

3 Sheets, Sheet 1

E. J. Gird,

Sewing Machine.

No. 109816.

Patented Dec. 6. 1870.

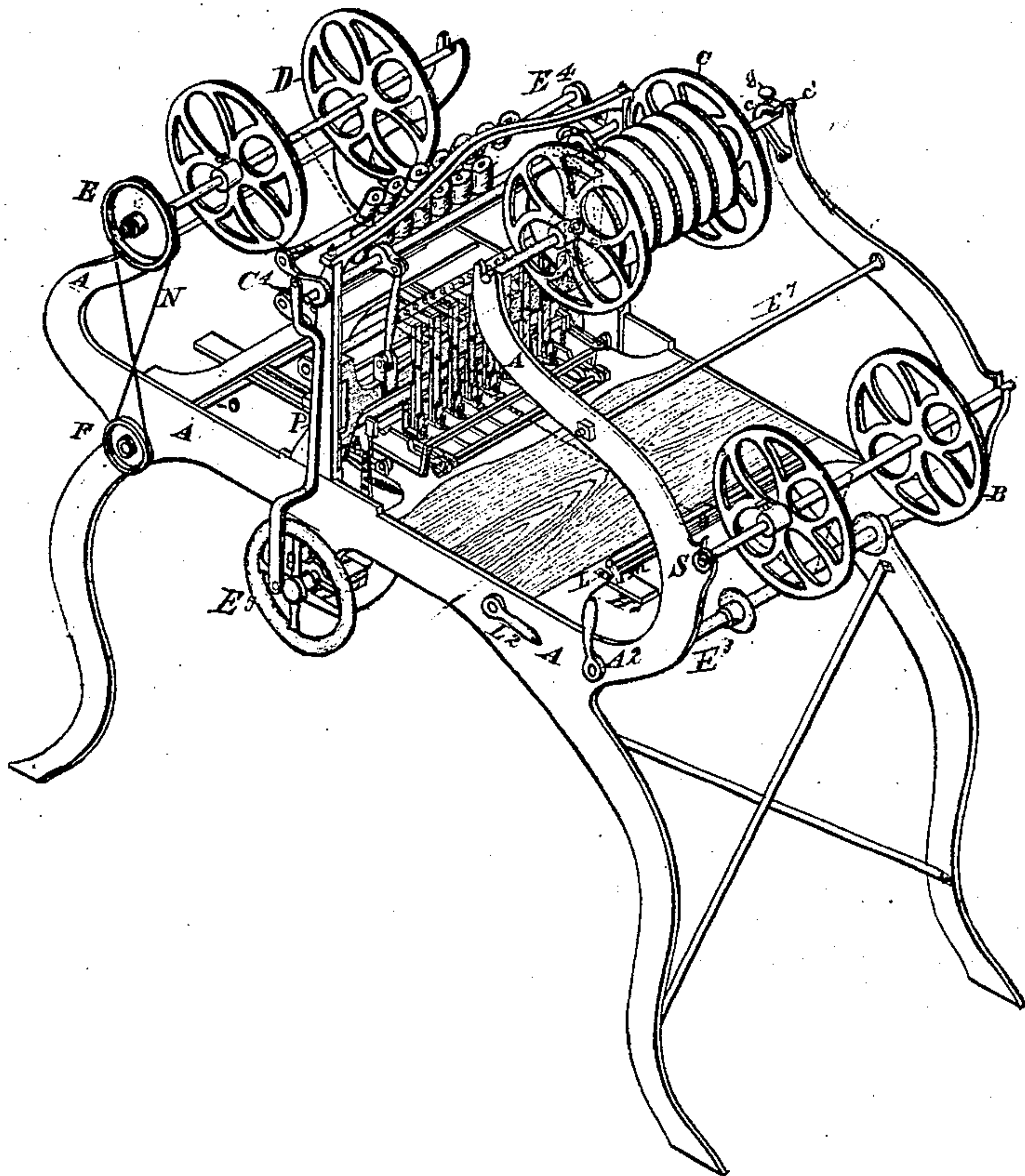


