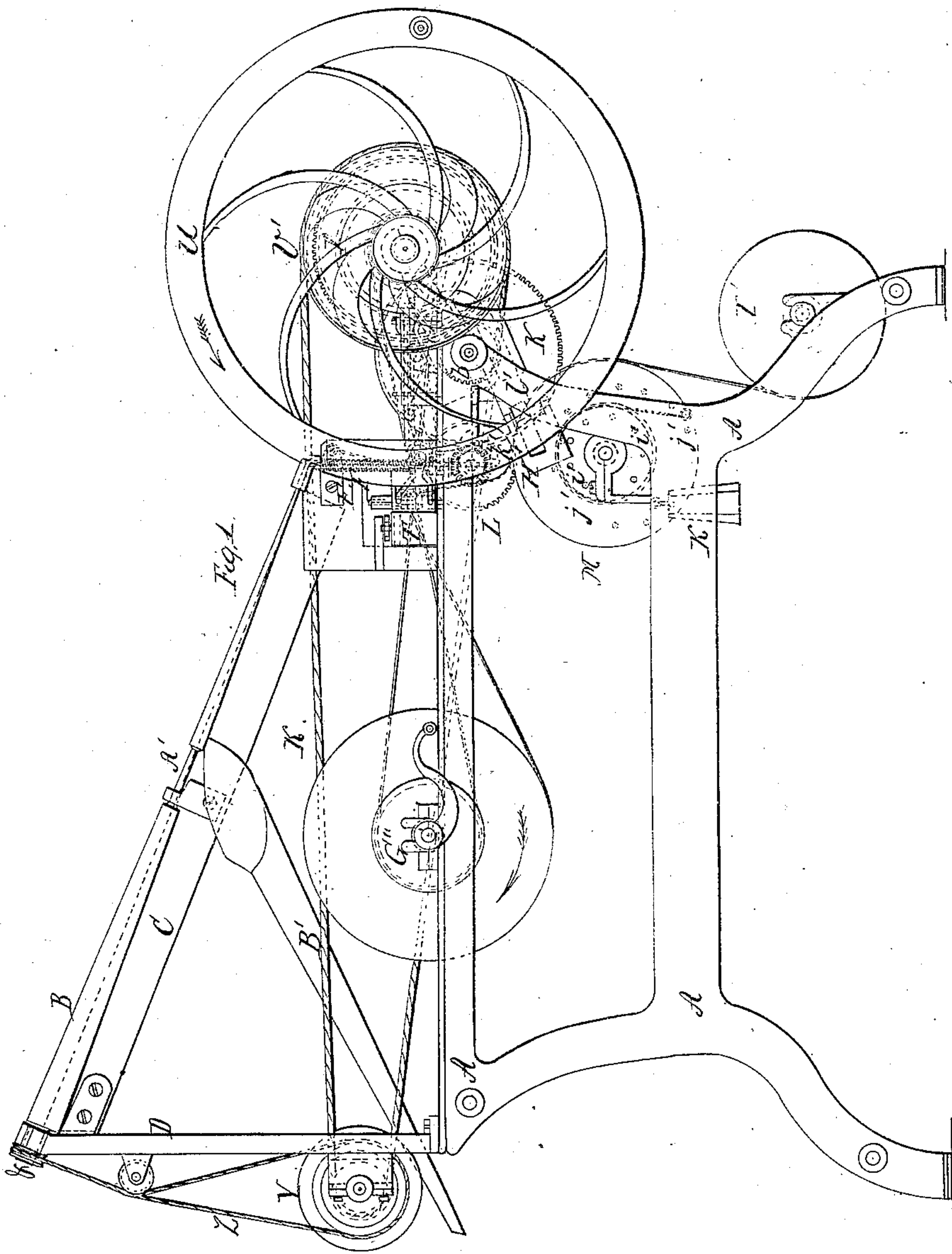


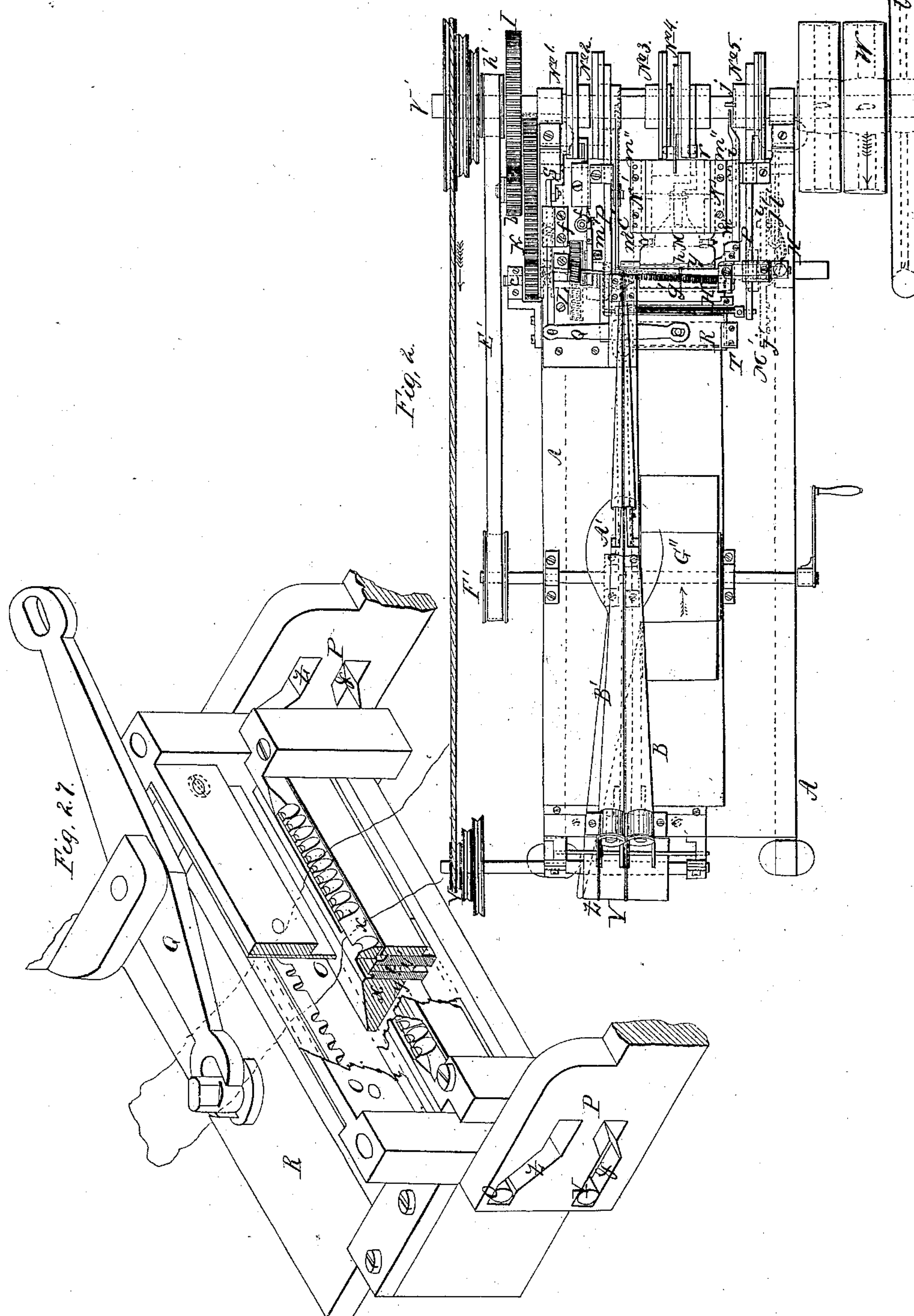
Sheet 1-4 Sheets.

