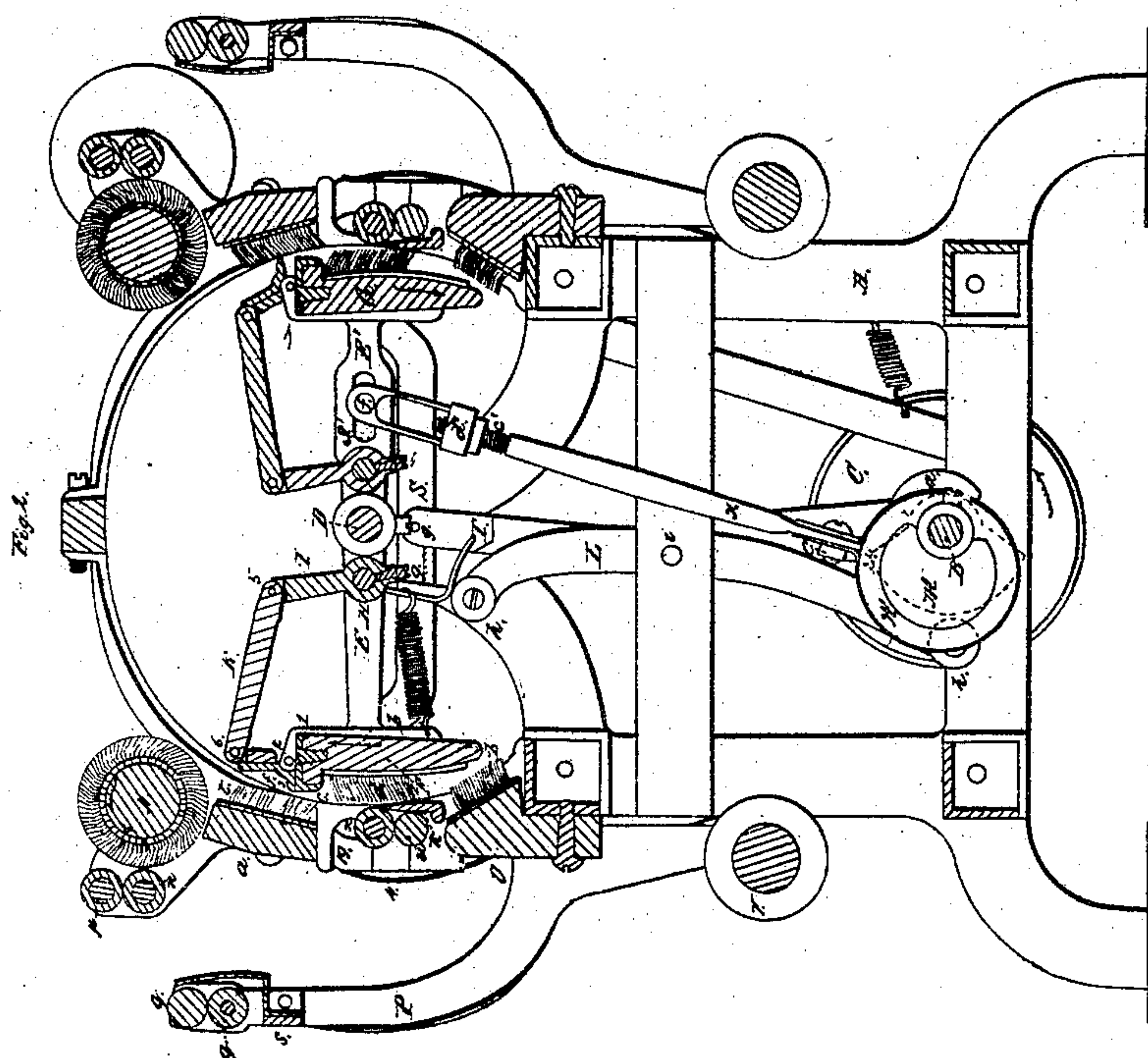
