

No. 633,131.

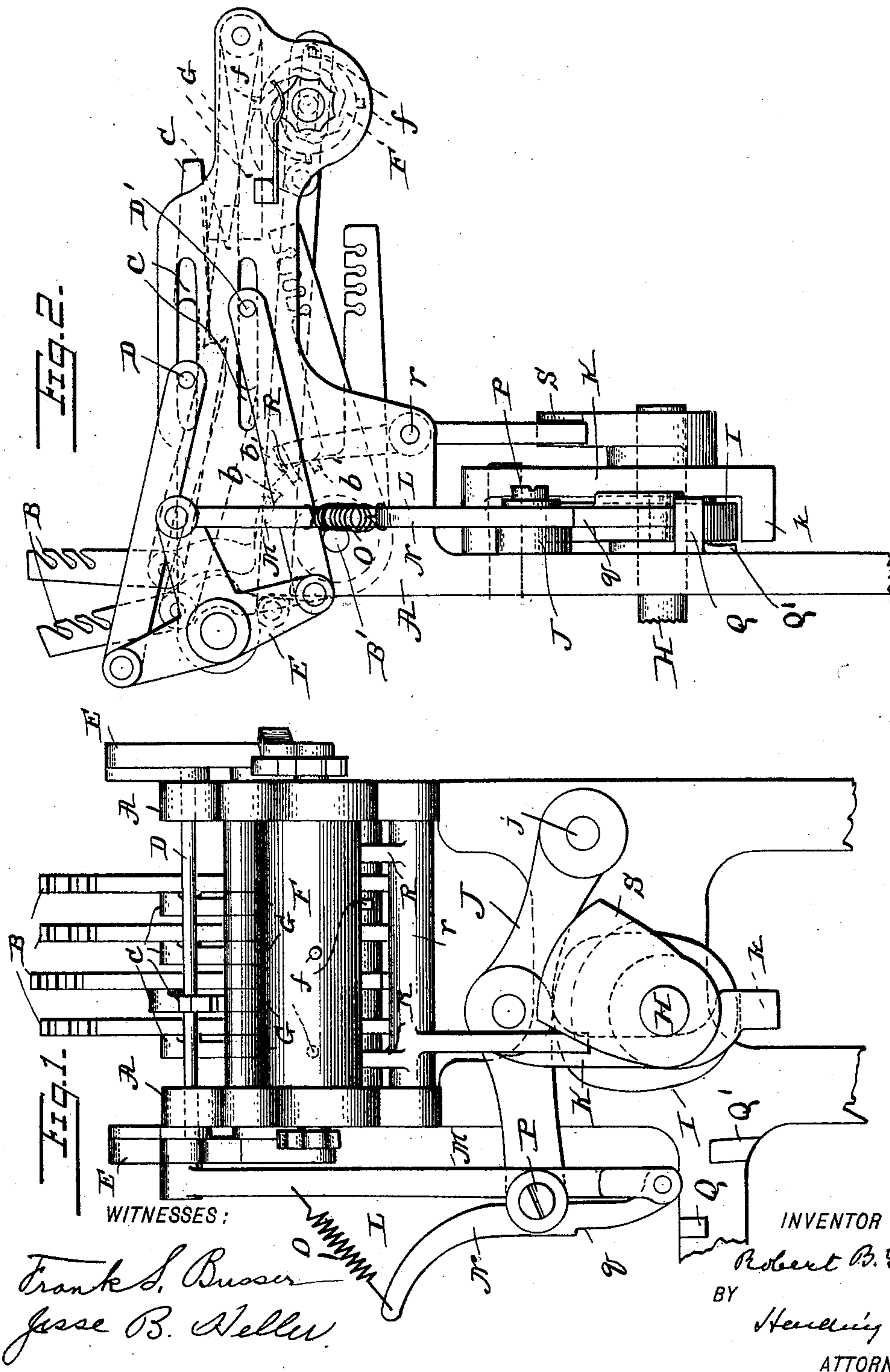
Patented Sept. 19, 1899.

R. B. GOODYEAR.
SHEDDING MOTION FOR LOOMS.

(Application filed May 1, 1899.)

