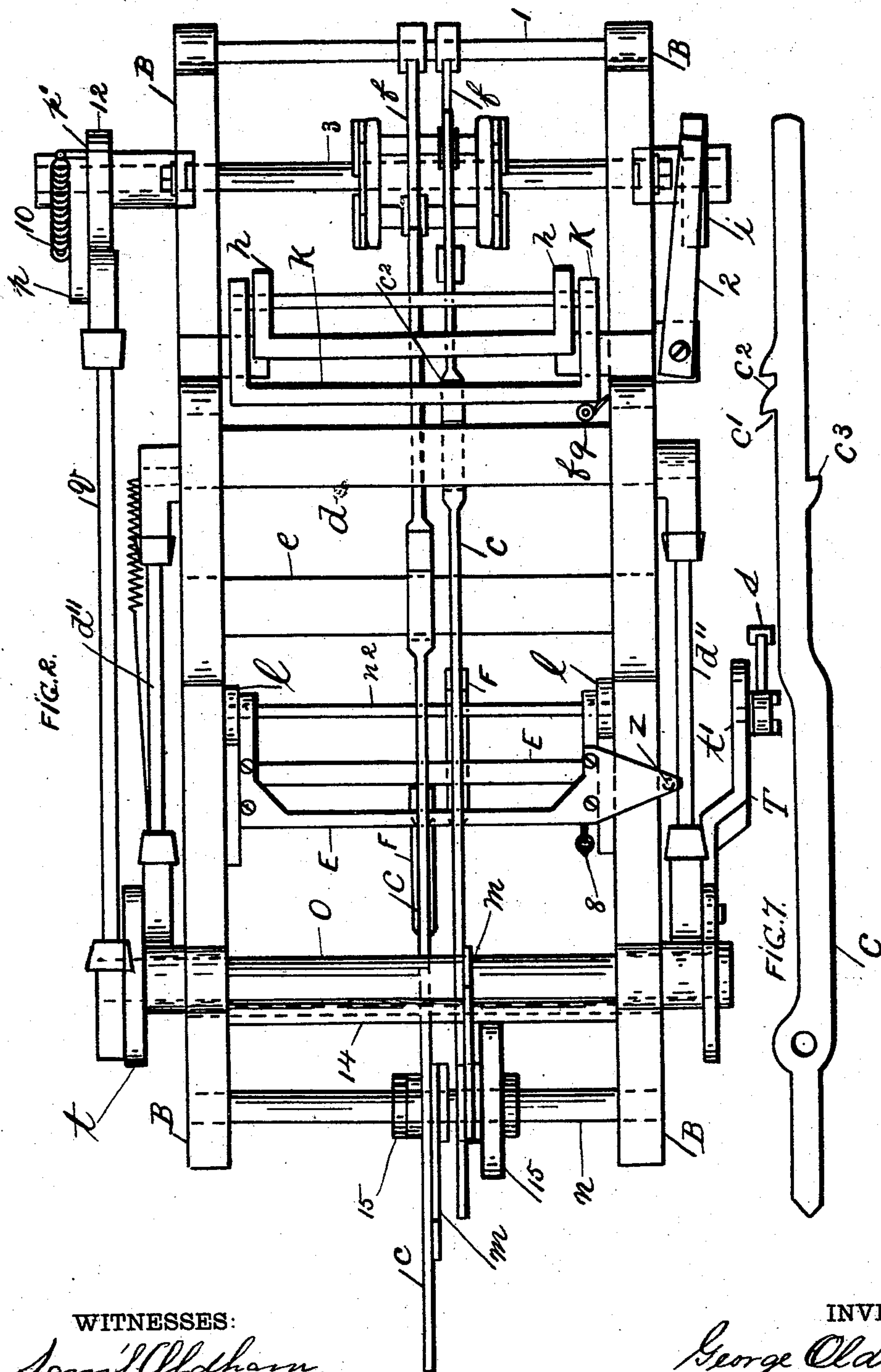
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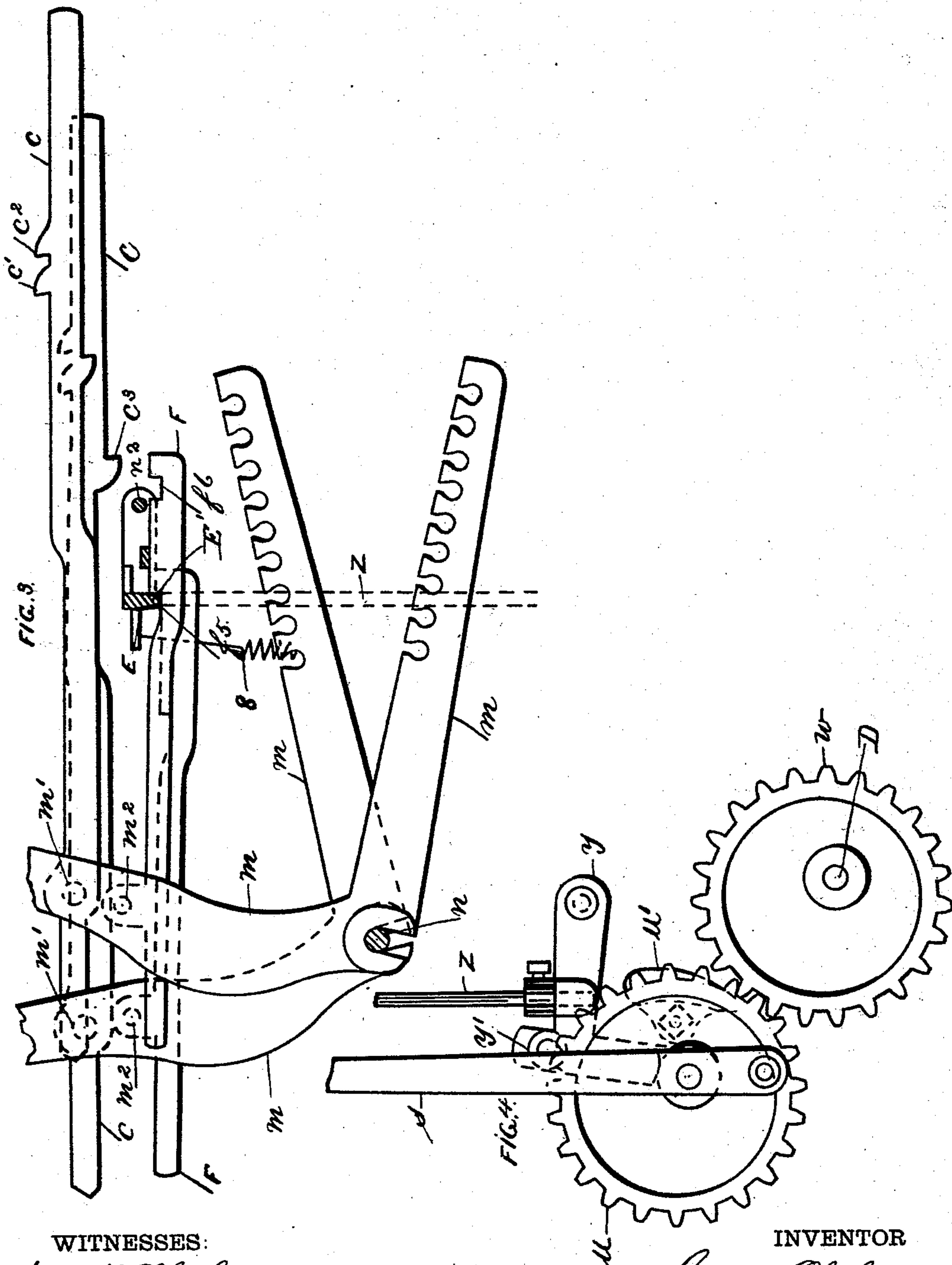
