2 Sheets—Sheet 1.

A. & O. B. NORTH & S. FRINK.

Making Clothes Buckles.

No. 7,398. Patented May 28, 1850.

Fig. 3.

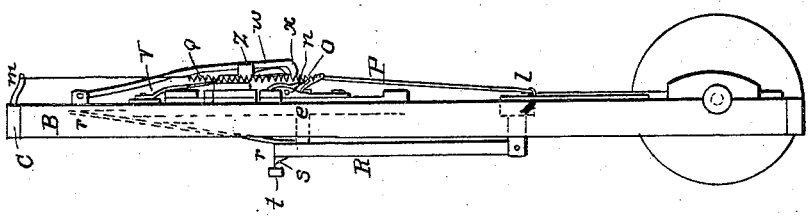


Fig. 7.

Fig. 2.

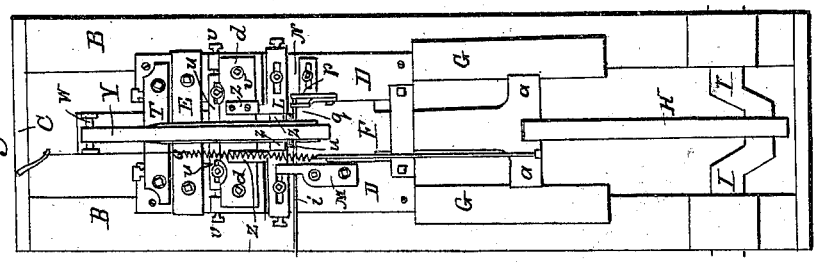


Fig. 8.

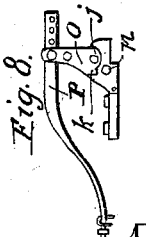


Fig. 9.

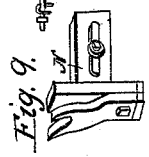


Fig. 6.

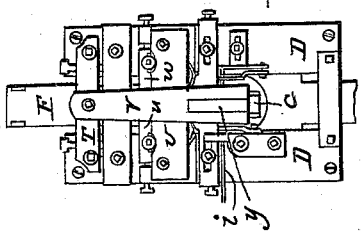


Fig. 1.

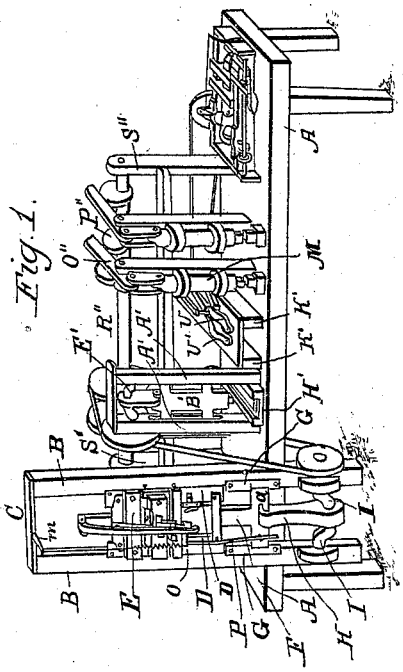


Fig. 5.

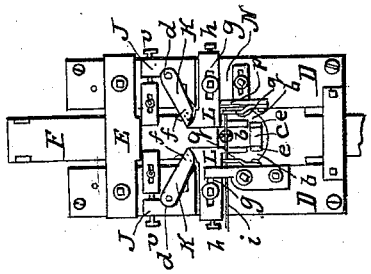
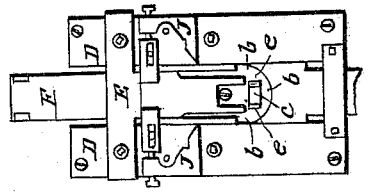


Fig. 4.



