

No. 709,454.

Patented Sept. 16, 1902.

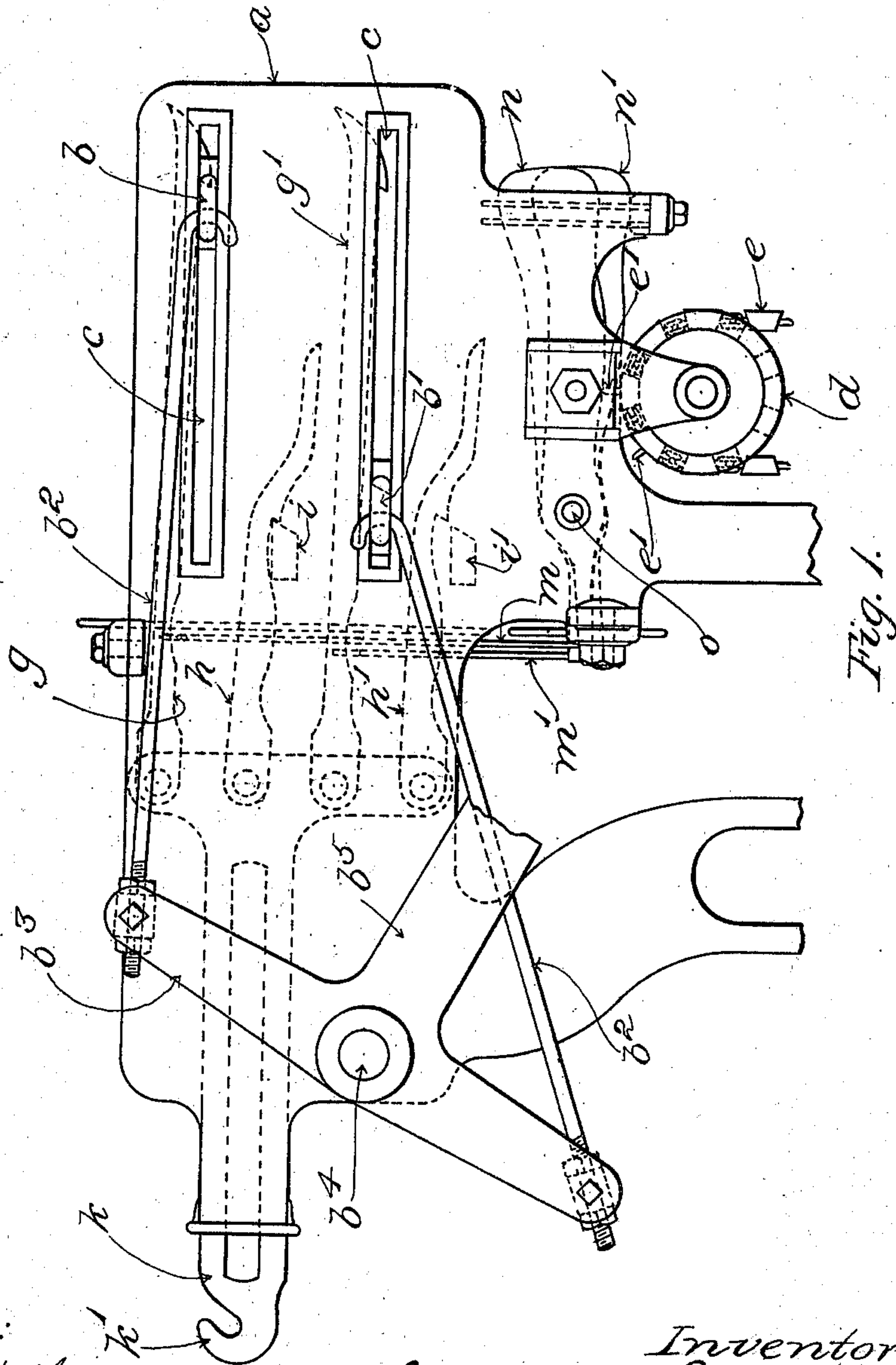
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(Application filed Jan. 2, 1902.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:
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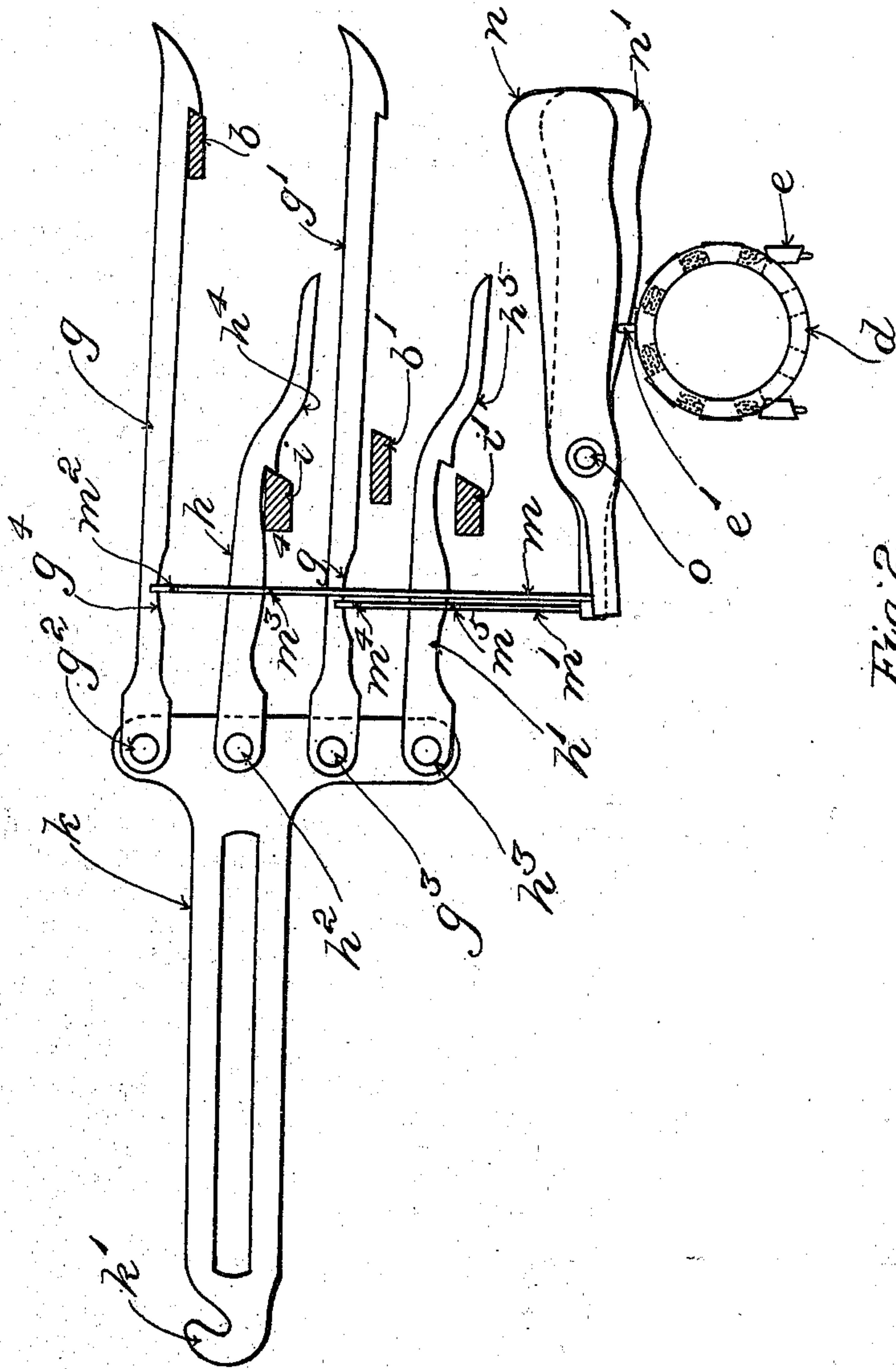


