No. 709,587. Patented Sept. 23, 1902.

L. O. TRIVETT & F. RANDALL.

CHENILLE SPOTTING MACHINE.

(Application filed Oct. 24, 1900.)

(No Model.) 4 Sheets—Sheet 1.

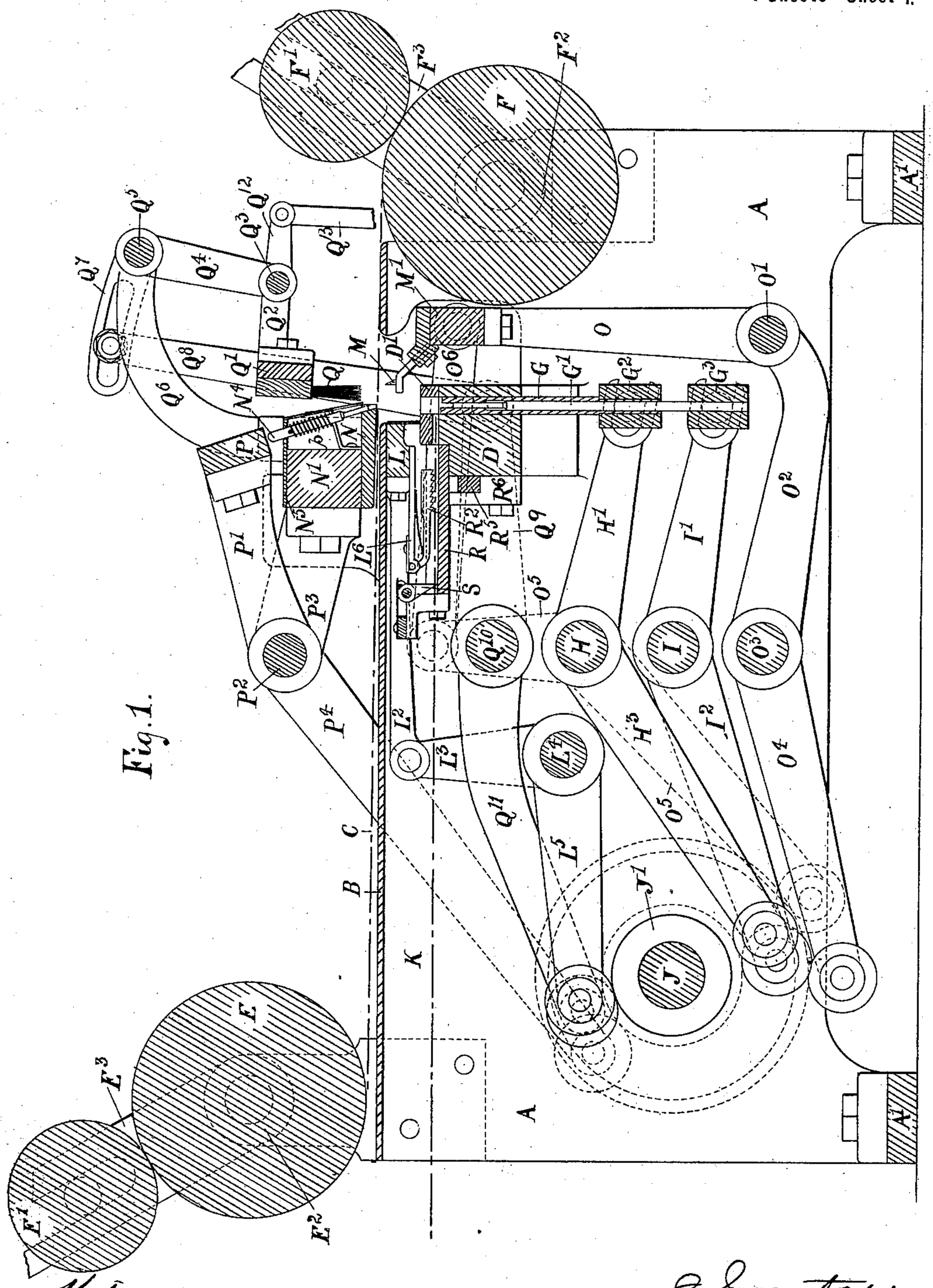

Fig. 1.

