

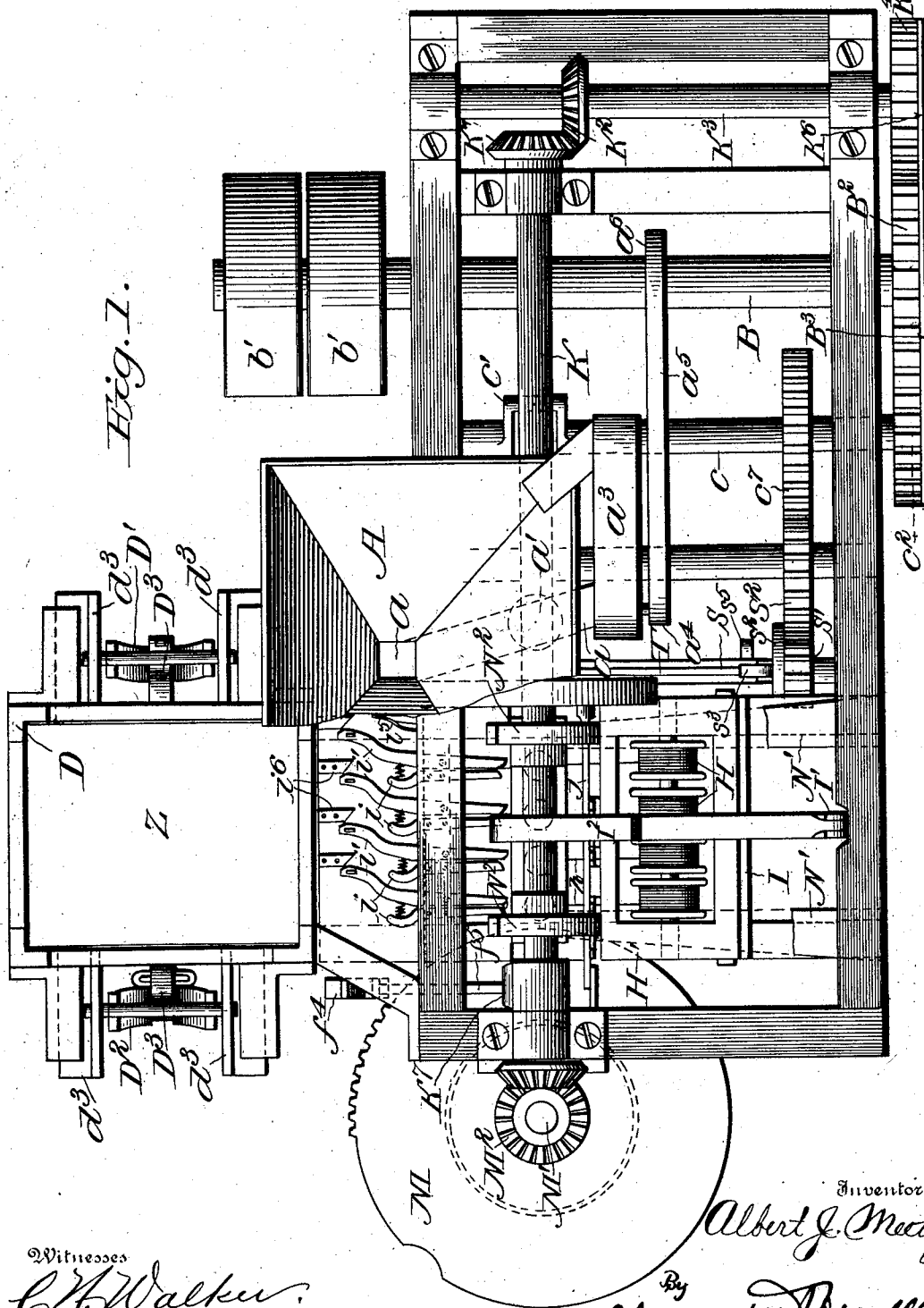
No. 760,893.

PATENTED MAY 24, 1904.

A. J. MEETZ.
BUTTON CARDING MACHINE.
APPLICATION FILED AUG. 18, 1903.

NO MODEL.

6 SHEETS—SHEET 1.



Witnesses
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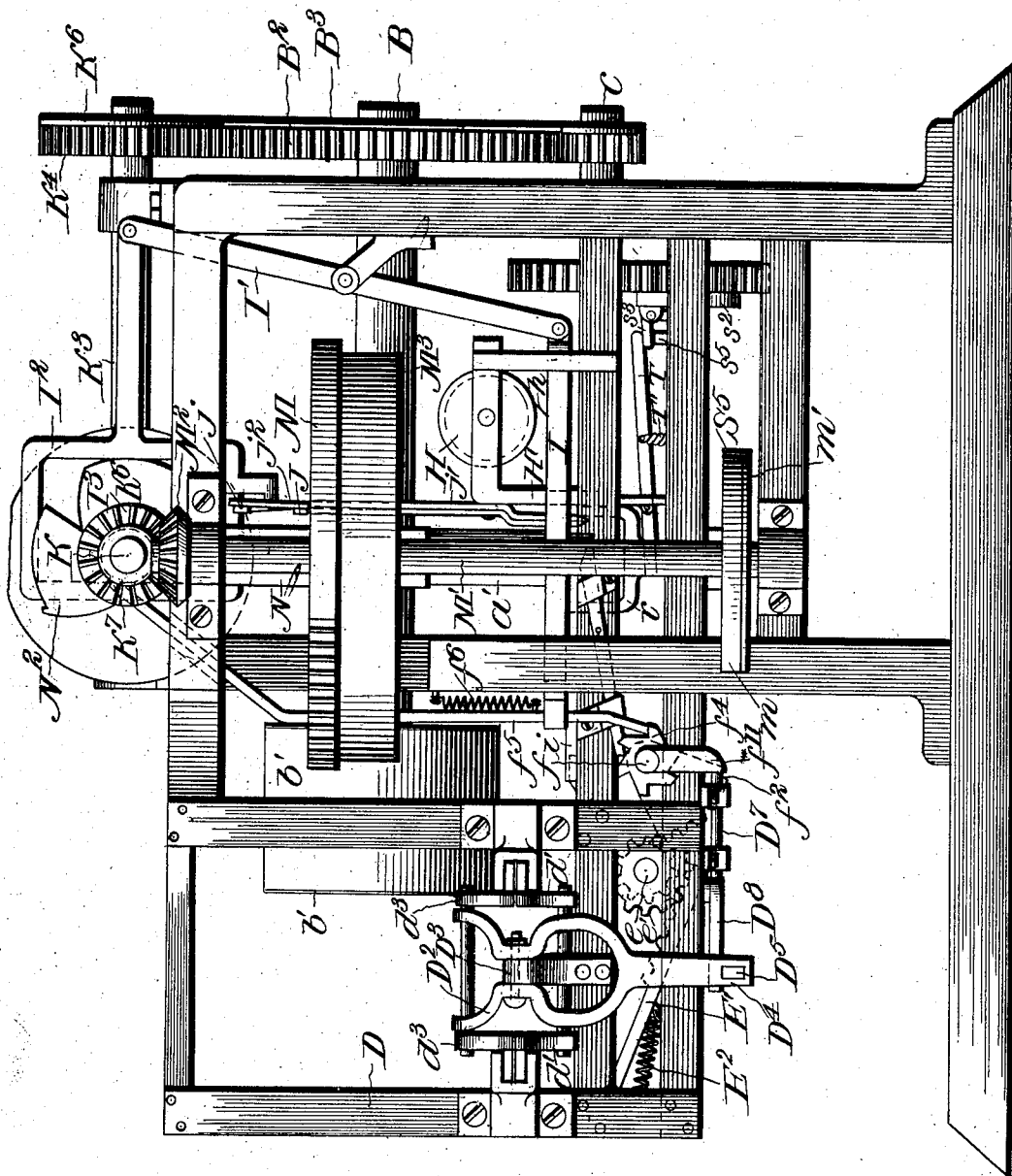