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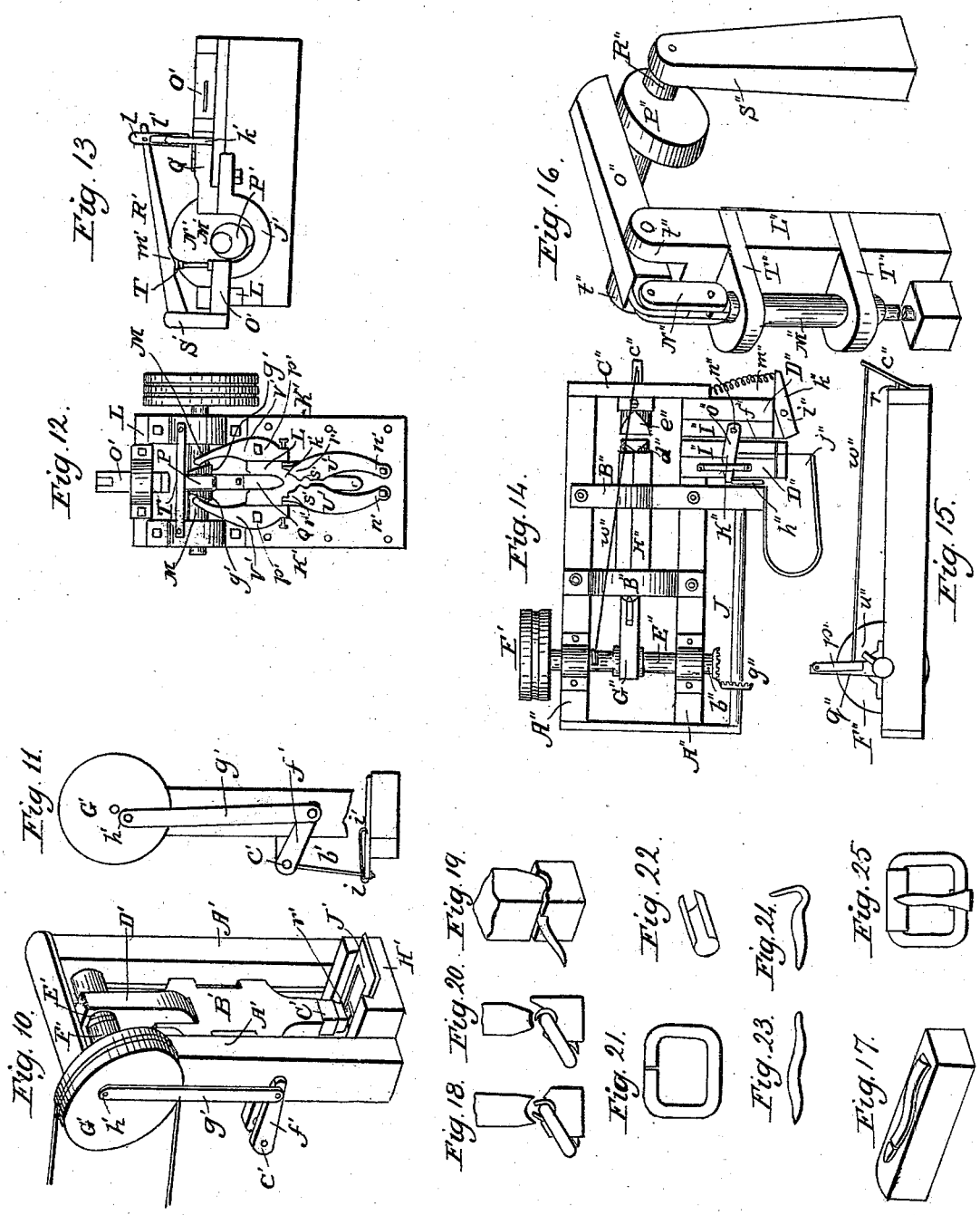
2 Sheets—Sheet 2.

Making Clothes Buckles.

No. 7,398.

Patented May 28, 1850.



UNITED STATES PATENT OFFICE.

ALVIN NORTH, OLIVER B. NORTH, AND STEPHEN FRINK, OF NEW BRITAIN, CONNECTICUT.

MACHINERY FOR MAKING FOUR-SIDED BUCKLES.

Specification of Letters Patent No. 7,398, dated May 28, 1850.

