(No Model.)

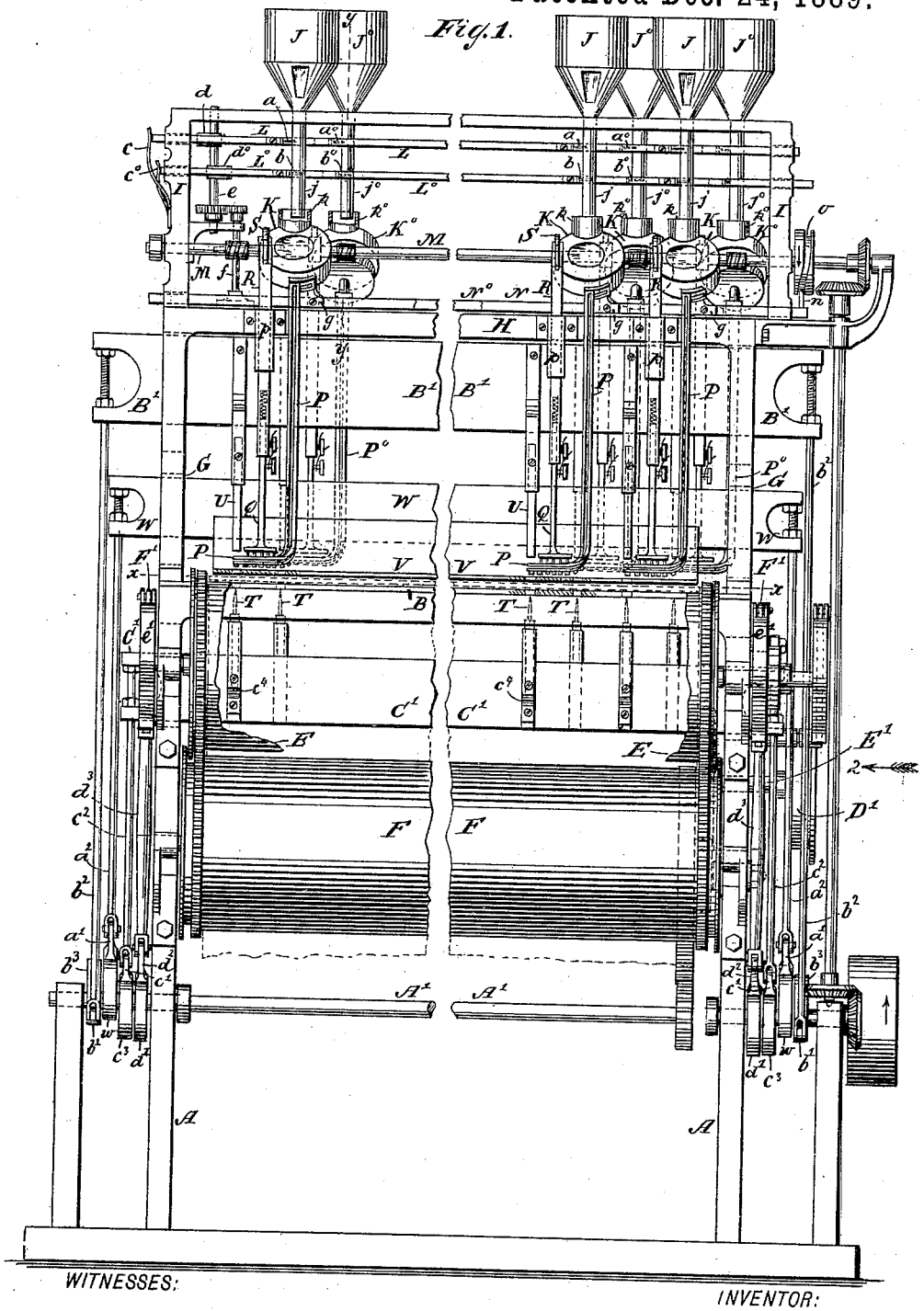
5 Sheets—Sheet 1.

D. H. COLES.

EYELET SETTING MACHINE.

No. 417,988. Patented Dec. 24, 1889.

Fig. 1.



WITNESSES:

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William Miller

INVENTOR:

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BY Van Santvoord & Hauff

ATTORNEYS.