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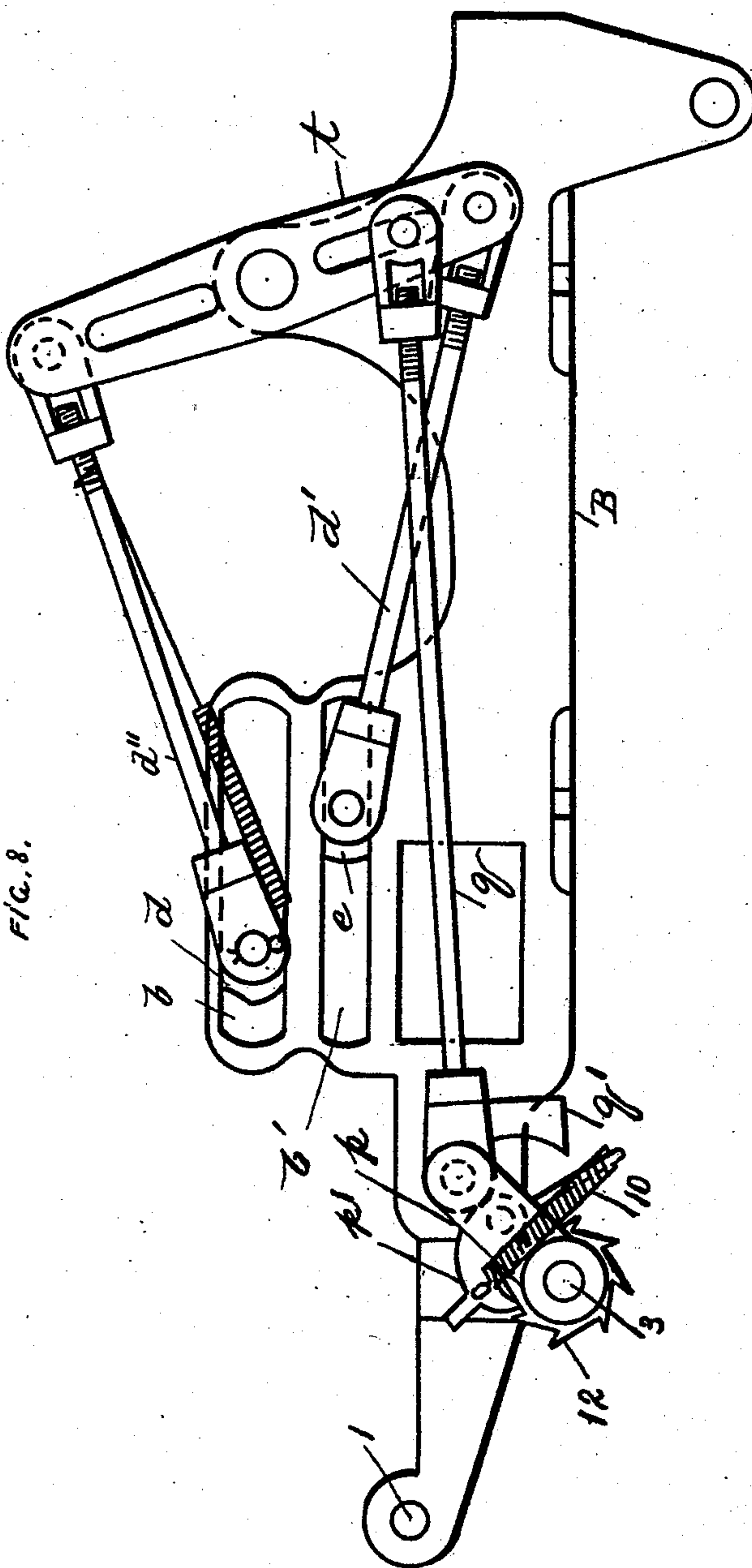