To all whom it may concern:

Be it known that we, ALVIN NORTH, OLIVER B. NORTH, and STEPHEN FRINK, all of New Britain, in the county of Hartford and State of Connecticut, have invented a new and useful Machine for Making Harness-Buckles; and we do hereby declare that the following is a full and exact description of the construction and operation of the same, reference being had to the annexed drawings, making part of this specification, of which—

Figure 1 is a vertical view showing the positions and connections of the several departments of the machine. Fig. 2 a front view of the department for forming the squares: Fig. 3 a side view of the same. Figs. 4, 5, 6, 7, 8, and 9 are detail views of the same. Fig. 10 is a perspective view of the department for swaging the squares. Fig. 11 a section of the same. Fig. 12 is a view of the department for bending the rollers; Fig. 13 a longitudinal section of the same. Fig. 14 is a view of the department for forming the tongues: Fig. 15 is a longitudinal section of the same showing the connections of the detaching spring. Fig. 16 is a perspective view of one of the two swaging presses, which are employed to form the eyes of the tongues, and close the rollers. Fig. 17 represents the principal die used in the department for forming the tongues. Figs. 18, 19, and 20 represent the three pairs of dies used in the press, Fig. 16. Figs. 21 to 25 represent different parts of the buckles in different stages of the process.

The several departments of this machine are attached to a strong or substantial bench or platform A A. Near the front edge of the platform are two timber-posts B B connected by a cap piece C at the top and to the fronts of these posts, at the height of two or three feet from the platform, are attached in a verical position, two stout iron side plates D D: these are partly embedded in the posts and secured by screw bolts. These side plates are connected to each other near the top by a cross-bar E in front, and a similar cross-bar in the rear, both attached to the side plates by bolts. A stout iron vertical sliding bar or vibrator F is adjusted between the plates D, and is guided or kept in place at the top by the front and rear cross-bars but at the bottom terminates in a cross *a* the two ends of which are grooved, and guided by two guide plates. To the bottom cross *a* is connected a pitman H which also connects to a central crank upon a horizontal shaft I below, and by which a vertical vibration is produced in the vibrator F. On one end of the shaft I is a band-wheel by which it is put in motion. In the front of the vibrator is a recess *b b b* about half an inch deep, and curving at the lower end, as plainly shown in the drawing Fig. 4; and within this curve is a projecting cog *c* permanently fixed in the vibrator; and on each side of the cog, is a small horizontal sliding bar *e e*, termed a detacher. To the front of the side plates, below the cross-bar E are permanently attached two irregular shaped plates J J Figs. 4 and 5 these have each a concavity, inward, to which are adjusted two toggle levers the cutting lever is sufficiently depressed to cut off a portion of the wire, which is then supported by the fingers *q q* of the holders M N. When the vibrator ascends the wire is lifted by the cog *c* (the detachers *e* having receded by means hereinafter explained) till the wire comes in contact with the gage plates L by which the two ends of the wire are bent downward, as it is forced into the grooves of the gage-plates; and when the curved bottom of the recess *b* comes in contact with the pins *f* of the toggle-levers K, these levers are lifted, and the centerward ends thereof coming in contact with the ends of the wire, forces them inward till the two ends meet, thus forming a square.

The two detachers *e e* extend two or three inches rearward and are connected by a pivot to a vertical lever R in the rear, as shown in Fig. 3. The bottom of this rear lever is connected by a hinge joint to a projecting arm S, attached to the rear of the bottom of the vibrator. A spring *r* is attached to the rear of the head of the vibrator, whence it descends to the head of the rear lever, which is thereby forced rearward. To the back side of the head of the rear lever is attached a wedge block *s;* and behind this is a cross bar *t*, the two ends of which are attached to the two posts B. This back cross-bar is so adjusted that when the vibrator approaches its lowest position, the wedge block comes in contact with the back cross-bar by which the detachers are forced to the front, and thus detach the newly formed square from the cog C. The head-bar T and the little restriction bars *u u*, which are attached to the front of the

side plates, aid in perfecting the square, at the moment the vibrator reaches its highest position. The bars *u u* are adjusted by lateral screws *v v* which pass through the head of the prominence J J.