(No Model.) 5 Sheets—Sheet 2.

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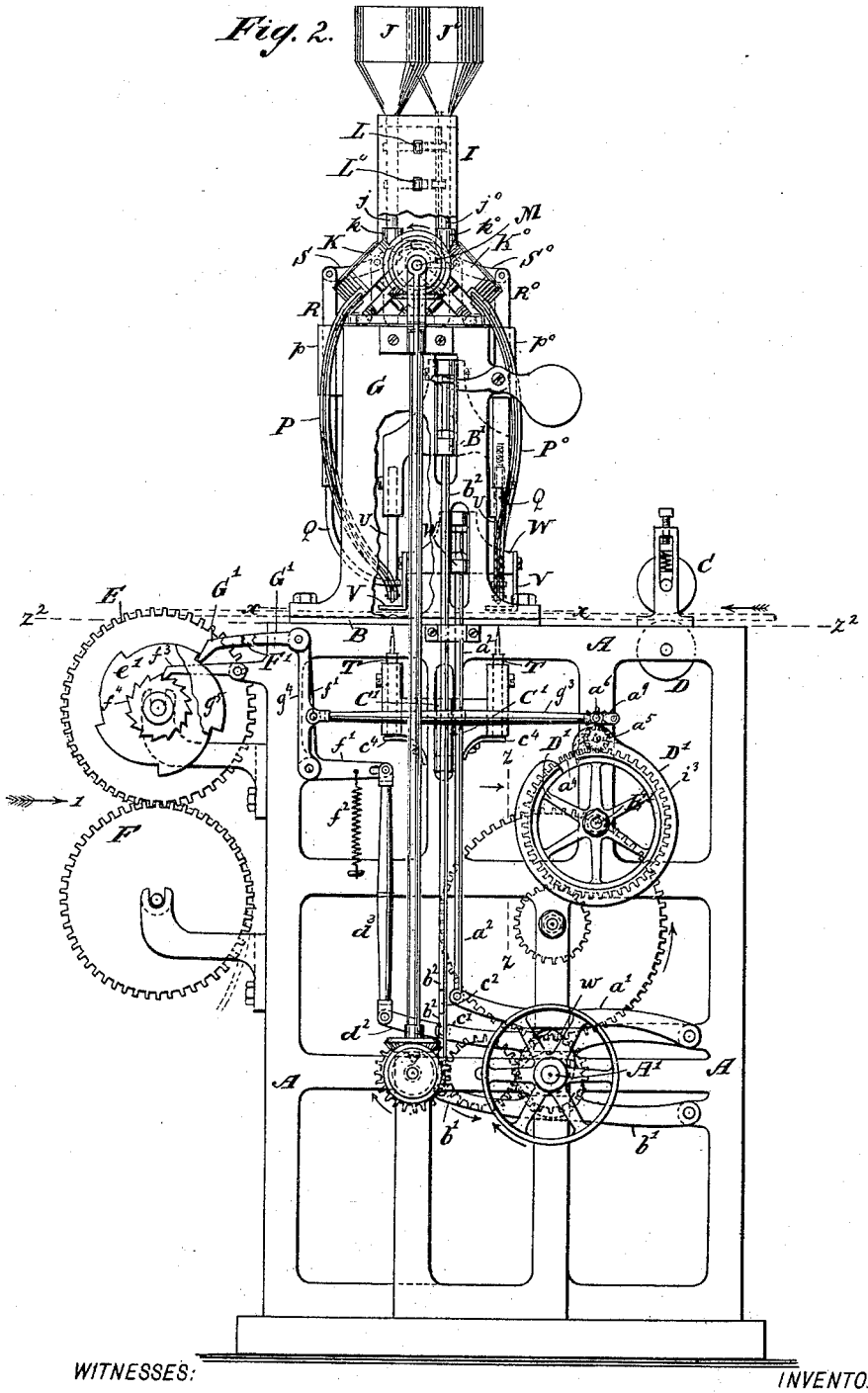
Fig. 2.



WITNESSES:

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Fig. 3.