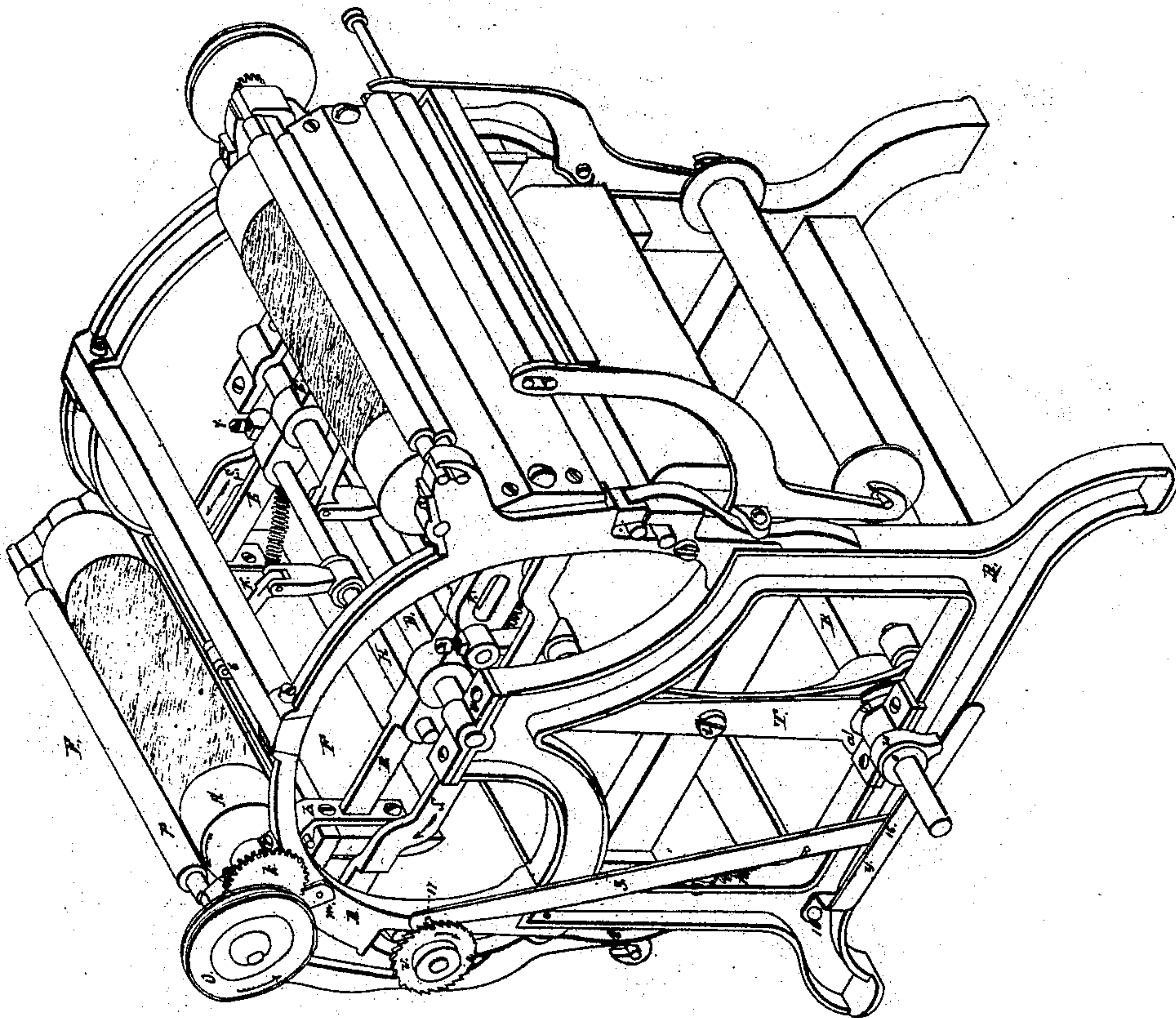


