

Isaac Lindsey's
 160 *Improvements in Looms for Weaving Hair Cloth.*

No. 119,277.

Patented Sep. 26, 1871.

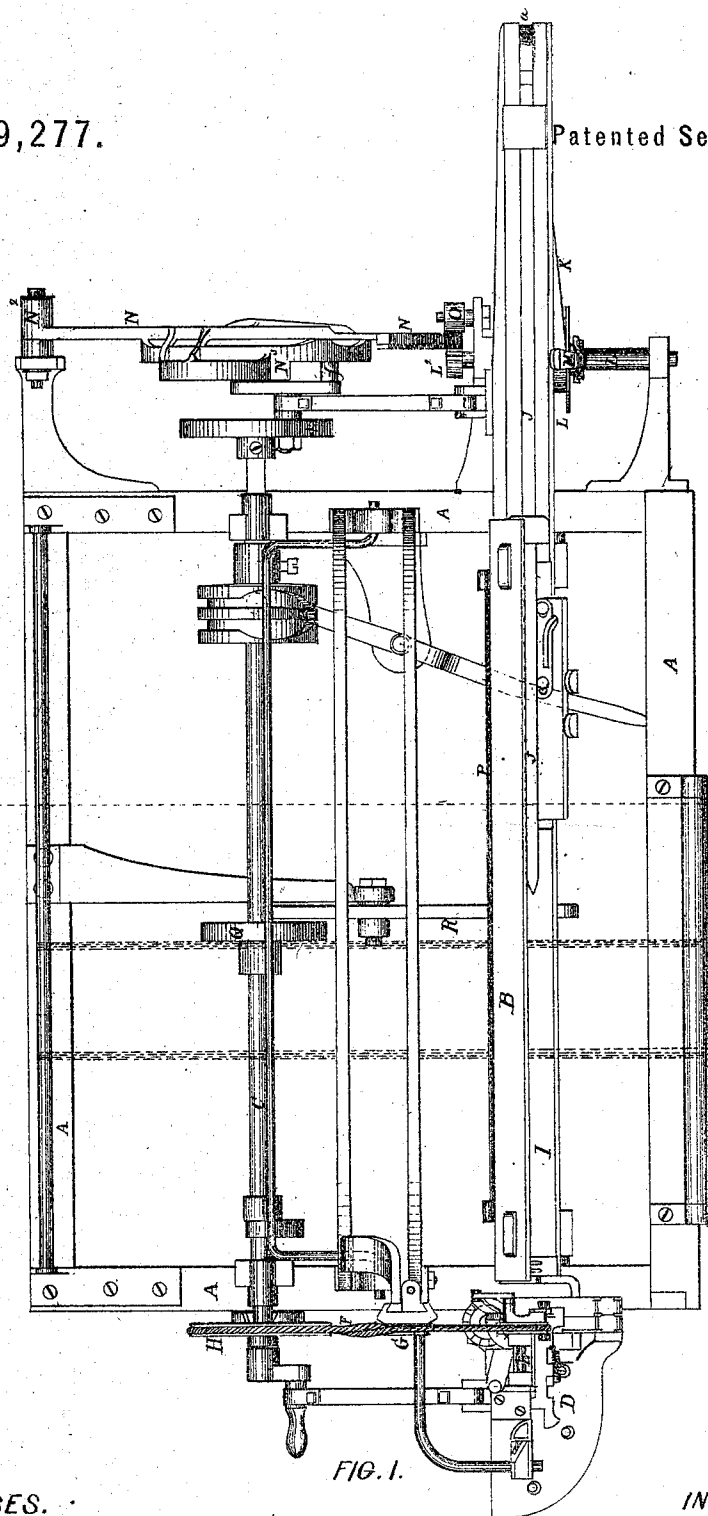


FIG. 1.

WITNESSES.

Frank M. Rogers -
Amrose Looms.

INVENTOR.

