

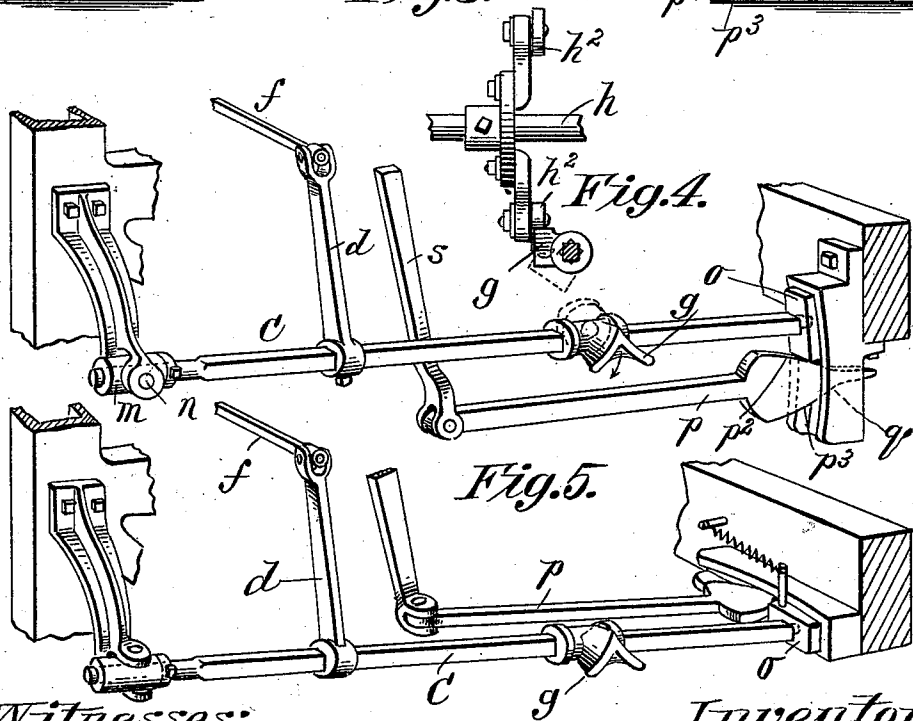
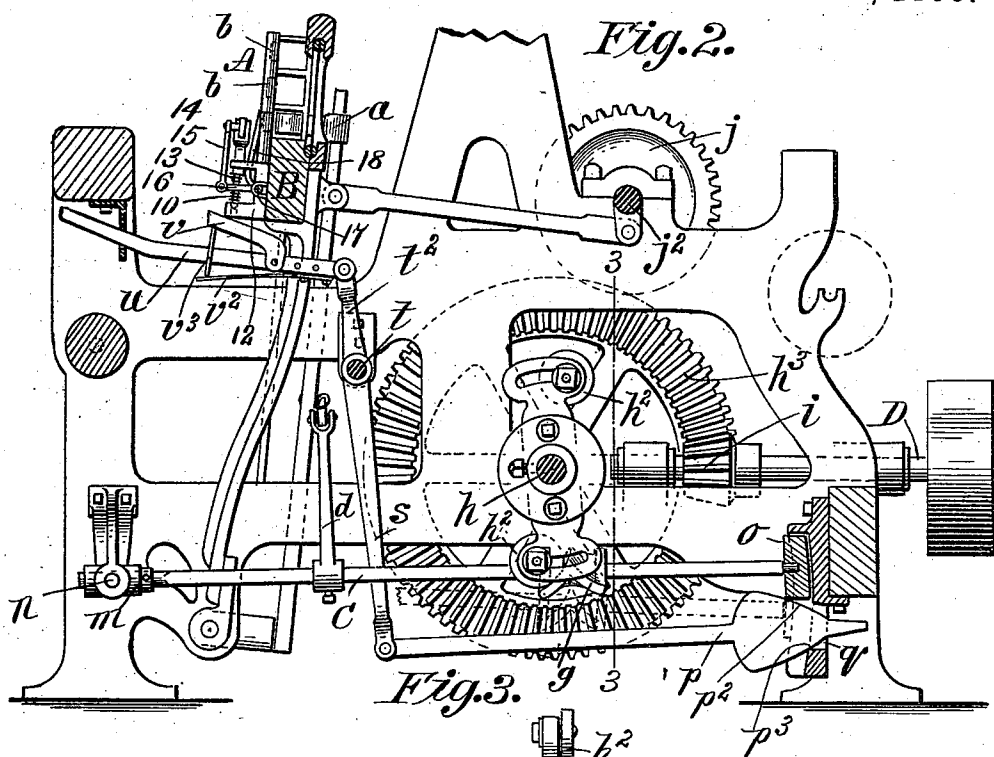
(No Model.)