*C. O. Crosby,*  
*Papering Pins,*  
*No 10,180,* *Patented Nov. 1, 1853.*



C. O. Crosby,  
Papering Pins,  
No 10,180,

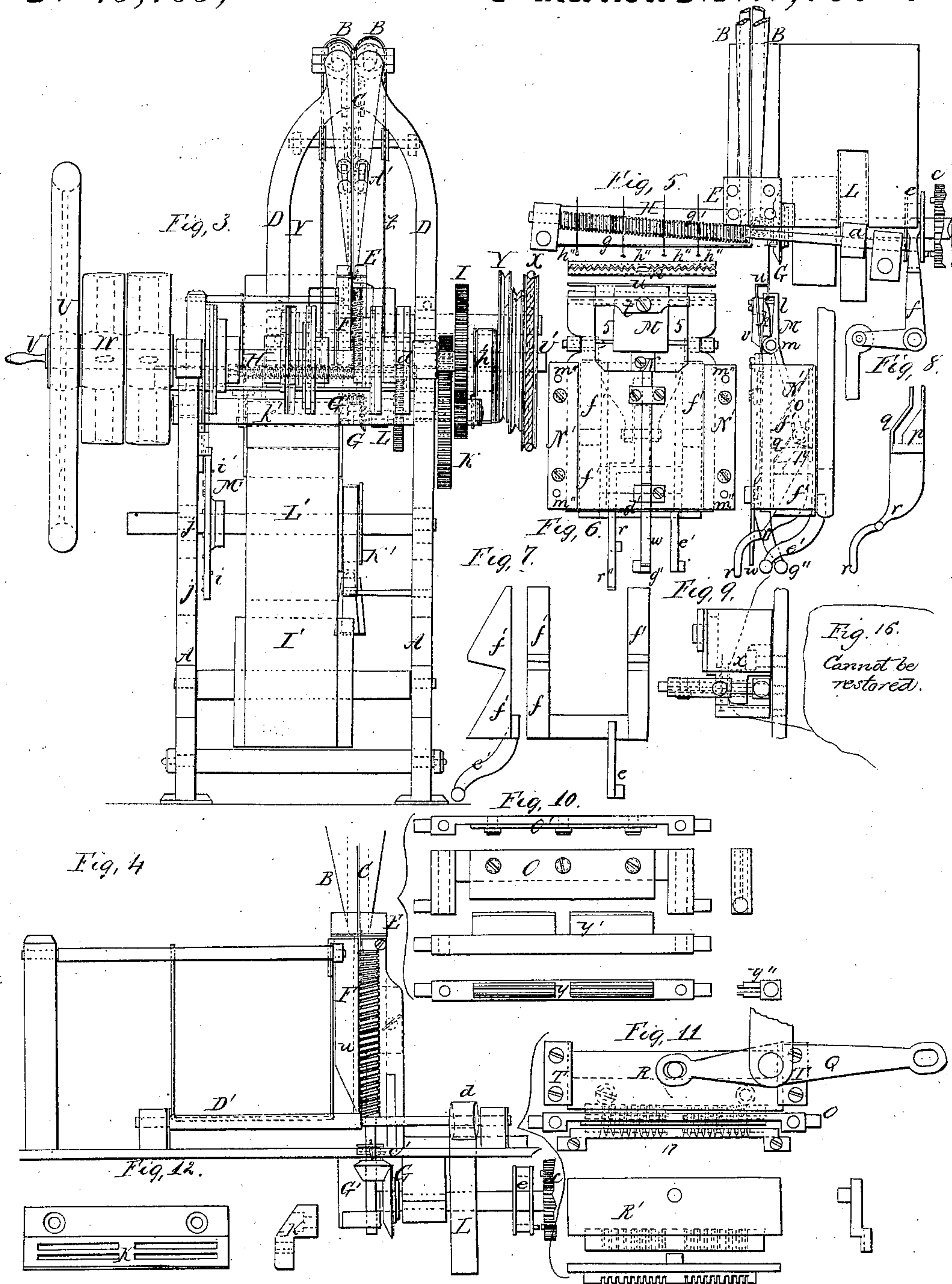
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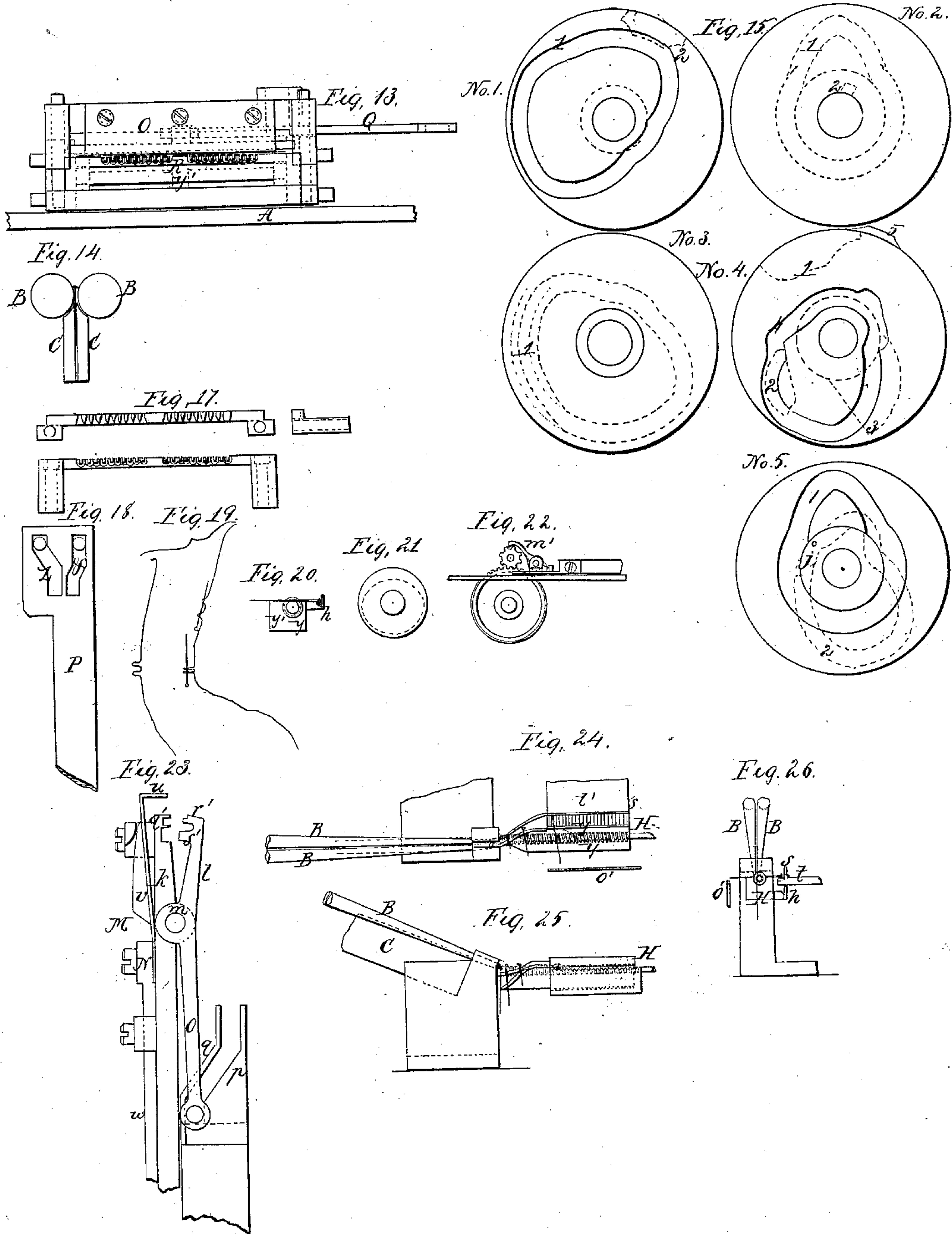


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# UNITED STATES PATENT OFFICE.

CHAUNCY O. CROSBY, OF NEW HAVEN, CONNECTICUT.

## MACHINE FOR STICKING PINS.

Specification of Letters Patent No. 10,180, dated November 1, 1853.

*To all whom it may concern:*

Be it known that I, CHAUNCY O. CROSBY, of the city and county of New Haven, in the State of Connecticut, have invented a new and useful Improvement in Machinery for Sticking Pins; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, which make a part of this specification, in which—

Figure 1, is a side view, or elevation of the whole machine. Fig. 2, is a plan, or bird's eye view, of the same. Fig. 3, is an end view of the same, taken from the front end, showing the screw separator, and screw distributor. Fig. 4, is a view of an upright section of the machine, showing the position of the lower ends of the conical rollers and the upright screw separator. Fig. 5, is a bird's eye view of a section showing the horizontal screw distributor, and the ways on which the pins are pushed along by the inclined plane of the thread of the screw with pins thereon. Fig. 6, is a bird's eye view of the lifting pliers, or sticking apparatus. Fig. 7, is a side view of the same, showing how the lifting apparatus is raised to lift the pins from the distributor. Fig. 8, is a view of that part of the lifting apparatus which acts in opening and closing the jaws. Fig. 9, is a view of an upright section of the crimping apparatus, showing the paper as passing through, crimped, and clamped, with pins in it. Fig. 10, is a view of several sections of the crimping apparatus, showing them in separate parts. Fig. 11, is a view of several sections of the moving clamping bar, and the lever which operates it. Fig. 12, is a bird's eye view of the bed plate of the crimping apparatus. Fig. 13, is a horizontal view of the moving clamping bar, and the folding blades. Fig. 14, is a view of a cross section of the inclined channel, showing how the pins are conducted to the screw separator. Fig. 15, is a view of the cams on the cam wheels, which are revolved by the main, or cam, shaft, which, by means of levers, bars, &c., produce all the sliding, elevating, and depressing motions. These cams are shown, on one side in full, and the other, in dotted lines. Fig. 16, is a view of the lifting pliers, and the box on which they slide, and are elevated, and depress; and also of the inclined planes which open and close the jaws; and the creeper,

