No. 666,270. Patented Jan. 22, 1901.

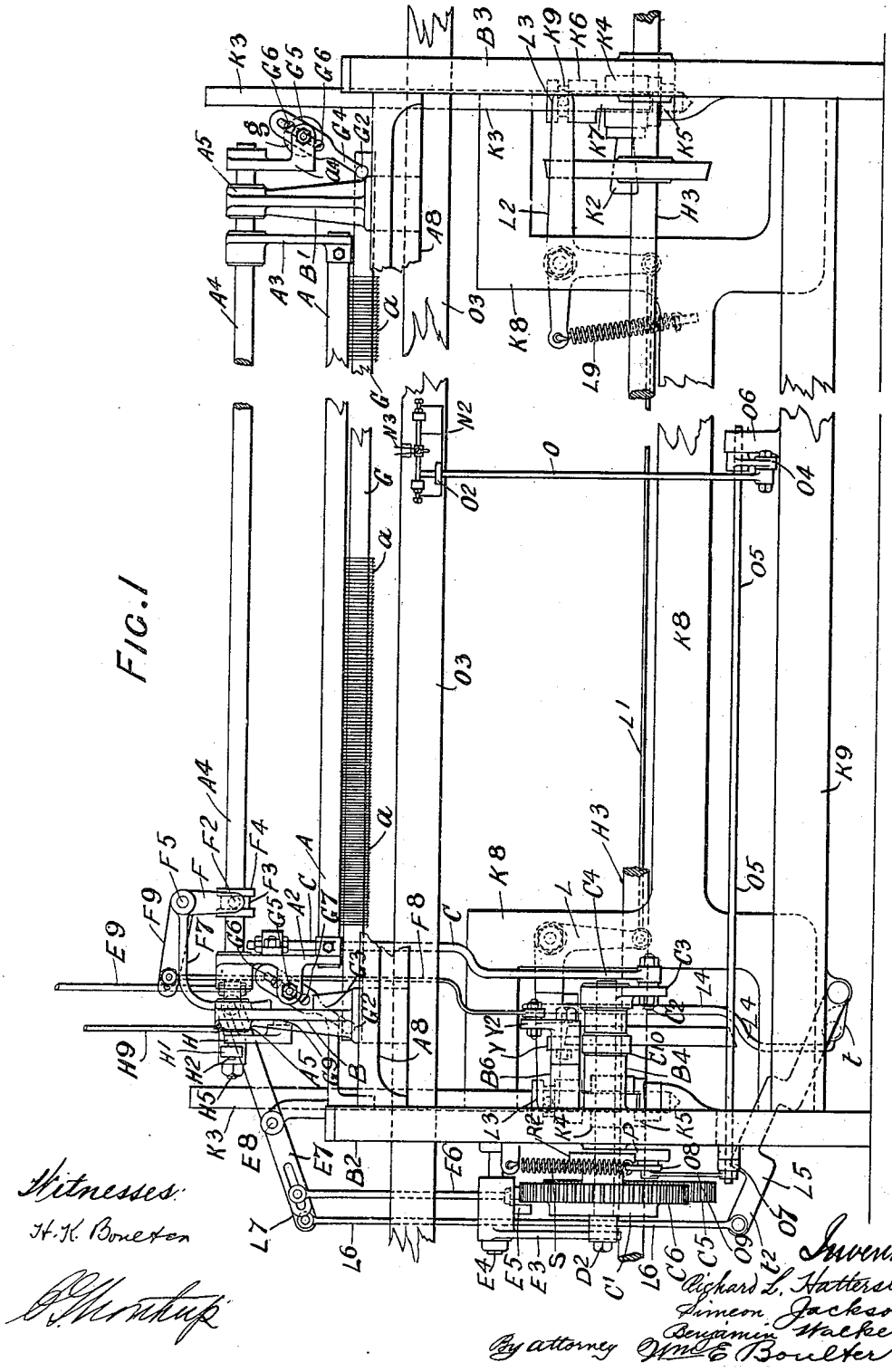
R. L. HATTERSLEY, S. JACKSON & B. WALKER.