Fig. 2.

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UNITED STATES PATENT OFFICE.

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SHEDDING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 709,454, dated September 16, 1902.

Application filed January 2, 1902. Serial No. 88,039. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. STAFFORD, a citizen of the United States, residing at Bay-side, Warwick, in the county of Kent, State of Rhode Island, have invented a certain new and useful Improvement in Shedding Mechanisms for Looms, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to double-acting open-shed shedding mechanisms or dobbies for looms; and it consists in a novel construction and combination of parts producing a shedding mechanism or dobbie of the class named of simple, inexpensive, and durable character.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 shows in side elevation part of a shedding mechanism or dobbie embodying my invention, only so much thereof being represented as is required for the purpose of making clear the nature and working of the invention and the manner and means of reducing the same to practice. Fig. 2 is a view on the order of a diagram, showing principally the parts in which the invention more immediately resides.

At *a* is represented part of the framing, which may be of any usual or suitable construction. Two lifters are shown at *b b'*, the same being guided in their movements by any suitable means. Herein they are represented as having the ends thereof fitted to work in horizontal slots *c c*, Fig. 1, in the opposite sides of the framing. Any preferred means of operating the said lifters may be employed in practice for the purpose of moving the same oppositely with relation to each other and of causing them to act alternately in moving the hooks and the connections of the latter in lifting the harness-frames. I have represented the said lifters as connected, respectively, by rods *b² b²* to the opposite arms of a rocker *b³*, which is mounted on a rock-shaft *b⁴*, one such rocker and pair of connecting-rods being in practice employed at each side of the shedding mechanism or dobbie and the rockers being operated for the purpose of actuating the lifters through power transmitted from the working parts of

the loom on which the mechanism is employed by suitable connections joined to a third arm, as *b⁵*, with which the rocker *b³* is shown provided.