Isaac Lindsey

Isaac Lindsley's
 [60.] *Improvements in Looms for Weaving Hair Cloth.*

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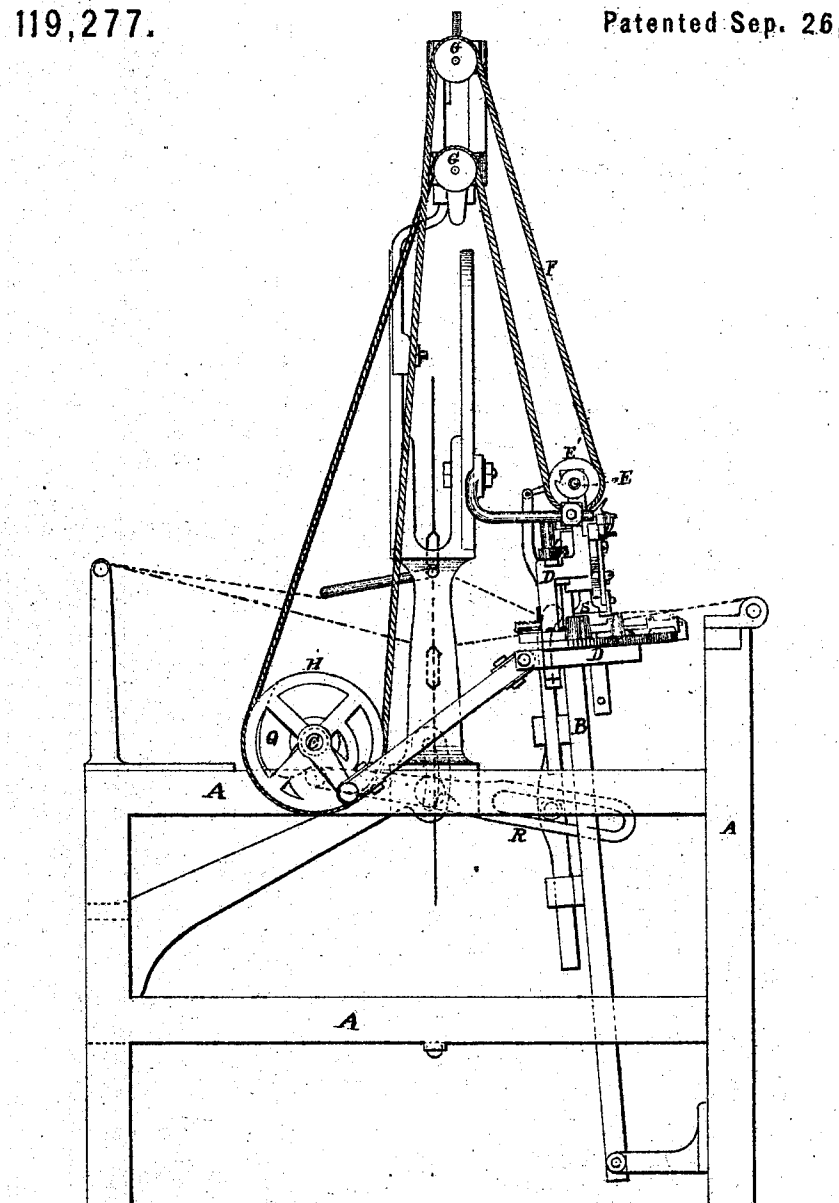


FIG. 2.

WITNESSES.

Frank H. Rogers -
Ambrose Lewis.

INVENTOR.

Isaac Lindsley

Isaac Lindsley's
Improvements in Looms for weaving Hair Cloth.