Witnesses
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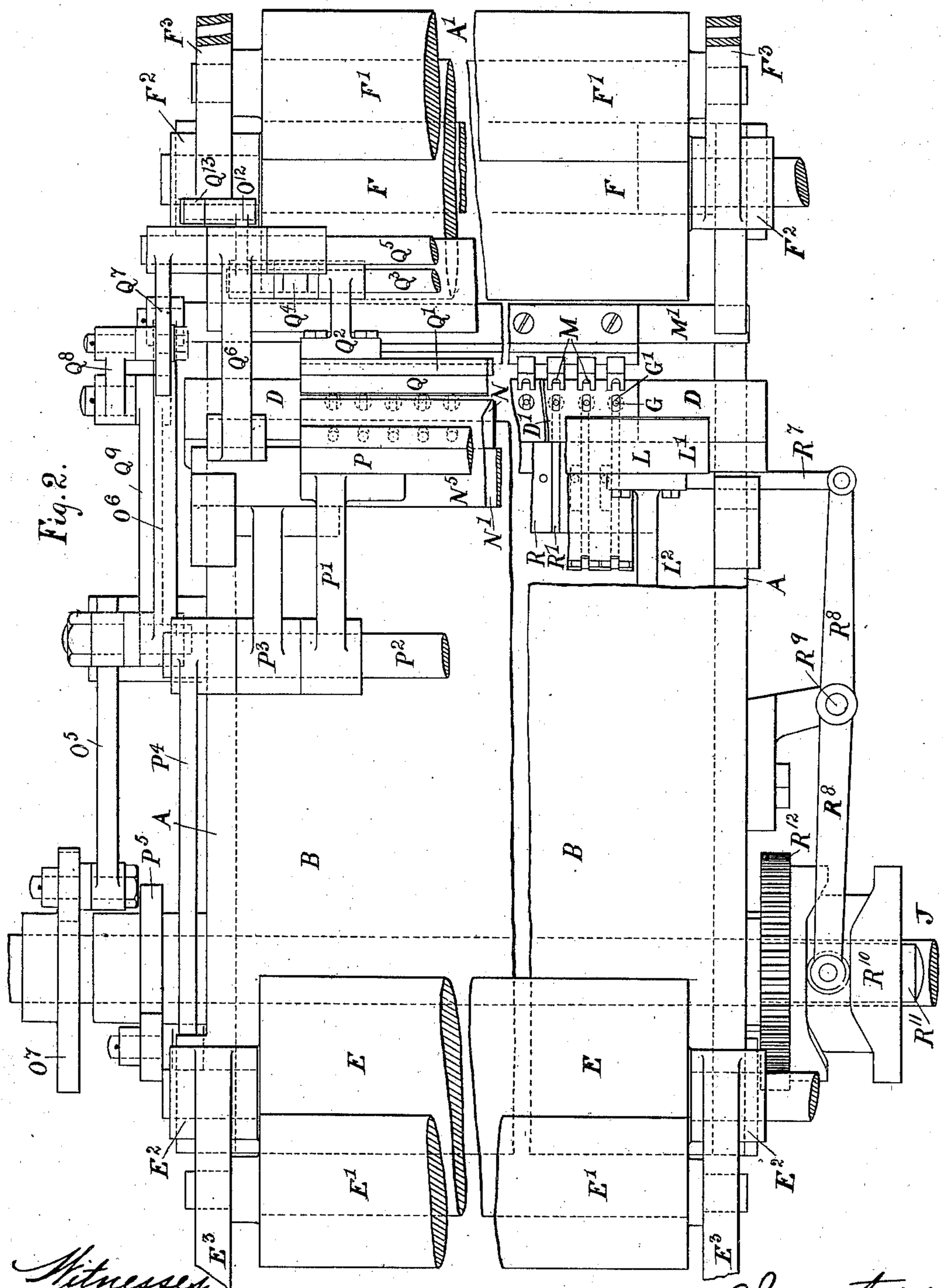
(No Model.) 4 Sheets—Sheet 2.

Fig. 2.



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(No Model.) 4 Sheets—Sheet 3.

Fig. 3.

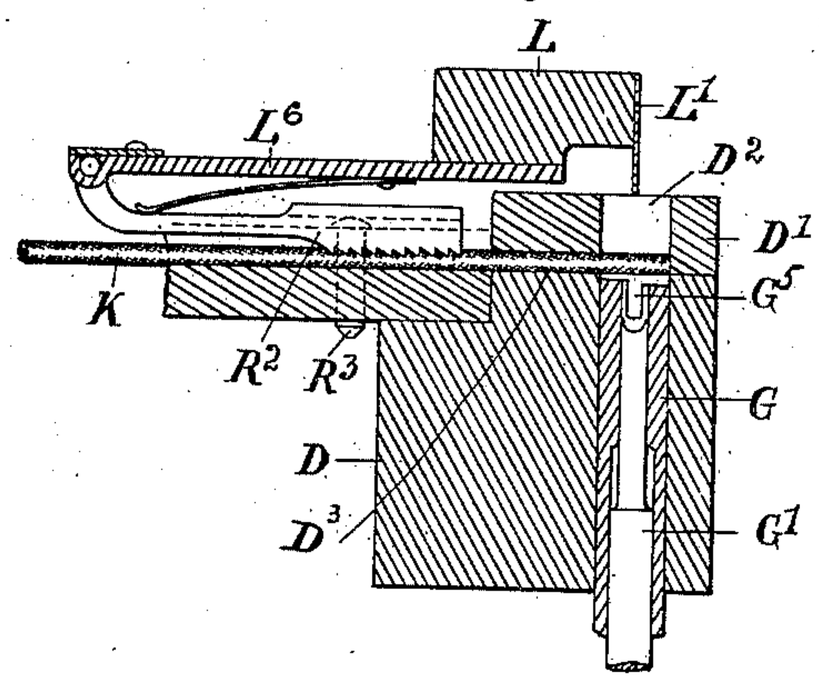


Fig. 4.