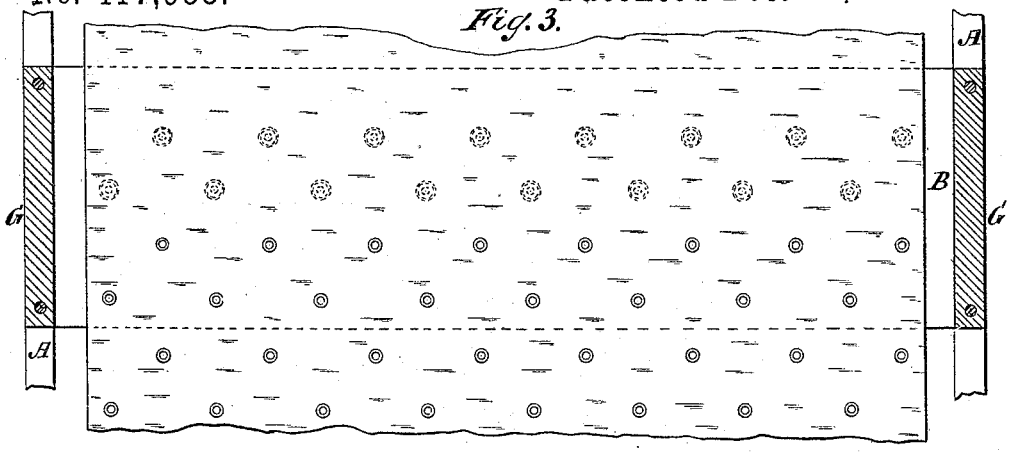

Fig. 8.

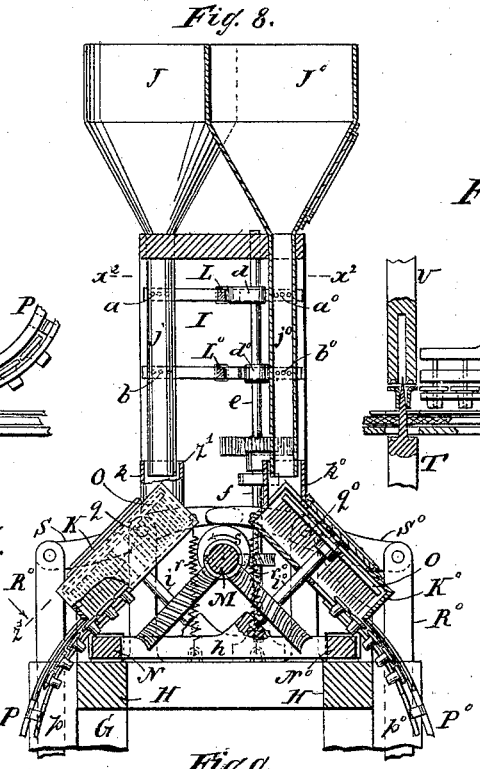

Fig. 4.

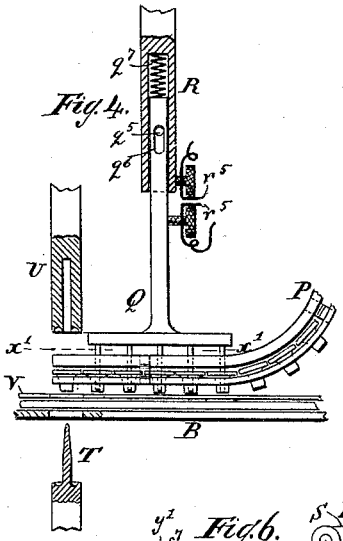

Fig. 5.

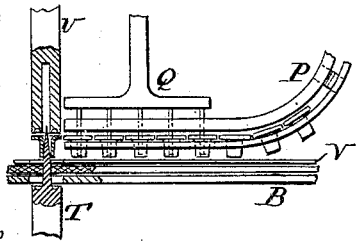

Fig. 6.

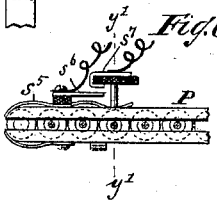

Fig. 7.

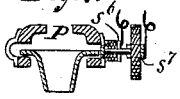

Fig. 9.

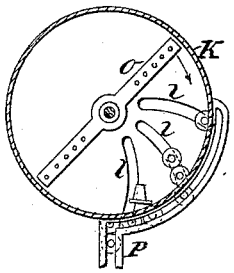

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Fig. 10.