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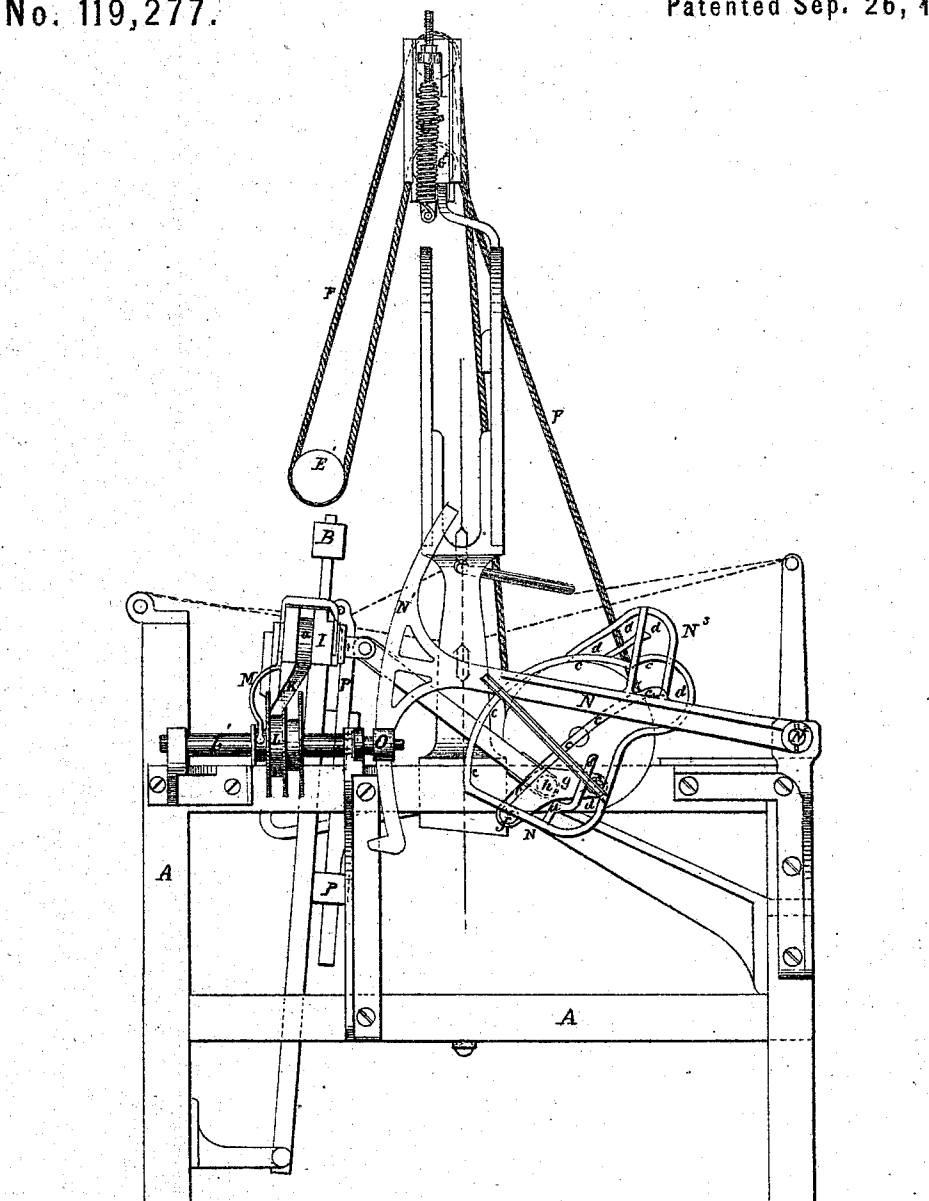


FIG. 3.

WITNESSES.

Frank H. Rogers -
Amrose Lewis.

INVENTOR.

Isaac Lindsley

[60.]

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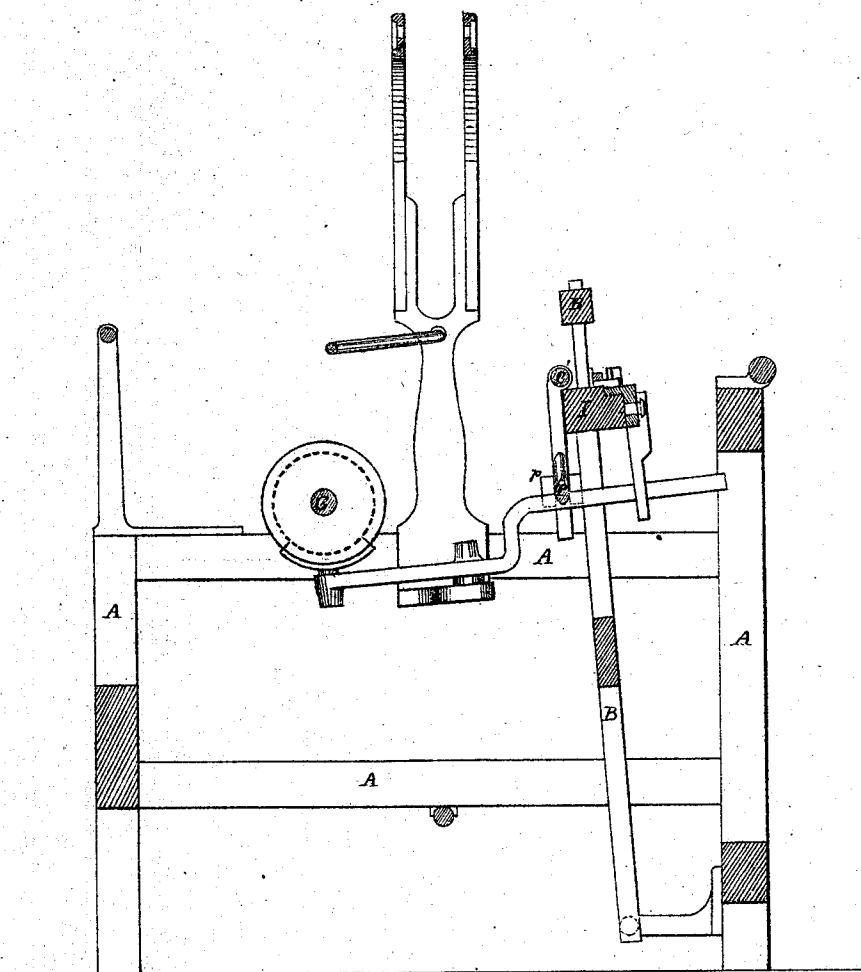