Fig. 2.

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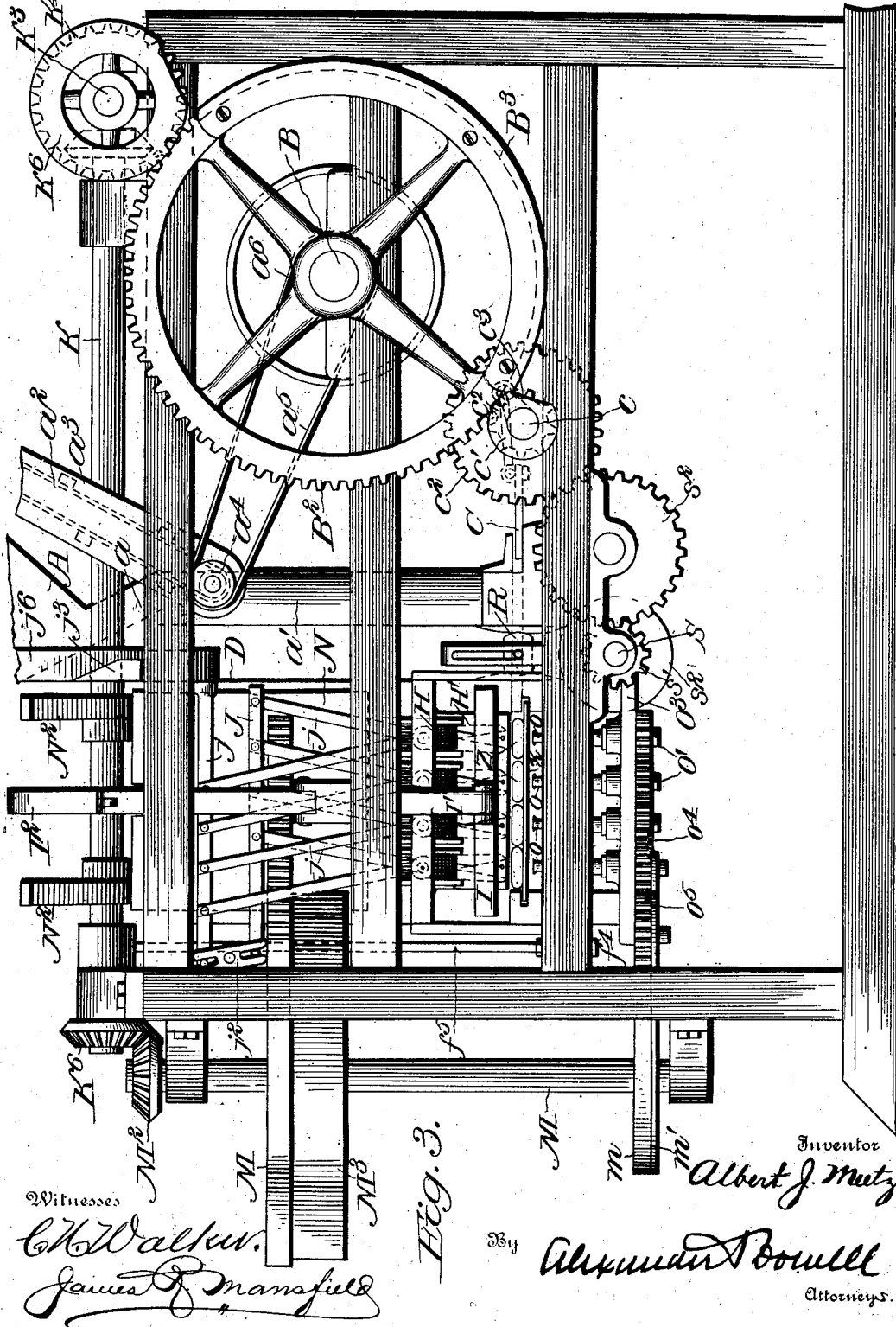
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6 SHEETS—SHEET 4.