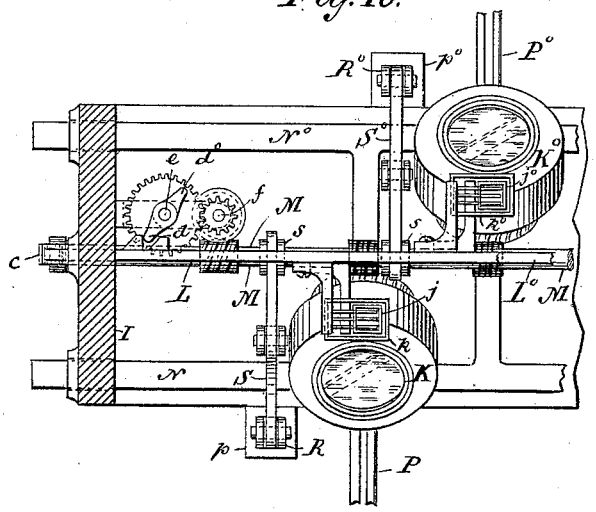


Fig. 11.

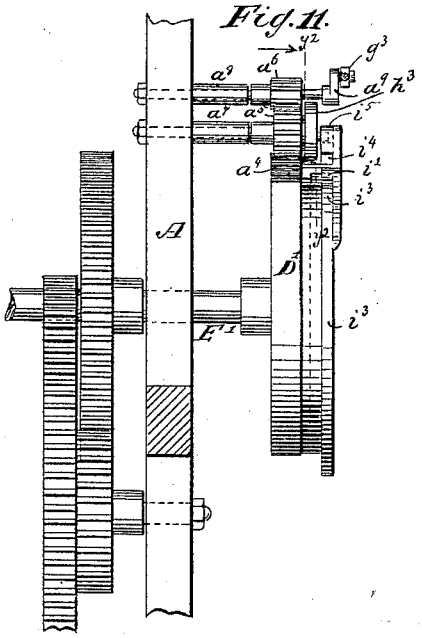


Fig. 12.

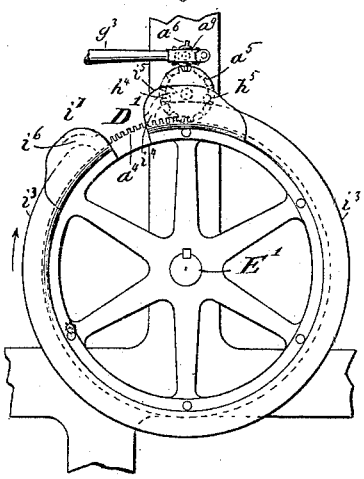
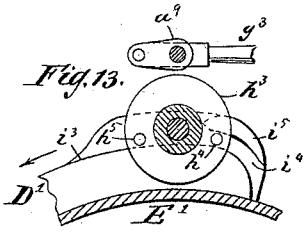


Fig. 13.



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(No Model.)

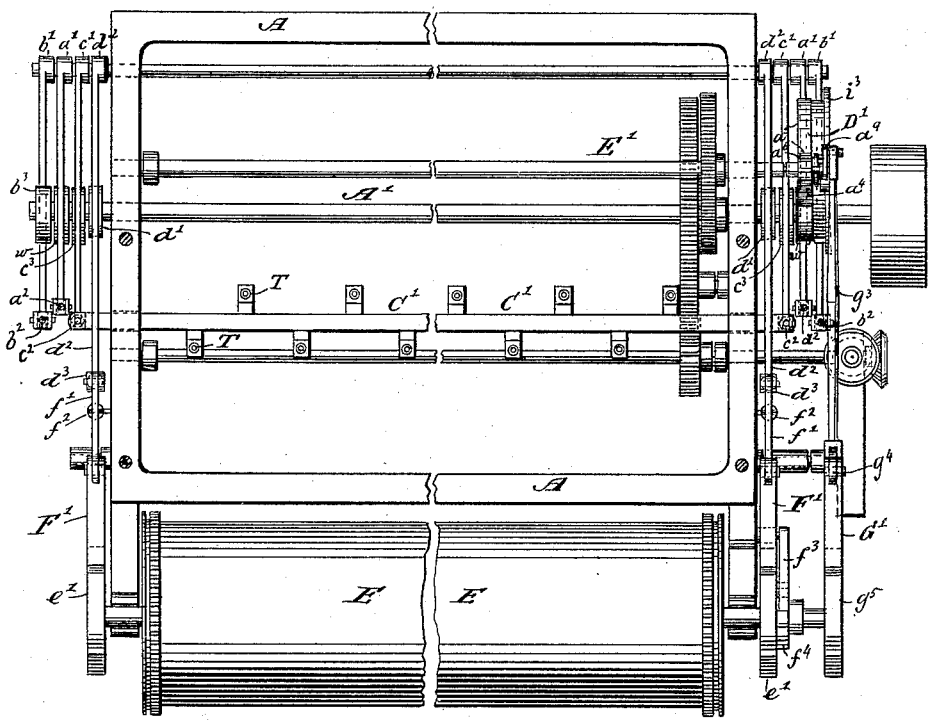
5 Sheets—Sheet 5.