LOOM FOR WEAVING AND CUTTING PILE FABRICS.

(No Model.) (Application filed Mar. 1, 1897. Renewed Nov. 19, 1900.)

4 Sheets—Sheet 1.

FIG. 1



Witnesses.
H. K. Boulter
[illegible]

Inventors
Richard L. Hattersley
Simeon Jackson
Benjamin Walker
By attorney Wm. E. Boulter

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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4 Sheets—Sheet 2.

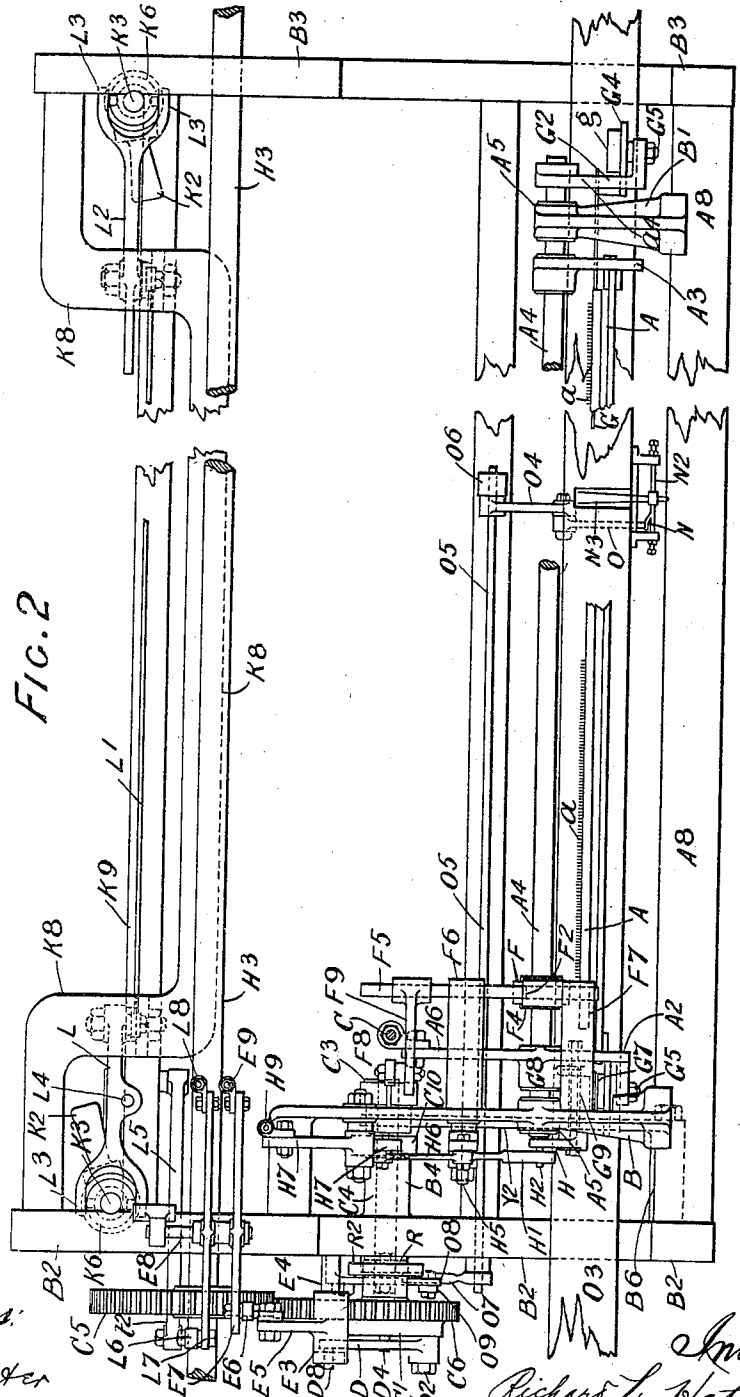


FIG. 2

Witnesses:
H. K. Boulter
J. Churchyard