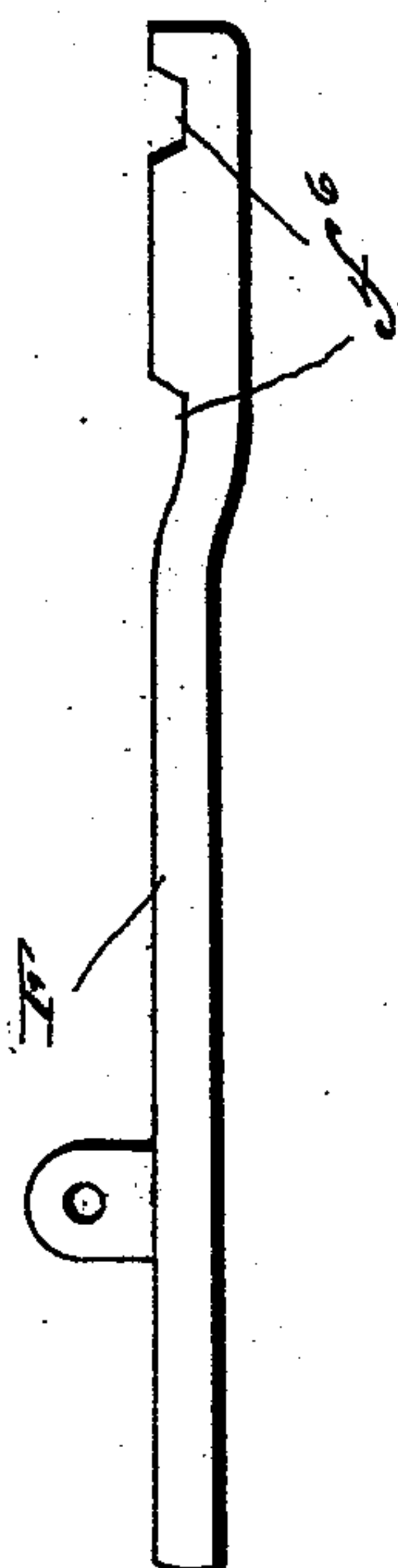
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**4 Sheets—Sheet 4.**