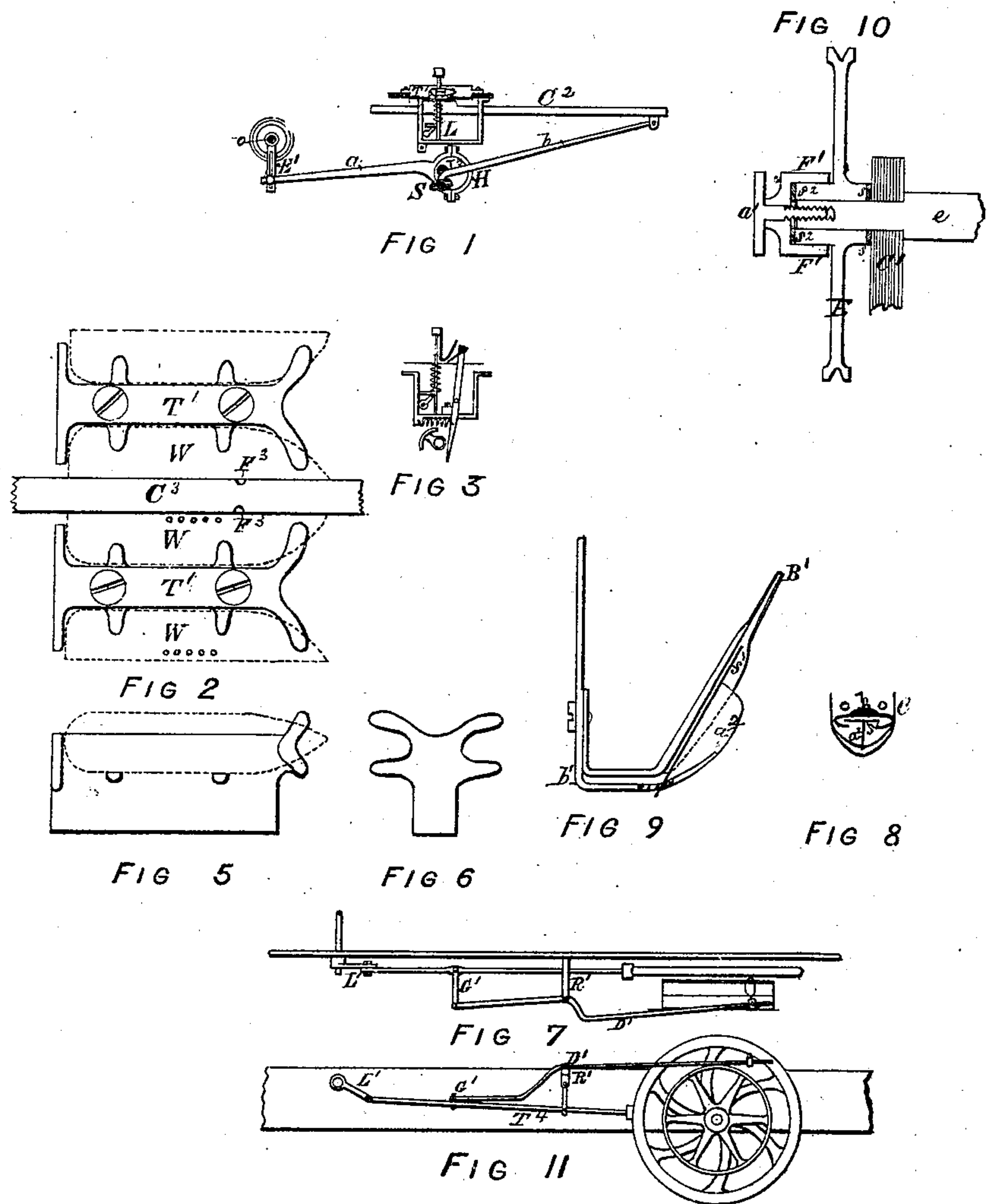
Fig 1

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*E. J. Gird,*  
*Sewing Machine.*  
*No. 109,816.*

