

No. 709,455.

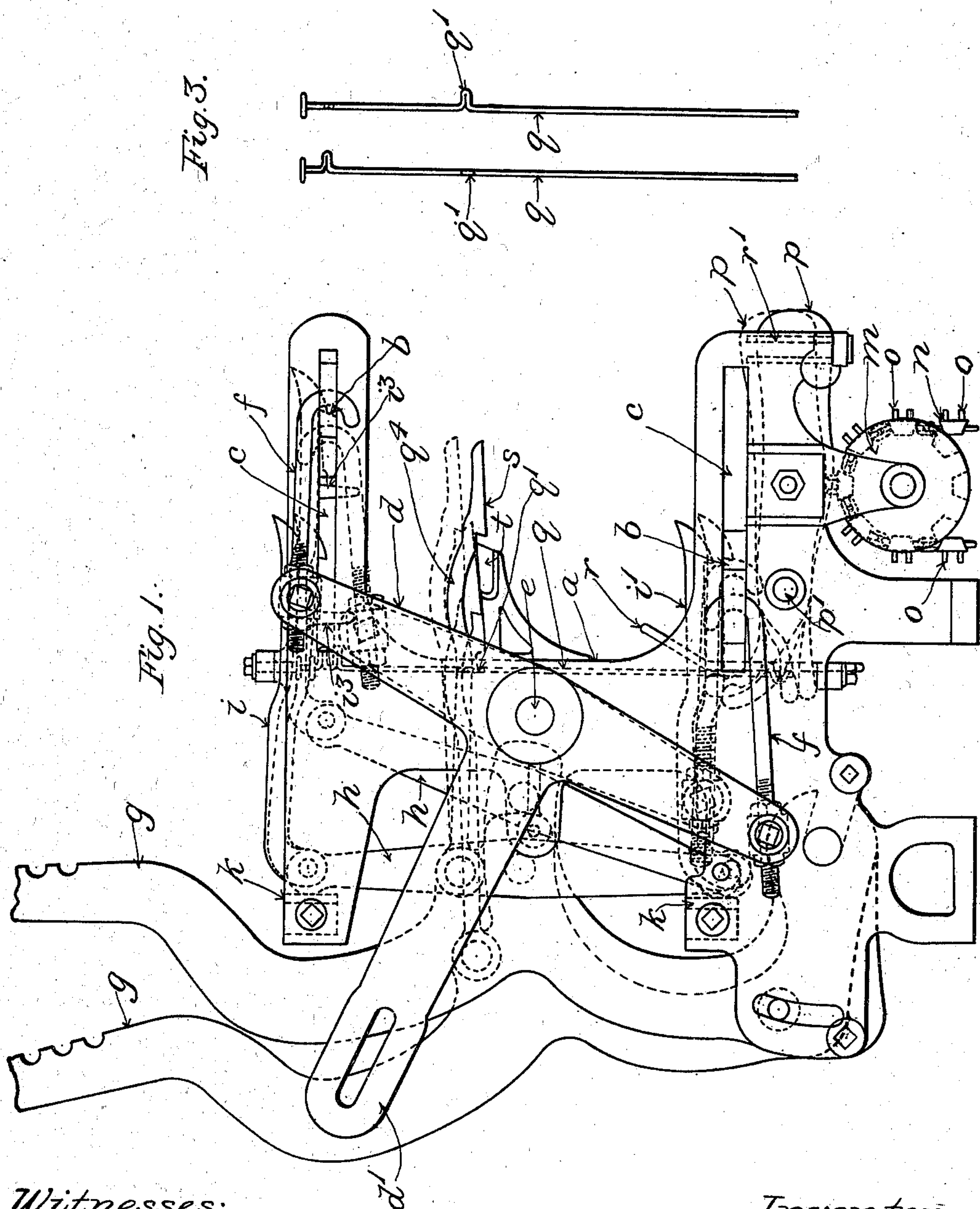
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SHEDDING MECHANISM FOR LOOMS.

(Application filed Jan. 2, 1902.)

(No Model.)