Fig 4.

WITNESSES.

Frank M. Rogers-
Ambrose Louis.

INVENTOR.

Isaac Lindsley

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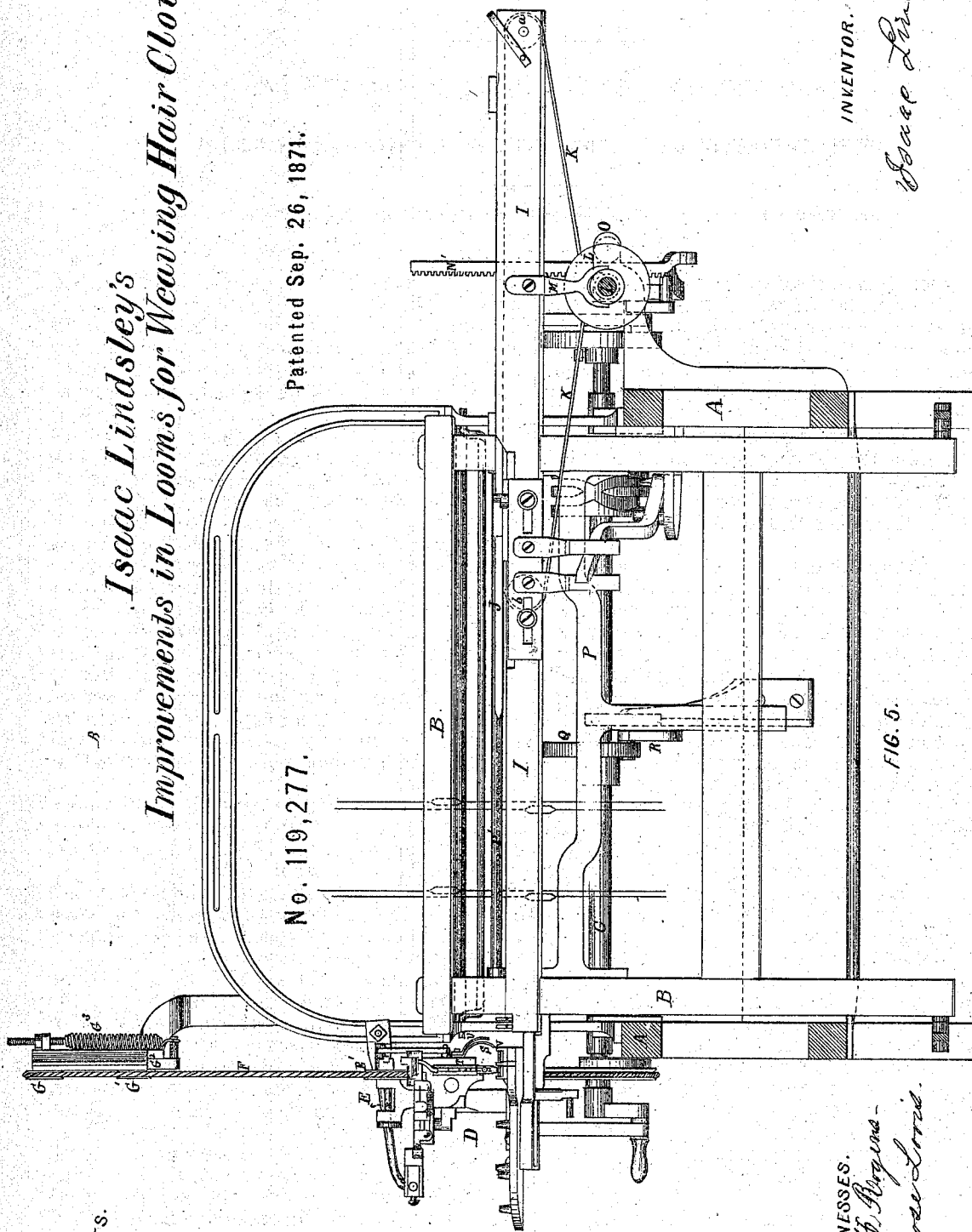