which directs the points of the pins. Fig. 17, is a bird's eye, horizontal, and end, view of the stationary clamping bar. Fig. 18, is a side view of one of the side sliding plates which work the folding blades, showing the shape of the slots which elevate, and depress, the blades for crimping. Fig. 19, is a view of the paper as crimped, before it is clamped; the crimps as clamped when the pin is stuck and the form which the paper assumes when the crimps are drawn out ready for winding onto the cylinder, (G'', Fig. 1.) Fig. 20, is a view of a cross section of the ways, and grooved bar, in front of the ways, showing how the heads of the pins rest in the groove to guide the pin on the ways. Fig. 21, is a view of the cam which works the slip band to roll up the paper, after the pins are stuck in it. Fig. 22, is a view of the dog, &c., which stops, and steadies, the distributing screw when the clutch wheel is thrown out of gear. Figs. 23, is a side view of a section of the lifting pliers, showing them when open. Fig. 24, is a bird's eye view of the inclined channel, and screw distributor, when the upright screw, &c., is dispensed with, showing the jaw, or instrument, for lifting the heads of the pins, and also the bar for lifting the points. Fig. 25, is a horizontal view of the same, taken from the back end, showing the winding ways. Fig. 26, is a side view of the same, taken in the line of the axis of the screw distributor, showing the lifting apparatus used instead of the lifting pliers. Fig. 27, is a perspective view of the crimping, and clamping, apparatus, taken from the front left hand corner, showing a section of the bed plate, ( $x$ ,) (with the paper resting on it ready to be crimped,) with the two longitudinal mortises, and the center bar, (2,) between them; and the double folding blades, ( $y$ , and  $y'$ ,) which pass up through the mortises in the bed plate ( $x$ ,) to crimp the paper, (having the single folding blade, (O,) between them, the stationary clamping bar, ( $x'$ ,) in front, and the moving clamping bar, (R,) behind them,); and the single folding blade, (O,) which, when depressed, holds the paper firmly on the center bar, (2,) while being crimped; both these folding blades, [double and single,] are elevated, and depressed by means of the inclined slots in the side bars, (P, and P,); and the stationary clamping bar, ( $x'$ ,) with



its inclined notches to receive the points of the pins, as they are about to be stuck into the paper; and the moving clamping bar, (R,) (with its transverse grooves on the under side,) which serves as the back bar, (when suitably brought forward,) for both crimping, and clamping, the paper; and the lever, (Q,) which moves the clamping bar, (R,) to assist in both crimping, and clamping, the paper; and the two side bars, (P, and P,) with their inclined slots, (Q and Z,) which elevate, and depress, the folding blades, (O, and y, and y'), by their longitudinal reciprocating motion; the lever, (Q,) side bars, (P, and P,) double folding blades, (y, and y'), and the single folding blade, (O,) being all worked by their appropriate cams, levers, bars, &c., as hereinafter described.

My improvement consists in so constructing and arranging the several parts of the machine, that the pins, being thrown into a hopper, will be fed to an inclined conducting channel composed of a pair of conical rollers, (to sustain the heads of the pins,) and a pair of side planes, or plates, (to steady the points of the pins,) to an upright screw, or threaded separator, and passing down on the inclined plane of the thread as the screw revolves, will be deposited in the spaces of a horizontal screw, or threaded distributor, by the inclined planes of the thread of which, as it revolves, the pins will be pushed, or forced, along on the ways, (one on each side of the screw,) to a position opposite, (but below,) the jaw of the clamps holding the crimped paper, when the open jaws of a pair of pincers, or pliers, will be advanced to receive, and grip, the pins near the heads, lift them from the spaces of the screw distributor, and carry them forward until the points of the pins rest in the inclined notches in the front, or stationary, clamping bar. A creeper, sliding guide, or director, will then be carried forward, and downward, so as to press on the pins near the points, and so hold them in the inclined notches in the front clamping bar, that, when the pins are forced forward by a projection on the lower jaw of the lifting pliers, the points will all enter the crimped paper in an exact line, even if the pins are not straight. And when the pliers are carried forward to force the pins through the crimped paper, they are opened, so as to release the pins, and drawn back, and depressed to their original position, ready for another operation. And, in so constructing and arranging the apparatus for crimping the paper, that the paper will pass over a stationary bed plate through which are two parallel mortises, or slots, when a folding blade descends onto the longitudinal center bar. The moving clamping bar will be advanced toward the

stationary clamping bar, to the proper position to form the back part of the crimping apparatus; when a double folding blade will be brought up through the mortises, or slots in the bed plate carrying the paper up in two folds, or crimps, one between the front clamping bar and the single blade, and the other between the back clamping bar, (after it has been advanced as above described,) and the single folding blade, (while the shoulders on the upper edges of the double folding blade presses the paper against the lower, and inner corner, of the two clamping bars, to form the extreme bends of the crimp.) The folding blades will then be withdrawn, and the moving clamping bar further advanced so as to clamp the two folds, or crimps, together, against the stationary clamping bar, where they are held while the pins are being stuck, or inserted, through the folds, or crimps. The moving clamping bar will then recede so as to free the paper, and pins, entirely, when, by means of a cylinder, the paper will be carried forward and wound up, and another portion of the paper brought forward to be crimped; and so on, winding the stuck paper on the cylinder.