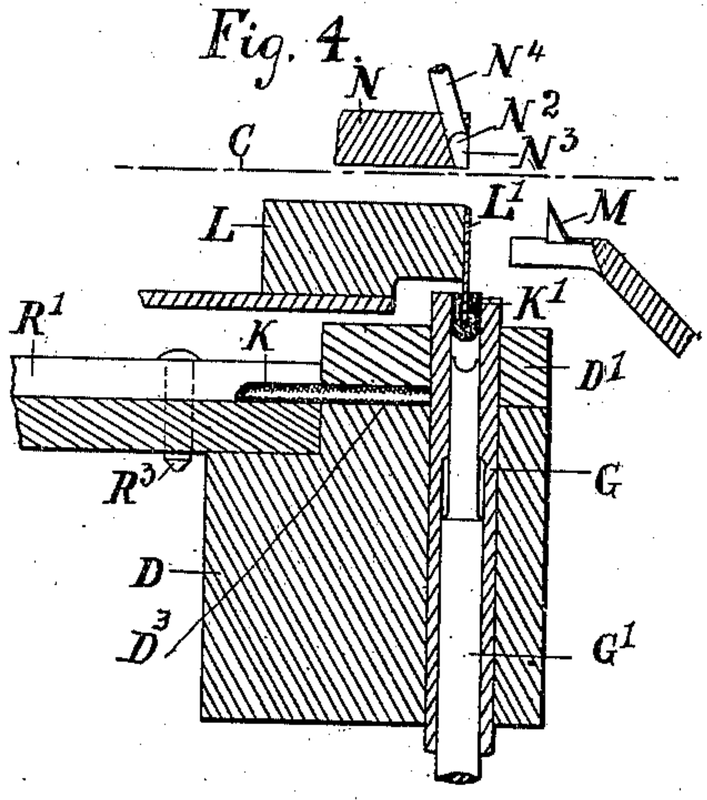


Fig. 5.

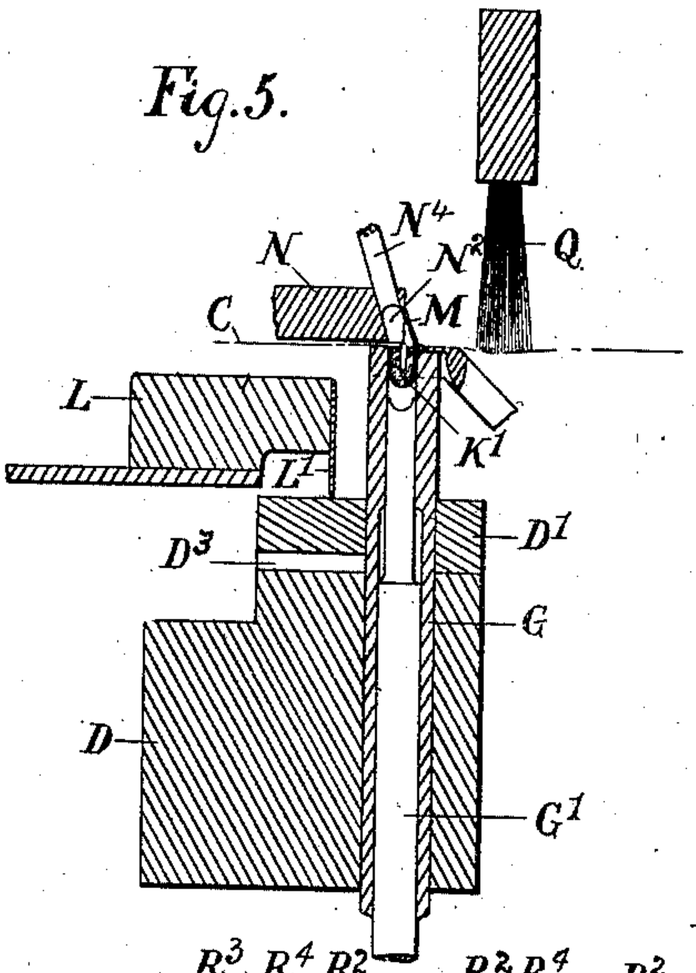


Fig. 6.

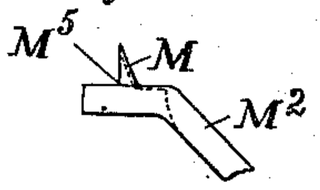


Fig. 7.

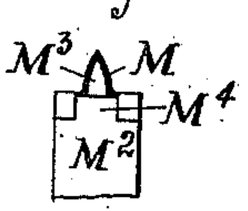


Fig. 8.

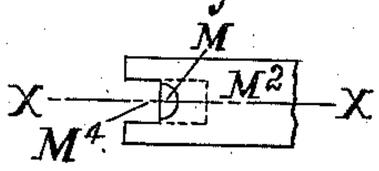


Fig. 9.