Inventors
Richard L. Hattersley
Simeon Jackson
Benjamin Walker
By Wm. E. Boulter attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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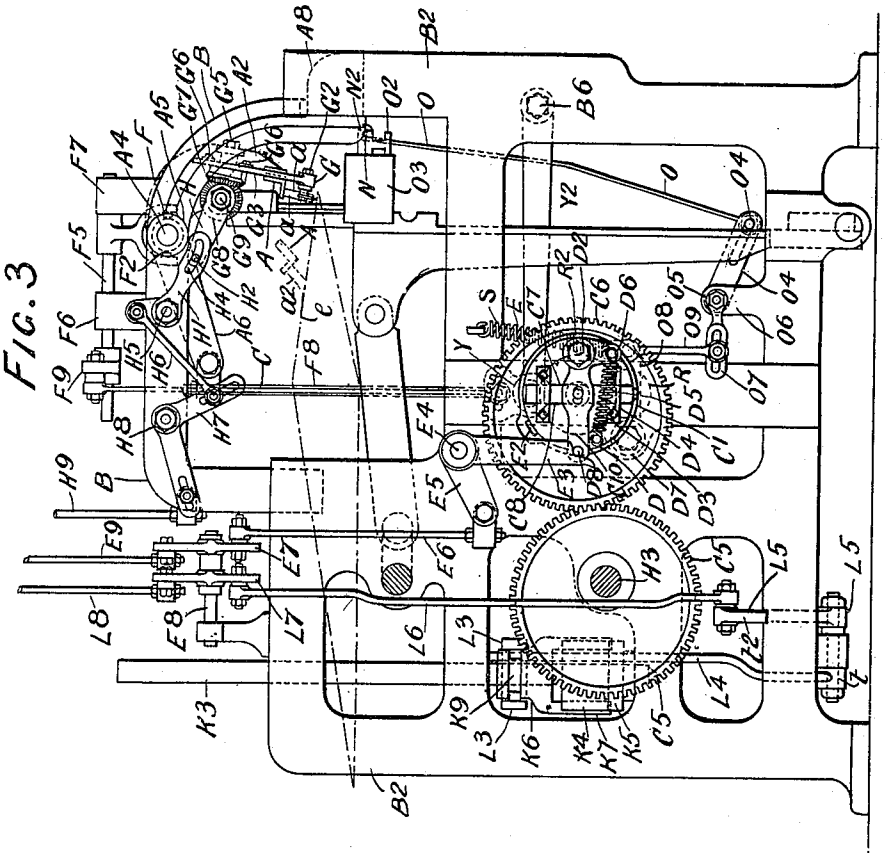
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4 Sheets—Sheet 3.

FIG. 3



Witnesses:
H. K. Boulton
P. Glentworth

Inventors
Richard L. Hattersley
Simeon Jackson,
Benjamin Walker,
By Wm. E. Boulton Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