2 Sheets—Sheet 2.

J. J. & G. E. GEOGHEGAN.
PROTECTOR STOPPING MECHANISM FOR LOOMS.

No. 549,716.

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UNITED STATES PATENT OFFICE.

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PROTECTOR STOPPING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 549,716, dated November 12, 1895.

Application filed September 21, 1894. Serial No. 523,702. (No model.)

To all whom it may concern:

Be it known that we, JAMES J. GEOGHEGAN and GEORGE E. GEOGHEGAN, citizens of the United States of America, residing at Gilbertville, in the county of Worcester and State of Massachusetts, have invented new and useful Improvements in Looms, of which the following is a specification.

The object of this invention is to provide improved mechanism in looms for preventing "smashes," as termed—that is, stop mechanism to insure the failure of the picker-sticks or shuttle-driving mechanism to operate to simultaneously propel two shuttles at different ends of the loom which might for some reason that may not be reliably guarded against be in the same line at the instant of the driving operation of the picker-sticks.

Under this invention, although the same is not necessarily dependent upon such characteristic, the loom as a whole is not necessarily stopped, but continues running, so that after one or more operations of the picker-sticks have been suspended and when the conditions of the shuttle mechanism are such that the weaving may be resumed the proper shuttle may again be shot without having to restart the loom.

Other advantages dependent upon and incidental to the present invention will be rendered apparent or be pointed out hereinafter.

The invention consists in constructions and combinations of parts, all substantially as below set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, in which—

Figure 1 is substantially a front view of the loom with the present improvements applied thereupon. Figs. 1^a and 1^b are sectional elevations to be hereinafter referred to as showing the different positions which the plunger therein comprised may assume when in one case one and in the second two shuttles are in shuttle-box compartments in the same line at different ends of the loom. Fig. 2 is a cross-sectional view of the improved loom. Fig. 3 is a vertical sectional elevation taken on line 3 3, Fig. 2, looking forwardly and showing important shiftable picker-stick-operating devices comprised in the present improve-

ments, while Fig. 4 is a perspective representation of the same. Fig. 5 is a perspective view illustrating a modified arrangement of the parts which constitute the device shown in Fig. 4.

The sets of shuttle-boxes A at the ends of the loom have vertical movements, as usual, to bring any compartment, as determined by the usual shuttle-box-controlling mechanisms, to the position to have a shuttle therein struck by the picker-stick *a*, one of which latter is provided at each end of the loom for each set of shuttle-boxes.

b b are the swell-fingers for the shuttle-boxes, each receiving and being maintained in an outward deflection on the entrance and continued presence within the box of a shuttle. Upon the face of the lay-beam B is a mechanism which peculiarly coacts with the shuttle-box swells and also with the shipping device for the rock-shaft C, which operates, through the lever-arm *d* and link *f*, the picker-sticks *a* in such a manner that in the event of there being shuttles in the shuttle-boxes at opposite ends of the loom which are in the line of shuttle traverse at substantially the instant of the striking action by the picker the rocker-shaft will be shifted into such a position that it will be out of range of the device which rocks it, the picker-sticks, therefore, then not receiving their shuttle-propelling motions, although the driving-shaft of the loom continues to turn and the lay to swing forward and back.

The mechanism on the lay above referred to consists of a plunger 10, vertically mounted for an axial movement in a suitable bracket 12 and normally held in its upward position by the spring 13. The lever 14 is intermediately of its length pivotally connected to the upper extremity of the plunger, while to its ends are secured the upper ends of the depending links 15 15, which by their lower ends are secured to the radial arms 16 16 of the rock-shafts 17 17, which are suitably journaled on and extend longitudinally of the lay. These rock-shafts have formed on or secured to their outer extremities the crank-arms 18 18, which extend vertically across the front of the shuttle-boxes and have contact with

or proximity to the swell-fingers *b* of such ones of the shuttle-compartments as may be in the line of the shuttle traverse.

A shuttle in a compartment at one end of the loom which is opposite the end of a rock-shaft arm 18 will cause by the outward deflection of the corresponding swell-finger *b* a certain extent of downward movement of the plunger 10, which movement, however, is not sufficient, for instance, to carry its end below the bottom of the bracket 12, in which it is guided for its reciprocatory movement. (See Fig. 1^a.) Shuttles in opposite compartments and in the same line and which are adjacent to the ends of both rock-shaft arms 18 will cause by the outward deflections of the corresponding swell-fingers *b b* double the extent of the downward movement of the plunger 10, which doubly-extensive movement in this instant will insure the projection of the end of the plunger considerably below the bottom of the bracket. (See Fig. 1^b.) The spring 13 serves to raise the plunger and replace the rock-shaft and its adjuncts, as permitted upon the retraction of the swell-fingers *b*.