2 Sheets—Sheet 1.



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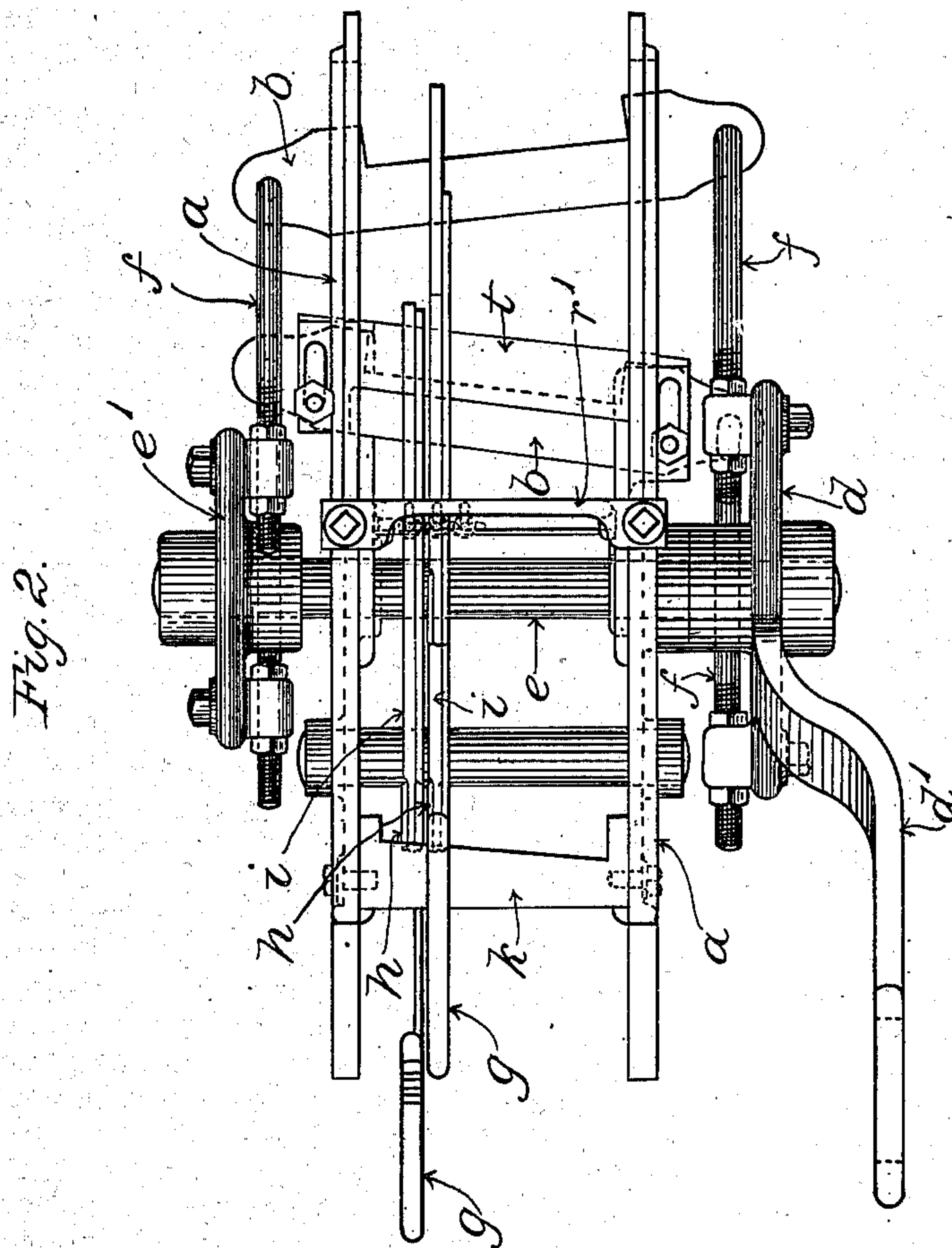
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UNITED STATES PATENT OFFICE.

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SHEDDING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 709,455, dated September 16, 1902.