I make a suitable frame of post and bars, or any other suitable shape, as seen at A, A, &c., Figs. 1, 2, 3, and 13, of cast iron or any other suitable material. I make two conical rollers, B, and B, Figs. 1, 2, 3, 4, 5, 14, 24, 25, and 26, of suitable metal, and attach them to the upper part of the frame, the large ends, or bases, of the cones being uppermost. I support these rollers, at each end, by suitable standards, D, and E, Figs. 1, and 3, &c., so as to form an inclined plane, as shown in Fig. 1, with side planes, or plates, C, and C, Figs. 1, 14, and 25, between the rollers, (to steady the points of the pins,) while the heads rest on the sides of the two rollers, (as seen in Fig. 14,) which are continually revolving over from each other, to keep the pins in motion.

At the apex of the conical rollers, or lower end of the inclined plane, I use an upright screw, F, Figs. 1, 4 and 5, which is revolved by the bevel gearing G, and G', Figs. 3, 4, and 5. The spaces in this screw receive the pins from the channel formed by the conical rollers, (B, &c.) and conducts them downward in the spiral groove, the heads resting against a light shield in front of the screw, as indicated by the dotted lines at a, Fig. 4. The thread of this screw at the upper end, should be so cut that the space (between the threads) can receive but one pin, and the thread about equal to the diameter of the pin barrel, but as it proceeds downward, the thread may be spread sufficiently to correspond with the distance, or space, between the pins on the paper, (as seen at F, Fig. 4.) At the lower end



of the screw-separator I place horizontally a screw distributor as seen at H, Figs. 2, 3, 5, 24 and 25. The screw distributor is revolved by the spur wheels J, K, and L, as seen in Figs. 2, 3, &c., with their pinions, *b*, *c*, *d*, as seen in Fig. 2, &c., until a sufficient number of pins has been brought in front of the lifting pliers, when the clutch wheel, *e*, Figs. 4 and 5, is thrown out of gear with the pinion, *c*, by the clutch bar, *f*, Figs. 2, and 5, which is worked by the cam 2, No. 1, and the screw is suddenly stopped by the dog, *m'*, Figs. 2, and 22, so that the screw distributor may remain at rest while the lifting pliers, M, Figs. 2, 6, 16, and 23, seize the pins, lift them up, and carry them to the crimped paper, when the clutch throws the wheel into gear again and the screws revolve as before, and separate, and distribute, another line of pins; so that while the lifting pliers are sticking one line, and returning, another line is distributed ready for the lifting pliers; so that the pins may be stuck as fast as the lifting pliers can work. This screw distributor, H, works in a box, or a space cut, longitudinally, in a bar, or drilled through the bar lengthwise and the top, or upper side, filed off, so as to leave the thread of the screw, at least, a diameter of the pin barrel above the edges of the box, as seen at, *g* and *g'*, Figs. 2, 5, 20 and 24, so that the edges of the box may serve as ways for the pins to slide on while being pushed, or forced, along by the spiral inclined plane of the revolving screw distributor, as seen at *g*, and *g'*, Figs. 2, 5, 20. In front of this box, *g*, and *g'*, I place a bar with a longitudinal groove cut in the upper edge in which the heads of the pins rest, and are guided, as seen at *h*, Fig. 2, and in cross section in Figs. 20 and 26. When the screw distributor ceases to revolve, this bar, *h*, is depressed by the pin *j*, on the cam wheel No. 5, acting on the lever, *i*, as seen in Fig. 2, which leaves the heads of the pins projecting over the way, *g*, as seen at *h''*, &c., Fig. 5, so that the jaws, *k*, and *l*, of the lifting pliers, M, when advanced, may freely grip them, and lift them out of the screw distributor, carry them away, and stick them.

I make the lifting pliers, M, Figs. 2, 6, 16, and 23, with an inflexible, or stationary, bar for the top, or upper, jaw, as seen at *k*, Figs. 16, and 23, with two ribs across the end, as seen at *q'*, Fig. 23, in which I cut semicircular transverse notches, (across both ribs,) of a size, and depth, suited to receive one half of the barrel of the pin, to serve as rests. And, I make the lower jaw, *l*, movable on a joint pin, *m*, Figs. 16, and 23, of one rib across the front end, with transverse V shaped notches, as seen at *n*, Fig. 6, corresponding in position and number with the notches in the two ribs of the

upper jaw; and, I also make a shoulder outside of, and below, these V shaped notches on this movable jaw across the whole of its front end, as seen at *r''*, Fig. 23, as an additional bearing for the pin to rest on to prevent the points being depressed while lifting, and carrying, them to the clamped folds for sticking them in the paper. This movable jaw, *l*, is depressed and elevated, to open and close the pliers, by means of the lever *o*, Figs. 16, and 23, being acted on by two inclined planes, shown at *p*, and *q*, Figs. 8, 16, and 23, the side or inclined plane, *q*, being a spring, so as to allow it to yield to the size of the pin. These inclined planes are moved, (together,) forward, to open, and backward, to close, the jaws by means of a cam, 1, No. 4, acting on the end of the bar, *r*, Figs. 2, 6, 8, and 16.