The rocker-shafts C, provided near each end of the loom, which, through the lever-arms and links *d f*, operate the picker-staffs *a*, each has, as is common, the lateral projection *g*, against which impinge the roller-studs *h² h²* on the shaft *h*, which latter is driven, through the gear *h³* thereon, by the bevel-pinion *i* of the driving-shaft D, and which gear-wheel *h³* also, through gear *j*, drives the cranked shaft *j²*, which operates the lay. Each of the said rocker-shafts C has its one end supported in the journal *m*, which in turn has trunnion-supports, as seen at *n*, whereby it may oscillate in the plane of its axis. The other end of each of the paired rocker-shafts C is journaled in the shiftable block *o*, respectively provided therefor, and the position of each of such journal-blocks *o* is governed by the respectively provided cam-ended bar *p*, the one cam edge *p²* of which has a wedge-like action relative to the journal-block, while the other cam edge *p³* rests against the wall of the aperture *q*. The other end of the said bar *p* is hung to the lower end of an arm *s*, depending from still another rocker-shaft *t*, which ranges longitudinally of the machine above and at right angles to rock-shafts C C. This said rock-shaft *t* has at its middle the upwardly-extended arm *t²*, which carries a bar *u*, that is provided with a dog or pawl *v*. This pawl is held in its elevated position by the spring *v²* through the medium of the clevis-shaped supporting-frame *v³*.

Now, in the operation of the loom, supposing that when the lay is about moving rearwardly there are two shuttles in shuttle-box compartments at different ends of the loom which are in the line of shuttle traverse, the plunger 10 will assume the position seen in Fig. 1^b, whereupon the lay in its rearward movement will cause the downwardly-pro-

jecting extremity of the plunger to strike the front end of the dog *v*, forcing it and its carrying-bar rearwardly, rocking shaft *t* and forwardly swinging its arms *s s*, and drawing the cam-ended bars *p p* forwardly, which permits the journal-blocks *o o* to have their shifting movements, whereupon the rock-shafts C C are so swung from the trunnion-support at *n* as to carry the lateral projections *g* thereof away from the path of the roller-studs *h² h²*, whereby the striking of the shuttles at the opposite ends of the loom will not take place. During the forward traverse of the lay there is an instant when, by reason of the passing downward at one end of the machine of the shuttle and the upward movement at the opposite end of the loom of another shuttle, two shuttle-box swell-fingers will simultaneously operate to depress the plunger to its maximum extent, as seen in Fig. 1^b. This may, however, be without effect to shift the rock-shaft C, which controls the action of the picker, because of the then relative position of the lay to the dog *v*; but before the completion of the forward traverse of the lay, the shuttles having passed the position above described, the swell-fingers and the plunger 10, by reason of the reaction of the plunger-spring, resume their normal positions instantly unless there is a misplaced shuttle, which would cause a smash. This is regarded as a very important capability in the operation of the loom, and the mechanism for automatically accomplishing it, so far as we have been able to ascertain, is new.

The spring-supported pawl or dog, which on occasion may be engaged by the plunger during the rearward traverse of the lay, may be adjusted to such a point on the bar *u* of the picker stop mechanism that a shipping of the parts to prevent a smash may be delayed until the last instant previous to the time the pickers would begin their throw, when such disengagement may be quickly and with certainty accomplished.

The rock-shaft, link and lever connections 17 14 15, &c., on the lay, which are combined with and intervene between the plunger and swell-fingers, being very light and yet sufficiently durable, permit the application of a very light spring to the plunger, so that thereby is exerted very little extra pressure or friction on the shuttles in the shuttle-boxes.

In Fig. 5 is shown a modification in the arrangement of the parts shown in Fig. 4, the variation consisting in there being in the automatic operation a horizontal shifting of the rocker-bar C under the impulse of a spring instead of a dropping shifting movement of the rock-shaft by gravity, as illustrated in the principal views of the drawings.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a loom, the combination with the lay, the shuttle-boxes, the picker sticks and a picker-stick operating mechanism compris-

ing the shiftable rock-shafts, and means for imparting to them their rocking movements, and mechanism having a cooperation with the said rock-shafts to shift them and having a member thereof in proximity to the path of swing of the lay, of the plunger, 10, spring-supported on the lay and having the lever, 14, pivoted centrally to the plunger, the rock-shafts, 17, 17, also mounted on the lay and provided at their outer ends with the arms, 18, to cooperate with the shuttle-box-swells and having the crank-arms at their inner ends, which are linked to the said lever, 14, substantially as and for the purpose set forth.

