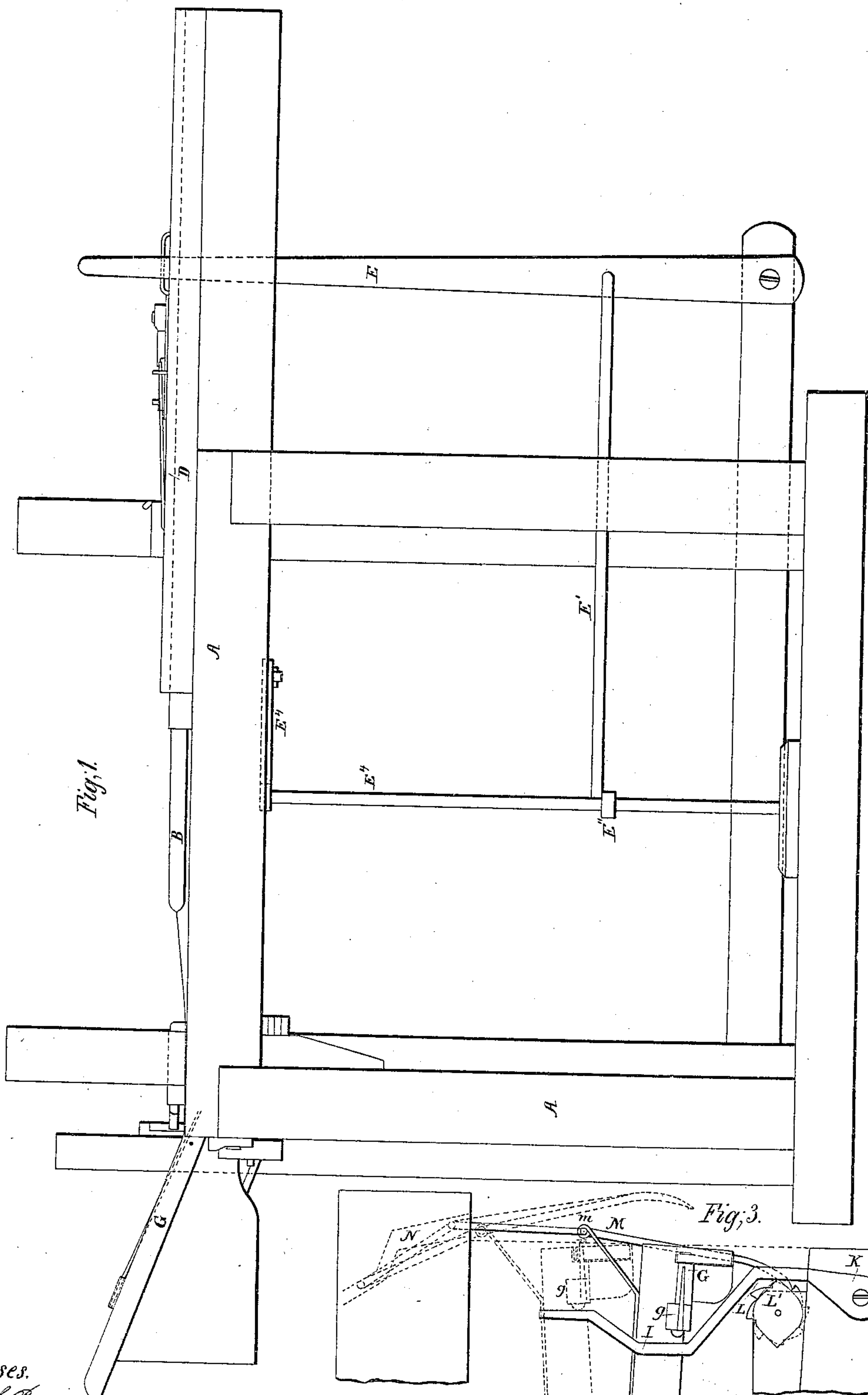


J. S. Winsor
Hair-Cloth.

Sheet 1-2 Sheets.

N^o 42,982.

Patented May 31, 1864.