M. D. Whipple.
Combing Mach.

N^o 21,932.

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UNITED STATES PATENT OFFICE.

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MACHINERY FOR COMBING COTTON.

Specification of Letters Patent No. 21,932, dated October 26, 1858.

To all whom it may concern:

Be it known that I, MILTON D. WHIPPLE, of Charlestown, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Machines for Combing Cotton, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of my machine; Fig. 2, a transverse vertical section through the same.

That others skilled in the art may understand and use my invention I will proceed to describe the manner in which I have carried out the same.

In the drawings is represented a double acting combing machine, having two sets of cards, nippers and doffers, so arranged that as the arms which carry the nippers are vibrated and one pair of nippers is carrying the cotton which it has drawn from the feed rolls up to one doffer the other pair of nippers will be returning for a fresh supply to be carried up to the other doffer, as will be hereafter more fully set forth. It is evident however that the machine may be made single acting, or with one pair of nippers and one doffer.

"A" is the frame of the machine, having suitable bearings in which is supported the driving shaft "B" to which motion is communicated through the pulleys "C," Fig. 2. A rocking shaft "D" near the upper part of the machine has its bearings at *a*, and has secured to it near each end a pair of arms E, E', which extend out laterally on each side from the shaft and carry at their ends heavy blocks. Thus on one side the arms E carry at their outer ends the block F and the arms E' the block G. Each of these arms terminates in a clamp *b*, to which the block is secured.

As the operating parts on each side of the machine are substantially similar, I will describe the construction and arrangement of but one set.

The block F which extends across the machine inside of the frame A is secured rigidly to the clamps *b* on the ends of the arms E. It has attached to its face a card *d*, the points of the teeth of which incline downward. A strip or plate of metal *e* extending the whole length of the block is secured by

screws 1 to the top of it. A piece of metal *f* of the form shown in section Fig. 2 also extends the length of the block F. It is hinged near each end to the upper part of the clamp *b* at 2 (the clamp being bent over the top of the block F, as shown). As the piece *f* is vibrated on its pivots 2 in a manner which will be presently explained, the lower portion or jaw 3 of it shuts down in contact with the strip *e* forming a pair of nippers, which are opened and closed at proper intervals in the following manner: A shaft H lying parallel to the shaft D has its bearings in and projects through the arms E, between the shaft D and the ends of the arms. To this shaft is secured at or near the middle of its length by a screw 14 the short arm I, to which is pivoted at 5 another arm K, the other end of which is pivoted at 6 to the top of the piece *f* of the nippers. A short arm *g* is secured to the outer end of the outer end of the shaft H beyond the arm E and hangs down below it. This arm *g* is secured to the shaft by a screw 7 (Fig. 1) and is continued down and bent back as at 8 (Fig. 2). A spring *e* draws the lower end of the arm *g* toward the block F and opens the jaw 3 of the nippers. This jaw is held open during the descent of the block F, and is closed and held shut during its ascent, in the following manner: A bent lever L having a friction roll *h* at each end of it, is pivoted at *i* to a cross brace at one end of the frame A of the machine. This lever is vibrated at proper intervals by a cam M (dotted in Fig. 2) secured to the shaft B, which bears against the friction roll at the lower end of the lever and presses the upper end against the arm *g*. This closes the jaw 3 of the nippers. The cam M is so formed that it shall retain the lever L in the position shown in Fig. 2 for a certain length of time, while the bent portion 8 of the arm *g* is so arranged that it will bear against the friction roll *h* at the upper end of the lever L during the ascent of the block F and arms E. This keeps the jaw 3 shut until the block F has reached the highest point to which it ascends, at which time the roll *h* drops off the point 24 of the cam M, when the retraction of the spring *e* opens the jaw 3.

A doffer N is supported in suitable bearings in the frame A and is revolved in the direction of its arrow by the gear *k* on the

end of its shaft, engaging with a small intermediate gear on an arm m , which gear in turn engages with one on the shaft of the draw roll n , to which is attached a pulley O.

5 A cord leads over this pulley and over a pulley o formed on the shaft B. Another roll p lies immediately above the roll n . These rolls take the lap from the doffer N and deliver it to a pair of calender rolls q ,
10 hung on the arms P, which rise from the back of the frame A. Before entering these latter rolls however the lap is passed through a hole in a piece of sheet metal r , which rises from a cross brace s , which connects
15 and steadies the arms P. The sliver is thus condensed in the usual manner to pass into the can. The rolls q are driven by a cord over a small pulley on the shaft of one of them, which is led to the pulley O (these
20 cords are not shown in the drawings).