(No Model.)

2 Sheets—Sheet 1.



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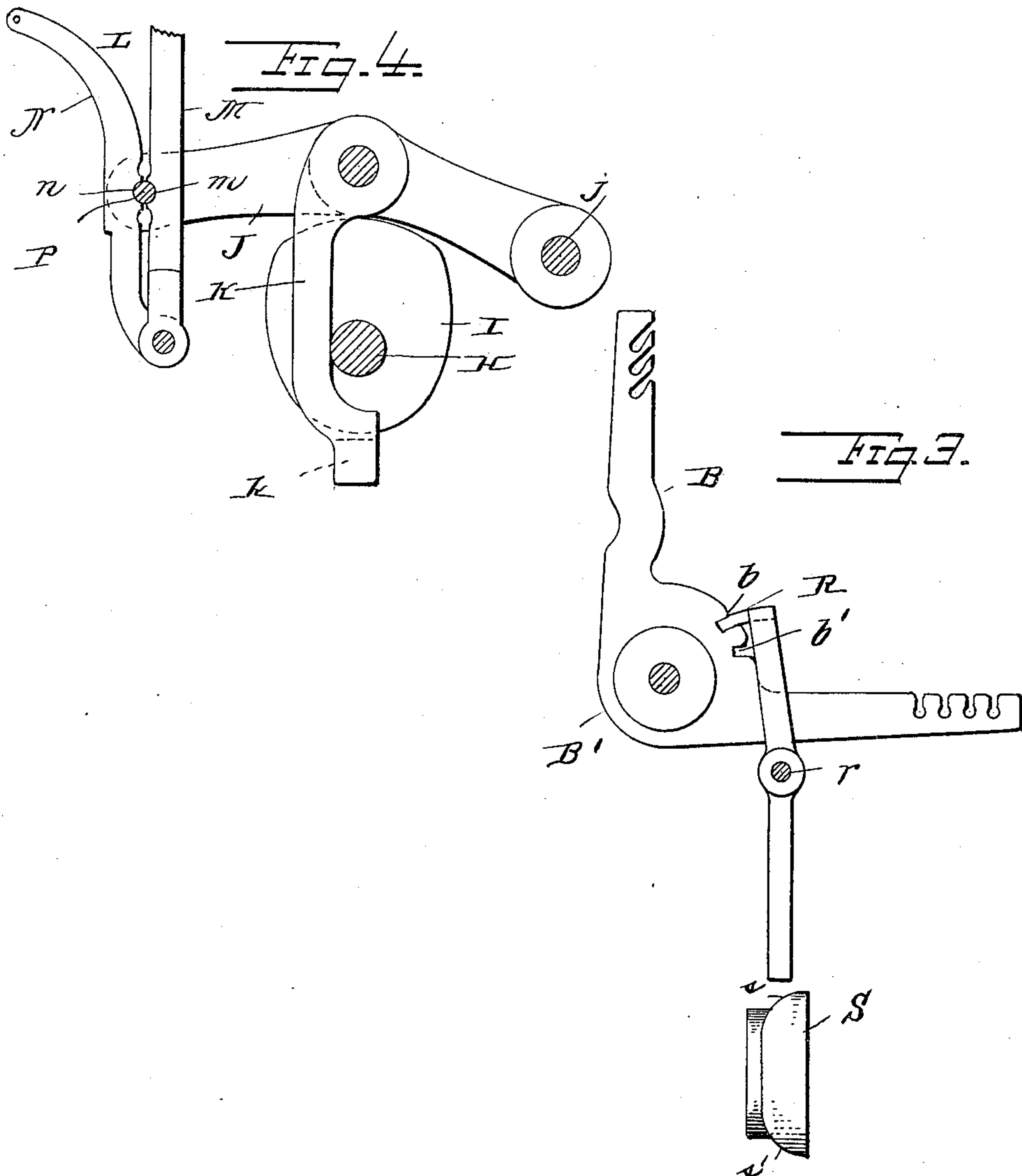
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2 Sheets—Sheet 2.