Witnesses.
William B. Dudley
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Inventor.
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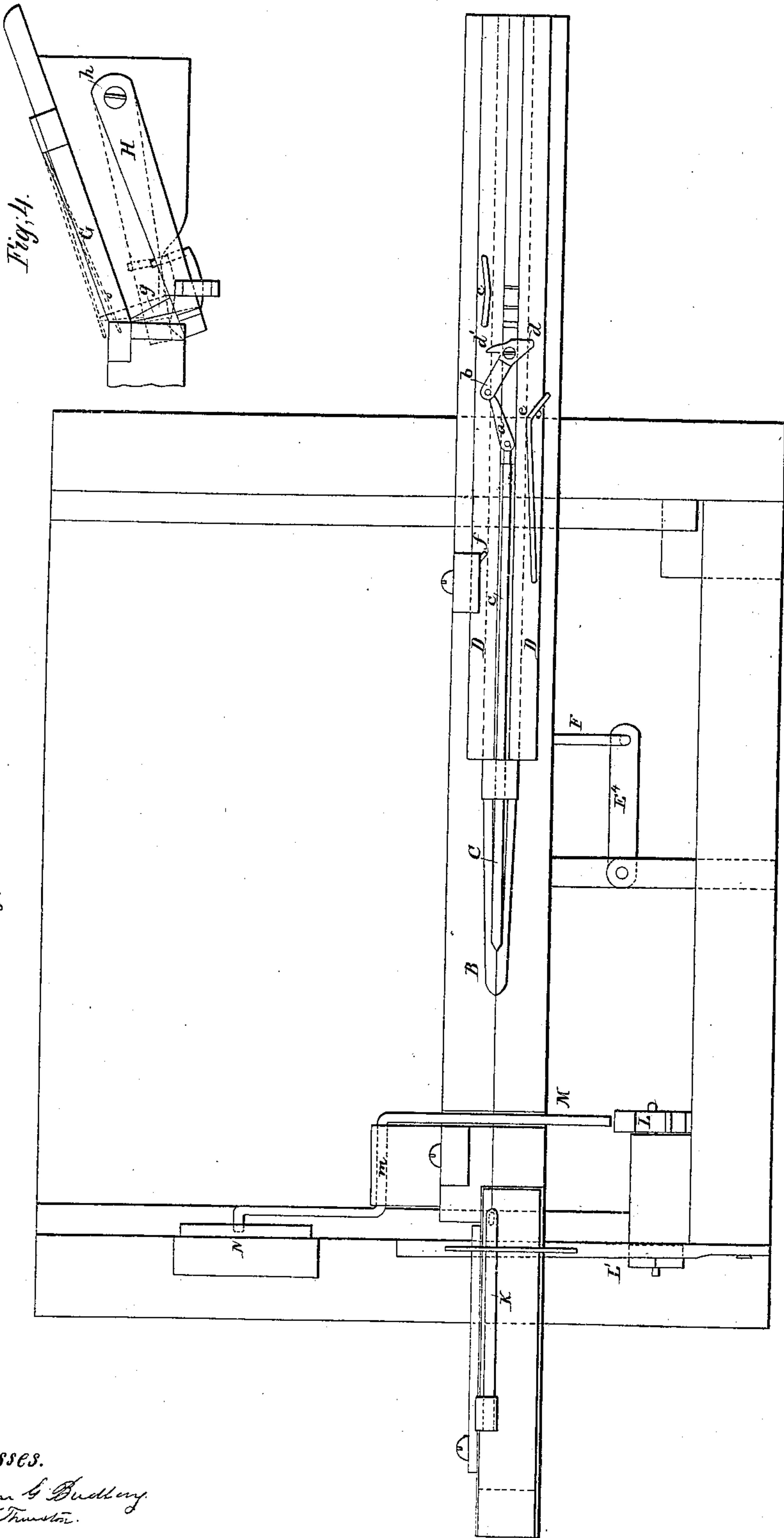


Fig. 2.

Fig. 4.

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UNITED STATES PATENT OFFICE.

JOSEPH S. WINSOR, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN LOOMS FOR WEAVING HAIR-CLOTH.

Specification forming part of Letters Patent No. 42,982, dated May 31, 1864.

To all whom it may concern:

Be it known that I, JOSEPH S. WINSOR, of the city and county of Providence, in the State of Rhode Island, have invented a new and useful Improvement in Hair-Cloth Looms; and I do hereby declare that the following specification, taken in connection with the drawings making a part of the same, is a full, clear, and exact description thereof.

Figure 1 is a front elevation. Fig. 2 is a top view. Fig. 3 is a section showing the manner in which the feeding-fork is operated by the lay. Fig. 4 shows in section the feeding-fork in the two positions which it occupies.

In the accompanying drawings, A represents the lay-frame, to which a backward and forward motion is communicated in the usual way. The heddles and the mechanical devices which work them are not shown, but may be supposed to be similar to those in common use in this variety of loom.

As my invention embodies a means for automatically feeding the hairs which compose the filling, I use, instead of the barbed hook, which is employed in looms where the hairs are supplied by the hand of an attendant, a pair of nippers, B, which are made to open and close their jaws at the proper times by the following means: The nippers consist of two spring-jaws, the tendency of which is to remain closed, and a wedge-formed tongue, C, Fig. 2, which is capable of being pushed forward between the jaws and open them. The nippers are fitted to slide in guides D D on the top of the lay-frame, and are actuated by the wag-staff E, which receives a reciprocating motion through the rod E', pivoted to the arm E'' upon the rod E''', this latter rod having a rocking motion coincident with the beat of the lay imparted to it by means of a link, F, Fig. 2, one end of which is attached to the lay-frame and the other to the arm E' upon the rod E'''. The tongue C is connected with the shank of the nippers by means of the toggle-jointed levers a and b, the jaws of the nippers being closed when the same are in the position shown in Fig. 2, and are open when the levers are in line. Upon the top surface of the guides D D are placed certain stops for controlling the opening and closing of the upper jaws, the operation of which will be readily understood. Suppose the nippers to have seized a hair and to be retreating backward. The grip upon