Immediately below the doffer N is secured to the frame A a block Q which extends across the machine. To the face of this block is attached a card t the teeth of
25 which incline downward. Beneath this block and running in suitable bearings in the frame is a pair of feed rolls, the lower one u of which runs in permanent bearings and carries on the end of its shaft which projects
30 beyond the side of the frame a ratchet wheel v (Fig. 1). The shaft of the other roll x runs in loose bearings 19 which are held up to the frame at each end of the shaft by a spring 4 attached to the frame. This allows
35 the roll to be pushed back away from the center of the machine at intervals as will be hereafter explained. The ratchet wheel v is fed in the direction of its arrow, one notch at each revolution of the shaft B, in
40 the following manner: A cam w on the shaft B vibrates a lever y pivoted at 15 to the side of the frame A. To the lever y near the middle of its length is pivoted at 16 a long rod z , in the upper end of which is inserted
45 a pin 17 that engages with the teeth of the wheel v and moves this wheel one notch at each vibration of the lever y . A spring 18 secured to the lower end of the rod z and to the frame A at a point somewhat higher
50 up tends to keep the lever y in contact with the cam w , and also the pin 17 in contact with the wheel v .

A rigid bar or knife edge R (of the form shown in section Fig. 2) extends across from
55 one side of the machine to the other, between the rolls x and u and the path of the card d . This bar is so placed with respect to the rolls that the upper edge of it (which is comparatively thin) shall be almost in contact
60 with the roll x , when this roll is pressed in by the spring 4, and the lap which is being fed through between the rolls x and u , and over the edge of the bar R, will be held by the pressure of the spring 4 between the
65 roll x and the knife edge for a certain inter-

val of time. When however it is requisite that the grasp of the roll x be relieved to allow the nippers to draw out the fibers this roll is moved back from the knife edge in the following manner: A bar S the notched end
70 of which bears against the axle of the roll x , is pivoted at 9 in the middle of its length to a broad flat lever T which is pivoted at i to a cross brace of the frame A and is forked at its lower end forming a cam a' that em-
75 braces the shaft B between the side of the frame and the cam M previously spoken of. A pin 10 (Fig. 1) projects from the side of this latter cam into the cam a' and vibrates the lever T at the proper intervals. This
80 causes the bar S to push back the roll x from the bar R and allow the fibers to be drawn through between the roll and the bar. The system consisting of the bar S lever T and its cam is in duplicate at the other end of
85 the machine, so that as the levers T are vibrated in one direction the two bars S will bear one against each end of the roll x and push it back square, (or without throwing it out of parallelism with the roll n). The
90 next vibration of the levers T in the opposite direction operates in the same manner the roll x belonging to the set of machinery on the opposite side of the machine. Immediately beneath the rolls x and u and ex-
95 tending across the machine, to the frame A of which it is rigidly attached, is another block V to the face of which is attached a card b' similar to the card t above the rolls. Both of these cards are inclined so as to
100 bring their faces nearly in a circle of which the shaft D is the center. A spool V hung on the lower part of the arms P carries the lap which is led up to the feed rolls above it.

I have heretofore described the parts and
105 their arrangement on one side of the machine only, as thus far the parts on the opposite side have been similar, with the cams which operate the machinery on one side secured to one end of the shaft B and those
110 which operate the machinery on the other side secured to the other end of this shaft. But as the two pair of arms E, E' are cast together, it only requires that one pair be vibrated to cause the other pair to move in
115 the opposite direction, the shaft D to which they are attached rocking in its bearings a . These vibrations are effected in the following manner: An eccentric W secured to the shaft B near one side of the frame is
120 embraced by a strap which is attached at c' to a pitman X the upper end of which is connected to one of the arms E' in a manner which allows of an adjustment of the vibration of the arms. Thus a screw e' on
125 the end of the pitman enters a nut d' , while a screw bolt f' passes through a slot g' in the arm and enters the head of the nut d' (a nut and washer secures the bolt f' in its position in the slot g'). This gives two
130

means of adjusting the vibrations of the arms *E'*—first by altering the length of the pitman, and second by altering the point at which it is attached to the arm *E'*.