D. H. COLES.

EYELET SETTING MACHINE.

No. 417,988. Patented Dec. 24, 1889.

Fig. 14.



WITNESSES:

Eduard Wolff.
William Miller

INVENTOR:

David H. Coles.

BY Van Santvoord & Hauff

ATTORNEYS

UNITED STATES PATENT OFFICE.

DAVID H. COLES, OF BROOKLYN, NEW YORK.

EYELET-SETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 417,988, dated December 24, 1889.

Application filed July 31, 1889. Serial No. 319,254. (No model.)

To all whom it may concern:

Be it known that I, DAVID H. COLES, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Quilting-Machines, of which the following is a specification.

This invention relates to a quilting-machine in which metallic fasteners are used for the purpose of securing the different layers of the quilt together.

The novel mechanism which constitutes my invention is described in the following specification and claims, and illustrated in the accompanying drawings, in which—

Figure 1 represents a front elevation, looking in the direction of arrow 1, Fig. 2. Fig. 2 is a side elevation looking in the direction of arrow 2, Fig. 1. Fig. 3 is a horizontal section in the plane $x\ x$, Figs. 1 and 2. Fig. 4 is a sectional front view of one of the plungers, one of the spears, and the feed-channel for the fasteners, on a larger scale than the previous figures. Fig. 5 is a similar view of the same parts in a different position. Fig. 6 is a horizontal section in the plane $x'\ x'$, Fig. 4. Fig. 7 is a vertical section in the plane $y'\ y'$, Fig. 6. Fig. 8 is a vertical section in the plane $y\ y$, Fig. 1. Fig. 9 is a transverse section in the plane $z'\ z'$, Fig. 8. Fig. 10 is a horizontal section in the plane $x^2\ x^2$, Fig. 8. Fig. 11 is a vertical section in the plane $z\ z$, Fig. 2. Fig. 12 is a face view of a portion of the feed mechanism. Fig. 13 is a vertical section in the plane $y^2\ y^2$, on a larger scale than the previous figures. Fig. 14 is a horizontal section in the plane $z^2\ z^2$, Fig. 2.

Similar letters indicate corresponding parts.

In the drawing, the letter A designates the main frame, which supports the work-table B. The material or the work to which the fasteners are to be applied passes through between the rollers C D, over the table B and the roller E, and then through between roller E and the roller F, as indicated in dotted lines in Fig. 2.

From the work-table B rise two standards G G, which are connected by a transverse bar H, and on this transverse bar rests a frame I, which supports the hoppers J J^0. These hoppers are arranged in two rows, one behind the other, and arranged in relation to each other in the manner indicated in Fig. 2, and they contain the metallic fasteners which serve to unite the different layers of the work. From the hoppers J J^0 extend discharge-channels $j\ j^0$ into the spouts $k\ k^0$ of distributing-boxes K K^0, and the discharge-channels $j\ j^0$ are provided each with two gates $a\ b\ a^0\ b^0$, which are opened and closed alternately, so that when the gates $a\ a^0$ are open the gates $b\ b^0$ are closed, and vice versa. If the gates $a\ a^0$ are open, the fasteners which drop down into the channels $j\ j^0$ are retained by the gates $b\ b^0$, and then the gates $a\ a^0$ are closed before the gates $b\ b^0$ are opened, so that when the last-named gates are opened only those fasteners drop down which are contained in the spaces between the gates $a\ b$ $a^0\ b^0$, respectively.