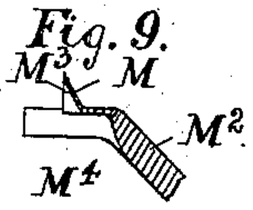
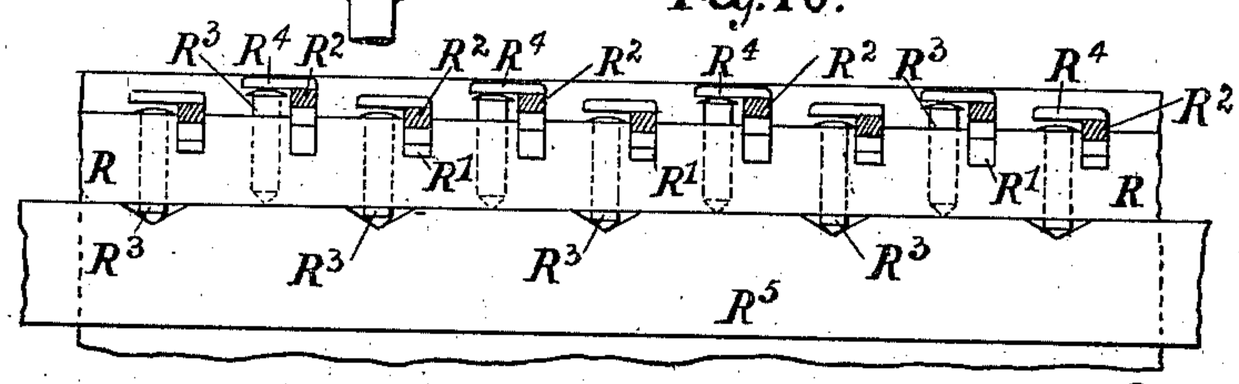


Fig. 10.



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No. 709,587. Patented Sept. 23, 1902.

L. O. TRIVETT & F. RANDALL.

CHENILLE SPOTTING MACHINE.

(Application filed Oct. 24, 1900.)

(No Model.) 4 Sheets—Sheet 4.

Fig. 11.

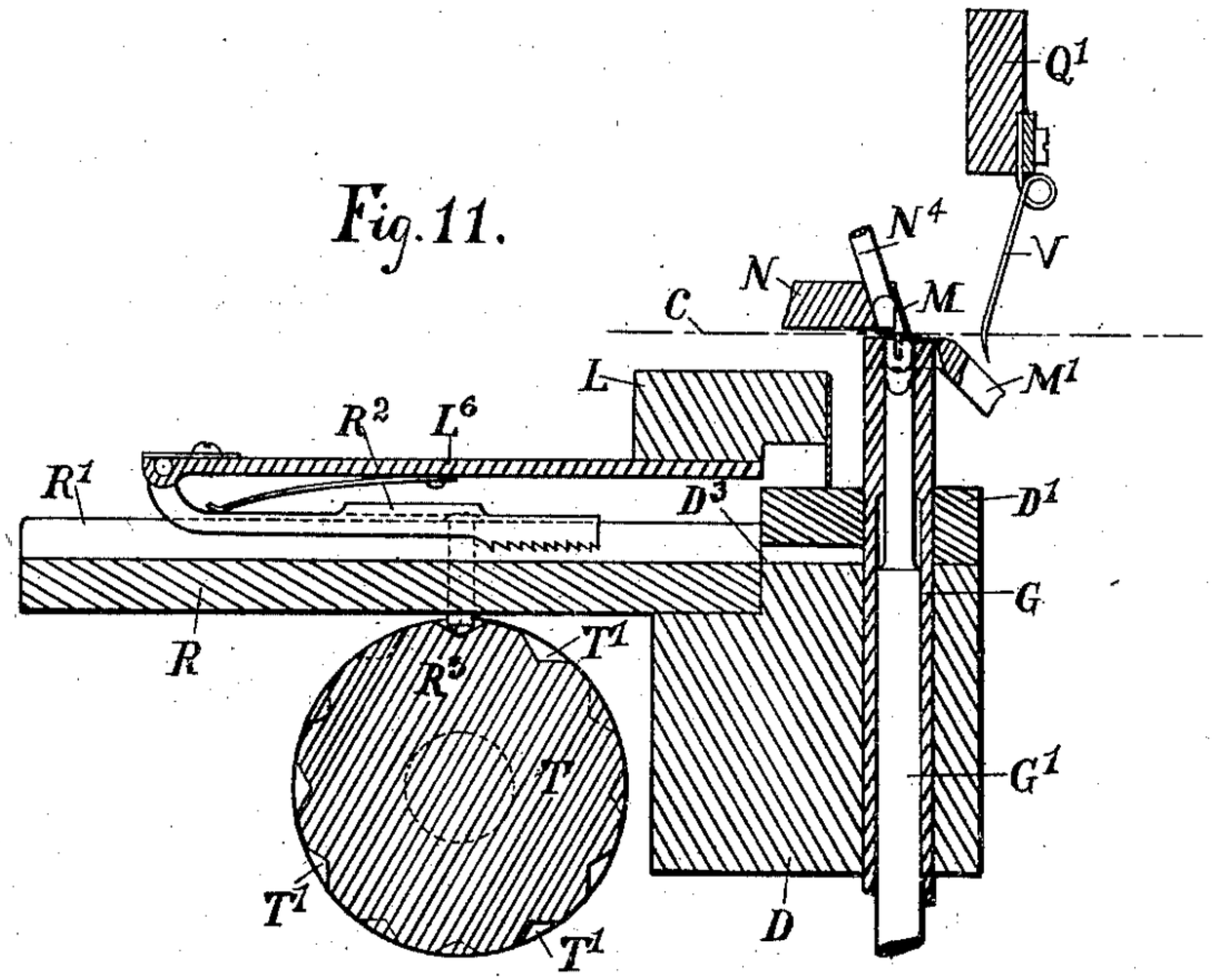


Fig. 12.