*Patented Dec. 6. 1870.*



*W. J. Johnston*  
*John Pierce*

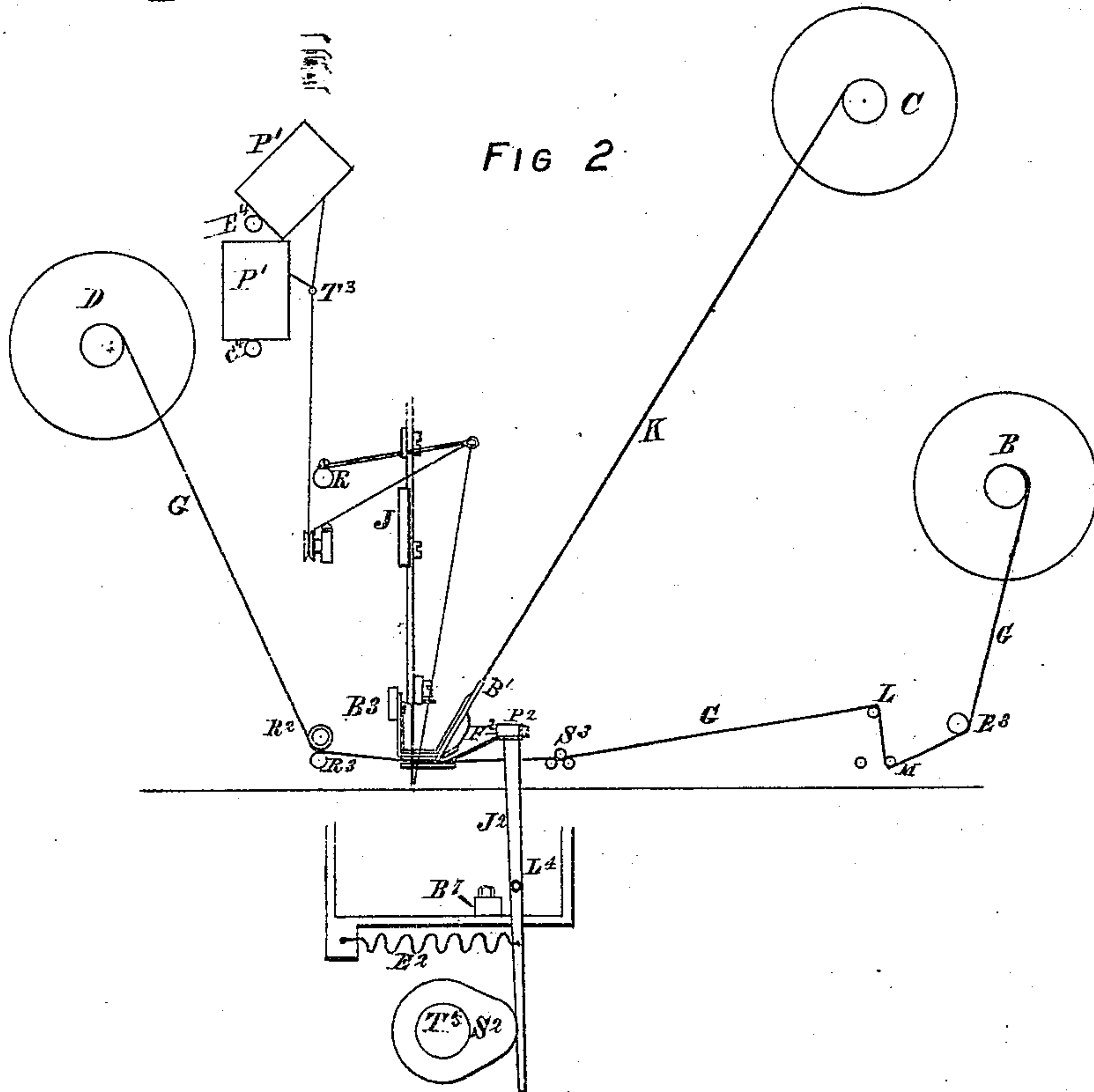
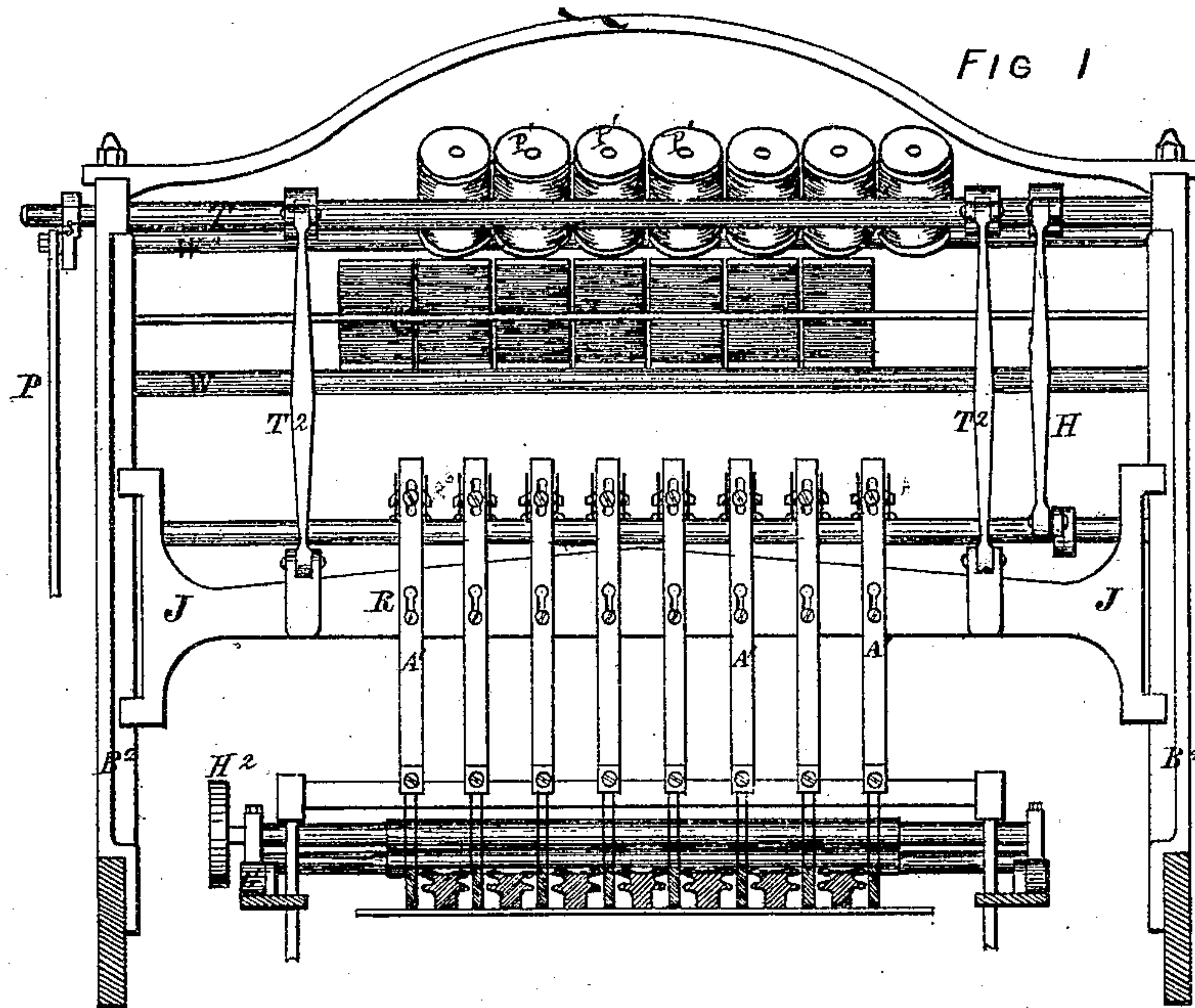
WITNESSES

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*E. J. Gird,*  
*Sewing Machine.*

No. 109,816.