To the upper side of the upper, or stationary jaw I attach a director, sliding guide, or creeper, N, Figs. 6 and 23, composed of two springs, *s* and *s*, with inclined planes, as seen at *v*, Figs. 16, and 23, passing under the ends of the straps, *t*, Fig. 6, and a blade, *u*, 6, 16, and 23, with A shaped notches, as represented at *n*, Fig. 6. This creeper, or director N, is forced forward by means of the cam, 4, No. 4 working against the end of the bar, *w*, Figs. 16 and 23, when the notched blade is gradually depressed by means of the inclined planes, (as at *v*, Figs. 16, and 23,) so as to bear on the points of the pins and press them down into the inclined spaces in the stationary clamping bar, seen in two views in Fig. 17, and 17, Fig. 11.

I make the crimping apparatus, of a bed plate, *x*, Figs. 9, and 12, with two longitudinal mortises, or slots, cut through it, (to admit the double folding blades,) and with a bar in the center from end to end, to enable the single folding blade to hold the paper firmly in the center while crimping. And, with a single folding blade, O, and O', Figs. 10, 11, and 13, which I make of a plate of steel of the thickness of the center bar in the bed plate, *x*, Fig. 12. This folding blade is depressed, and elevated, by the inclined slots, *z*, Fig. 18, in the side bars, P, and P, Fig. 2, (one of which is shown in section in Fig. 18.) These side bars are moved backward, and forward, at the proper time, by means of the cams, 1, Nos. 2, and 5, (Figs. 2, and 15.) And, with a double folding blade, (*y*, &c.,) which I make of two plates of steel, attached together, and made of the shape, or form, represented in a bird's eye view at *y*, in horizontal view at *y'*, and in cross section at *y''*, Fig. 10, and *y'*, Fig. 13, with small shoulders near the upper edges, (as seen at *y''*,) to bend up the paper, against the inner lower corners of the clamping bars, before, and after the folds, (as shown in



Fig. 19.) This double folding blade is elevated, and depressed, by means of the slot, and, in the side bars, P, and P, Fig. 2, (one of which is shown in section in Fig. 18,) which are moved as before described. And, with a stationary clamping bar, shown in two views, (bird's eye, and horizontal,) in Fig. 17, which forms the front part of the crimping apparatus, (and is located near  $\alpha$ , Fig. 2.) And, with a moving clamping bar, R, Figs. 2, and 13, and R, and R', Fig. 11, (which I also make of a bar of steel,) with transverse grooves on the front part of the under, or lower, surface as indicated by the dotted lines near R, and R', Fig. 11, and R, Fig. 13, and a small longitudinal groove in the front edge, immediately above the transverse grooves, to prevent breaking the paper by clamping. The front edge of this clamping bar, when advanced to the proper position, forms the back part of the crimping apparatus. This clamping bar is moved forward, and backward, by means of the lever, Q, (Figs. 2, 11, and 13,) and the bar, or rod, S, (Fig. 2,) worked by the cam 1, No. 1, (Figs. 2, and 15,) while it rests in, and is guided by, transverse grooves in the upright standard, T, and T, (Fig. 11, and T, Figs. 1, and 2,) as shown by the dotted lines. Thus these two parts of the crimping apparatus, (forming the front and back,) assist in making four of the five bends in the crimped paper, in crimping, and also clamp, and hold, the paper for sticking the pins.

Having constructed, and arranged, the parts of the machinery, I throw the pins into a suitable hopper situated above the upper end of the inclined channel formed by the conical rollers and side planes, at B, B, and C, C, Figs. 1, &c., and apply the power to the wheel, U, Figs. 1, 2, and 3, or by a band, to the driving pulley W, Figs. 2, and 3, which will revolve the main, or cam, shaft, V, and V', in the direction indicated by the darts on the driving pulley, W, Fig. 2, and the wheel, U, Figs. 1, and 2. And, by means of the sectional pulley at V, the band, X, the pulleys Y, and Y', (both on the same arbor,) the bands Z, and Y', (Fig. 2,) and the two small pulleys on the upper ends of the conical rollers (seen in Figs. 1, 2, 3,) I revolve the conical rollers over from each other; so that, when the pins fall from the hopper into the inclined channel the heads will be supported by the conical rollers, (B, and B,) while the points will fall down between the side planes, (C, and C,) as seen in cross section, Fig. 14, (while all the surplus pins will pass off at A', into the spout, B', (Figs. 1, and 2,) and fall into a box below.)

The pins will pass down in the channel to the lower end, where they will be received

by the upper part of the screw separator, F, Figs. 1, 3, and 4, which is revolved by the bevel gear wheels,  $g$ , and  $g'$ , Figs. 3, 4, and 5, and are secured from falling out by an upright shield bearing against their heads, as represented in dotted lines at  $a$ , in Fig. 4.

By this screw separator the pins are deposited in the spaces of the horizontal screw distributor, H, Figs. 2, 3, 5, 24, 25, and 26, which is revolved by the spur wheel gearing, J, K, L, and  $b$ ,  $c$ ,  $d$ , Fig. 2, &c., and the clutch wheel,  $e$ , Figs. 4 and 5, with twice the velocity of the upright screw separator, so that it will receive only half as many pins as there are spaces in a given portion of the screw distributor, (this is done to cause the threads of the screw to be nearly at right angles to the clamping bars, and it may be set somewhat inclined to them, as seen in Fig. 5.)

When it is desired to leave a greater blank space, on the paper than ordinary, (as between the two columns of pins on the paper,) the bevel gear wheel  $g'$ , may be thrown out of gear by the clutch  $c'$ , Figs. 2, and 4, being acted on by the cam, 2, No. 2, (Figs. 15, and 2,) while the horizontal screw distributor continues to revolve until the pins have filled the whole length; (except the spaces.)