WITNESSES:

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ROBERT B. GOODYEAR, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF
ONE-HALF TO THE BRIDESBURG MACHINE COMPANY, OF SAME PLACE.

SHEDDING-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 633,131, dated September 19, 1899.

Application filed May 1, 1899. Serial No. 715,258. (No model.)

To all whom it may concern:

Be it known that I, ROBERT B. GOODYEAR, a citizen of the United States, residing at Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Shedding-Motions for Looms, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to a shedding-motion for looms, and has for its object an improvement in the actuating mechanism for the harness-levers or jack-levers for operating the heddle-frames.

More particularly stated, my object is to so construct the operating connections between the main shaft and the harness-levers whereby under normal conditions the harness-levers will be positively actuated, but whereby under abnormal conditions, such as an obstruction in the mechanism which would prevent the harness-levers from being drawn forward by the usual reciprocating knives, the said operating connections will yield to the extent necessary to prevent the reciprocating knives from being moved forward beyond the safe limit of movement of the harness-levers.

A further object of the invention is to so construct said operating connections whereby they will be prevented from so yielding in case of an excessive strain under otherwise normal conditions upon the connections between the harness-levers and heddle-frames, due to heavy warp or the like, which would otherwise prevent the harness-levers from being thrown to the full extent of their movement.

A further object of the invention is to so construct the said operating connections that the elements thereof that most directly actuate the harness-levers will not be actuated at all in case the loom is revolved backward, as often happens.

The invention consists of the essential features of construction, to be hereinafter described and claimed, by means of which the the said objects of my invention may be attained; and it consists also of details of con-

struction that will hereinafter be fully described and claimed.

In the drawings, Figure 1 is an end elevation of the frame and moving parts. Fig. 2 is a side elevation. Fig. 3 is a detail face view of the harness-lever-actuating cams and levers. Fig. 4 is a detail view of the harness-lever, locking-bar thereof, and actuating-cam for the locking-bar.

A designates the frame of the shedding-machine.

B are the harness-levers or jacks pivoted on the shaft B'. These harness-levers are connected in the usual way respectively with the several heddle-frames and are actuated in the usual way—namely, by the notched draw-bars C and the transverse reciprocating knives D D' engaging the same and pivoted, respectively, to the upper and lower ends of the T-shaped rocker-arms E, pivoted on the frame of the machine. The draw-bars C are raised so as to bring the notched portions on the upper edge thereof into alignment with the upper transverse knife D in the usual way—namely, by the pattern-rollers F on the overhanging end of the frame having the pins f, which engage and lift the pivoted fingers G at predetermined intervals, which lift the corresponding draw-bars, causing the knife D to push the corresponding draw-bars, tilt the corresponding jack-levers, and operate the corresponding heddle-frames. The draw-bars are returned in the return movement of the reciprocating knives by means of the lower knife D' engaging the notched portions on the lower edge of the draw-bars in the usual manner. It will be understood that one or more of these jack-levers will be operated at each turn of the pattern-roller and that the remaining jack-levers will be held stationary by reason of their corresponding draw-bars not being elevated by the pattern-roller pins into line of travel of the knife D. The knives D D' slide in slotted guideways in the overhanging framework in the usual manner.

The machine so far as I have described the same does not substantially differ in detail from an old and well-known type of shedding-machine, and it embodies the same principle

of construction and operation as is exhibited in the Letters Patent issued to me on the 4th day of April, 1882, No. 255,850.

I shall now describe the mechanism for actuating the T-bars or rocker-arms E.

H is the main shaft, having secured thereto and rotating therewith the cam I.

J is a lever pivoted at *j* to the frame of the machine above and in line of movement of the cam I.

K is a lever pivoted on and depending from the lever J, resting normally against the shaft H and having the intumed lower end, to which is secured a lug *k* in line of movement of the cam I. Rotation of the shaft causes the high part of the cam to alternately engage the lever J and lug *k*, imparting a reciprocating vertical swinging movement to the lever J on its pivot.