Patented Dec 6 1870.



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# United States Patent Office.

EDWARD D. GIRD, OF SYRACUSE, NEW YORK.

Letters Patent No. 109,816, dated December 6, 1870; antedated November 25, 1870.

## IMPROVEMENT IN SEWING-MACHINES FOR MAKING PUFFING.

The Schedule referred to in these Letters Patent and making part of the same.

I, EDWARD D. GIRD, of the city of Syracuse, in the county of Onondaga and State of New York, have invented certain Improvements in Machine for Making Puffing and Seaming, of which the following is a specification.

This invention has for its object the production of an improved machine for puffing cloth and other kindred purposes, and consists, mainly, of various combination of its parts, and in certain specific details of construction, all of which will be fully described hereafter.

In the drawing—

Figure 1, sheet 1, is a perspective view of my improved machine.

Figure 1, sheet 2, is a vertical sectional view, showing the carriage and the pitman moving the same, and also the eccentric and the pitman moving the take-up reel, with the clamp-dog and foot-lifter.

Figure 2, sheet 2, is a top view of the double shuttle-carrier, with the shuttles and double face-plate.

Figure 3, sheet 2, is a vertical sectional view, showing the tucker and eccentric moving the same, and also the hemmer and foot-lifter.

Figure 4, sheet 2, is an end view, showing the feed-rollers and hinge-joint.

Figure 5, sheet 2, is a side elevation of the shuttle-carrier, showing the position of the shuttle.

Figure 6, sheet 2, is a top view of the end of the double shuttle-carrier.

Figure 7, sheet 2, is a top view of the belt-shifter and brake.

Figure 8, sheet 2, is an end elevation of the hemmer.

Figure 9, sheet 2, is a side elevation of the same.

Figure 10, sheet 2, is a view of the tension device on the take-up reel.

Figure 11, sheet 2, is a side view of the belt-shifter and brake.

Figure 1, sheet 3, is a foot elevation, showing the cross-head, needle-bars, needles, and needle-cap, rock-shafts, pitman, and feed-rollers.

Figure 2, sheet 3, is a vertical transverse sectional elevation, showing the position of the spools, the line of the thread from the spools to the guide-rod, from the guide-rod to the tension devices, from there to the take-up rod, and thence to the needles; also the position of the take-up rod, the needle-bar, and double hemmer, the arrangement of the reels, the tuckers, feed-rollers, and guides; also the line of movement of the cloth.

To enable others skilled in the art to make and use my invention, I will proceed to describe its different parts.

A, fig. 1, sheet 1, represents the frame of the machine, which is preferably made of iron, the different

parts being securely bolted or otherwise attached together.

The form of said frame is such as to give the proper position to the various parts which are attached thereto.

The reel B, it will be observed, is located low down upon the frame, it being nearly in a line with the bed-plates of the latter.

Upon this reel is placed the main or wide strip of cloth, upon which the other narrow strips are to be sewed.

C represents a sectional reel, upon which are placed the narrow strips, which pass through the hemmers. It is located much higher up on the frame than the reel B, for the purpose of placing the strips at the proper angle to be brought into the hemmers, and also to afford sufficient room for the operator to suitably arrange the cloth.

The reels B D are provided with a tension device, located upon the end of the shaft, such device being correctly shown in fig. 10, sheet 2.

The tension device for reel C consists of a hook, c, the lower end of which is pivoted to the frame, as shown in fig. 1, sheet 1, and is so arranged that its curved upper end swings over the shaft c.

It is provided with a thumb-screw, g, by means of which the pressure upon the shaft may be regulated, and thus control its speed.

If desired, a bearing-plate may be interposed between the end of the screw and the shaft.

By means of this contrivance, the movement of the reel C is readily controlled, as may be necessary, either to prevent the strips from paying off too rapidly, or to permit the feed to make the desired amount of gathering in the under strip or main piece G.