Application filed January 2, 1902. Serial No. 88,040. (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
5 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.

10 The invention relates to double-acting open-shed shedding mechanisms or dobbies for looms.

The main objects of the invention are to obviate in the case of shedding mechanisms or
15 dobbies of the class named and of the general construction now in common and extensive use a large part of the labor and strain heretofore devolving upon the lifters and the operating mechanism therefor in effecting the
20 movements of the harness-frames, thereby reducing considerably the amount of power which is consumed in the actuation of the shedding mechanism or doobby and reducing considerably the wear and tear of the various
25 working parts which are comprised within the head thereof.

The invention consists, essentially, in the combination, with the harness-levers or equivalent devices employed for transmitting to
30 the harness-frames the movements which are derived from the actuation of the hooks or hooked jacks by the knives or lifters, of holding-hooks which operate under control of the pattern devices and act whenever it is neces-
35 sary that the respective harness-frames should be elevated for two or more picks in succession to hold said harness-levers or other transmitters in position to keep the corresponding harness-frames elevated until the depression
40 of said harness-frames is required in the order of shedding. Heretofore in dobbies as ordinarily constructed and operated when it has been necessary to keep a harness-frame ele-
45 vated for more than one pick this has been effected by causing the hooks or hooked jacks, which are pivoted to the opposite ends of the lever connection or connector of the harness-lever pertaining to such harness-frame, to engage alternately with the respec-

tive lifters for as many outgoing movements 50
of the lifters as correspond with the number of picks for which the harness-frame should remain elevated. This throws at every pick upon the lifters, hooks or hooked jacks, lever connections or connectors, and the oper- 55
ating mechanism for the lifters the burden of sustaining the strain of every harness-frame which requires to be elevated or to remain elevated, and in consequence not only consumes a proportionately great amount of 60
power in the actuation of the lifters, but occasions a corresponding amount of wear of all the moving parts.

I have illustrated my invention in the accompanying drawings, in which— 65

Figure 1 shows in side elevation an embodiment of the invention. Fig. 2 shows the same in plan. Fig. 3 shows different views of one of the needles.

I will first refer briefly to the usual main 70
features of the doobby, which is illustrated in the drawings, and afterward will more particularly explain the invention and its application.

The framing is designated *a*. The two lift- 75
ers are shown at *b b* and are represented as guided in their movements by having their ends fitted within horizontal slots *c c*, which are formed in the respective side frames. One of the rockers with which the lifters are 80
connected is shown at *d*, it being fixed upon the rock-shaft *e*, which extends through to the other side of the doobby and there has fast thereon the opposite rocker, (shown at *e'*.) The usual rods *f f* are employed for connect- 85
ing the opposite ends of the lifters with the respective arms of the rockers. Power is transmitted to the rockers and lifters in usual manner through suitable connections (not necessary to be shown or specifically de- 90
scribed) joined to the arm *d'* of the rocker *d*.

At *g g* are shown harness-levers, these hav-
ing in practice suitable connections with har-
ness-frames. (Not shown.) In some embodi- 95
ments of my present invention the said harness-levers may be replaced by some other suitable transmitters having proper connection with the harness-frames. The lever con-

nection *h* is pivoted, as usual, to the harness-lever at *h'*, and at *i i'* are represented the usual hooks or hooked jacks, which are connected with the opposite extremities of the said lever connection or connector and arranged to cooperate with the lifters.

At *k k* are shown the back-rests or girths, against which the extremities of the lever connections or connectors take bearing at the inner extremes of their movements. A pattern-cylinder is shown at *m*, portion of a pattern-chain at *n*, and indicator pegs or pins carried by said pattern-chain are designated *o*. Pattern-fingers *p p*, arranged to be acted against by the said pegs or pins, are pivoted at *p'*. The inner ends of the pattern-fingers, which cooperate with the lower hooks or hooked jacks *i'* in the illustrated construction of dobby, act directly against the under surfaces of the said hooks or hooked jacks, although this is not material, while needles *q* are interposed between the upper hooks or hooked jacks *i* and the inner ends of the pattern-fingers which cooperate with the said upper hooks or hooked jacks. The gratings, which position and guide the hooks or hooked jacks *i i'* and pattern-fingers *p p*, are indicated at *r r'*.