L is a device connecting the lever J and rocker-arm E, and consists of the bar M, having the recess *m*, and the bar N, having the recess *n* opposite the recess in bar M. These bars are pivoted together at their lower ends, while their upper ends are connected by a spring O. On the free end of lever J is a pin P, which extends into the recesses *m* and *n* of the rocker-arm-actuating bars. Under normal operating conditions these two bars do not change their relative positions, but are moved up and down in unison by the reciprocation of lever J, causing the arm E by reason of its connection with the upper end of arm M to rock on its pivot and reciprocate the transverse knives D D'. Should anything occur in the way of breakage or obstruction to interfere with or prevent the tilting of any particular jack-lever and bind the parts directly actuating it, the movement of lever J will simply cause the pin P to spring clear of the recesses *m* and *n*, the lever N being moved outwardly on its pivot against the action of the spring O, the bar M and the parts operated thereby remaining stationary. In the event of any excessive tension in the connections between the jack-levers and the heddle-frames (due, for example, to heavy warp) which might cause the pin P to spring out of its bearing in the recesses *m* and *n*, and thus prevent the jack-lever from completing its full range of movement, I provide the following mechanism for insuring under these conditions a complete throw of the jack-lever and the proper lifting of its corresponding heddle-frame:

Q is a lug on the frame of the machine. Before the bars M and N have quite completed their downward movement the outer straight edge *q* of bar N will strike the lug. The time at which the lever N is caused to engage the lug Q is fixed, so that no resistance of the jack-lever to further movement due purely to excessive tension will substantially manifest itself until this engagement takes place. During the remaining throw of lever J there is no possibility of the pin P

forcing bar N away from bar M, the lug Q effectually preventing this, and consequently the bars M and N will be forced down until the jack-lever is thrown to its full extent of movement. If desired, an additional lug Q' may be placed on the frame in line of movement of the inner edge of bar M and at such a height that both lugs Q and Q' will be engaged, respectively, by levers N and M simultaneously.

R is a locking-bar pivoted on the frame at *r*.

S is a cam on the main shaft for operating the locking-bar, said cam having the inclined faces *s* and *s'*. The cam is so adjusted with respect to the cam I that it will engage and move the locking-bar out of engagement with the notches *b* and *b'* on the jack-levers during the forward and return throw of the harness-levers, but will move said bar into engagement with either notch *b* or notch *b'*, dependent upon whether the harness-levers have been thrown up or down, so that said harness-levers will be held firmly in either position for the desired length of time. The loom can be run backward without operating or affecting the mechanism for directly actuating the harness-levers, as the cam I instead of depressing the lever K will simply throw it outwardly on its pivot at each revolution. Thus by a contrivance of extreme simplicity, involving no additional parts, the loom has the capacity of reversal without danger of breakage.

Having now fully described my invention, what I claim, and desire to protect by Letters Patent, is—

1. In a shedding-motion for looms, the combination with the harness-levers, and mechanism for directly actuating the same, of a recessed bar connected with said actuating mechanism, a recessed bar pivoted to the first-mentioned bar, a shaft, a cam actuated thereby, a lever reciprocated by said cam, a pin on said lever engaging the recesses in said bars, and a spring for normally holding said bars in proper relation, whereby under normal resistance to movement of said bars, the pin will be forced out of said recesses and separate said bars, and devices for preventing a separation of said bars after the same have moved a predetermined distance.

2. In a shedding-motion for looms, the combination with the harness-levers, the draw-bars connected therewith, the knives for actuating the draw-bars, and the rocker-arm for reciprocating the knives, of a recessed bar connected with said rocker-arm, a recessed bar pivoted to the first-mentioned bar, a shaft, a cam actuated thereby, a lever reciprocated by said cam, a pin on said lever engaging the recesses in said bars, and a spring for normally holding said bars in proper relation; whereby under abnormal resistance to movement of said bars, the pin will be forced out of said recesses and separate said bars, and devices for preventing a separation of said

bars after the same have moved a predetermined distance.

3. In a shedding-motion for looms, the combination with the harness-levers, and mechanism for directly actuating the same, of a bar connected with said actuating mechanism, a second bar extending alongside of and connected to the first-named bar, a shaft, connections from said shaft normally engaging both bars and normally acting to positively move them and thereby operate said harness-lever-actuating mechanism, and means thrown into action by an abnormal resistance to movement of the first-mentioned bar for disengaging said connections from said bar, and devices for preventing the disengagement of said connection after said bar has moved a predetermined distance.