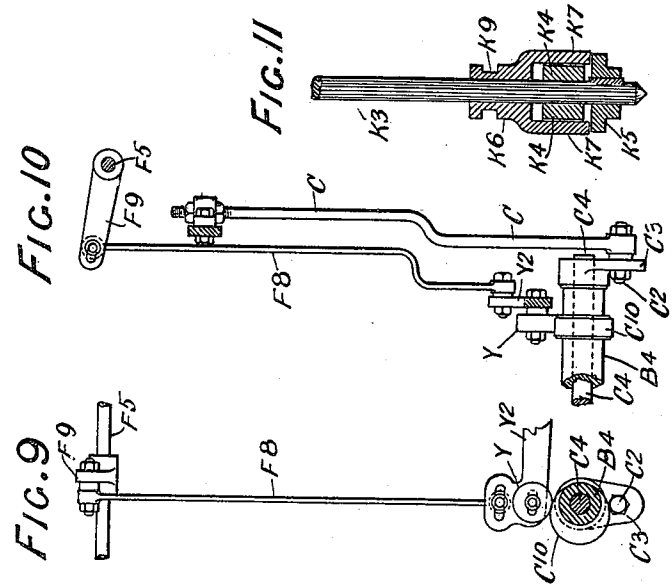
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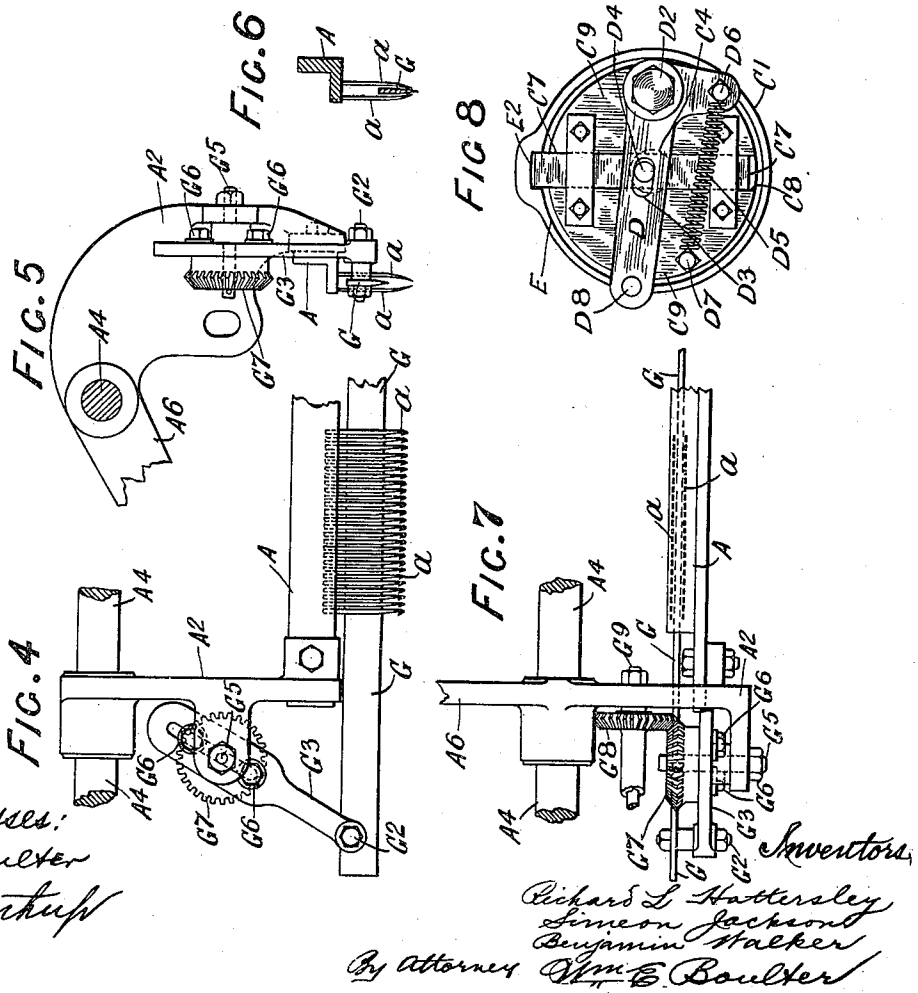
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(No Model.) (Application filed Mar. 1, 1897. Renewed Nov. 19, 1900.)

4 Sheets—Sheet 4.





Witnesses:
H. K. Boulter
C. Glenthup

Inventors,
Richard L. Hattersley
Simeon Jackson
Benjamin Walker
By attorney Wm. E. Boulter

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

RICHARD L. HATTERSLEY AND SIMEON JACKSON, OF KEIGHLEY, AND BENJAMIN WALKER, OF BINGLEY, ENGLAND.

LOOM FOR WEAVING AND CUTTING PILE FABRICS.

SPECIFICATION forming part of Letters Patent No. 666,270, dated January 22, 1901.

Application filed March 1, 1897. Renewed November 19, 1900. Serial No. 37,088. (No model.)