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# UNITED STATES PATENT OFFICE.

GEORGE OLDHAM, OF PHILADELPHIA, PENNSYLVANIA.

## SHEDDING-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 572,711, dated December 8, 1896.

Application filed July 3, 1896. Serial No. 598,031. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE OLDHAM, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Shedding-Motions for Looms; and I do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to an improvement in harness-motion for looms, actuated by means of a pattern-chain in which each heddle-frame to be operated on is connected directly to a separate harness-lever or what is now commonly known as a "jack." These levers or jacks each bear the same relationship one to the other throughout the series or nest and are individually operated on so as to produce a uniform result by means of mechanism that coacts alike with each of them. A number of difficulties are at present experienced in construction of motions for the purpose indicated, and at the same time my object is to have such construction overcome all troubles, yet attain all the advantages and the perfect operation necessary in a machine for the purpose. One of the principal objects sought to be secured in such a device, however, is the locking of each heddle-frame either at the highest or lowest point that it assumes in the weaving operation, and it is my intention in this description to confine myself to the especial means I employ in giving to each jack or lever a positive movement in either direction in order to operate each heddle-frame independently when called into action by the pattern-chain and also the locking of the whole number of heddle-frames used in the weave in the position in which they have been placed for an intermittent period. This means the production of an open shed or the establishment of a uniform line at which the upper and lower warps will be held to insure the shuttles' flight and many other advantages in the weaving operation, but which are to those skilled in the art

too well understood to need any detail explanation.

All the parts of my device are made universally interchangeable. Little or no care need be exercised in the assembling of the machine to insure its proper working when once the parts are placed in position in the framework, and it is so constructed that it can be made either a right or left hand machine instantly, if desired.

In the drawings herewith, Figure 1 is a side elevation of the principal working part of the device, represented as mounted on one end of the arch of the loom-frame and showing the jacks in their two directly-opposite positions or when the heddle-frame is at its highest and lowest point. Fig. 2 is a top or plan view of the same. Fig. 3 represents a skeleton of the locking-frame in its operative position in connection with independent notched bars connected with the jacks, the locking-frame being shown in section, holding the jack at its full forward movement, and the dotted position of the two parts illustrating the jack at the point of its full backward movement. Fig. 4 is a side view of the eccentric gears and the operating parts for imparting motion by means of the connecting-rod to one of them and to the proper working part of the machine. Figs. 5 and 6 are the two alternate positions of the ratchet mechanism for revolving the pattern-chain. Fig. 7 is a side view of the notched draw-bar. Fig. 8 is a detail view showing the connections between the draw-bar-operating knives and their actuating-lever. Fig. 9 is a modified form of locking-bar.

In order to describe the drawings, *a'* represents the loom-arch, to the appropriate side of which on the top the machine is securely mounted. As I prefer to construct my device in order to secure the greatest amount of steadiness to the machine I locate the same between the two parallel sides *a a* of the loom-frame that span the harness and which are bolted or otherwise secured to the uprights, which are in turn fastened to their respective sides of the loom-frame. *B B* are the two side frames of the dobby-frame, which are connected together by means of the grate or rack *h* and the cross-girt *l*. Upon



the inner ends of the side frames B B is secured a shaft *n*, which gives a bearing to each of the levers or jacks *m* used in the machine.

Directly forward of the shaft *n*, journaled in the two side frames, is a rock-shaft *o*, to the outer end of which at the proper side of the frame is secured a T-shaped rocker-arm T, and in an opposite position upon the other end of the said shaft is a lever *t*. Pivottally connected by means of an integral boss or projection *m'* upon one side of the upwardly-directed arm of each jack *m* is a long draw-bar *c*, provided, preferably, with two notches *c'* and *c''* or teeth upon its upper edge, and the bottom edge of each of said draw-bars *c* is constructed with a single notch or projection *C''*. The said notches are for engagement with the transverse knives *d* and *e*, located one above and the other below the notched draw-bars *c* and sliding with a reciprocating movement in suitable openings *b* and *b'* in the side frames B. These knives are connected, respectively, by the rods *d'* and *d''* and *e'* to the T-shaped rocker-arm T and the lever *t*.