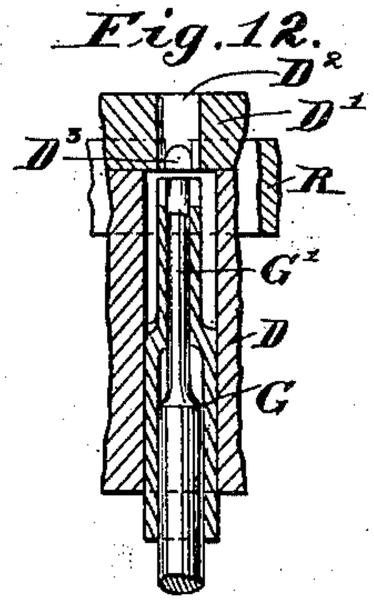
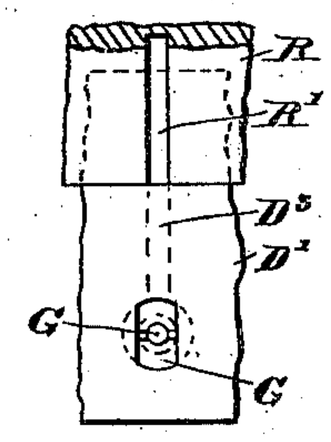


Fig. 13.



Witnesses
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UNITED STATES PATENT OFFICE.

LOUIS ORAM TRIVETT AND FRED RANDALL, OF NOTTINGHAM, ENGLAND;
SAID RANDALL ASSIGNOR TO SAID TRIVETT.

CHENILLE-SPOTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 709,587, dated September 23, 1902.

Application filed October 24, 1900. Serial No. 34,167. (No model.)

To all whom it may concern:

Be it known that we, LOUIS ORAM TRIVETT and FRED RANDALL, subjects of the Queen of England, and residents of Nottingham, England, have invented certain new and useful Improvements in Chenille-Spotting Machines, (for which application has been made in Great Britain under No. 11,807, dated June 29, 1900,) of which the following is a specification.

This invention relates to improvements in automatic machines for forming and attaching loops or staples of chenille or like material to lace nets, such as veilings or other fabrics, so as to form what are termed "chenille spots" on the said nets or fabrics.

The invention will be best understood by reference to the accompanying drawings, in which—

Figure 1 is a sectional elevation, and Fig. 2 a plan, of a machine constructed according to our invention. Figs. 3, 4, and 5 are sectional elevations illustrating the operation of the machine. Fig. 6 is a side elevation, Fig. 7, a front elevation, and Fig. 8 a plan, of one of the points or instruments for registering the net. Fig. 9 is a section taken on the line X X of Fig. 8. Fig. 10 is an elevation showing the device for controlling the chenille-feeders. Fig. 11 is a sectional elevation showing a modification. Fig. 12 is a sectional view of part of the cutting-plate D′, bed D, a ram, ejector, and plate R; and Fig. 13 is a plan view of the parts seen in Fig. 12. Figs. 3 to 11, inclusive, are drawn to a larger scale than Figs. 1 and 2. Like letters indicate like parts throughout the drawings.

According to our invention the framing of the machine is comprised mainly of two end standards A, (see Figs. 1 and 2,) which are either placed on a base-plate or connected by cross-stays A′, as shown. On the top of the standards is a preferably horizontal table or plate B, over which the net or material C, (see Fig. 1,) to which the spots are attached, is carried. Near the front of the plate is a bed D for carrying the spotting-rams. The upper face of this bed is placed lower than the plate B, as shown, and its ends are secured to the standards A.

At the back of the plate B is a pair of rollers E E′, the former, E, of which is journaled in bearings E^2, secured to the standards A, and the latter, E′, in the forks E^3, extending from the said bearings. At the front of the bed D is a corresponding pair of rollers F F′, the former, F, of which is journaled in bearings F^2, secured to the standards A, and the latter, F′, in forks F^3, extending from the said bearings. The material to be spotted is placed on the roller E′ and is carried therefrom under the roller E, along the plate B, over the bed D of the spotting-rams, and over the roller F, from which latter it is delivered onto the roller F′. The rollers E and F, or only the latter, may be roughened and are both advanced the requisite distance after each row of spots have been affixed to the fabrics C by rack-wheel and pawl mechanism, which is not shown, but may be of any well-known form. The rollers E′ F′ rest on the respective rollers E and F and are rotated by the latter. By advancing the whole of the rollers simultaneously, as described, no strain or tension is put on the net or material C; but it is merely extended and intermittently fed forward by the said rollers and held stationary while the spots are attached in rows thereto.

Each spotting device is comprised mainly of a hollow ram G and an ejector G′. (See Figs. 1 to 5.) The former are mounted in a row in preferably vertical openings in the bed D, while the latter, G′, work in the interior of the rams G. The lower ends of the whole of the rams G are secured in and are simultaneously actuated by a bar G^2 (see Fig. 1) on the under side of the bed D, and the lower ends of the whole of the ejectors G′ are in like manner secured in and are actuated by a second bar G^3, placed on the under side of the bar G^2. The bar G^2 is actuated—that is, raised and lowered—by forked arms H′ on the rocking shaft H, which latter is journaled in bearings secured to or formed integrally with the standards A. This shaft H is provided with an arm H^3, the free end of which has an anti-friction-roller engaging with a cam on the main cam-shaft J, from which cam the bar G^2 consequently receives its motion. The main shaft J is carried in bearings J′, secured to or formed integrally with the standards A. The second bar G^3 is actuated by forked arms I′ on the rocking shaft I, which latter is also

journaled in bearings in the standards A. This shaft I is provided with an arm I^2, the free end of which has an antifriction-roller engaging with a cam on the main cam-shaft J.