5 Operation: The operation of this machine is as follows: The lap of partially prepared cotton is brought to this machine on the spool *V*, from which the end is led up between the feed rolls *x* and *w*, where it
10 passes between these rolls and over the edge of the bar *R*. The shaft *B* now being driven in the direction of the arrow on the pulley *C* the arms *E* will be vibrated in the manner described, the card *d* on the block *F*
15 will be brought down past the knife edge *R* and the fibers of the end of the lap which projects over the knife edge will be combed out straight by this card. The pressure of the spring 4 causes the roll *x* to nip the lap
20 between it and the edge of the bar *R*. This prevents the fibers from being drawn through by the card *d* as it descends. This card thus combs out and lays straight the ends of the fibers of cotton which project
25 over the knife edge (the other ends of these fibers being held between the roll and the knife edge) and combs off the waste and noil. After the card *d* has performed its work on the projecting fibers, as the arms *E*
30 continue their descent, the jaw 3 of the nippers on the block *F* (which has been held open during the descent by the spring *e*) is closed onto the fibers by the vibration of the lever *L* operated by the cam *M* on the
35 shaft *B*. The block *F* now begins to ascend. At this instant the levers *T* are vibrated and the bars *S* attached to them are moved in the direction of their arrows. This
40 pushes back the roll *x* away from the bar *R* sufficiently to allow the lap to be fed up. At the same time the nippers draw out the fibers from the end of the lap and carry them up past the face of the card *t* by
45 which the other ends of these same fibers are combed out as the block *F* ascends. Then as the block *F* reaches the upper limit of its vibration the lower end of the lever *L* drops off from the cam *M* and the spring *e* opens the jaw 3 and delivers the combed
50 cotton onto the doffer *N* from which it passes off through the rolls *p* and *n* to the calendar rolls *q* through the piece *r*. As the portion of fibers is drawn out by the nippers from the end of the lap (and before the card *d*

again descends) a fresh portion of the lap 55 is fed up by the cam *w* vibrating the lever *y* and revolving the ratchet wheel *v* one or more notches as required, the nippers drawing the lap up between the roll *x* and the bar *R*. When this has been done the levers 60 *T* are vibrated in the opposite direction, and the bars *S* being drawn away from the roll *x* the spring 4 presses this roll up and nips the lap, as before explained. While the feed is
65 taking place, the lap as it comes through the rolls will be drawn up between the upper roll and the knife edge, and then the fibers which are grasped by the nippers will be torn off from the lap, to be carried up past the card above the rolls. As the block *F* 70 again descends to repeat these operations, the card *t* is cleaned by the card *d* which passes in contact with it, and this latter card is in turn cleaned at its next ascent by the card *b'* which is in its turn cleaned by the
75 card *d* as it descends.

It will be observed that the vibrations of the arms *E* and *E'* are alternate and that when the block *F* is ascending, as represented in the drawings, the block *G* of the 80 other set of machinery is descending, the parts connected with one side are performing their functions, though with alternate movements, at the same time with the parts connected with the other side of the ma- 85 chine, which thus becomes in a measure double acting.

The roll *x* and knife edge *R* grasp the lap in a manner similar to a pair of jaws, and as the nippers on the block *F* can approach 90 close to the edge of the bar *R* I am enabled to grasp and draw out the shorter fibers of the cotton.

What I claim as my invention and desire to secure by Letters Patent is:— 95

1. The vibratory elastic feed roll and permanent knife edge for holding the staple as set forth.

2. I claim the combination of a feed for introducing the material into the machine, 100 the vibrating card *d* and nippers, and the stationary cards *t* and *b'* operating in the manner substantially as described.

MILTON D. WHIPPLE.

Witnesses:

THOS. R. ROACH,

P. E. TESCHEMACHER.