In the extreme outer end of the two side frames B of the machine are pivoted loosely on the shaft 1 small levers or feelers *f*, corresponding in numbers to the draw-bars *c* and upon which the outer ends of the said bars rest, the feelers or levers being raised by means of the risers on the pattern-chain, the sinkers of the chain allowing for the fall of the levers or feelers in keeping with the character of the weave, the construction and operation of which parts are commonly understood. A spring 2, secured to one of the sides of the machine, has its free end resting in one of the suitable curved depressions in the periphery of the hand-wheel *i*, secured on one end of the shaft 3, by which the pattern-chain cylinder is rotated.

To the main arm T is connected a depending rod *s*, adjustable at 20, and the same is pivoted at its bottom end to the eccentric gear *u*, that meshes with a similar gear *w*, secured on the power-shaft D of the loom. Pivoted on the frame in the rear of the eccentric gears referred to is a lever *y*, provided at its free end with a loosely-revolving roller *y'*, which is engaged at each revolution of the eccentric gear *u* by the cam-piece *u'*. A vertically-moving rod Z is secured to the lever *y*, the upper end of which is connected to a frame E, pivoted by means of the rod *n''* on the stationary cross-girt *l*. A spring 8 has one end secured to the stationary rack *h'* and connects with frame E. Upon one end of shaft 3 is secured an arm *p*, supplied with a pawl *p'*, a spring 10 connecting said arm and pawl and causing the latter to constantly be in engagement with the teeth of the ratchet-wheel 12.

Connected to the upper end of the arm *p* is a supplemental connecting-rod *q*, whose rear end is pivoted to the lever *t*, and the front connecting part or head has an integral foot

*q'*, which rests upon the face of the second rear tooth engaged by the pawl and prevents any recoil to the pattern-chains. Supplemental or auxiliary notched connecting-rods F are pivoted near the rear ends upon suitable bosses or projections *m''* on the jacks *m*, their forward ends provided with suitable shoulders *f''* and notches *f'''* for engagement with the pivoted locking-frame E, as will hereinafter be described.

A transverse rod 14, directly in the rear of the rock-shaft O, the two ends of which are secured in the two side frames, is covered, preferably, with rubber, thereby limiting the forward movement of the jacks and furnishing a cushion for the latter to strike against.

The whole series of jacks are assisted in being supported in an upright position by means of the clamps or guards 15, placed each side of the series and bearing against the two outer jacks, these clamps being rigidly secured on the shaft *n*.

Pivoted on the rack or grate *h* is a holdback or locking-frame K, placed transversely over the draw-bars *c* for engaging the notches *c''* and the outer ends of said draw-bar *c*, and it is provided with an arm *f''*, by which the holdback can be liberated from all the draw-bars by the operator.

In the operation of the machine motion is communicated from the drive-shaft of the loom by means of the eccentric gears and communicated to the T-shaped lever by means of the adjustable arm *s*, and at each revolution of the gear to which the said arm is connected a proper amount of vibrating motion is imparted to the same and by means of the connections *d'* and *e'* to the reciprocating knives *d* and *e*. In the forward movement of the knife *d* all of those draw-bars that have been raised by the movement of the pattern-chain will be in such a position as to cause the notches *c'* of the draw-bars to be engaged by the upper knife *d*, and its forward movement will pull the draw-bars forward, thereby drawing the respective jack to which they are attached its full stroke. The opposite result will come to those draw-bars that are depressed by the directly opposite movement of the lower knife *e*, engaging those notches *c''* or projections on the bottom edge of the draw-bars. During the reciprocating movement of the knives the pivoted locking-frame E will be elevated by means of the cam *u'*, roller *y'*, lever *y*, and vertical rod Z, so as not to engage the notches *f'''* and shoulders *f''* of the auxiliary notched connecting-rods F to the jacks *m*. When the stroke of the two knives is complete, the frame E is forced by its own weight and assisted by the spring 8 to drop in the rear of the shoulders *f''* or into the notches *f'''* of the proper connecting-rods F and remaining there until the harness is to make another change, when the whole series of rods F will be simultaneously liberated.