The gates $a\ a^0$ of all the hoppers J J^0 are secured to a slide L, which moves in slots in the end pieces of the frame I, Fig. 1, and which is subjected to the action of the spring c, and the gates $b\ b^0$ of all the hoppers J J^0 are secured to a slide L^0, which moves in slots in the end pieces of the frame I, and is subjected to the action of a spring c^0, Fig. 1. The slides L L^0 are moved against the action of their springs $c\ c^0$ by cams $d\ d^0$, which extend in opposite directions from a vertical arbor e, to which motion is imparted from a horizontal shaft M, Figs. 1, 8, and 10, by means of an intermediate arbor f, which is geared together with the shaft M by a worm and worm-wheel and with the shaft e by cog-wheels, as seen in Figs. 1, 8, and 10.

The distributing-boxes K K^0 are firmly connected to slides N N^0, which extend through slots in the end pieces of the frame I, Figs. 1 and 10, the connections being effected by transverse bars h, Figs. 1 and 8, which form the bearings for oblique shafts i i^0, which extend through the boxes K K^0, and are geared together with the shaft M. On the shafts $i\ i^0$ are mounted brushes O O^0, which serve to bring the fasteners contained in said boxes, heads up, into curved slots l, Fig. 9, whence they pass out into the conveyers P P^0. The distributing-boxes and the brushes are devices well known in the art and require no further description.

From one of the transverse bars h, Fig. 1, which connect the slides N N^0 rises a pin n, which engages a cam-groove o in a drum which is mounted on the shaft M, so that at the proper intervals all the distributing-boxes K K^0, together with their conveyers P P^0, receive a reciprocating motion in the direction of the axis of the shaft M.

The metallic fasteners used in the machine represented by the drawings are eyelets, and they are fed to the work and inserted therein by the following devices: The lower ends of the conveyers P P^0 are made to extend horizontally close over the presser-plate and the work and these horizontal parts are made sufficiently long to contain a number of—say six—eyelets. (Best seen in Figs. 4 and 5.) Over these horizontal parts of the conveyers are placed forks Q, each of which has five prongs, (more or less.) The shanks of these prongs extend into sockets formed in the lower ends of bars R R^0, which are guided in brackets p p^0, attached to the transverse bars H H, (Figs. 1, 2, and 8,) and which are suspended from levers S S^0, which have their fulcra on pivots q q^0. The free ends of the levers S S^0 are subjected to the action of springs r r^0, which retain the same in contact with a cam s, mounted on the shaft M, Fig. 8. If this cam occupies the position shown in Fig. 8, the forks Q are depressed, so that each of their prongs engages one of the eyelets in the conveyers P. (See Figs. 4 and 5.) As seen from Fig. 4, the eyelet contained in the extreme end of the conveyer is disengaged from the fork Q, and it is situated directly over a spear T and beneath a plunger U, and before the conveyer is moved by the action of the cam o, Fig. 1, the spear T is made to rise, so that it passes through the work and through said eyelet. Then the conveyer P is moved into the position shown in Fig. 5 and the plunger U descends so as to force the eyelet through the opening formed in the work by the spear and to clinch it by its co-operation with a shoulder formed on the shank of the spear. As soon as this has been accomplished the plunger U and the spear T recede to the position shown in Fig. 4, the fork Q is raised by its spring r, and the conveyer P is advanced from the position shown in Fig. 5 to the position shown in Fig. 4, when the fork Q descends again, ready for the insertion of the next eyelet.