4. In a shedding-motion for looms, the combination with the harness-levers, the draw-bars connected therewith, the knives for actuating the draw-bars, and the rocker-arm for reciprocating the knives, of a bar connected with and actuating the rocker-arm, a second bar extending alongside of and connected to the first-named bar, a shaft, connections from said shaft normally engaging both bars and normally acting to positively move them and thereby operate said rocker-arm, and means thrown into action by an abnormal resistance to movement of the first-mentioned bar for disengaging said connections from said bar, and devices for preventing the disengagement of said connection after said bar has moved a predetermined distance.

5. In a shedding-motion for looms, the combination with the harness-levers, and mechanism for directly actuating the same, of a recessed bar connected with said actuating mechanism, a recessed bar pivoted to the first-mentioned bar, a shaft, a cam actuated thereby, a lever reciprocated by said cam, a pin on said lever engaging the recesses in said bars, and a spring for normally holding said bars in proper relation, whereby under normal resistance to movement of said bars, the pin will be forced out of said recesses and separate said bars, and a lug in line of travel of the second bar and adapted to be engaged thereby after said bars have moved a predetermined distance.

6. In a shedding-motion for looms, the combination with the harness-levers, the draw-bars connected therewith, the knives for actuating the draw-bars, and the rocker-arm for reciprocating the knives, of a recessed bar connected with said rocker-arm, a recessed bar pivoted to the first-mentioned bar, a shaft, a cam actuated thereby, a lever reciprocated by said cam, a pin on said lever engaging the recesses in said bars, and a spring for normally holding said bars in proper relation; whereby under abnormal resistance to movement of said bars, the pin will be forced out of said recesses and separate said bars, and a lug in line of travel of the second bar and

adapted to be engaged thereby after said bars have moved a predetermined distance.

7. In a shedding-motion for looms, the combination with the harness-levers and mechanism for directly actuating the same, a bar for imparting a reciprocating movement to said mechanism, a shaft, a cam on said shaft, a lever connected with and operating said bar and in line of travel of said cam and adapted to be moved by said cam, a second lever pivoted to the first-mentioned lever and extending to one side of and below said shaft and in line of travel of said cam, whereby said cam will engage said second lever so as to move it away from said shaft and return the first lever when the shaft is revolving in one direction, and whereby when the shaft is revolving in the opposite direction said second lever will be swung to one side of said shaft.

8. In a shedding-motion for looms, the combination with the harness-levers, and mechanism for directly actuating the same, of a bar for imparting a reciprocating movement to said mechanism, a shaft, a lever reciprocated by connections from said shaft, said lever being yieldingly connected with said bar, and means for normally maintaining a positive connection between said lever and bar but adapted to sever said connection under abnormal resistance to movement of said device, and additional means for maintaining a positive connection between said lever and bar after said bar has moved a predetermined distance.

9. In a shedding-motion for looms, the combination with the harness-levers, and mechanism for directly actuating the same, of the upright recessed bar M connected with said actuating mechanism, the recessed upright bar N pivoted to the lower end of the bar M, a spring O connecting the bars M and N, a shaft, a lever J reciprocated by connections from said shaft, and a pin P on the end of the lever J engaging the recesses in said bars.

10. In a shedding-motion for looms, the combination with the harness-levers, the draw-bars connected therewith, the knives for actuating the draw-bars, and the rocker-arm for reciprocating the knives, of the upright recessed bar M connected with said rocker-arm, the outwardly-curved recessed upright bar N pivoted to the lower end of the bar M, a shaft, a cam S actuated thereby, a lever J reciprocated by said cam, a pin on the end of lever J engaging the recesses in said bars, and a spring O connecting the upper ends of bars M and N for normally holding said bars in proper relation.

In testimony of which invention I have hereunto set my hand, at Philadelphia, Pennsylvania, on this 18th day of April, 1899.

ROBERT B. GOODYEAR.

Witnesses:

FRANK S. BUSSE,
JESSE B. HELLER.