When a sufficient supply of pins has been distributed to make the line desired, the clutch wheel,  $e$ , is thrown out of gear with the wheel,  $c$ , by the cam 2, No. 1, acting on the clutch bar, or lever,  $f$ , Figs. 2, and 5, when the screw distributor ceases to revolve. When the pins are received by the screw distributor they rest, and are pushed along on the ways,  $g$ , and  $g'$ , Figs. 2, 5, 24, and 26, (by the inclined planes of the threads of the screw,) the heads of the pins being guided by the longitudinal groove in the bar in front of the ways, as seen at  $h$ , Fig. 2, and in cross section in Figs. 20 and 26, while the points of the pins are steadied on the way,  $g'$ , by a swinging bar, shown at D', Fig. 4, which rests upon them by its own weight.

While the pins are being thus arranged, separated, and distributed the crimping apparatus crimps the paper, as before described, and, (the folding blades being withdrawn,) the clamping bars clamp the folds, or crimps, ready for sticking the pins. The grooved bar,  $h$ , which had guided the heads of the pins is depressed, as seen in Fig. 26, by the pin,  $j$ , acting on the lever,  $i$ , which leaves the heads of the pins projecting over the way,  $g$ , as seen at  $h''$ ,  $h''$ ,  $h''$ ,  $h''$ , Fig. 5, ready to be seized by the lifting pliers, M, Fig. 6, &c., and gripped, as seen in Fig. 16. The lifting pliers, M, Fig. 6, &c. (the jaws being open, as when they released the last pins,) are then forced forward by means



of the cam projection, 5, No. 4, acting against the end of their main plate at  $d'$ , Fig. 6, so as to receive the pins within the jaws, when a projection,  $s'$ , Figs. 16, and 23, on the lower jaw, back of the V shaped notches, presses against the heads of the pins, so as to perfectly even them.

The cam 1, No. 4, then acting on the bar,  $r$ , Figs. 2, 6, 8, and 16, draws it back and closes the jaws of the pliers, so as firmly to grip the pins near the heads. (as seen in Fig. 16,) and by means of the V shaped notches in the lower jaw, and the semicircular notches in the upper jaw, the pins are brought into, and held in, a line ready for sticking. The cam 4, No. 4, then draws back the pliers sufficiently to release the points of the pins from the swinging bar  $D'$ , Fig. 4. The cam 1, No. 3, working against the bar,  $e'$ , Figs. 6, 7, and 16, forces forward the inclined planes,  $f'$ ,  $f'$ ,  $f'$ ,  $f'$ , and thereby elevates the box,  $N'$ ,  $N'$ , Figs. 2, 6, and 16, on which the lifting pliers, (M,) slide so as to raise the lifting pliers, with the pins, to a level with the stationary clamping bar. (This box  $N'$ ,  $N'$ , rises and falls vertically on steady pins,  $m''$ ,  $m''$ , &c., Figs. 2, and 6.) The cam, 4, No. 4, acting on the bar  $g''$ , Figs. 6, and 16, forces the pliers forward until the points of the pins are over the inclined notches in the stationary clamping bar; at which time the cam 4, No. 4, acting on the bar,  $w$ , Figs. 16, and 23, forces forward the creeper,  $N$ , Fig. 6, &c, which by means of the A shaped notches in its cross bar, or blade,  $u$ , and being depressed by the inclined planes  $V$ , Figs. 16, and 23, presses the points of the pins down into the inclined notches in the stationary clamping bar, and, at the same time, the cam 2, No. 4, by forcing forward the bar  $r$ , Figs. 2, 6, and 16, slightly opens the jaws of the pliers so as not to bind, while they steady, the pins, with their heads resting against the projection,  $s'$ , on the lower jaw, (back of the V shaped notches,) when by the cam 4, No. 4, continuing to act on the bar,  $g''$ , Fig. 6, &c., the pins are forced through the fold, or crimps, of the paper, about half of their length. The pins being struck over the front or stationary clamping bar, which causes all the points to enter in an exact line, and under the back, or moving, clamping bar, so that as soon as the clamp is released the pins in the paper will pass down the inclined plane, shown at  $x$ , Fig. 9, being thus, immediately freed from the moving clamping bar. The cam 3, No. 4, then forces in the bar,  $r$ , (by acting on its extremity at  $r'$ , Fig. 16, &c.) and opens the jaws of the lifting pliers and releases the pins; when the cam 1, No. 3, acting on the bar,  $e'$ , forces forward the inclined planes  $f'$ ,  $f'$ , &c., so as to elevate the box on which the lifting pliers slide so that the ribs of the upper jaw will

be free from the pins. The cam 4, No. 4, acting on the bar,  $g''$ , draws back the lifting pliers while the cam 1, No. 3, acting on the bar,  $e'$ , draws back the inclined planes  $f'$ ,  $f'$ , &c., thus returning the lifting pliers to their original position, with the jaws open ready for the next operation.

While the pliers are returning to their original position, the cam at  $h'$ , Figs. 2, 3, and 21, by means of the cross band  $E'$ , and pulley  $F'$ , I revolve the cylinder  $G''$ , which draws forward, straightens, and rolls up the paper. (As the band  $E'$ , works on a cam it operates as a slip band, so that it will not strain the paper.) And, the cam, 2, No. 5, acting on the sliding bar,  $l'$ , of the hand, or click,  $H'$ , Figs. 1, and 2. This hand acts against the pins,  $i'$ ,  $i'$ , &c., in sticking "book pins", and, (by changing sides of the wheel,  $M'$ ,) it acts against the pin  $j'$ ,  $j'$ , &c., in common sticking, to revolve the wheel  $M'$ , Figs. 1, 2, and 3. The pins  $j'$ ,  $j'$ , &c., are set at equal distances from each other, and are placed in a circle eccentric to the wheel, (except one pin, which is at the beginning of each paper,) to let off the requisite quantity of paper, as more paper is required for rolling up as we approach the middle of the paper. This wheel,  $M'$ , is on the arbor of a cylinder,  $L'$ , Fig. 3, over which the paper passes, and which revolves against a roller  $k'$ , Figs. 1, and 3, which by its weight causes sufficient friction to draw the paper from the coil,  $I'$ , Figs. 1, and 3. This cylinder is steadied by a strap and weight, as shown at  $R'$ , Figs. 1, and 3. From this cylinder  $L'$ , the paper passes up through a mortise in the bed plate of the machine, under, and behind, the stationary clamping bar, and over the bed plate of the crimping apparatus, as seen in Figs. 1 and 2, where it is to be crimped as before described; when, by the operation of the slip band,  $E'$ , Fig. 2, the paper cylinder,  $G''$ , may recoil so as to afford sufficient slack paper for the back crimp, or fold.