To all whom it may concern:

Be it known that we, RICHARD LONGDEN HATTERSLEY and SIMEON JACKSON, residing at Keighley, and BENJAMIN WALKER, residing at Bingley, England, subjects of the Queen of England, have invented certain new and useful Improvements in Looms for Weaving and Cutting Pile Fabrics, of which the following is a specification.

This invention relates to improvements in that type of loom for weaving pile fabrics in which the pile is formed by a hooked comb or a series of hooks which periodically engage the pile-warp and hold it while the loops are formed; and the objects of the invention are to enable the loops to be cut and also to improve the mechanism operating the loop forming and cutting devices which is operated by a "dobby."

In the accompanying drawings, forming a part of this specification, Figure 1 represents a front elevation of such parts of a loom as are necessary to illustrate the application of our invention. Fig. 2 represents a plan view, and Fig. 3 represents an end view, of the same. Figs. 4 to 11 represent views of details hereinafter referred to.

The hooked comb A, a portion of which is shown on a larger scale in Figs. 4, 5, 6, and 7, is mounted on curved arms A^2 and A^3, projecting from the rocking shaft A^4, mounted in bearings A^5, formed in the brackets B and B', fixed to the front rail A^8. The bracket B is continued beyond the shaft A^4, and its inner end is secured to the side frame B^2. The arm A^2 has an extension A^6 at the back connected by the rod C to the crank-pin C^2 of the crank C^3, fixed on the inner end of the short shaft C^4, mounted in the bearings B^4, formed in the side frame B^2. The short shaft C^4 is intermittently operated by the gear-wheel C^5, fixed on the tappet-shaft H^3, engaging the gear-wheel C^6, loosely mounted on the short shaft C^4, and this latter wheel is intermittently locked to the short shaft by means of the sliding bolt C^7, fitted in the groove C^8, formed in the face of the disk C^9, rigidly fixed on the short shaft C^4 and lying in the recess E, formed in the projecting boss or hub C' on the face of the wheel C^6. A lever D is mounted upon the stud D^2, fixed in the face of the disk C^9, and this lever is provided with a slot D^3, which engages the pin D^4, rigidly fixed in the bolt C^7. A spiral spring D^5, stretching between the screw D^6, fixed in the lever D, and the screw D^7, fixed in the disk C^9, tends to move the lever D so as to force the upper end of the bolt C^7 outward and cause it to engage the notch E^2, formed in the internal periphery of the recess E. Fig. 8 represents a separate view of these parts, with the bolt C^7 engaging the notch E^2. The bolt C^7 is disengaged from the notch E^2 and is normally held disengaged therefrom by means of the lever E^3, which is moved across the path of the stud D^8, projecting from the end of the lever D, and by arresting the motion of the lever disengages the bolt and stops the shaft C^4. The lever E^3 is pivoted upon the stud E^4, fixed in the side frame B^2, and the arm E^5 of the lever E^3 is connected by the rod E^6 to one end of the lever E^7, mounted upon the stud E^8, fixed to the side frame B^2. The other end of the lever E^7 is connected by the rod E^9 to one of the jack-levers of the dobby employed to operate the shedding mechanism.

It has not been deemed necessary to show the dobby, as its construction and application to a loom are well known, and it will be readily understood that each time the shaft C^4 requires to be operated the dobby is made to lower the rod E^9, which, through the medium of the connecting parts, disengages the lever E^3 from the stud D^8 and leaves the bolt C^7 at liberty to engage the notch E^2, constantly revolving with the wheel C^6, and locks that wheel to the shaft C^4. The wheels C^5 and C^6 are preferably made eccentric to reduce the speed of the wheel C^6 at the time the bolt C^7 engages and disengages the notch E^2. The rotation of the shaft C^4 also imparts a longitudinal movement to the shaft A^4. This is effected by means of the fork F, having projections F^2 engaging the annular groove F^3, formed in the collar F^4, fixed on the shaft A^4. The fork F is mounted on the cross-shaft F^5, mounted in brackets F^6 and F^7, secured to the top bracket B. The shaft F^5 is rocked or operated as required by means of the cam or eccentric C^{10} on the short shaft C^4 engaging the

antifriction-roller Y, carried by the arm Y^2, mounted on the stud B^6, fixed on the side frame B^2. The arm Y^2 is connected by the rod F^8 to the arm F^9, rigidly secured to the shaft F^5.