In carrying my invention into effect I combine with the harness-lever *g* or other transmitter a holding-hook, which is represented herein at *s*. The said holding-hook preferably is connected with the said harness-lever, as by pivoting the same thereto. It is represented as pivoted to the said harness-lever at a point that is adjacent to the point of pivotal attachment of the lever connection or connector *h* to the said harness-lever.

At *t* is shown a holding-bar, preferably stationary, and in any event arranged to sustain the harness-frame in elevated position without communicating strain to the lifters. With the said holding-bar the holding-hook *s* is caused to engage for the purpose of retaining in its elevated position the harness-frame, which is connected with the harness-lever *g*. The holding-hook when caused to engage with the holding-bar retains the harness-frame in the said elevated position, relieving the lifters, hooks or hooked jacks *i i'*, and lever connection *h* of the continuous strain to which the said parts usually are subjected. The said holding-hook *s* is placed under control of the pattern devices for the purpose of occasioning the engagement of the same with the holding-bar at the proper times. It may be separately controlled, if desired; but in order to avoid any increase in the number of pattern-fingers and needles it is preferred to control the same by means of the same pattern-finger *p* and needle *q* which serve for the upper hook or hooked jack *i*. Thus the said needle *q* is furnished with a rest or shoulder at *q'*, which projects under the holding-hook *s* and is adapted to engage and lift such holding-hook sufficiently to cause it to clear the holding-bar *t* when needle *q* is raised.

When the harness-lever *g* occupies the position thereof which places in its elevated position the harness-frame which is connected therewith and so long as holding-hook *s* remains in engagement with holding-bar *t*, the lever connection *h* may move freely about the point of pivotal attachment of the same to the harness-lever without affecting the position of the said harness-lever. This provides for the action of the parts, which facilitates the lowering of the said harness-frame at the desired time. In order to avoid shock and possible injury to the shedding mechanism or warp-threads, it is necessary that the descent of a harness-frame from its elevated position should always be caused to take place under the control of the particular lifter which at the predetermined time for such descent is making its ingoing movement. To this end while holding-hook *s* remains in engagement with holding-bar *t* the lever connection pertaining to the harness-lever, which thereby is maintained in its outer position, is caused to swing or rock upon its point of pivotal connection with the said harness-lever in unison with the movements of the lifters, causing the opposite extremities thereof to take bearing alternately against the corresponding back-rests *k k* and also causing its hooks or hooked jacks to accompany idly the lifters in the movements of the latter. This maintains the parts in proper working relations, and if now at the outward extreme of the outgoing movement of either lifter the holding-hook is disengaged from the holding-bar the hook or hooked jack corresponding with the said lifter will engage the latter, the opposite end of the lever connection being at this time in contact with the corresponding back-rest, so that the inward movement of the said harness-lever and descent of the connected harness-frame will be caused to take place smoothly and without shock at a rate of speed which is proportioned to the speed with which the lifter itself moves inward. For the purpose of causing the lever connection thus to rock or swing and the hooks or hooked jacks to accompany the respective lifters in the movements of the latter, as just referred to, while the harness-lever remains locked in its outer position with the harness-frame elevated, various means may be employed. In order, however, to avoid an increase in the number of parts, I preferably in some cases form the hooks or hooked jacks *i i'* with projections *i³ i³*, which extend downward across the paths of the respective lifters. The lifters in moving inwardly alternately engage with the said projections, and thus compel the hooks or hooked jacks to accompany them in their inward movements, thereby rocking or swinging the lever connection. As each lifter approaches the outer extreme of its outgoing movement it engages with the shoulders of all the adjacent hooks or hooked jacks *i* or *i'*, which occupy a lowered position, and com-

communicates thereto a sufficient amount of outward movement to ease the hold of the corresponding holding-hooks upon the holding-bar. This facilitates the disengagement of the said holding-hook from the said holding-bar by the action of the pattern devices.