D, fig. 1, sheet 1, fig. 2, sheet 3, represents the take-up reel, upon which the strip of finished puffing is wound, after passing the needles.

Motion is given to this reel by the belt N, which passes around the pulleys or drums E and F.

The drum F, fig. 1, sheet 1, is attached to the end of the shaft O, which latter is moved by means of the pitman a, fig. 1, sheet 2, the pitman being operated by means of an eccentric, H.

The pitman a is connected with the shaft by means of a lever, E', which latter is provided with a friction-dog, by means of which an intermittent rotary motion is communicated to the shaft.

The tension device for regulating the speed of reel D will now be described.

The pulley E, fig. 10, sheet 2, is made loose upon the shaft e, and between the inner face of its hub and bearing C', a washer, s, is placed, as shown in the drawing.

F' represents a cap, which fits over the outer end



of the hub of pulley E, and is secured in place by means of a set-screw,  $a^1$ , which enters a socket in the end of the shaft  $e$ .

A washer,  $s^2$ , is interposed between the other face of the hub and the face of the cap, as shown.

By adjusting the set-screw  $a^1$ , the pressure against the bearing  $c$  is regulated, and, consequently, also the speed of the shaft  $e$ .

Having now described the position of the reels and the manner of regulating their speed, and thus controlling the movement of the cloth as it passes through the machine, I will now proceed to describe the guides, tension-rods, hemmers, and tucking device, by means of which the cloth is properly operated upon.

G, fig. 2, sheet 3, represents the main or wide strip of cloth, forming a foundation, to which the narrower strips are attached.

K represents the narrow strips, which may be employed in any desired number within the capacity of the machine.

The main strip G is placed upon the reel B, and then drawn down beneath the roller  $E^3$  and rod M, and over the rod L. From these it is carried forward between the rollers  $C^3$ , and passing through the guides beneath the hemmer-feet, is brought through between the rollers  $R^2$   $R^3$ , and upon the reel D.

The roller  $E^3$  is provided with suitable collars to guide the cloth.

The rod L is held by means of a spring, which has a tendency to yield slightly, as the cloth is drawn by the tucker, and this prevents it from being torn.

The roller  $S^3$  serves to straighten and smooth the cloth before it enters the final guide, and passes to the needles. As the cloth passes through the hemmer, the strips upon reel C are brought down through them, and are attached to the cloth by the action of the needles.

The construction of the hemmer will now be described.

$a^2$   $s^1$ , fig. 9, sheet 2, represents a T-shaped piece of metal, a transverse section of which is shown in fig. 8. This piece of metal is secured to the presser-foot, as shown in fig. 9, and is set at the proper angle to receive the strips K.

About the T-shaped piece is located a cap,  $b$ , which is held in place by being attached to the foot  $b'$ , or its vertical standard by means of a screw, as shown.

The upper end, as shown at  $B^1$ , fig. 9, sheet 2, is converted into a guide, by placing a piece across its under side, thus making it the width and thickness of the strip of cloth to be hemmed.

As the strip enters the guide and passes into the hemmer, its edges are caused by the cap to turn about the bar of the T-shaped piece  $S^1$  and become folded in position for hemming.

The device described will cause but a single fold of the cloth to be made, but if desired, the cap can easily be caused to make a double fold.

The strips K K, after having been properly folded, pass down through the lower part of the hemmer and presser-foot immediately in front of the needles, and are sewed to the main strip, the seams being close to the edge of the hemmed strips.

$R^2$   $R^3$ , fig. 2, sheet 3, represent the rollers, which are employed to draw the cloth through the machine. One of these is preferably covered with rubber, and the other is provided with creases, and the cloth is firmly grasped and drawn forward.

An intermittent motion is given to this roller by means of a friction-dog or pawl, actuated by a lever and cam under the table, and engaging the pulley  $H^2$  of the feed-roller.