As shown in Fig. 4, the shank of the fork Q is retained in the socket of the bar R by a pin q^5 passing through a slot q^6, and a spring q^7 has a tendency to force the fork down. If the prongs of the fork strike a faulty eyelet or any other unexpected resistance, the fork can yield, and as it yields the metallic plates r^5 r^5 are brought in contact and an electric circuit is closed, so as to sound an alarm. The contact-pieces r^5 are provided with electrical conductors (shown by conventional lines) to connect electrically with an alarm and a battery or other source of electricity. I do not deem it essential to illustrate an alarm and battery, for they may be of any well-known type. An alarm is also sounded when the supply of eyelets in one of the conveyers gives out. For this purpose a spring s^5 is secured to the outer end of the conveyers, and the free end of this spring bears against the flanges of the successive eyelets in the conveyers. When the supply of eyelets gives out, the free end of the springs s^5 drops into the side of the conveyers and the contact-pieces s^6 s^7 close an electric circuit through the alarm. These contact-pieces s^6 s^7 are also provided with electrical conductors in the same manner and for the same purpose as the contact-pieces r^5.

In order to permit the spears T to pierce the work, presser-plates V are brought to bear upon the work before the spears rise, said plates being provided with openings for the passage of the spears. These presser-plates are secured to the opposite sides of a head W, to which a rising-and-falling motion is imparted by cams w w, mounted on shaft A′ and acting upon levers a' a', which connect by rods a^2 a^2 with the head W. (See Figs. 1 and 2.) The plungers U are secured to a head B′, which is connected by rods b^2 b^2 with levers b' b', said levers being actuated by cams b^3 b^3. The spears T are carried by a head C′, which connects by rods c^2 c^2 with levers c' c', to which motion is imparted by cams c^3 c^3. In order to prevent the eyelets from being crushed in the operation of clinching, the spears are fitted loosely into sockets in the head and they rest upon springs c^4, Fig. 2, so that they can yield in case of necessity.

The machine represented in the drawings is provided with two rows of conveyers P P^0 and with a corresponding number of spears T and plungers U, so that for each revolution of the shaft A′ two rows of metallic fasteners or eyelets are inserted into the work. After this has been accomplished the work must be fed forward to receive the next two rows of fasteners. The feed mechanism which I use for this purpose consists of two cams d' d', mounted on the shaft A′, which impart motion to two levers d^2, Figs. 1, 2, and 14,) that connect by rods d^3 with bell-crank levers f' f', on which are pivoted the propelling-pawls F′, which engage ratchet-wheels e', firmly connected to the roller E, Fig. 1. Springs f^2 retain the levers d^2 in contact with the cams d'. A stop-pawl f^3, which engages a ratchet-wheel f^4, prevents the roller E from turning backward. By the action of the cams d' d' upon the levers d^2 the ratchet-wheels e' are turned for one tooth and the feed-roller E is turned so as to bring the work in position for the next two rows of fasteners. Of course this feed motion takes place while the spears are down, the plungers are up, the conveyers are at rest, and the presser-plate V is raised.

In order to be able to continue the operation of securing the metallic fasteners

into successive quilts without interruption, I connect the successive quilts at their ends by loose stitches or in a continuous strip, and when the last rows of fasteners have been introduced and clinched in the first quilt I feed the work forward automatically, so as to bring the first fastening-line of the second quilt in the proper position. The feed mechanism which I use for this purpose consists of a mutilated wheel D′, which is mounted on a shaft E′, Figs. 2, 11, and 12. This shaft is geared together with the driving-shaft A′, so that it makes one revolution to, say, six revolutions of the shaft A′, and one-twelfth of its circumference is provided with teeth a^4, while the remainder of said circumference is plain. The teeth a^4 engage a cog-wheel a^5, which engages a pinion a^6, which turns loosely on a stud a^8. On the pinion a^6 is firmly secured a crank a^9, which connects by a rod g^3 with a lever g^4, carrying a pawl G′, which engages a ratchet-wheel g^5, mounted on the shaft of the feed-roller E. In the example shown in the drawings the pinion a^6 has only six teeth, and consequently it makes two complete revolutions during the time the teeth a^4 (twelve in number) act upon the cog-wheel a^5. By these two revolutions of the pinion a^6 the pawl G′ causes the ratchet-wheel g^5 to advance two steps, and the work is fed forward, so as to bring the new quilt in position to receive the first two rows of fasteners. This feed motion takes place during the time the spears, the plungers, and the presser-plate are out of contact with the work.