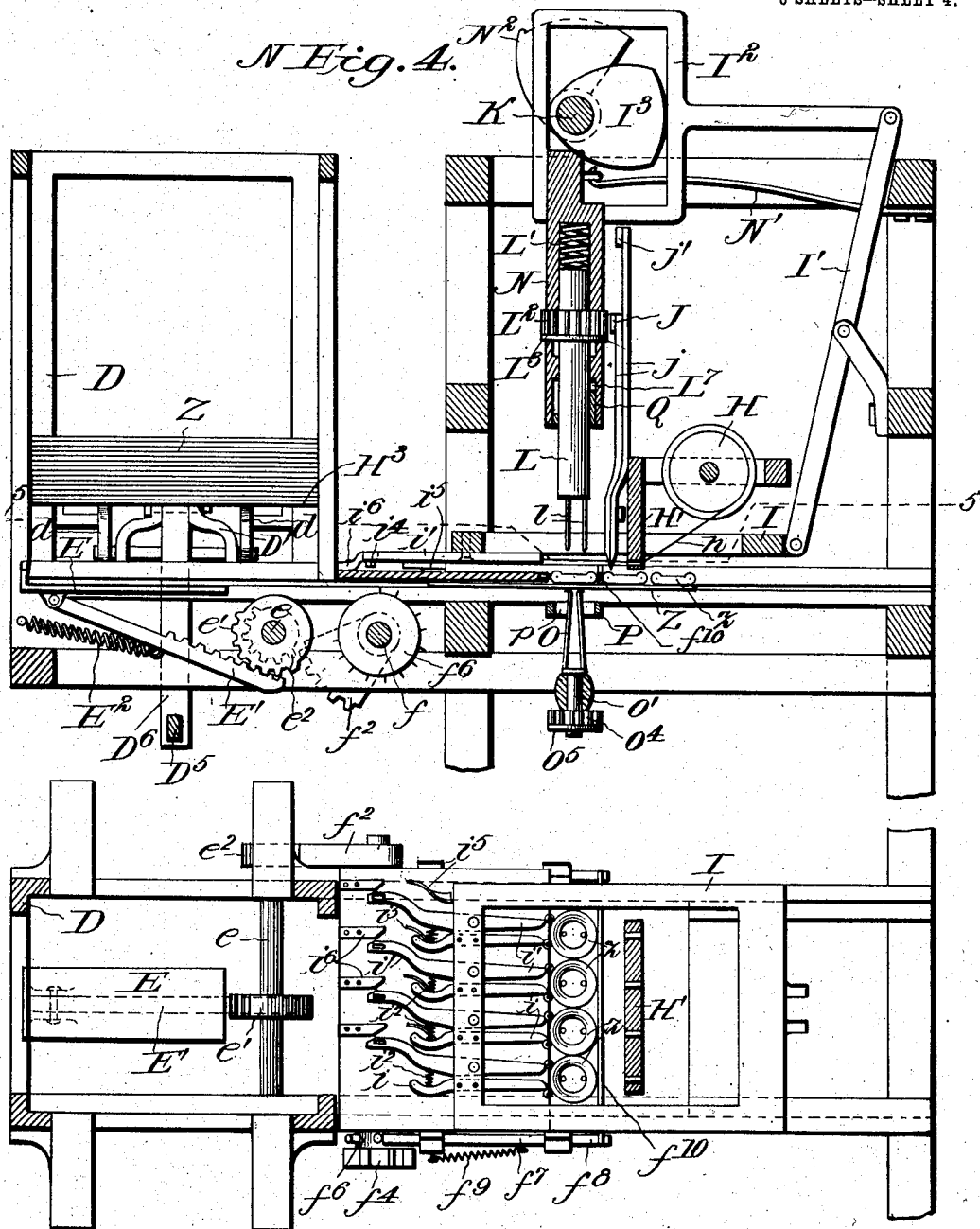


Fig. 5.

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6 SHEETS—SHEET 6.

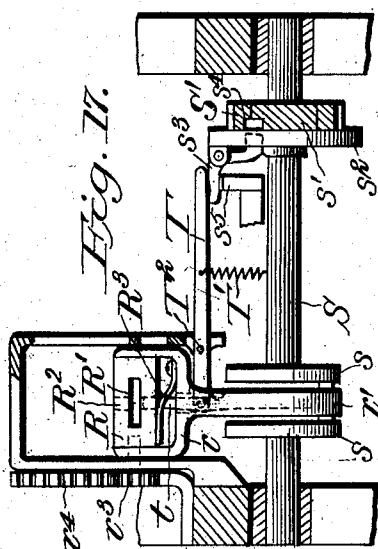


Fig. 17.

Fig. 19.

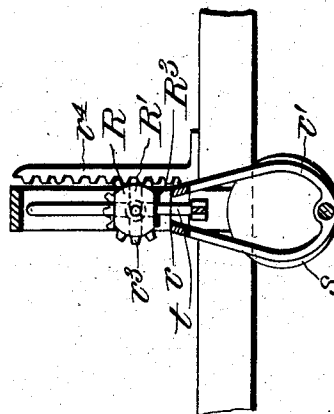


Fig. 18.

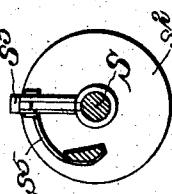


Fig. 15.

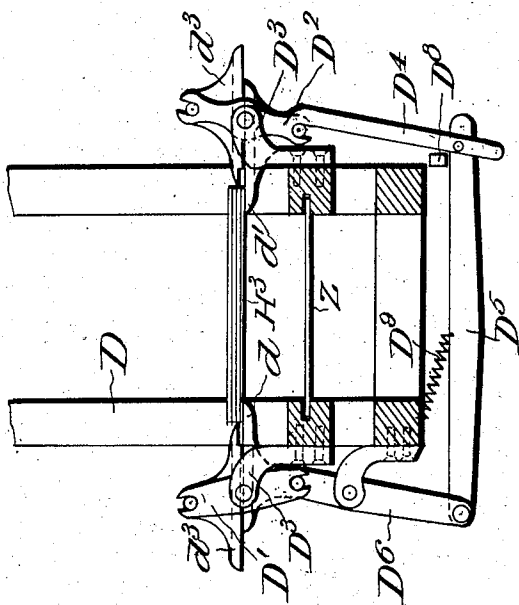
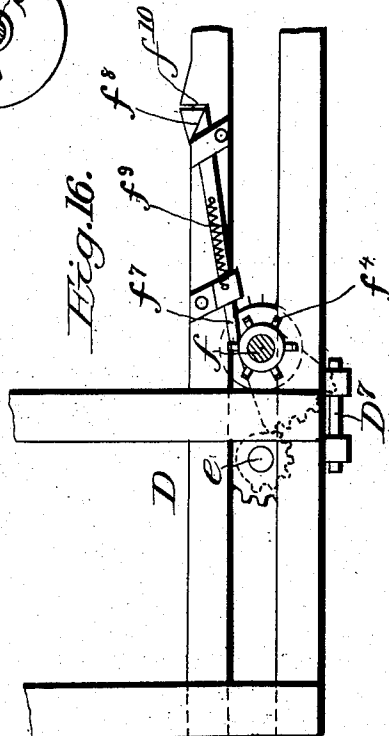


Fig. 16.



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UNITED STATES PATENT OFFICE.

ALBERT J. MEETZ, OF DAVENPORT, IOWA, ASSIGNOR OF ONE-HALF TO
JAMES A. MUNRO, OF DAVENPORT, IOWA.

BUTTON-CARDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 760,893, dated May 24, 1904.