On the top of and forming part of the bed D (see Figs. 1 to 5) is a cutting-plate D′, provided with openings D^2 for the passage of the upper ends of the rams G, which may be reduced in width at this point, as in Fig. 2, and on its under face with lateral passages D^3, leading into the openings D^2. (See Fig. 5.) The chenille K (see Figs. 1, 3, and 4) is fed through these lateral passages D^3 by an arrangement, hereinafter described, over the top of the ram G, as shown in Fig. 3, and when the latter rises the short length of chenille above each ram G is cut off by the latter. The lengths of chenille cut off are then pushed up by their respective rams G and are formed into loops or staples K′ and at the same time pushed into the hollow ends of the rams, as shown in Fig. 4, by a looper-bar L, (see Figs. 1 to 5,) placed immediately above the cutting-plate D′. This looper-bar L is provided with a longitudinal plate or former L′, which enters a recess or nick G^5 (see Fig. 3) in the end of each ram G and forces the chenille therein, as shown in Fig. 4. The looper-bar L is normally in the position shown in Figs. 1 and 5; but immediately prior to the upward movement of the rams G to form the staples K′ it is moved into the position shown in Figs. 3 and 4. After the staples K′ have been formed the rams G are lowered and the looper-bar L is moved back into the position shown in Figs. 1 and 5 again, leaving the staples K′ in the rams G ready to be delivered onto the net or fabric. The looper-bar L is connected by links L^2 (see Fig. 1) to arms L^3 on the shaft L^4. This shaft L^4 is journaled in bearings in the standards A and is provided with an arm L^5, having an antifriction-roller engaging with a cam on the main cam-shaft J. The looper-bar L is prevented from rising by the plate B.

In front of the bed D is a bar M′, (see Figs. 1 and 2,) provided with a net-registering point or instrument M opposite to each ram G. Each point or instrument is comprised of a point M, (see Figs. 6, 7, 8, and 9,) mounted on a stock M^2, and the lower ends of the latter are secured to the bar M′. Each point M is fluted at M^3, while the stock M^2 is cut away at M^4 to admit the upper end of the corresponding ram G. Immediately after the formation of the chenille staples K′, as previously described, the points M′ rise from the position shown in Fig. 4, enter the meshes of the net, and move up to the plate N and over the rams G, as shown in Fig. 5. The plate N (see Fig. 1) is secured to a bar N′, connected to the standards A. It is formed with a hole N^2 directly over each ram G, and the said holes are inclined to the vertical, so that they run out and form openings N^3 at the lower front corner of the plate N, as shown in Fig. 4. The lower ends of the clenching-rams N^4 (see Figs. 1, 4, and 5) are mounted in these holes N^2 in the plate N and their upper ends in openings in a second plate N^5, (see Fig. 1,) secured to the bar N′. When the points M rise and move up to the plate N, each point by its movement engages with a thread of the net, and the said threads lie across the flutes M^3 of the points and in the angles M^5 (see Fig. 6) between each point M and its stock M^2. When the points M reach the position shown in Fig. 5, they register with and close the front opening N^3 in the plate N, the flute M^3 of each point forming practically a continuation of the front walls of the respective holes N^2 in the plate N, while the threads of the net lying across the flutes M^3 consequently lie diametrically across said holes N^2. The rams G now rise up to the position shown in Fig. 5, and the staples K′ of chenille are ejected therefrom by the ejectors G′ and are delivered with certainty onto the threads of the net, owing to the fact that the said threads are registered with and held directly over the rams G by the registering-points M during this operation. The staples K′, of chenille, are also at the same time delivered into the holes N^2 in the bar N and are held therein by the ejectors G, while they are clenched on the net by depressing the clenching-rams N^4. The several operating parts then return to their normal positions again, (in which they are shown in Fig. 1,) and the net C is then fed forward ready to receive the next row of spots.

The point-bar M′ (see Fig. 1) is carried on the upper ends of arms O, which are mounted on a shaft O′, and the latter is carried in the free ends of arms O^2, mounted on the shaft O^3, which latter is journaled in bearings in the standards A. This shaft O^3 is provided with an arm O^4, having an antifriction-roller engaging with a cam on the cam-shaft J, from which cam the point-bar M′ receives its up-and-down movement.

The point-bar M′ is moved to and from the plate N by a cam-lever O^5, (see Figs. 1 and 2,) mounted loosely on the end of the shaft H, one end of the said lever being connected to the point-bar M′ by a link O^6, while the other end is provided with an antifriction-roller which engages with a cam O^7 (see Fig. 2) on the cam-shaft J.