We have now shown how the cloth has been formed and sewed, with the exception of the tucking opera-

tion, which consists of a number of strips of spring-steel, which are in width a little more than are the strips to be sewed on. These leaves of steel, as shown, at  $F^2$ , fig. 2, sheet 3, are secured to a bar running across and above the strip of cloth as it enters the machine.

The other or opposite ends of these steel pieces press down upon the bed or main strip G, as shown in fig. 2. These pieces or tuckers are provided with little notches or teeth, so that they will not slip over the cloth, but push it forward. They are moved by the lever  $J^2$ , fig. 2, sheet 3, which is supported on a pivot at  $L^1$ .

The lower end of this lever is moved by a cam,  $S^2$ , fig. 2, sheet 3, which is on the main shaft  $T^5$ , same figure.

The lever is held upon the cam by a spring,  $E^2$ , same figure.

This lever can have the whole stroke of the cam, or may be stopped at any point by the block  $B^7$ , same figure.

This block is movable, and can be adjusted at the desired distance.

It will be seen that by this arrangement the tucker is moved each time the needles make a stroke.

The tuckers take up a fold or tuck of cloth so as to be under the descending needles in time to be stitched on at each time of descent.

The manner of winding and unwinding the cloth, and hemming of the strips, and the tucking of the main piece having been shown, we will now describe the sewing devices.

The cross-head R, upon which the needle-bars are secured, as shown in fig. 1, sheet 3, is made to run upon two ways, which are a part of the upright posts of the frame, as shown at  $B^2$ .

Across the top of these posts, and connecting them together is a lintel.

Motion is imparted to the cross-head by means of the pitman  $T^2$ , same figure and sheet. These pitmen are operated by a joint or short lever, which swings with the rock-shaft T.

This rock-shaft is moved the sufficient part of a circle to give the necessary stroke to the needles, and, by swinging past the center or dead-point, the needle is slightly lifted, thus giving requisite motion for opening the loop to admit the shuttle.

The rock-shaft T is vibrated by the pitman P, same figure and sheet, which is connected at its lower end with the main shaft at  $E^5$ , fig. 1, sheet 1.

The carriage,  $C^2$ , fig. 1, sheet 2, runs upon the ways  $H'$ , fig. 1, sheet 1.

This carriage is moved by a pitman,  $h$ , sheet 2 and fig. 1.

This pitman is operated by a crank in the main shaft  $T^5$ , fig. 1, sheet 2.

The shuttles W lie in carriers  $T^1$ , plainly shown in fig. 2, sheet 2. These carriers are so formed that they drive two shuttles each, with the exception of the one fig. 5, sheet 2, which is to carry one opposite shuttle, as will be shown hereafter. These run between face-plates, as shown in fig. 2, sheet 2, at  $C^3$ .

The needles come down on each side of these face-plates, and in the slots  $F^3$   $F^3$  in the face-plate.

The shuttles are made opposite or right and left, so that the face sides are toward each other, as shown at W W.

The object of this arrangement of face-plates, double-shuttle carriers, and right-and-left shuttles is to admit of the seams being made more closely together.

The needle-bars  $A^1$ , fig. 1, sheet 3, are fitted into the cross-head, and are held in place by a screw.

A slot is made in the bar sufficiently large to admit the head of the screw at the upper end, and at the lower end is narrow enough to allow the head of the



screw to hold it fast in its position. The lower end is provided with a cap, between which and the main bar two needles are held at a sufficient distance apart to correspond with the face-plates C<sup>3</sup>; fig. 2, sheet 2.

On the upper end of these bars is an adjustable cross-piece A<sup>3</sup>, for the purpose of adjusting the take-up, as regards height of stroke.

The spools P<sup>1</sup> P<sup>1</sup>, fig. 2, sheet 3, are set upon pins upon the rods E<sup>4</sup> and C<sup>4</sup>, fig. 1, sheet 1. These rods are one above the other, as shown.

The guide-rod to which the thread is brought is midway between these, or nearly so, as shown at T<sup>3</sup>, fig. 2, sheet 3, and, in order to give the tension to the needle-thread by friction against rod T<sup>3</sup>, the rods are so formed as to fit in journals at their ends, and can be turned so as to throw the pins and spools in such relative position with the rod T<sup>3</sup>, as to bring the thread more or less against it. These rods or racks are held in place by a spring and pin.