the hair will be continued until a projection on the lever b strikes against the stop c, when the tongue will be moved forward just far enough to release the hair upon the instant that the nippers leave the shed of the warp in which the hair belongs. This stop is intended to be adjustable, so as to accommodate both the wider and narrower goods of this kind. While the nippers are completing their motion in this direction the harnesses are operated to change the shed. Upon the return movement the nippers pass through the shed with the jaws closed; but as they are near to the hair which is to be seized the projecting arm d upon the lever b strikes against the spring-stop e, whereby the tongue C is thrust forward and the jaws of the nippers are opened. Continuing on in their course, another projection, d', on the same lever, b, strikes against the stop f just as the movement of the nippers in that direction is completed, which withdraws the wedge-formed end of the tongue from between the jaws and permits them to close upon the hair which is presented to them. In the return movement the projection d rides over the spring-stop e and depresses it.

The next part of my invention relates to the means by which a single hair is separated from a bunch of hairs and presented to the nippers.

G is a box or trough, open at the top, in which is placed a bunch of hairs, which may be compressed together at the sides by means of spring-pressure pads, and are prevented from being lifted upward by wire pins, which extend transversely across the box. Directly beneath this box, and pivoted at h to the lay, is hung a lever, H, Fig. 4, which carries at right angles to its length, or nearly so, the feeding-fork g. To this fork an upward and downward movement through the bunch of hairs in the box is imparted, under certain conditions, by the movement of the lay, in combination with the movable inclined plane I, Fig. 3, the end of the lever H being made to ride up the face of the plane I, when the latter is raised so high as to intercept the path in which the former, by the beating of the lay, is made to travel. The end of the fork g is formed with a notch which is capable of holding only a single hair, so that when the fork, by the means before described, is thrust through the bunch of hairs one only will be selected from the mass and rest in the notch until it is seized by

the nippers. As the fork ascends through the mass, its end strikes against a flat piece of spring-steel, K, Fig. 2, the tendency of which is to keep the hair in its place in the notch. It will often happen that the fork will fail to seize a hair. In such case it will become necessary that no attempt should be made to select another from the bunch, until in the course of the revolution of the main shaft of the loom the same shed has been again opened—as, for instance, if four harnesses are used to weave the body of the cloth, an interval of four revolutions, or, what is equivalent to it, four beats of the lay, should occur before another hair is taken. In my invention this is accomplished by the use of a ratchet-wheel, L, Fig. 3, which is attached to an elliptically-shaped cam, L'. The number of teeth in the ratchet-wheel should be with this form of cam double the number of the harnesses employed. The movable inclined plane I, jointed to the frame at k, rests upon the face of the cam L, and is obviously raised higher or lower, according to the position which the cam occupies. When the long diameter of the cam L is perpendicular to the plane of the horizon, as shown in Fig. 3, the inclined plane I will intercept the path in which the lever H, Fig. 4, which carries the feeding-fork, travels, and cause the fork to be plunged through the bunch of hairs; but in any other position of cam the inclined plane will be dropped so low as to be unable to perform this office. The ratchet-wheel L will be turned to the distance of one notch at every forward beat of the lay by means of the pawl M, Fig. 3, hung in a bearing, m, connected with the lay-frame. The rear end of the pawl is guided by a cam-groove, which, during the backward movement of the lay, causes the forward end of the pawl to be raised so high that the nippers can pass underneath it. As the lay beats forward, the pawl is allowed to fall, and its forward end will engage

with one of the teeth of the ratchet, if no hair has been taken, by the nippers. If, however, a hair has been taken the pawl will rest upon the hair, and, being sustained by it, will be thereby prevented from operating the ratchet.

It is obvious that so long as the nippers continue to seize and insert in the web the successive hairs of the filling the relation of the inclined plane I to the feeding-fork will not be disturbed; but as soon as a failure to do so has occurred, the pawl will commence to turn the elliptical cam L', and will continue to do so during four successive beats of the lay, when the inclined plane will again be in a position to operate the fork to bring up another hair.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The spring-nippers, consisting of the jaws B and the wedge-formed tongue C, or their equivalents, constructed and arranged to operate with reference to each other substantially as described, for the purposes specified.

2. The combination of the spring-nippers, as above described, with the stops *c e f*, for controlling the opening and closing of the jaws at the proper times, for the purposes specified.

3. The mode of operation, substantially as specified, by means of which the feeding-fork *g* is made to plunge through a bunch or mass of hairs, for the purposes set forth.

4. The mode of operation, substantially as specified, by means of which, in case the feeding-fork fails to select or the nippers to seize a length of hair for insertion in the web, the motion of the fork is arrested until the same shed of the warp is again opened, for the purposes specified.

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Witnesses:

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