On the cog-wheel a^5 is firmly secured a disk h^3, which carries two pins h^4 h^5. These pins are in such a position that they bear upon a rim i^3, secured to the mutilated gear D′, Figs. 11, 12, and 13, thereby preventing the cog-wheel g^5 from turning. At the moment the teeth a^4 of the mutilated gear D′ engage the cog-wheel a^5 the pin h^4 strikes a cam-groove i^4, so that the cog-wheel a^5 is free to turn, and as this wheel follows the action of the teeth a^4 the pin h^5 rides down over the edge i^5, Fig. 13. As the teeth a^4 release the cog-wheel a^5, the pins h^4 h^5 are brought in the proper position to ride upon the rim i^3 by the cam-groove i^6 and edge i^7. By these means the feed-pawl G′ is held stationary during eleven-twelfths of the revolution of the shaft E′, and it is caused to propel the ratchet-wheel g^5 two steps during one-twelth of the revolution of the shaft E′.

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

1. The combination of a work-table B, a plunger U, a spear T, a conveyer P, feed mechanism for feeding the work while the spear and plunger are out of engagement therewith, and means for operating the plunger, spear, and conveyer, substantially as described.

2. The combination, with the work-table B, the plunger U, the spear T, the conductor P, and cams for operating the plunger, spear, and conductor, of a rising and falling presser-plate V, and means for moving the presser-plate downward independent of the plunger prior to the movement of the spear into the work, substantially as described.

3. The combination, with the work-table B, the plunger U, and the spear T, of the conveyer P, cams for imparting motion to the conveyer, the spear, and the plunger, and contact-pieces secured to the conveyer and provided with electrical conductors to connect with a signal and a source of electricity, substantially as described.

4. The combination, with the work-table B, the plunger U, and the spear T, of the conveyer P, the fork Q, and cams for imparting motion to the fork, the conveyer, the spear, and the plunger, substantially as described.

5. The combination, with the work-table B, the plunger U, and the spear T, of the conveyer P, the fork Q, having a telescopic stem, cams for imparting motion to the fork, the conveyer, the spear, and the plunger, and contact-pieces on the sections of the telescopic stem of the fork, said contact-pieces provided with electrical conductors to connect with a signal and source of electricity, substantially as described.

6. The combination, with the work-table B, the plunger U, and the spear T, of the hopper J, the distributing-box K, containing a rotating distributer, a channel j, leading down from the hopper into the distributing-box, the conveyer P, and cams for imparting motion to the conveyer, the spear, and the plunger, substantially as described.

7. The combination, with the work-table B, the plunger U, and the spear T, of the hopper J, the distributing-box K, the pipe j, leading from the hopper into the spout of the distributing-box, the gates a b arranged in this pipe, means, substantially as described, for actuating these gates, the conveyer P, and cams for imparting motion to the conveyer, the spear, and the plunger, substantially as described.

8. The combination, with the work-table B, of a presser-plate V, a series of plungers U, connected to a common head B′, a series of spears T, connected to a common head C′, a series of conveyers P, connected to a slide N, and cams b^3 c^3 o, for imparting motion to the heads B′ C′ and the slide N, substantially as described.

9. The combination, with the work-table B, of a presser-plate V, a series of plungers U, connected to a common head B′, a series of spears T, connected to a common head C′, a series of conveyers P, connected to a slide N, a feed-roller E, and cams b^3 c^3 o d', for imparting motion to the heads B′ C′, the slide N, and the feed-roller E, substantially as described.

10. The combination, with the work-table B, of a presser-plate V, a series of plungers U, connected to a common head B′, a series of spears T, connected to a common head C′, a

feed-roller E, a feed-dog G′, for propelling the feed-roller, the cams for imparting motion to the heads B′ C′ and to the presser-plate V, and the mutilated gear D′, constructed to impart to the feed-dog G′ two successive strokes, substantially as described.

11. The combination, with the work-table B, the plunger U, the spear T, and the cams for imparting motion to the plunger and to the spear, of the feed-roller E, the feed-dog F′, for moving the feed-roller one step after each stroke of the plunger and the spear, and the feed-dog G′, for moving the feed-roller two steps at certain intervals, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

DAVID H. COLES.

Witnesses:

WILLIAM C. HAUFF,

ERNST F. KASTENHUBER.