Application filed August 18, 1903. Serial No. 169,916. (No model.)

To all whom it may concern:

Be it known that I, ALBERT J. MEETZ, of Davenport, in the county of Scott and State of Iowa, have invented certain new and useful
5 Improvements in Button-Carding Machines; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

10 The present invention is an improvement in machines for carding eyelet-buttons—i. e., buttons which are perforated for the attaching-threads; and the object of the present invention is to provide a machine which will
15 automatically select the buttons from a mass in a hopper, arrange them in proper order upon a card, and attach them thereto by means of threads, each button being separately attached, and by which the cards will be auto-
20 matically fed into position to receive the buttons and be automatically fed forward, so that the buttons may be attached thereto in rows in proper sequence, all the operations necessary to select the buttons and arrange them face up-
25 permost on the cards in rows, attach them to the cards, and deliver the filled cards from the machine being performed automatically by the mechanisms hereinafter described and illus-
trated.

30 The invention I do not consider restricted to the specific constructions and arrangements of parts shown in the drawings, the same being the best now known to me; but the invention will obviously be capable of variation and
35 modification within the scope of my invention.

In said drawings, Figure 1 is a top plan view of the machine, partly broken away for the purpose of clearness. Fig. 2 is a rear ele-
40 vation of the machine. Fig. 3 is a side elevation thereof. Fig. 4 is an enlarged section through the card-feeding and button-sewing mechanism. Fig. 5 is a section on line 5 5, Fig. 4, looking down. Fig. 6 is a sectional
45 view showing the needle spindles and twisters. Fig. 7 is a sectional view taken at right angles to Fig. 6. Fig. 8 is a plan view of the needle-frame. Fig. 9 is a plan view of the twisters. Fig. 10 is a perspective view of

cam-ring in needle-frame. Fig. 11 is a detail 50 showing method of rotating the twisters. Fig. 12 is a view of the needles. Fig. 13 is a view showing needles carrying down the thread. Fig. 14 is a view showing the thread 55 twisted and ready to be drawn up by the needles. Fig. 15 is a sectional view showing mechanism for dropping the cards. Fig. 16 is a view showing mechanism for operating the alinement-bar. Fig. 17 is a view showing the mechanism for properly facing the but- 60 tons. Figs. 18 and 19 are sectional views of the facing mechanism.

In said drawings, A is a hopper, in which the buttons are placed in mass and from which they pass through a spout *a* into a chute *a'*, 65 through which they drop in front of the button-feeding plunger C. This chute *a'* is intended to be kept continuously filled with buttons lying flatwise therein, and any oversup- 70 ply of buttons to said chute are carried back into the hopper by means of the elevator-belt *a''*, operated in the spout *a''*, as shown, said belt being driven by pulley *a'''* and belt *a''''* from pulley *a''''* on the main shaft B, which is suit- 75 ably journaled in the framework of the machine, and it may be driven by belt-pulleys *b'* on one end thereof, from any suitable source of power. The plunger C is operated by means of a pitman C' from a crank *c'* on a shaft *c*, which shaft *c* is driven from the shaft 80 B by means of pinions *c''* on the shaft *c*, which is adapted to mesh with the tooth-segment B² on the shaft B, the rate of proportion of the pinion *c''* and the segment B² being such that the shaft *c* will be rotated four times by the 85 segment. Said segment B² is semicircular, and the remainder of the circle is completed by a smooth-surface segment B³, which is adapted to engage a notched part *c'''* at the side of pinion C² and prevent the shaft *c* rotating 90 while the pinion *c''* and segment B² are out of mesh. The proportion of the pinion *c''* and segment B² may be varied according to the number of buttons to be arranged in a row on a card. In the machine shown four buttons 95 are to be in a row. Consequently the proportion of the pinion and segment is four to one. For each revolution of shaft *c* a button Z is

fed forward onto a card z , which lies in position beside the lower end of the shaft c , the buttons passing underneath the needle-frame hereinafter referred to. The cards z are fed upward from a container D, (see Figs. 1 and 4,) which contains a stack of cards superimposed one above the other, the lowermost card being supported on slides d , which are movable toward or from each other and are suspended on rocking levers D' D^2 , pivoted on brackets D^3 , attached to the side of the container D. On the upper end of these levers are pivoted selectors d^3 , which move oppositely to the slide d d' , so that when the latter move forward the selectors move inward. The selectors are adapted to separate the lowermost card from the superimposed cards and support the superimposed cards when the slides d d' move outward, thus permitting the lowermost card to drop to the bottom of the container in a position to be ejected from the container by the feed-slide E, hereinafter referred to.

The lever D^2 is provided with a depending arm D^4 , which extends below the bottom of the container D and is connected by a bar D^5 with the lower end of a rocking lever D^6 , the upper end of which is pivotally connected to the lower end of the lever D' , so that by oscillating bar D^5 the slides d d' will be simultaneously moved in or out, the slides being normally held in their innermost position by means of a spring D^9 , attached to bar D^5 and to a fixed point on the frame, as indicated in Fig. 15.

The lowermost card H^3 is fed forward from the container by means of a reciprocating slide E, which slide is operated in one direction by means of a rack-bar E' , which meshes with a segment e' on a shaft e , on which shaft is a second segment e^2 , which is engaged at intervals by a segment f^2 on a shaft f , which is operated step by step from the shaft K, as follows: On the shaft f is a six-toothed ratchet f^4 , which is engaged by the lower end of a bar f^5 , the upper end of which lies adjacent to the shaft K and is adapted to be engaged in each rotation of said shaft by lug K^7 thereon, by which the bar f^5 is depressed and imparts a rotation on notch of one tooth of the shaft f by the ratchet f^4 . The bar f^5 is retracted by means of a spring f^6 , as shown. The toothed ratchet f^4 on each side of the frame when rotated pushes forward a rod f^7 , with a cam-face f^8 on its forward end, each cam-face supporting the ends of a bar f^{10} , which is for the purpose of keeping the buttons in proper alinement as they are fed in by the feeding mechanism. The cam-faces on the rods elevate the bar f^{10} sufficiently to permit a row of buttons to pass thereunder as the card is pushed forward to receive another row of buttons. When the row of fastened buttons has passed beyond the bar f^{10} , the latter will fall by gravity behind said row of attached buttons and be ready

to aline the next row of buttons. Helical springs f^9 are provided to return the said cam-rods to their former position.