In order to permit the outer extremity of the holding-hook to rest normally upon the top of the holding-bar and be supported thereby, relieving the needle q and corresponding pattern-finger of the weight of such hook, the said holding-hook is formed with an upward bend at q^4 . In the position of the holding-hook corresponding with the inner or normal position of the harness-lever and depressed position of the harness-frame this upward bend in the needle is presented at the rest or shoulder q' of the needle, thereby causing the holding-hook to clear the said rest or shoulder. When, however, the harness-lever is moved outward, so as to raise the harness-frame, the endwise movement of the holding-hook outward presents a different portion of the said hook to the said rest or shoulder, the said portion taking a bearing upon the said rest or shoulder.

I claim as my invention—

1. In a double-acting shedding mechanism or dobby for looms, in combination, the transmitter, the lever connection connected with the said transmitter, the hooks or hooked jacks connected with the opposite extremities of the said lever connection, the lifters acting alternately, the pattern devices controlling the engagement of said hooks or hooked jacks with said lifters, and the holding-hook acting under control of the said pattern devices to retain the said transmitter in position to keep the corresponding harness-frame elevated, substantially as described.

2. In a double-acting shedding mechanism or dobby for looms, in combination, the transmitter, the lever connection connected with the said transmitter, the hooks or hooked jacks connected with the opposite extremities of the said lever connection, the lifters acting alternately, the pattern devices controlling the engagement of said hooks or hooked jacks with said lifters, the holding-bar, and the holding-hook carried by the said transmitter and engaging with the said holding-bar under control of the said pattern devices to retain the transmitter in position to keep the corresponding harness-frame elevated, substantially as described.

3. In a double-acting shedding mechanism or dobby in combination, the harness-lever, the lever connection, the hooks or hooked jacks connected with the opposite extremities of said lever connection, the lifters acting alternately, the pattern devices controlling the engagement of said hooks or hooked jacks with the lifters, and the holding-hook acting under control of the said pattern devices to retain the transmitter in position to keep the

corresponding harness-frame elevated, substantially as described.

4. In a double-acting shedding mechanism or dobby for looms, in combination, the transmitter, the lever connection pivoted to the said transmitter, the hooks or hooked jacks connected to the opposite extremities of the said lever connection, the lifters acting alternately, the holding-hook whereby said transmitter is retained in position to keep the corresponding harness-frame elevated, and the pattern devices including a hook or hooked-jack controlling member which controls also the action of the said holding-hook, substantially as described.

5. In a double-acting shedding mechanism or dobby for looms, in combination, the transmitter, the lever connection pivoted to the said transmitter, the hooks or hooked jacks connected to the opposite extremities of the said lever connection, the lifters acting alternately, the pattern devices, including one or more needles, to control the engagement of said hooks or hooked jacks with the said lifters, and the holding-hook also controlled by the said needle and acting to retain the said transmitter in position to keep the corresponding harness-frame elevated, substantially as described.

6. In a double-acting shedding mechanism or dobby for looms, in combination, the transmitter, the lever connection pivoted to the said transmitter, the hooks or hooked jacks connected to the opposite extremities of the said lever connection, the lifters acting alternately, the holding-hook connected with said transmitter and serving to retain the corresponding harness-frame in elevated position, and the pattern devices, including a jack-controlling needle which also controls the action of said holding-hook, substantially as described.

7. In a double-acting shedding mechanism or dobby for looms, in combination, the transmitter, the lever connection pivoted to the said transmitter, the hooks or hooked jacks connected to the opposite extremities of the said lever connection, the lifters acting alternately, the holding-bar, the holding-hook connected with said transmitter, serving to retain the corresponding harness-frame in elevated position, constructed to rest on said holding-bar while said harness-frame occupies a depressed position, and an upward bend as described to clear the controlling-needle, and the pattern devices, including a jack-controlling needle which also controls the action of said holding-hook, substantially as described.

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

GEORGE W. STAFFORD.

Witnesses:

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