FIG. 5.

WITNESSES.

Frank M. Rogers -
Amos L. Linsley

INVENTOR.

Isaac Lindsley

UNITED STATES PATENT OFFICE.

ISAAC LINDSLEY, OF PAWTUCKET, RHODE ISLAND.

IMPROVEMENT IN LOOMS FOR WEAVING HAIR-CLOTH.

Specification forming part of Letters Patent No. 119,277, dated September 26, 1871.

To all whom it may concern:

Be it known that I, ISAAC LINDSLEY, of Pawtucket, in the county of Providence and State of Rhode Island, have invented certain Improvements in Looms for Weaving Hair-Cloth and other similar fabrics, of which the following is a specification.

This invention consists of certain improvements in the looms for weaving hair-cloth for which Letters Patent of the United States have been granted to me, which are respectively dated June 25, 1861, and October 25, 1864, and November 15, 1864.

The first improvement in this application relates to the mechanism for driving the selecting instrument, so called. When the selecting instrument has seized and raised a hair, or when the nipper approaches it, its motion is arrested by the detents carried by its driving-shaft, as is elsewhere described, which requires the driving-band to slip upon its pulley; also, as the selecting mechanism is attached to the lay and vibrates with it, and the pulley which drives the selecting instrument is fixed upon the crank-shaft of the loom, it follows that the distance between the pulleys in the line of the belt or band is continually changing with the vibrations of the lay. The purpose of this improvement is to keep the driving-band of the proper tension at all times under these conditions. This improvement, therefore, consists in the combination of the stationary driving-pulley and the pulley on the selecting mechanism with a pair of guiding-pulleys placed nearly in a line with the radius of the lay, one or both of which are made movable in that direction, and held by a yielding pressure that will allow the band to conform to the movements of the lay and maintain a proper tension, as will be described. My second improvement relates to the mechanism for operating the nipper, and consists in a combination and arrangement of mechanism that will be described. The third improvement relates to a method of holding the weft-hairs straight in the shed before they are beaten up by the reed. In drawing the hairs singly into the shed by the nipper, so long as the rear end of the hair is in the bunch there is sufficient drag upon it to keep the hair straight; but when the hair has left the bunch and the rear end is free it is liable to curl so as to lie irregularly across the open shed, and in that con-

dition to be beat up by the reed, making bad work. This improvement, therefore, consists in the employment of a device called a binder for depressing the upper part of the shed onto the weft just before its rear end has left the bunch and while it is in a straight position, so that during the latter part of the drawing in of the weft it will be preserved in its proper position by being held between the warps before it is beat up by the reed and before the heddles close the shed, as will be described. My fourth improvement relates to the construction of the clipping or shearing device for clipping the ends of the hairs that may be drawn out so as to project beyond the end of the bunch. In my previous patents the clipping-blade works horizontally and is actuated by the lay, and, therefore, acts but once at each pick; but by my present improvement it is made to act vertically as often as the selecting instrument acts. This improvement, therefore, consists in combining the clipping-blade with the selecting instrument so as to move with it, and modifying the stationary blade to conform to that modification.

In the drawing, Figure 1 is a plan of the loom. Fig. 2 is an end elevation. Fig. 3 is an elevation of the opposite end. Fig. 4 is a vertical section, and Fig. 5 is a front elevation.

Many of the details of the complete loom are omitted in the drawing, which are not affected by the improvements which form the subject-matter of this application.