The clenching-rams N^4 are depressed by means of a bar P, (see Figs. 1 and 2,) which is secured to the outer ends of arms P′, mounted on the shaft P^2. This shaft P^2 is carried in bearing-brackets P^3, secured to the bar N′, and is provided with an arm P^4, having an antifriction-roller engaging with a cam P^5 (see Fig. 2) on the cam-shaft J. The clenching-rams N^4 are each raised after being depressed by the bar P by spiral springs *p*, (see Fig. 1,) placed on the said rams.

In connection with the points M we employ a brush Q (see Figs. 1 and 2) in order to help the net C down to the roots of the points M and also hold it in this position while the spots are attached thereto. This brush Q is

placed above the net C, as shown in Fig. 1, and as the points M rise the brush Q descends, meets the points, and pushes the net thereon. As the points M after rising move up to the plate N the brush Q moves in the reverse direction into the position shown in Fig. 5. This action of the brush draws the threads of the net into the angle M^5 of the points previously referred to and holds them in this position while the chenille spots are attached. The brush Q is mounted on a bar Q′, (see Figs. 1 and 2,) and the latter is carried on the outer ends of the arms Q^2, secured to a rocking shaft Q^3. This shaft Q^3 is in turn mounted in the ends of arms Q^4, secured to a second rocking shaft Q^5, which latter is carried in bracket-bearings Q^6, secured to the bar N′. The shaft Q^5 is connected by an arm Q^7 and link Q^8 to an arm Q^9 on the shaft Q^{10}, (see Fig. 1,) and the latter is provided with an arm Q^{11}, which is actuated by a cam on the cam-shaft J. The shaft Q^3 is also connected by an arm Q^{12} and link Q^{13} to a cam-lever (which is not shown) actuated by a cam on the cam-shaft J.

If preferred, we may only use a registering instrument M to every two or more spotting-rams G and traverse the said instruments in order to bring them opposite to those rams which are for the time being spotting. With this arrangement the registering instruments only engage with the net at the points where the spots are attached.

The chenille K is fed through the hereinbefore-described openings D^2 in the cutting-plate D′ by the following arrangement: At the back of the bed D is a plate R, (see Figs. 1, 2, 3, 4, and 10,) provided with grooves R′, each of which corresponds to and leads up to an opening D^3 in the plate D′. The chenille K is led from suitable spools at the back of the machine along these grooves R′ and is intermittently advanced the requisite distance by toothed spring-feeders R^2, (see Figs. 1 to 3 and 10,) working in the said grooves. These feeders R^2 (see Figs. 1 and 3) are hinged or pivoted to a plate L^6, connected to the looper-bar L, and they are thus moved forward, taking the chenille with them, when the looper-bar L is moved forward to form the chenille staples K′. In order to place the spots in one row opposite the spaces in the next row, we only feed the chenille to half the spotting device—that is, to every alternate spotting device one row and to the remainder the next row. To obtain this result, the feeders R^2 are controlled by the following arrangement: Mounted in holes in the plate R at the side of each feeder is a pin R^3, (see Fig. 10,) which when raised engages with a lateral projection R^4 on the corresponding feeder and raises the latter and holds it clear of the chenille K. On the under side of the plate R is a bar R^5, on which the lower ends of the pins R^3 rest. This bar is notched or cut away at intervals, which are so spaced as to allow, say, every alternate feeder to fall into operation. By moving this bar R longitudinally the odd-numbered feeders may be put into action and the even-numbered feeders held out of action, or vice versa. When the bar R^5 is midway between its two extreme movements, the whole of the feeders R^2 are raised out of action, and it is held in this position while the said feeders make their return movement. The bar R^5 is carried by brackets R^6, (see Fig. 1,) and its end R^7 (see Fig. 2) is connected to a cam-lever R^8, which is pivoted at R^9 to a bracket secured to the framing. This cam-lever is actuated by a cam R^{10}, which is mounted on a pin R^{11}, secured to the standard A, and is connected to the cam-shaft J by gearing R^{12}, which is arranged to impart half a revolution to the cam R^{10} to every complete revolution of the shaft J. The chenille is prevented from moving backward when the feeders are raised by spring-catches S, (see Fig. 1,) the lower ends of which enter the grooves R′ and trap the chenille K.

If preferred, instead of employing the bar R^5 for controlling the feeders R^2, we may use a pattern-cylinder T, (see Fig. 11,) provided with longitudinal rows of recesses T′, the recesses in each row being placed at the requisite points on its surface. This cylinder T is placed under the plate R in such a position that its periphery holds up the pins R^3, but each row of recesses allows those pins R^2 which register with the recesses to fall and lower the corresponding feeders into action. The ends of the cylinder are mounted in suitable bearings secured to the framing, and it is advanced the requisite distance each row of spots by rack-wheel and pawl mechanism of suitable construction. With this arrangement more changes may be obtained, and the spots may be thus attached to the net, so as to produce any simple pattern and at the same time a border of different character.

For very coarse nets we may employ spring-fingers V (see Fig. 11) instead of the brush Q in order to pull the threads of the net up to the fluted side of the point and into the angle M^5. These spring-fingers are attached to the bar Q′ or to a separate bar attached to the bar Q′.