At *d* is shown a pattern-cylinder which in practice is operated in suitable manner by means not necessary to be shown and described, and at *e* is represented portion of a pattern-chain applied to the said pattern-cylinder and provided with indicators constituted by pegs or pins *e' e'*. Pattern-fingers *n n'* of usual character are shown, the same being pivoted at *o* and being arranged to be acted upon by the said indicators of the pattern-chain.

In carrying my invention into effect I provide a pair of hooks, as *g g'*, which coöperate, respectively, with the upper and lower lifters *b b'*, respectively. In connection with said hooks *g g'* I provide also a pair of holding or locking hooks which engage with a pair of stationary holding-bars *i i'*, as *h h'*. All four hooks coöperate in securing the required action of a harness-frame, the respective hooks *g g'* serving to connect the said harness-frame with the respective lifters when a movement of the harness-frame is required to take place and the respective holding-hooks serving to retain the harness-frame elevated for two or more picks in succession when this is required to occur. The four hooks *g g' h h'* constitute a connected group pertaining to one harness-frame, each of the harness-frames in a loom having a similar group connected therewith. The manner and means of uniting the four hooks with one another into a group and connecting such group with the corresponding harness-frame may vary in practice. Preferably I employ a movable part to which all of the respective hooks constituting the group are joined and which itself is joined in suitable manner and by approved connections to the said harness-frame. The said movable part may for the purposes of the present case be termed a "transmitter," and preferably the said transmitter is constituted by a slide *k*, having the four hooks pivoted at *g² h² g³ h³*, respectively, to its outer end, which is extended vertically to an extent sufficient to enable the said hooks

to be pivoted thereto one above another in the order that is illustrated. The inner end of the said slide *k* is hooked, as at *k'*, or otherwise adapted for the attachment of the harness connection. (Not shown.)

In conjunction with each hook *g* or *g'* and its companion hook *h* or *h'* I employ pattern devices serving to control the engagement of the respective hooks *g* *g'* with the respective lifters *b* *b'* and of the respective holding-hooks *h* *h'* with the respective holding-bars *i* *i'* and also the disengagement of the respective hooks from the respective lifters and holding-bars. The most satisfactory arrangement for the purposes comprise needles *m* *m'* and pattern-fingers *n* *n'*, the said pattern-fingers being pivotally mounted at *o*. The needles *m* *m'*, respectively, are engaged by the inwardly-projecting ends of the pattern-fingers, while the weighted outer portions of said pattern-fingers overhang the pattern-chain and are acted against by the pegs or pins *e'* of the said chain. Needle *m* has rests or projections at *m*² *m*³ to engage with the under surfaces of the upper hook *g* and its companion holding-hook *h*, and needle *m'* has corresponding rests or projections at *m*⁴ *m*⁵ to engage with the under surfaces of the lower hook *g'* and its companion holding-hook *h'*. Pattern-finger *n* and needle *m* control the engagement of upper hook *g* and upper holding-hook *h*, respectively, with upper lifter *b* and upper holding-bar *i*, respectively. Pattern-finger *n'* and needle *m'* control the engagement of lower hook *g'* and lower holding-hook *h'*, respectively, with lower lifter *b'* and lower holding-bar *i'*, respectively.

When either needle is dropped, the hooks controlled thereby will be dropped also, and the shedding-hook *g* or *g'*, as the case may be, will be engaged by the corresponding lifter in the outgoing movement of the said latter, thereby causing the slide *k* to be drawn outward and the harness-frame raised. The drawings show needle *m* lowered, the upper hook *g* engaged with the upper lifter *b*, and the parts positioned as at the outer extreme of the outgoing movement of the said upper lifter, with the upper locking-hook *h* dropped and engaged with the upper holding-bar *i*. Needle *m'* is shown raised, whereby the lower holding-hook *h* is raised above the lower holding-bar *i'*. So long as pegs or pins *e'* on the pattern-chain are presented beneath the pattern-finger *n* the hook *h* will be permitted to remain in engagement with the upper holding-bar *i*, and this will hold the slide *k* in its outer position, with the harness-frame elevated. The holding-hook *h* being engaged with holding-bar *i*, the lifter *b* at each outgoing movement thereof as it reaches the end of its stroke will act against the shoulder of hook *g*, and thereby draw said hook and the parts which are connected therewith outward slightly far enough to ease up the hold of the holding-hook *h* against the holding-bar *i*. If in consequence of a shift or advance of the