As the machine may be driven by power, two pulleys are attached to the main shaft, one loose and one fast.

The driver or balance-wheel is on the same end of the shaft, and is near the loose pulley, as is shown in fig. 11, sheet 2.

The belt runs on the loose pulley, and when it is desired to set the machine in motion, the belt-shifter moves it to the fast pulley by the device shown in figs. 7 and 11, sheet 2.

L<sup>1</sup> is a crank, which is operated by a rod passing through the machine-frame, the handle of which is seen at A<sup>2</sup>, fig. 1, sheet 1.

The crank L<sup>1</sup> reciprocates the rod T<sup>1</sup>, upon the end of which is a clamp or brake.

This rod works through a slot in a bracket. R<sup>1</sup>, same figure, so that it can be moved against the rim of the driving-wheel by operating the handle A<sup>2</sup>, as above mentioned.

Above this rod, and on a line with the upper face of the pulleys, is the belt-shifter, a top view of which is shown in fig. 7, sheet 2.

This shifting-rod is secured to the same projecting support as the brake-rod, the said support acting as a pivot, across which it works.

This shifting-rod is operated by being connected at its end with the reciprocating brake-rod T<sup>1</sup>, by a connecting-piece, G<sup>1</sup>, which, when the brake is on the driving-wheel, and the shifter on the loose pulley is at right angles, as shown in fig. 7, sheet 2. This connection being at right angles, the belt-shifter cannot be moved.

It will be seen that the shifter and brake, operating together by means of the right-angled piece G<sup>1</sup>, the

machine can be put in operation and stopped with great ease and rapidity.

The different parts of the machine having now been described, it will be seen that the cloth from which the fabric is to be made is arranged upon the reels.

The bed or main strip G, fig. 2, sheet 3, passed down to the tucker P<sup>2</sup>, same sheet and figure, through the intervening devices. Here the strips are brought down from the sectional reel C, same figure, through the hemmers B<sup>1</sup>, same figure, where the edges are both hemmed, passing directly from this hemmer under the needles into the feeding-rollers, and from there up to the take-up reel; the thread passing from the spool to the tension and guide-rod, and from thence, as shown in fig. 2, sheet 3, directly to the take-up, and from the take-up to the needles.

The machine being ready for operation, the operator stands near the lever handle A<sup>2</sup> of the shifter and stop, by moving which he sets the machine in motion, and is in a position to watch the cloth and thread as it is fed into the machine.

A cord may be run into each hem from spools situated upon the rod E<sup>1</sup>, fig. 1, sheet 1, the cord passing in at each side of the hemmer, the hem being made or formed around the cord, and the same being close to the cord, giving the edge of the strip so sewed on, a round and raised appearance, thus making puffing with two cords in each strip sewed on.

Having thus described my machine,

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

1. The guide-roller E<sup>3</sup>, the rod M, the spring rod L, and guide-rollers S<sup>3</sup>, when arranged as described, and used in connection with each other for the purpose set forth.

2. The shifting-device, consisting of the crank L<sup>1</sup>, reciprocating brake T<sup>1</sup>, link G<sup>1</sup>, and pivoted shipper D<sup>1</sup>, when operating together for the purpose specified.

3. The double hemmer B<sup>1</sup>, composed of the T-shaped piece a<sup>2</sup> s<sup>1</sup>, and lipped cap b, for turning a hem on each edge of the narrow strip, as set forth.

4. The adjustable spool-racks C<sup>4</sup> E<sup>4</sup>, in combination with the rod T<sup>3</sup>, for governing the tension of the needle-threads, as set forth.

5. The combination, with sewing mechanism, of the hemmer, constructed to turn both edges of a narrow strip, and secured to the presser, a feeding mechanism and a tucking mechanism, substantially as described.

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Witnesses:

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O. F. SAUL.