Fig. 9 represents a separate side view of certain parts of the mechanism operated by the shaft A^4, and Fig. 10 is a front view of the same.

The comb A is provided with a double row of hooks *a a*, and the knife G for cutting the loops is located between them. Immediately before the comb is moved from the next row of loops the knife is brought down to the position shown in Fig. 3 and the separate sectional view Fig. 6, and the loops then upon the hooks are thereby cut, and consequently released from the hooks. To enable this movement to be imparted to the knife, it is mounted upon the studs G^2, fixed in the arms G^3 and G^4, pivoted upon the studs G^5, fixed to the arms A^2 and a^4 on the shaft A^4. Figs. 4, 5, and 7 show the parts upon a larger scale. The arm G^3 is adjustably connected by the screws G^6 to the bevel-wheel G^7. This wheel engages the bevel-wheel G^8, mounted upon the stud G^9, fixed to the arm A^2. The arm H is fixed to the wheel G^8 and has a projecting stud H^2, which normally lies concentric with the shaft A^4, as shown in Figs. 1 and 2. Therefore the comb may be moved to engage the pile-warp without independent movement of the knife G. To depress the knife and at the same time slide it longitudinally so as to produce a smooth cutting movement, the lever H′ is provided, having a slot H^4, which engages the stud H^2. The lever H′ is mounted upon the stud H^5, fixed to the bracket B, and is connected by the rod H^6 to the lever H^7, placed upon the stud H^8 and also fixed to the bracket B. The lever H^7 is connected by a rod H^9 to one of the jack-levers of the dobby, which is arranged to be depressed each time the knife requires to be operated. The arm G^4 is adjustably connected to the disk *g*, loosely mounted upon the stud G^5, fixed in the arm a^4.

The comb A is shown in Fig. 3 in the position it occupies after the loops are formed and the intermediate picks of the weft are introduced. Then the loops are cut. To engage the warp again to form the next row of loops, the comb is moved to the position shown by the broken lines a^2, Fig. 3, when the slay O^3 is moved back and the warp *e* is lifted, and after the hooks *a* have passed beneath the warp the above-mentioned longitudinal movement is imparted to the shaft A^4 in order to enable the whole of the pile-warp then lifted to be engaged by the hooks. Then after the hooks are passed back to their normal position the pile-warp is lowered and the intermediate picks of weft are introduced, so as to bind the pile to the fabric as much as possible before the loops are cut.

It is generally desirable to miss a pick while the looping mechanism is in operation, and for this purpose the loom may be provided with any ordinary mechanism arranged at suitable intervals to miss a pick at one end and make two picks in succession at the other end, the second pick being made when the shuttle is in the opposite shuttle-box. In the arrangement we prefer for this purpose the cone or antifriction-roller K^2 on each of the picking-shafts K^3 is fixed to the collar K^4, loosely mounted on said shaft. This collar is connected to the collar K^5, rigidly fixed below by means of the sliding key-piece K^6, having two projecting keys K^7 K^7, fitting grooves formed in the periphery of the collar K^4, and the ends of said keys project into notches formed in the upper face of the collar K^5. Fig. 11 represents a separate sectional view of these parts. To disconnect the picking-shafts from the collars K^4, the lever L is provided on one side and the lever L^2 at the other. These levers are each pivoted upon the cross-frame K^8 and are provided with forked ends L^3, engaging grooves K^9, formed in the said key-pieces. The levers L and L^2 are connected together by means of the rod L′, and the lever L is connected by the rod L^4 to the arm *t* of the lever L^5, pivoted to the lower back cross-rail K^9, and its other arm t^2 is connected by the rod L^6 to the lever L^7. The other end of this lever L^7 is connected by the rod L^8 to one of the jack-levers of the dobby. The dobby is so arranged that each time a pick is required to be made at the left-hand side of the loom the rod L^8 is lowered, which, through the medium of the connecting mechanism, operates the levers L and L^2, thereby disconnecting the picking-cone K^2 on the right-hand side of the loom and connecting the one on the left-hand side with the picking-shaft, and while they remain thus a pick will not be made on the right-hand side of the loom. On the other hand, a pick is only made at the left-hand side when the cone on the right hand is disconnected from the picking-shaft. The spring L^9 (stretched between the lever L^2 and the cross-frame K^8) is provided to assist in restoring the parts to the position shown when the jack-lever again raises the rod L^8.