2. In a loom, the combination with the lay, the shuttle-boxes, the picker-sticks and a picker-stick operating mechanism comprising rock-shafts, C, C, having the driving connections with the picker-sticks, each rock-shaft having one end mounted in a journal which is pivotally supported for a swinging movement and having its other end journaled in a movable block, and each rock-shaft having the projection, *g*, the revoluble studs, *h*², *h*², for imparting by impingement against said projections the rocking movements to the rock-shafts, the rocker-shaft, *t*, having the depending arms, *s*, and the rising arm, *t*², the cam-bars, *p*, *p*, hung to said arms, *s*, *s*, and normally exerting a crowding action upon said blocks, *o*, *o*, whereby the rock-shafts, C, C, are held subject to the action of the said revoluble studs, the bar, *u*, carried by said arm, *t*², provided with the dog, *v*, and a device supported on the lay, and controlled by the shuttles in the shuttle-boxes whereby upon the presence of shuttles in opposite boxes at the line of race, said device will engage said dog, *v*, substantially as described.

3. In a loom, the combination with the rock-shafts, C, C, journalsleeves, *m*, *m*,—in which is mounted one end of each of the rock-shafts,—said sleeves having trunnion supports whereby they may have swinging movements, the movable journal-blocks, *o*, at the opposite end of each of the rock-shafts, and means for periodically imparting rocking movements to the said rock-shafts, of the bars, *p*, having the double cam-faced extremities which impinge against the wall of an aperture within fixtures of the loom framing and against the journal-blocks, *o*, a movable part, as *u*, having a dog which is in proximity to the path of movement of the lay, a connection between said part, *u*, and said cam-ended levers, and a device supported on the lay and controlled by the shuttles in the shuttle-boxes whereby upon the presence of shuttles in opposite boxes at the line of race said device will have an engagement with said dog, substantially as described.

4. In a loom, the combination with the lay and shuttle-boxes having the swell-fingers, the vertically movable and spring-supported

plunger, 10, the lever, 14, which is centrally pivoted to the plunger, the rock-shafts, 17, 17, having the arm, 16, linked to the lever, 14, and having the arms, 18, 18, to cooperate with said swell fingers, of the rock-shafts, C, C, provided with oscillating journals at one end, and the movable journal-blocks, *o*, at the other end, and having driving connections with the picker-sticks, the devices substantially as described for rocking said shafts, the rock-shaft, *t*, having the upstanding arm, *t*², carrying the bar, *u*, upon which is mounted the spring-supported pawl, *v*, and the said rock-shaft, *t*, also provided with the depending levers *s*, and the cam-ended bars, *p*, *p*, secured to said depending arms, *s*, and, normally, having impingement against the said journal blocks, *o*, substantially as shown and described.

5. In a stop mechanism for the picker motion of a loom, the combination with the shiftable rock-shafts, C, means for rocking them, and mechanism operative for shifting the same comprising the rock-shaft, *t*, having the bar, *u*, with the dog, *v*, pivotally secured thereto and having the spring, *v*², the frame, *v*³, supported by the spring and in turn supporting the said dog, devices for normally maintaining the rock-shafts, C, in their positions of proximity to the rocking mechanism therefor, and connections between said latter devices and said rock-shaft, *t*, of the shuttle-boxes and lay, a device supported on the lay and controlled by the shuttles in the shuttle-boxes, whereby, upon the presence of shuttles in opposite boxes at the line of race, said device, on the lay, will have an engagement with said spring-supported dog, substantially as described.

6. In a stop mechanism for the picker motion of a loom, the combination with the shiftable rock-shafts, C, means for rocking them, and mechanism operative for shifting the same comprising the rock-shaft, *t*, having bar, *u*, with the dog, *v*, pivotally mounted on, and adjustable along the length of said bar, and having the spring, *v*², the frame, *v*³, supported by the spring and in turn supporting the said dog, devices for normally maintaining the rock-shafts, C, in their positions of proximity to the rocking mechanism therefor, and connections between said latter devices and said rock-shaft, *t*, of the shuttle-boxes and lay, a device supported on the lay and controlled by the shuttles in the shuttle-boxes, whereby, upon the presence of shuttles in opposite boxes at the line of race, said device, on the lay, will have an engagement with said spring-supported dog, substantially as described.

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