During each complete rotation of shaft f segment f^2 is brought into mesh with segment e^2 and imparts partial rotary motion to the latter sufficiently to cause segment e' to engage rack E' and move slide E forward sufficient to eject the lowermost card from the container over the shaft f , where it will be engaged by pin-wheels f^6 on said shaft f , the pins on the periphery of said wheel engaging the side edge of the card and feeding them forward properly and exactly. When the segment f^2 disengages segment e^2 , a spring E^3 retracts rack-bar E' and the slide E. In this manner the cards are fed properly forward and at the proper time. During the time that the segments f^2 and e^2 are in mesh there are no pins in engagement with the card, the peripheries of wheels f^6 , which are at that time beneath the card, being clear from the pins. This enables the incoming card to push the forward card ahead more or less, as may be necessary, in accordance to variations in the length of the card, and this variation will occur between the third and fourth rows of buttons on the cards. In the machine shown each will have six rows of buttons, and therefore the first and last rows of buttons on the card will be equally spaced from the adjacent ends thereof, and any inequality of distances between the rows will come between the third and fourth rows, where it will be most convenient to sever the cards when it is desired to sell buttons by the dozen.

On the shaft f , adjacent to the ratchet f^4 , is secured a lug or arm f^{11} , which after the slide E has been retracted by the spring E^3 , engaged with the push-rod D^7 , moves the latter backward. The outer end of this push-rod engages a bell-crank lever D^8 , which is pivoted to move horizontally, and the other arm of said lever engages with lever D^4 and rocks the latter when bar D^7 is pushed back, as described, thereby operating the slides d d' and the retainers d^3 , so as to release the lowermost card and permit it to drop down into position to be fed forward by the slide E' on its next positive movement.

When four buttons have been fed inward in a row over the card, as indicated in Fig. 5, and beneath the needles, the shaft c comes to a rest, and then the needle-frame is actuated after the threads are made; but before the wheels contact with the buttons the attaching-threads are severed.

I prefer to describe the thread feeding and severing mechanism before describing the action of the needles in sewing the buttons to the card.

Behind the needle-frame is a spool-holder, in which a series of spools H, carrying the thread, are placed, there being one spool carrying thread for each button in a row or for

each needle-spindle. The threads h are led through openings in the frame H' in rear of or above the row of buttons, and at the proper time, which may be while the buttons are being fed forward, the threads are cut by the feeders and drawn inward over the underlying buttons to be attached to the card.

Each thread-finger consists of a stationary finger i and a movable finger i' , the former being fixed to the inner end of a reciprocating frame I , working horizontally just above the button-card, while the movable fingers are pivoted to said frame adjacent to the stationary fingers. Springs i'' , interposed between the rear end of the fingers, tend to keep their forward ends normally closed.

When the frame I is moved outward, the fingers i' are opened by means of lugs i^4 on the lower end of the fingers engaging fixed cams i^5 , attached to the fixed part of the frame and to pass the movement i^4 . This opens the thread-catchers before they reach the projecting ends of the threads in the apertures in the plate H' ; but when the frame I moves inward the fingers are closed by the springs i^3 and catch the threads and pull the latter forward over the buttons until the lugs i^4 strike cam i^5 , attached to another fixed point on the frame, as shown in Fig. 5, which opens the thread-feeders and they release the threads, the frame I remaining in this retracted position until the needles have sewed the buttons to the card and are raised out of the way, whereupon the thread-feeders are moved forward to engage and draw over fresh lengths of threads to attach the succeeding row of buttons to the card.

The threads are severed at the proper moment by suitable actuating means. As shown, it is accomplished by means of scissors attached to the front plate H' of the spool-frame above the thread. One member of each pair of scissors has its upper end pivoted to a bar j , the other member, j' , of the scissors having its upper end pivoted to a bar J' . These bars J' are pivotally connected to a slotted lever j^2 , so that when one bar is moved to the left the other will be moved to the right, and in this manner the scissors are opened and closed.

The upper bar j is moved at proper times by means of a cam j^5 on the periphery of a wheel j^6 , mounted on a counter-shaft K , which is driven between seats $K' K^2$ from a shaft K^3 , parallel to shaft B , and which is actuated at the proper time by the segment B^2 , which meshes with a pinion K^4 on shaft K^3 after it has disengaged the pinion c^2 , the relative proportion of the segment B^2 and pinion B^3 being one to four, so that the shaft K^3 is turned once by the segment B^2 , while the shaft c is still and said shaft K^3 remaining idle while shaft c^2 is making its four revolutions.

The plate B^3 engages a locking-segment K^6 on the gear K^4 , so as to hold shaft K^3 still while shaft c is operating. It will thus be observed that the shaft c makes four revolutions and

then remains idle while the shaft K^3 is making one revolution.

The frame I is reciprocated at the proper time by means of a cam I^3 on the shaft K , which works in a cam-frame I^2 , connected to the upper end of the lever I' , fulcrumed on a suitable fixed point on the frame, the lower end being connected to frame I , as shown in Fig. 4.

The needle-frame (see Figs. 6 and 7) in the machine, as shown, has four spindles L , which are pressed downward by springs L' , and each has a pair of needles l on its lower end, which needles are set apart a distance corresponding to the diametrical distance apart of the holes in the button.

The several spindles are provided with intermeshing pinions L^2 , so that they can be rotated pivotally and simultaneously. The pinion L^2 on the outermost spindle is adapted to be rotated at the proper time by means of a segment M on a vertical shaft M' , which is driven by bevels $M^2 K^6$ from the shaft K .

The segment M need give but a partial rotation to the spindles, sufficient to enable the needles to find the holes in the buttons. A fourth-revolution of the spindle will ordinarily be sufficient for this purpose, as hereinafter explained. After the spindles have been rotated in this manner they are locked from further rotation by means of a smooth plate M^3 on the segment M engaging a locking-plate L^3 on the outermost pinion L^2 . The spindles L are arranged vertically and in axial alinement within a reciprocating frame N , which is upheld normally by means of springs N' , but are depressed at proper times by means of cams N^2 on shaft K , which are adapted to engage the upper end of the frame N at the proper time and depress the latter with the spindle.

Upon the initial depression of the frame the needles L contact lightly with the buttons, as the springs L' ordinarily exert but very little downward pressure thereupon, and during its light contact of the needles with the button the spindles are partially rotated, as specified, enabling the needles to find and enter the holes in the buttons and aline the latter uniformly upon the card.