To prevent the weft-fork mechanism from operating the stop mechanism when a pick is missed in this way, we provide a projection N on the spindle N^2, carrying the weft-fork N^3, which projection is engaged by the top of the rod O each time a pick is missed, and the weft-fork is thereby prevented from falling and putting the stop mechanism into operation.

The rod O passes through the top guide O^2, secured to the front of the slay O^3, and is hinged below to the arm O^4, projecting from the front of the rocking shaft O^5, mounted in bearings O^6 O^6. The shaft O^5 is vibrated each time the cone is operated by its arm O^7, connected to the arm O^8 by the rod O^9. The arm O^8 carries an antifriction-roller R, which is kept in contact with the periphery of the cam R^2 (rigidly secured to the shaft C^4) by

the spiral spring S. This arrangement is the same as that described in specification of application Serial No. 604,695.

We claim—

1. The combination with a comb having two rows of hooks, and a knife located between said rows, of mechanism for operating said knife comprising a rock-shaft adapted to have a longitudinal movement and having a projecting arm A^2 carrying the comb, a rotatable shaft, means for imparting longitudinal movement to the rock-shaft from said rotatable shaft, an arm pivotally connected with the arm A^2, a bevel-wheel with which the pivoted arm is connected, a second bevel-wheel carried by the arm A^2 and engaged by the first bevel-wheel, an arm H secured to the second bevel-wheel, the lever H′ having a movable connection with lever H and connections between lever H′ and a moving part of the loom.

2. The combination with a comb having two rows of hooks, and a knife located between said rows, of mechanism for operating said knife comprising a rock-shaft adapted to have a longitudinal movement and having a projecting arm A^2 carrying the comb, a rotatable shaft C^4, shaft F^5, fork F on shaft F^5, an eccentric on shaft C^4, an arm Y^2 carrying a roller engaged by the eccentric, the arm F^9 on shaft F^5, a rod connecting the arm Y^2 and arm F^9, an arm pivotally connected with arm A^2, a bevel-wheel with which the pivoted arm is connected, a second bevel-wheel carried by arm A^2 and engaged by the first bevel-wheel, an arm H secured to the second bevel-wheel, lever H′ having a movable connection with lever H and connections between lever H′ and a moving part of the loom.

3. The combination with a comb having two rows of hooks, of a rock-shaft A^4, arm A^2 thereon, a shaft C^4, a connection between the latter and the arm, gear-wheel C^5, gear-wheel C^6 loose on shaft C^4, a disk rigid on shaft C^4, a sliding bolt carried by the disk and adapted to engage and disengage with the wheel C^6 as set forth, a lever D having a pivotal connection with the disk, a connection between the lever and the bolt whereby the former is adapted to effect the movement of the bolt, a lever E^3 adapted to effect the stoppage of movement of the lever, a lever E^7 with which the lever E^3 is connected, and a connection between the lever E^7 and a moving part of the loom.

In testimony whereof we have hereunto set our hands in the presence of the two subscribing witnesses.

RICHD. L. HATTERSLEY.
SIMEON JACKSON.
BENJAMIN WALKER.

Witnesses:
DAVID NOWELL,
CLAUDE MEEKER.