pattern-chain a portion of the latter having no peg or pin *e'* should be present beneath pattern-finger *n* at the time when the holding-hook is thus eased, the said pattern-finger will be permitted to turn so as to raise needle *m*, and thereby lift holding-hook *h* out of engagement with the holding-bar *i*. Thereupon the hook *g* and connected parts will be free to accompany lifter *b* in its ingoing movement and will do so in consequence of the pull of the spring that is connected with the harness-frame. In order that needle *m* may rise, as aforesaid, so as to raise the holding-hook *h* out engagement with holding-bar *i*, notwithstanding the fact that hook *g* is still engaged with lifter *b*, the hook *g* is constructed and arranged so that when in its outward position represented in the drawings there is sufficient clearance vertically between the same and the rest or shoulder *m*² of said needle to permit independent movement of the needle and the holding-hook *h* sufficient in extent to raise hook *h* out of engagement with holding-bar *i*. This clearance may be provided for in more than one way; but in the present instance I have upwardly bent or curved the under surface of the hook *g*, as at *g*⁴, at the portion thereof which overlies the needle *m* when hook *g* is in its outermost position. The description just given with respect to the working, &c., applies equally in the case of hook *g'* and the adjunctive parts.

An especial aim in connection with the invention has been to reduce the length of the shedding mechanism so that the extent of the projection thereof laterally of the loom shall be slight. In securing compactness I have brought the holding-bars *i* *i'* close to the needles *m* *m'*. The distance traversed by the slide *k* and group of hooks carries the shoulders of the holding-hooks *h* *h'* past said needles in the inward movement of said hooks. It is necessary, therefore, to prevent the said shoulders from engaging with the rests or projections at *m*³ *m*⁵ on the respective needles *m* *m'*. To this end the portions of the holding-hooks *h* *h'* which project outwardly beyond the said shoulders thereof are formed underneath as cams *h*⁴ *h*⁵. During the inward movement of the hooks these cams encounter the tops of the holding-bars *i* *i'*, and as they ride over the same the action raises the holding-hooks sufficiently to cause the shoulders thereof to clear the rests or projections *m*³ *m*⁵ of the needles. In the outward movement of the hooks the holding-hooks descend as soon as their shoulders have passed outward beyond the said rests or shoulders.

I claim as my invention—

1. In a double-acting shedding mechanism for looms, in combination, the lifters acting alternately, the holding-bars, two pairs of hooks, each pair respectively comprising a hook to engage with the corresponding lifter, and a holding-hook to engage with the corresponding holding-bar, means for transmit-

ting to a harness-frame the movements which are communicated by the lifters to the hooks, and pattern devices whereby the engagement of the hooks with the lifters and holding-bar is controlled, substantially as described.

2. In a double-acting shedding mechanism for looms, in combination, the lifters acting alternately, the holding-bars, two pairs of hooks, each pair respectively comprising a hook to engage with the corresponding lifter, and a holding-hook to engage with the corresponding holding-bar, means for transmitting to a harness-frame the movements which are communicated by the lifters to the hooks, and pattern devices having a member which engages with the hooks of one pair to control the engagement of such hooks with the corresponding lifter and holding-bar, and a second member which engages with the hooks of the other pair for the like purpose, substantially as described.

3. In a double-acting shedding mechanism for looms, in combination, the lifters acting alternately, the holding-bars, two pairs of hooks, each pair respectively comprising a hook to engage with the corresponding lifter, and a holding-hook to engage with the corresponding holding-bar, means for transmitting to a harness-frame the movements which are communicated by the lifters to the hooks, and pattern devices having a needle which controls the engagement of the respective hooks of one pair with the corresponding lifter and holding-bar, and a second needle which controls the engagement of the respective hooks of the other pair with the corresponding lifter and holding-bar, substantially as described.

4. In a double-acting shedding mechanism

for looms, in combination, the lifters acting alternately, the holding-bars, the transmitter, the two pairs of hooks connected therewith, each pair thereof comprising a hook to engage with the corresponding lifter and a holding-hook to engage with the corresponding holding-bar, and the pattern devices comprising essentially a pattern-surface, pattern-fingers, and needles operated by said pattern-fingers and cooperating, respectively with the respective pairs of hooks, substantially as described.

5. In a double-acting shedding mechanism for looms, in combination, the lifters acting alternately, the holding-bars, two pairs of hooks, each pair, respectively, comprising a hook to engage with the corresponding lifter, and a holding-hook provided with a cam to cause vertical movement of the hook as it moves across the corresponding holding-bar, to thereby clear the needle during the inward movement of the holding-hook, means for transmitting to a harness-frame the movements which are communicated by the lifters to the hooks, and pattern devices having a needle which controls the engagement of the respective hooks of one pair with the corresponding lifter and holding-bar, and a second needle which controls the engagement of the respective hooks of the other pair with the corresponding lifter and holding-bar, substantially as described.

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

GEORGE W. STAFFORD.

Witnesses:

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WILLIAM A. COPELAND.