A is the frame of the loom; B, the lay; C, the lay-shaft; D, the frame-work and some of the parts of the serving mechanism, the details of which are elsewhere described, which is attached to the left-hand end of the race-beam. E is the crank-shaft that drives the selecting instrument, which is driven by the pulley E' upon it by means of the round band F, which is led upward over the guide-pulleys G G¹ and downward to the pulley H upon the lay-shaft, as is shown. The guide-pulleys G G¹ are nearly in a line with the sword of the lay, so that the vibrations of the lay would not greatly change the proper length of the band F; but this inequality is compensated for by the pulley G¹, which is mounted upon a movable slide, G², which is drawn upward with the proper tension by the spring G³, as is shown. I is the race-beam, and J is the nipper-staff, which slides upon the top of the race-beam and is provided

with a nipper, not shown, but is such as is described in my patent No. 45,107. The nipper-staff is driven back and forth by the belt K, which is attached to the back end of the nipper-staff J, the two ends of which are led over the pulleys *a* and *b* in the race-beam, and attached to and wound upon the pulley L in the two scores thereof, as is seen in Fig. 3. The pulley L slides loosely upon the shaft L¹, but revolves with it by means of a spline. M is a fork, which is attached to the race-beam and works in a groove in the hub of the pulley L, by which the pulley is caused to slide lengthwise upon the shaft L¹ as the lay vibrates, and thus maintains the strap K in the proper relation to the lay. The shaft L¹ is rotated in both directions by means of the bevel-pinion L², which engages with the bevel-segment N¹ upon the outer end of the lever N, which vibrates upon an axis at N². To the intermediate portion of the lever N is attached a duplex cam, N³, having two systems of inclines, *c* and *d*, with which two wrists, *e* and *f*, work, which are attached to the yoke *g*, fixed upon the crank-pin *h*, which operates that end of the lay. The purpose of this construction is to give a large range of motion to the lever N with a cam of limited diameter, and as the lever and cam work past the center of the crank-shaft C on either side it requires two grooves or inclines and two wrists placed at considerable angular distance apart to enable the wrists to control the motions of the lever at all points of their revolution; and, further, this construction enables the nipper to have the proper period of rest when the weft is beat up and the motions desired in all parts of its movement. By the revolution of the crank-shaft C the lever N is thus vibrated, and by the geared segment N¹ rotates the shaft and pulley L, winding up one end of the strap K, and unwinding the other alternately, which carries the nipper-staff J back and forth in an obvious manner. O is a roller to hold the segment N¹ in gear with the pinion L². P is the device called the binder, which consists of a frame extending across the lay and moving vertically in guides *p* upon the back side of it. The top bar of the frame P' is placed above the warps, and when the frame is depressed brings the upper part of the shed down near the lower part, as is seen in Figs. 3 and 4, at about the time that the rear end of the hair

which is being drawn in leaves the bunch, which keeps the hair straight till it is taken by the reed. The frame P is moved up and down at the proper times by the cam Q upon the crank-shaft through the intervention of the lever R, as is seen most clearly in Figs. 1, 2, and 5; but the bar P' may be mounted and operated in any other convenient manner that will cause it to depress the upper part of the shed at the proper time to hold the weft, as described. S is a clipping-blade, which is attached to the slide T, which carries the selecting instrument and the guard U. It is placed between the guard and the selecting instrument, and has its cutting-edge upon the lower side, and co-operates with a horizontal stationary blade, V, which forms the inner end of the recess in which that end of the bunch of hair is held, so that the hairs will be clipped, if any project beyond the end of the bunch, at each insertion of the selecting instrument.

The operation of these improvements can be fully understood from the foregoing description without further explanation.

What I claim is—

1. The combination of the stationary driving-pulley H and the pulley E' on the selecting instrument with the two guiding-pulleys G G', one or both of which are movable and held by a yielding pressure to maintain a proper tension of the belt, substantially as described.
2. The combination of the lever N and the duplex cam with the wrists *e* and *f* upon the crank, co-operating, substantially as described, to produce a proper motion to drive the nipper.
3. The combination of the lever N with the nipper-staff by means of the pulley L and its shaft and the strap K, or their equivalents, substantially as described.
4. The binder P', constructed and operating substantially as described.
5. The combination of the clipping-blade with the slide that carries the selecting instrument so as to operate as often as that operates, substantially as described.

Executed March 31, 1871.

ISAAC LINDSLEY.

Witnesses:

FRANK K. ROGERS,
AMBROSE LOVIS.