The locking-frame E has its lower edge



rounded slightly, as shown at E', Fig. 3, so as that if unusual strain is exerted on any of the bars F the locking-frame E will rise slightly against the tension of the spring 8 and free the bars F, so as to prevent breaking any of the working parts of the machine. In lieu of rounding the lower edge of the frame I may of course give a slight inclination to the sides of the notches  $f^6$  in the bars F, as shown in Fig. 9. The spring 8, however, should be sufficiently strong to preserve at all times under ordinary circumstances an even shed-line. The supplemental spring  $f^9$ , connected to the locking-frame K, serves to form an additional hold on all those draw-bars connected with the jacks carrying the upper shed by engaging the upper notch  $C^2$  of each of them in their forward position. The spring  $f^9$ , secured thereto, connects with one of the side frames B, and an operating-rod  $f^7$  serves to unlock it from all the draw-bars it engages from the opposite side of the loom. This is for evening the shed.

In case the pattern of weave requires a long pattern-chain, the weight and momentum of the pattern-chain cylinder has a tendency to overlap or override to the following pick when the usual form of ratchet and pawl is used, but not so in this case. The integral foot  $q'$  prevents any further rotation of the pattern-cylinder than a single tooth of the ratchet-wheel.

It very often happens the loom is revolved backward, which would result in breaking any positive locking device, the locking-frame E, having the beveled edge E', and the safety-spring 8 in this case instantly releasing the transverse locking-frame from all the supplemental draw-bars F, as hereinbefore explained, thus overcoming the danger of breakage when the loom is reversed.

I claim—

1. In a loom, the combination with a dobby-frame, of a series of harness-levers mounted thereon, draw-bars pivoted on said harness-levers, reciprocating knives engaging said draw-bars to operate the harness-levers, means for reciprocating said knives, mechanism actuated by the pattern-chain to throw said draw-bars into operative relation to said knives, a series of locking-bars pivoted to the harness-levers, a locking-frame coöperating with said locking-bars to secure the harness-levers against movement, said locking-frame automatically releasing said locking-bars when they are subjected to an excessive strain.

2. In a loom, the combination with a dobby-frame, of a series of harness-levers mounted thereon, notched draw-bars pivoted on said harness-levers, reciprocating knives engaging said draw-bars to operate the harness-levers, means for reciprocating said knives, a series of feelers operated by the pattern-chain to throw said draw-bars into operative relation with said knives, a locking-frame or holdback for said draw-bars, and means

whereby the operator may throw said locking-frame from its operative position.

3. In a loom, the combination with a dobby-frame, of harness-levers mounted thereon, draw-bars pivoted on said levers, means for operating said draw-bars, a locking-frame or holdback for said draw-bars, a series of auxiliary locking-bars pivoted to said harness-levers and independent locking mechanism for said last-named bars.

4. In a loom, the combination with a dobby-frame, of harness-levers mounted thereon, draw-bars pivoted on said levers, means for operating said draw-bars, a spring-held locking-frame or holdback for said draw-bars, means whereby the operator may release said draw-bars at will, a series of auxiliary locking-bars pivoted on said harness-levers, a spring-held locking-frame for said last-named bars, said frame automatically releasing the said locking-bars when undue strain is exerted on them.

5. In a loom, the combination with the dobby-frame, of a series of harness-levers mounted thereon, draw-bars pivoted on said harness-levers and provided with notches on their upper and lower edges, reciprocating knives engaging said notched draw-bars, the locking-frame K engaging the notches  $c^2$  on the upper edges of said draw-bars, a rod  $f^7$  by means of which the operator may lift the locking-frame K and release the draw-bars, a series of auxiliary locking-bars F provided with the notches  $f^6$ , a spring-held locking-frame E having a rounded lower edge E' which engages the notches  $f^6$  on said bars F and secures them and the harness-levers against movement under normal strain, and means for raising and lowering said locking-frame E.

6. In a loom, the combination with a dobby-frame, of a series of harness-levers mounted thereon, notched draw-bars pivoted to said harness-levers, means for controlling said draw-bars, reciprocating knives engaging said draw-bars, an operating-lever for said knives, eccentric drive-gears for moving said lever, an adjustable rod connecting said drive-gears and said lever, auxiliary locking-bars pivoted to said harness-levers, a locking-frame for said last-named bars, an operating-rod for said locking-frame, and an actuating-cam carried by one of said drive-gears to move said rod and actuate the locking-frame.

7. In a loom, the combination with the dobby-frame, of a series of harness-levers, means for actuating said levers, and locking mechanism which secures said levers against normal strain at predetermined intervals but automatically releases them if undue pressure be brought to bear upon them.

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

GEORGE OLDHAM.

Witnesses:

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GEORGE H. PATTISON.