The needles l , it may be observed by reference to Fig. 12, are notched in their lower ends and are arranged with the notches parallel and in alinement with the thread overlying the buttons, and as the needles descend they catch the threads in these notches and carry them on down to the buttons, the threads being simultaneously severed by the scissors and released by the thread-feeders, so that the threads are cut with the needles as they find the buttonholes. The frame N is then further depressed, so that the needles perforate the card and carry the thread ends down through the button and cards, as indicated in Fig. 13. The ends of the threads being carried through the cards by the needles come into position

to be engaged by the twist-ers O, which are spring-fingers, the upper ends of which are hooked, as shown at *o*, and are guided in cam-shaped slots *p* in plates P, underlying the card. (See Fig. 9.) The ends of the thread which are brought down by the needles depend over the card in the form of a staple, and while the needles are thus depressed the twist-ers O are given a semi-axial rotation, and they catch the depending ends of the threads and carry them around, so that the thread brought down by one needle is carried over and led against the opposite needle in position to be engaged by a notch *l*² in the side of said needle, and when the needles rise the ends of the thread guided by these notches are pulled back and up through the card and needle and button, as indicated in Fig. 14, the machine operating to first cut the thread, then carry both ends of the thread through opposite ends of the needle down through the card, lap the depending ends of the thread under the card, and pull the end of the thread up through the card and buttons in the holes opposite to that to which it passed and bound, or, in other words, one needle carries down one end of the thread and pulls up the opposite end of the thread.

It will be observed by reference to Fig. 12 that the needles are provided with notches *l*¹ in their bottoms, by which they are enabled to engage and hold the length of thread in position on the buttons while moving the latter into place and finding the holes therein, and they are also provided on their sides with notches *l*², by which they engage the opposite end of the thread and pull the latter upward as they rise.

The thread loopers or twist-ers O are preferably mounted on rotatable studs O', journaled in plate O³, fixed to the stationary part of the frame, and these studs have on their lower ends small intermeshing pinions O⁴, by which they are simultaneously and similarly rotated. These twist-ers are rotated at the proper moment to the proper extent by means of a segment *m* on the lower end of shaft M, which is adapted to engage the nearest pinion O⁴ at the proper time and impart the desired degree of movement thereto and there-through to all the others, and then a locking-plate *m*¹ on segment *m* engages the corresponding locking-plate *o*⁵ on the adjacent spindle L and holds the twisting-fingers stationary until they are to be again operated. The testing-fingers O after the needles have ascended are automatically drawn back to normal position by means of a spring O⁶, (see Fig. 6,) which spring is arranged to rotate the said fingers in an opposite direction to the positive motion imparted to them by segment *m*. To enable the fingers to be thus drawn back, the locking-plate *m*¹ is provided with a recess or notch *m*² at the point in its periphery which will come opposite plate *o*⁵ after

the needles have ascended, and when this notch comes opposite the plate *o*⁵ the spring operates to return said fingers to normal position.

The cam *n*² may be so shaped as to give a slight dwell to the needles after they have descended to the buttons, but before they have entered the cards, or I have also shown in the drawings a device by which even should the cam continue to press the frame downward the needles will be momentarily suspended in their downward movement with the frame until they have found the buttons' eyes and are in position to proceed with the operation of sewing the buttons to the card, as described.

By reference to Fig. 6 it will be seen that each spindle L is provided with a pin L¹ near its lower end, and surrounding the spindle at this point is a cam-ring Q, which is provided with a gradual cam Q', with which the pin L¹ contacts just as the needles reach the buttons, and as the spindles are turned the pins L¹ ride up on the cams Q' and uphold the spindles thereon, although the frame N may be still descending, the cams Q' being so proportioned as to compensate the spindles for the descent of the frame, and thus give the needles time to find the eyes of the buttons before they are forced downward through the gear.

It is essential in this class of machines that the buttons should all face alike. The buttons are ordinarily made flat on their under surfaces and recessed or chamfered on their upper surfaces or "centered," as it is commonly called, to present a neater appearance. They are fed into the chute *a*¹ indifferently and may come to the bottom thereof upside down. In the latter case it is necessary that they shall be faced upward before they reach the card, and this is accomplished by the following mechanism: Between the chute *a*¹ and the card is located the button-facing device. This comprises a block R, which is pivotally mounted in the upper end of a yoke *r*, which is supported on a pitman *r*¹, attached to the crank on a shaft S, on which is loosely mounted a pinion S', driven by an intermediate gear S² from a pinion *c*⁷ on shaft *c*. The block R is provided with an aperture R', which when the block is in its lowermost position forms a part of the feed-channel for the buttons between the chute *a*¹ and the card, the buttons being injected into this aperture into the block R by the plunger C. The block R is extended normally in its lowermost position and the shaft S stopping with the crank when the block is in such position, and the block R is held against rotation in the yoke *r* normally by means of a spring R³, which bears against the flat surfaces of the block. The pinion S', as stated, is loose on the shaft S and operates on a hub *s*⁴, and to this hub is fixed a disk *s*², which projects against the side of pinion S', and on this disk is pivoted a clutch-arm *s*³, which

is adapted when its upper end is depressed to have its lower end engage corresponding notches s^4 in the pinion S' and hub s' and lock the two together, so that the shaft S will be rotated once; but in place of one rotation, however, the clutch-arm s^3 is disengaged from the pinion by means of a cam-spring S^5 , (see Fig. 18,) so that the shaft S stops, as stated, after one revolution, with the block R in its lowermost position. The clutch-arm is tripped whenever a button comes into the aperture R' in an inverted position by means of a lever T , which is normally pulled downward by a spring T' and is pivoted at T^2 on a fixed point on the frame and on its inner end carries a lever t , which is adapted to project into the aperture R' of block R through transverse apertures R^2 in the block, and if the button in the apertures comes in face uppermost the feeder is arrested thereby and cannot move into the aperture R' sufficiently to allow lever T to throw the clutch into operation; but if a button comes into block R upside down the feeder again rises into the center of the button and permits spring T' to depress levers K^5 and throw the clutch s^4 into position to lock the hub s' and pinion S' together, whereupon the shaft S makes one rotation and then stops, as described, and through its rotation the yoke r of the block R is reciprocated. During this reciprocation the block R is inverted or turned over by reason of a pinion r^2 on one end of the block R meshing with a fixed rack r^4 opposite the frame. This pinion r^2 is ratcheted to the shaft of the block, so that it turns the block R during its ascent, and on the descent of the yoke and block the pinion ratchets on the block and the latter descends in an inverted position, bringing the button back face uppermost in position to be placed face uppermost on the card. Thus whenever a button comes into the block upside down the clutch is tripped and the parts caused to bring the button into right position. Thus every button that will be carded will be carded face uppermost.