When spotting fine nets or fabrics, the registering-points M are not required and may be put out of action. The opening N^3 in the plate N may in this case be permanently closed by a plate secured to the front of the plate N or a plate N used which is only provided with holes N^2.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In a chenille-spotting machine, the combination of means for intermittently moving the fabric, means for feeding the chenille, mechanism for cutting off a length of chenille and forming same into a staple, a net-registering instrument for selecting, positioning, and holding a thread of the fabric directly over the staple-forming mechanism comprising a stock, a point or projection on said

stock to enter the net provided with a flute in its inner side across which a thread of the net can lie, and means for closing the staple on said thread.

2. In a chenille-spotting machine, the combination of means for intermittently moving the fabric, means for feeding a plurality of lengths of chenille, mechanism for cutting off lengths of chenille and forming the same into staples, a plurality of net-registering instruments for selecting, positioning, and holding threads of said fabric over the staple-forming devices each of which comprises a stock, a point or projection on said stock to enter the net provided with a flute in its inner side across which a thread of the net can lie, and means for closing said staples on said threads.

3. In a chenille-spotting machine, the combination of means for intermittently moving the fabric, means for feeding a plurality of lengths of chenille, mechanism for cutting off lengths of chenille and forming the same into staples, means for holding alternate chenille-feeders out of action, a plurality of net-registering instruments for selecting, positioning, and holding threads of said fabric each comprising a stock, a point or projection on said stock to enter the net provided with a flute in its inner side across which a thread of the net can lie, and means for closing said staples on said threads.

4. In a chenille-spotting machine, the combination of means for intermittently moving the fabric, means for feeding a plurality of lengths of chenille, mechanism for cutting off lengths of chenille and forming same into staples, a holding-plate above the net fabric having a hole which is inclined to the face of the plate so as to run out at the lower front corner of the same forming openings in both its under and front face, a clenching device in said hole, a net-registering instrument beneath said fabric comprising a stock, a point or projection on said stock to enter the net provided with a groove or flute in its inner side across which a thread of the net can lie, means for causing the point on the registering instrument to pierce the fabric, means for moving said point up to the opening in said plate, and means for operating the staple-forming mechanism and clenching device to close a staple on the fabric in the cavity formed by the holding-plate and flute in the point of the registering instrument.

5. In a chenille-spotting machine the combination of means for intermittently moving the fabric, means for feeding lengths of chenille, mechanism for cutting off lengths of chenille and forming said lengths into staples, a holding-plate above the net fabric, a hole in said plate forming an opening in its edge above said staple-forming mechanism, a clenching device in said hole, a net-registering instrument beneath said fabric comprising a stock, a point or projection on said stock to enter the net provided with a flute in its inner side across which a thread of the net can lie, a brush above the fabric, means for causing said registering instrument and brush to meet at the plane of the fabric, means for moving the point of the registering instrument against the opening in the holding-plate, means for moving the brush in a direction away from the holding-plate and opposite to that in which the registering instrument is moved, and means for operating the staple-forming mechanism and clenching device to close a staple on the fabric in the opening in the holding-plate.

6. In a chenille-spotting machine, the combination of means for intermittently moving the fabric, staple cutting and forming rams for each length of chenille, a bed to carry the said rams, a cutting-plate forming part of the bed, passages for the chenille on the under side of the cutting-plate, a chenille-feeder for each staple-forming mechanism, means for holding alternate chenille-feeders out of action, and means for closing said staples on the fabric.

7. In a chenille-spotting machine, the combination of means for intermittently moving the fabric, mechanism for cutting off lengths of chenille and forming same into staples, a chenille-feeder for each staple-forming mechanism, a notched bar below the feeders, a connection between each feeder and the notched bar, and means for closing said staples on the fabric.

8. In a chenille-spotting machine, the combination of means for intermittently moving the fabric, mechanism for cutting off lengths of chenille and forming same into staples, a chenille-feeder for each staple-forming mechanism, means for holding alternate chenille-feeders out of action, a holding-plate above the net fabric having a hole above each staple-forming mechanism, a clenching-ram in each of said holes, and means for operating the staple-forming mechanism and clenching device to close said staples on the fabric.

9. In a chenille-spotting machine, the combination of means for intermittently moving the fabric, a plurality of rams beneath said fabric, an ejector within each ram, a cutting-plate between said rams and said fabric, a looper-bar, means for advancing said looper-bar opposite the operative ends of said rams and for withdrawing it, a plurality of extensions on the looper-bar, a feeder hinged to each of said extensions and engaging with the chenille, a bar beneath said feeders, a series of notches in said bar, a pin between each feeder and the notched bar, means for reciprocating said notched bar, a holding-plate above the net fabric having a plurality of inclined holes which run out at the angle of the bar forming openings on both the lower and front faces of the same, a clenching-ram in each hole, a plurality of net-registering instruments beneath said fabric each comprising a stock, a point or projection on said stock to enter the net provided with a groove or flute in its inner side across which a thread

of the net can lie, a brush above the fabric, means for causing said registering instrument and brush to meet at the plane of the fabric, means for moving the projection of the registering instrument against the holding-plate, means for moving the brush in a direction away from the holding-plate and opposite to that in which the registering instrument is moved, means for moving the rams beneath the fabric up to the holding-plate, and means for operating the clenching-rams to clench the chenille staples against the lower ram, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

LOUIS ORAM TRIVETT.
FRED RANDALL.

Witnesses:
MARK SHAW,
ALFRED CLARKE.