Instead of the lifting pliers, as already described, when the pins are small, an instrument may be used similar to the lower jaw of the pliers, as seen in section at  $t'$ , Figs. 26, and 24, for lifting the heads of the pins, while the points may be lifted by a blade, or plate, with V-shaped notches on its upper edge, placed back of the ways,  $g$ , and  $g'$ , as seen at  $o'$ , Figs. 24, and 26, with a lever attached, and worked by a cam, like the grooved bar,  $h$ , in front of the ways, or otherwise, so that it may be elevated simultaneously with and to the same extent as, the jaw, or instrument,  $t'$ , Figs. 24, and 26. This instrument should be forced forward until the projection,  $s'$ , back of the V shaped notches, coming in contact with the heads of the pins, may push them forward till the points of the pins will rest in the V shaped



notches in the blade, or plate, O', back of the ways, when by elevating the box N', N', Fig. 6, &c., on which the jaw, or instrument, t', must slide, the pins would be lifted by both the heads and points resting in V shaped notches, instead of lifting them by gripping them near the heads, as before described. And when the pins have been lifted to the level of the clamping bars, they will be carried forward, as before described, until the points of the pins rest in the inclined notches in the stationary clamping bar; (the bottoms and sides of the notches being inclined planes, as shown in Figs. 17, &c., will receive the pins though not straight, and guide them so that all will be stuck in an exact line). The blade, or plate, o', which lifted the points of the pins will then be depressed, the pins forced through the folds, or crimps, of the paper, and the instrument returned to its place as before described. Or, the lifting pliers, before described, may be used, (without the creeper,) in connection with the plate, or blade, o', just described. And the inclined channel formed by the conical rollers, &c., may be placed in a line with the horizontal screw, as seen in sections in Figs. 24, 25, and 26, when that screw will receive the pins from the inclined channel, and will act both as separator, and distributor; when the upright screw, &c., may be dispensed with. But in that case the ways, g, and g', must be placed in a winding position, as seen in Figs. 24, and 25, to change the position of the pin from vertical to horizontal. And, instead of using the bed plate in the crimping apparatus, as described, a single bar may be used, (in the position of the center bar in the bed plate,) or pins in the upper part of the moving clamping bar may be used to sustain the paper, or, the crimped paper may be sustained in any other convenient manner, while being clamped;—but I prefer the arrangement, &c., before particularly described; that is, using lifting pliers, and two screws, &c., for the larger pins,—and the bed plate in the crimping apparatus.

The advantages of my improvement consist in so constructing the machine that the pins may be lifted from the distributor, and while they are being stuck, the distributor will bring forward another supply of pins for the lifting apparatus, so that all parts of the machine may be constantly in operation, and one part never waiting for another. And, in that it is a self acting, and self directing, machine for sticking pins lengthwise of the paper instead of crosswise, as in my patent issued April 1st, 1851, as it may be worked by any convenient power at any time.

I am aware that conical rollers have been used for forming the inclined channel for conducting the pins;—and that a screw has

been used to separate the pins;—and that pliers have been used in the manufacture of pins;—and that clamping bars have been used for clamping the paper, after it has been crimped;—and that the paper has been drawn through and rolled up by a revolving cylinder so graduated as to regulate the quantity of paper, as to folding up;—I therefore do not claim either of these, as such, as my invention; but

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

1. The method of crimping the paper by means of movable folding blades, in combination with the bed plate, while the back, and front, sides of the paper are sustained by the clamping bars, substantially, as herein described.

2. I also claim the method of crimping the paper by means of moving folding blades descending and ascending between the stationary, and moving clamping bars, when these clamping bars serve as a part of the crimping apparatus, whether the paper be sustained by a bed plate, or otherwise, when constructed, and operating, substantially, as herein described.

3. I also claim the method of lifting the pins from the distributor, and carrying them away, and sticking them into the crimped paper, while the distributor is bringing another supply of pins in front of the clamping bars, thereby keeping the lifting pliers, or other lifting apparatus, continually in operation, when performed by the means, and in the manner, substantially, as herein described.

4. I also claim the lifting apparatus in combination with the crimping apparatus, or any substantial part thereof, when constructed, combined, and made to operate, substantially, as herein described.

5. I also claim the combination of the lifting apparatus, herein described, with the inclined transverse notches in the stationary clamping bar, by which means the pins will always be stuck in an exact line, even though the pins are not straight, when constructed, combined, and made to operate, substantially, as herein described.

6. I also claim the combination of the conical rollers, (B, B,) with the side planes, (C, C,) to form a straight inclined conducting channel, when combined; constructed, and made to operate, substantially, as herein described.

7. I also claim the lifting pliers, (M,) when constructed and made to operate substantially, as herein described, either with, or without, the creeper, sliding guide, or director, (N).

CHAUNCY O. CROSBY.

Witnesses:

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JAMES M. ROSS.