The operation of the several parts have been described in detail in connection with the several mechanisms composing the machine, and, briefly, the operation is as follows: The buttons Z are placed in the hopper and descend through the chute a' , from which they are ejected successively in sets of four by means of the spindle C , at which time the needle-frame is raised, and during this same time the thread-feeders are moved forward and grasp threads and pull out a proper length of same over the four buttons just fed in. Then while shaft C is stopped and the feeding of the buttons ceases the needle-frame descends, the needles catching the threads, which are simultaneously severed as they descend, and after the needles first lightly touch the buttons they are given a slight rotary movement sufficient to enable them to find the holes in the buttons, and after they have found the holes in the buttons

and brought them into exact alinement the frame carries the needles through the card, taking the ends of the severed threads through the buttons and card. Then the thread-twisters turn and carry the ends of the thread away from the needle which brought it down over against the opposite needle in position to be cut by the crochet-hook in the side of said needle. The needles then ascend and pull the end of the thread up through the card and eye of the button and the second return of the thread through the card series and tie sufficiently strong to securely hold the button in place without any actual tying of the thread.

I have referred to "thread" herein because I prefer to use thread; but obviously light wire might be used in place of threads, if desired, and I consider the use of metallic thread or wire equivalent of ordinary thread.

The explanation of the button-turning device by which the buttons are all faced upward before they reach the card is sufficiently explained above.

I do not wish to limit myself to the specific combination or construction of parts herein shown and described unless the same shall be specifically described in the claims.

Having thus described my invention, I claim—

1. In a machine for carding eyelet-buttons, the combination of means for carrying opposite ends of a thread through adjacent eyes of a button and through the card, means for crossing the threads under the card and means for bringing the ends of the thread back through the opposite holes, substantially as described.

2. In a button-machine for carding eyelet-buttons, the combination of mechanism for feeding the buttons, means for feeding the card, means for carrying opposite ends of thread through adjacent eyes of a button and through the card, means for crossing the threads under the card and means for bringing the ends of the thread back through the opposite holes, substantially as described.

3. In a button-carding machine, the combination of mechanism for feeding buttons, mechanism for feeding the cards, a pair of reciprocating needles adapted to simultaneously carry the ends of a piece of thread through opposite eyelets of the button and through the card, means for crossing the ends of the thread beneath the card, and engaging the ends of the thread with the opposite needles whereby said ends are brought up through the card and button, substantially as specified.

4. In a button-carding machine, the combination of a reciprocating needle-holder, a pair of needles attached thereto adapted to engage the thread and carry the ends thereof simultaneously through the eyes of a button and through the card, said needles also having notches or hooks near their lower ends adapted to pull threads upward, and means for carry-

ing the end of the thread brought down by one needle over to the notch of the opposite needle, whereby said end is carried upward through the card when the needle ascends, substantially as described.

5. In a machine for carding eyelet-buttons, the combination of means for carrying opposite ends of a thread through adjacent eyes of a button and through the card, means for crossing the threads under the card and means for bringing the ends of the thread back through the opposite holes; with means for feeding the cards beneath the needles, means for feeding buttons on the card beneath the needles, and means for feeding lengths of thread between the needles and buttons prior to the descent of the needles, substantially as described.

6. In a button-carding machine, the combination of a reciprocating needle-holder, a pair of needles attached thereto adapted to engage the thread and carry the ends thereof simultaneously through the eyes of a button and through the card, said needles also having notches or hooks near their lower ends adapted to pull threads upward, and means for carrying the end of the thread brought down by one needle over to the notch of the opposite needle, whereby said end is carried upward through the card when the needle ascends; with means for feeding the cards beneath the needles, means for feeding buttons on the card beneath the needles, and means for feeding lengths of thread between the needles and buttons prior to the descent of the needles, substantially as described.

7. In a button-carding machine, the combination of a card-feeding mechanism and a button-feeding mechanism, a pair of needles, means for moving said needles into contact with the buttons and for causing them to perforate the card, means for causing a momentary dwell of the needles in their descent just as they reach the buttons and for rotating the needles during this dwell until they find the eyes of the buttons, and means for feeding the length of thread before the needles descend.

8. In a button-carding machine, the combination with a card-feeding mechanism and button-feeding mechanism, a reciprocating frame carrying a series of spindles each provided with a pair of needles on its lower end, means for moving said frame to lower the needles into contact with the buttons and to cause them to perforate the cards, means for causing momentary dwell of the needles in their descent when they reach the buttons and for rotating the needles during this dwell until they find the eyes of the buttons, and means for feeding the lengths of thread before the needles descend.

9. In a button-carding machine, the combination of a reciprocating pair of needles adapted to sew buttons to the card, and means for lowering the needles to the buttons and causing them to perforate the card; with mechanism

whereby the needles are caused to momentarily dwell after they reach the buttons and to partially rotate so as to find the holes in the buttons before they descend and puncture the card, with the thread-twisters below the card adapted to carry that end of the thread brought down by one needle across to the opposite needle after the needles have descended and before they rise, substantially as described.

10. In a button-carding machine, the combination of a card-feeding mechanism and a button-feeding mechanism, a pair of needles, means for moving said needles into contact with the buttons and causing them to perforate the card, means for causing momentary dwell of the needles in their descent and for rotating the needles during this dwell until they find the eyes of the buttons, and means for feeding the length of thread before the needles descend; with the thread-twisters below the card adapted to carry that end of the thread brought down by one needle across to the opposite needle after the needles have descended and before they rise, substantially as described.

11. In a button-machine, button-carding mechanism, comprising a reciprocating slide adapted to move the card forward, a segmental rack pivoted to said slide, a segment meshing with said rack, the card-feeding-wheel shaft, and a segment on said shaft adapted to actuate the segment controlling the slide, substantially as and for the purpose specified.

12. In a button-carding machine, the combination of a shaft, wheels thereon adapted to feed the cards, mechanism for giving said shaft a step-by-step movement, a reciprocating slide adapted to feed the card forward to said feed-wheels, a spring for retracting said slide, a toothed rack for drawing said slide forward, a segment engaging said rack, a second segment connected with the first segment adapted to engage a segment on the feed-wheel shaft, for the purpose and substantially as described.

13. In a button-carding machine, the combination of means for feeding the buttons forward, a slotted block through which the buttons are fed, means for reciprocating said block, and for turning the same half over during its reciprocation, and a clutch mechanism controlling the actuation of said reciprocating means, and adapted to be released by the entry of an inverted button into the block, substantially as and for the purpose specified.

14. In a button-machine, the combination of means for feeding the buttons, a slotted block through which the buttons are fed, said block being rotatably mounted in a reciprocating support, means adapted to turn the block half over when the support is reciprocated, a shaft for reciprocating said support, a driving-pinion loosely mounted thereon, a clutch for locking the said pinion to the shaft, and a clutch-controlling device adapted to

throw the clutch into engagement upon the entry of an inverted button into the slide in the block, and means for disengaging the clutch and stopping the rotation of the shaft after the support has made a complete reciprocation, substantially as described.

15 15. In a button-carding machine, the combination of card-feeding mechanism, a reciprocating needle-frame carrying a series of intergears spindles, springs for depressing said spindles in the frame, a pair of needles attached to each spindle, means for depressing said frame to force the needles through the cards, means for momentarily suspending the descent of the needles and for rotating the needles at this movement until they find the eyes of the buttons, and means for feeding thread between the needles and buttons prior to the descent of the latter.

20 16. In a button-machine, the combination of means for feeding the buttons, a slotted block through which the buttons are fed, said block being rotatably mounted in a reciprocating yoke, a ratcheted pinion on one end of the block-shaft adapted to engage a fixed rack and adapted to turn the block half over when the yoke is reciprocated, a crank-shaft for reciprocating said yoke, a driving-pinion loosely mounted thereon, a clutch for locking the said pinion to the shaft, and a clutch-controlling device adapted to throw the clutch into engagement upon the entry of an inverted button into the slide in the block, and means for disengaging the clutch and stopping the rotation of the shaft after the yoke has made complete reciprocation, substantially as described.

40 17. In a button-carding machine, the combination of the card-feeding mechanism, the reciprocating needle-frame carrying a series of intergears spindles, springs for depressing said spindles in the frame, a pair of needles attached to each spindle and having notches in their lower ends and hooks in their sides near their lower ends, means for depressing said frame to force the needles through the cards, means for momentarily suspending the descent of the needles and for rotating the needles at this movement until they find the eyes of the buttons, and means for feeding thread between the needles and buttons prior to the descent of the latter.

50 18. In a button-carding machine, the combination of card-feeding mechanism, a reciprocating needle-frame carrying a series of intergears spindles, springs for depressing said spindles in the frame, a pair of needles attached to each spindle, means for depressing said frame to force the needles through the cards, means for momentarily suspending the descent of the needles and for rotating the needles at this movement until they find the eyes of the buttons, and means for feeding thread between the needles and buttons prior to the

descent of the latter; with means for severing the threads into lengths before the needles descend, and twisters beneath the card adapted to take that end of a thread brought down by one needle and over into engagement with the opposite needle, all substantially as and for the purpose described.

19. In a button-carding machine, the combination of the card-feeding mechanism, the reciprocating needle-frame carrying a series of intergears spindles, springs for depressing said spindles in the frame, a pair of needles attached to each spindle and having notches in their lower ends and hooks in their sides near their lower ends, means for depressing said frame to force the needles through the cards, means for momentarily suspending the descent of the needles and for rotating the needles at this movement until they find the eyes of the buttons, and means for feeding thread between the needles and buttons prior to the descent of the latter; with means for severing the threads into lengths before the needles descend, and twisters beneath the card adapted to take that end of a thread brought down by one needle and over into engagement with a notch in the opposite needle, all substantially as and for the purpose described.

20. In a button-carding machine, the combination of a button-feeding device and a thread-feeding device; with a pair of reciprocating needles, adapted to simultaneously pass through opposite eyes of a button, said needles having notches in their lower end to engage the thread and carry it through the button, and also having hooks in their sides adjacent to the lower end adapted to pull the opposite ends of the thread up through the button, and means for carrying that end of the thread brought down by one needle over to the notch of the opposite needle, for the purpose and substantially as described.

21. In a button-feeding machine, the combination of mechanism for feeding cards, mechanism for feeding buttons into position on the card, a reciprocating frame, a series of spindles mounted therein, a pair of needles on the lower end of each spindle adapted to engage the adjacent eyes of the same button, means below the card for crossing the ends of the threads brought down by the needles below each button, the needle-frames operating when the card-feeding mechanisms are at rest.

22. In a button-feeding machine, the combination of mechanism for feeding cards forward intermittently, mechanism for feeding a series of buttons in position on the card, a reciprocating frame, a series of spindles mounted therein, a pair of needles on the lower end of each spindle adapted to engage the adjacent eyes of the same button, means for feeding lengths of thread between the needles and buttons before the needles descend, and means below the card for crossing the ends of

the threads brought down by the needles below each button, the needle-frames operating when the card-feeding mechanisms are at rest.

23. In a button-feeding machine, the combination of mechanism for feeding cards, mechanism for feeding buttons into position on the card, a reciprocating frame, a series of spindles mounted therein, a pair of needles on the lower end of each spindle adapted to engage the adjacent eyes of the same button, means below the card for crossing the ends of the threads brought down by the needles below each button, the needle-frames operating when the card-feeding mechanisms are at rest; with means for severing the threads prior to the descent of the needle, means for causing a momentary dwell of the needles after they touch the buttons and for rotating the spindles until the needles find the eyes of the button, and means for returning the thread-crossing devices to normal position after the needles have ascended, all substantially as described.

24. In a button-feeding machine, the combination of mechanism for feeding cards forward intermittently, mechanism for feeding a series of buttons in position on the card, a reciprocating frame, a series of spindles mounted therein, a pair of needles on the lower end of each spindle adapted to engage the adjacent eyes of the same button, means for feeding lengths of thread between the needles and buttons before the needles de-

scend, and means below the card for crossing the ends of the threads brought down by the needles below each button, the needle-frames operating when the card-feeding mechanisms are at rest; with means for severing threads prior to the descent of the needle, means for causing a momentary dwell of the needles after they touch the buttons and for rotating the spindles until they find the eyes of the button, and means for returning the thread-crossing devices to normal position after the needles have ascended, all substantially as described.

25. In a button-carding machine, the combination of a reciprocating pair of needles adapted to engage the thread and carry the ends thereof simultaneously through the eyes of a button and through the card, and means for lowering the needles to the buttons and for causing them to perforate the card, with mechanism whereby the needles are caused to momentarily dwell after they reach the buttons and to partially rotate so as to find the holes in the buttons before they descend and puncture the card, substantially as described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

ALBERT J. MEETZ.

In presence of—

F. W. NEAL,
WM. J. PUGH.