A front bar U is placed in front of the toggle levers, and is supported by the two bolts which constitute the fulcrum pivots thereof. A plate spring V is attached to the upper cross-bar and extends down as low as the center of the holders M N. The two edges of this spring, at the bottom, project about half an inch and the two projections are bent rearward, as shown at X Fig. 3; and to the front is attached a small block *y* wedge-shaped at the top, and curved in front at the bottom. The use of the rear projections X, is to press the wire toward the vibrator till it is brought in contact with the gage bars L L. From each side of the head of the vibrator, a small ear or hanger projects to the front, and serves as bearings to a short horizontal shaft *w*, from which a front rod Y descends in front of the spring V to a point below the cog *c*. The bottom of this rod has an oblique projection (*x* Fig. 3) rearward and from each side of the rod, near the bottom, projects a small pin *w*. Two pieces of metallic plate Z Z are attached to the bars U and thence descending to a point a little below the bottom of the spring V; the front edge of each, for the space of two or three inches, is bent centerward, forming two flanges *z z* parallel to the face of the spring. When the vibrator and rod Y descends, the small pins *w*, pass down in front of the flanges *z z* to the bottoms thereof, when they fall rearward; and when ascending, the pins pass up in the rear of the flanges, in consequence of which the oblique projection *x* is brought in contact with the wedge block *y* by which the rearward projections *x* are pressed rearward against the wire till the pins *w* have passed the flanges *z*, when the spring becomes liberated and resumes its ordinary position.

When the rims or squares of the buckles have been thus formed they are subjected to the swaging operation of the second department, Figs. 10 and 11. The machinery of this department consists of two guide posts A′, A′, each of which has a groove on the inward side, and between the two posts is adjusted to the grooves, a vertical vibrating press B′, to the bottom of which is attached a die C′. This swage press is connected by a shackle bar D′ to a crank E′ on an elevated horizontal shaft F′, on the left end of which is a band wheel G′, below the die C′, is a stationary die H′, and in the faces of each die, is formed a grooved square I′ corresponding to the square of the buckle, and which it is intended to receive, for the purpose of perfecting its form by swaging. Upon the die H′ is adjusted a sliding frame J′, the central part of which is open for the space of six inches in length, and in width corresponding to that of the buckle square to be swaged; and this sliding frame is made to vibrate horizontally by means of the connection of the rear end thereof, to the bottom of a vertical arm *b′* which projects downward from a small horizontal rocking shaft *c′* which has its bearings in two staples, hangers or boxes attached to the rear of the two posts, as represented in the section Fig. 11. From the left end of the shaft *e′* an arm *f′* projects horizontally to the front, and is connected by a rod *g′* to a crank pin *h′* attached to the face of the band wheel G′. A small hook *i′* is connected to the rear end of the sliding frame, and extends horizontally forward toward the grooved square I′, for the purpose of taking the buckles-square from the groove after it has been swaged. When the sliding frame has approached its front position, a buckle square is placed within the central space, and is carried by the rearward motion of the sliding frame and nicely deposited in the grooved square, whence it is by the next vibration taken rearward and dropped into a receptacle below.

The third department embraces an arrangement of machinery for bending the square plates which are to constitute the rollers of the buckles. A horizontal frame consisting of two side bars K′ K′ see Fig. 12, and two cross bars L′ L′ are attached to the platform, and near the rear end thereof, supports a horizontal shaft M′, on the right end of which is a band wheel N′. Central between the side bars, and supported by the two crossbars L′ L′ is a horizontal sliding bar O′, adjusted on a level with the shaft M′. On the center of the shaft, where it crosses the sliding bar, is an eccentric cam P′; and the sliding bar, at the same point, has a semicircular curve downward, as shown at *j′*, Fig. 13, to accommodate the eccentric cam, so that the sliding bar is vibrated horizontally by the rotary motion of the cam. To the top of the sliding bar, in front of the cam, is attached a forming block Q′ the front end of which is reduced to the form of a round vertical rod *k′* which extends upward an inch or more, and enters the bottom of a tube *l′* which has a vertical slot in the rear side to accommodate the connection between the rod and the block, and is connected at the top to the front end of a horizontal lever R′, the rear end of which is connected by a hinge joint, to the head of a post S′ which stands upon the rear end of the sliding bar, to which it is firmly attached.

On the right and left of the forming rod *k′* is adjusted a pair of gripping jaws U′ U′, the front ends of which are connected to the frame by vertical pivots *n′ n′*, and a bent

spring o' is adjusted between, to force them asunder; but the rear ends of the jaws are prevented from separating too far, by the front ends of two levers V′ V′ which are connected to the frame by two vertical fulcrum pivots p' p', and the rearward ends of the levers extend to the top of the shaft, on opposite sides of the eccentric cam. Contiguous to the cam, on the right and left thereof, are adjusted to the shaft two circular cams q' q', which have opposite lateral swells, by which the rear ends of the levers V′ are, in the progress of each revolution, made to recede from each other, by which movement the gripping jaws are forced centerward, or toward each other, and the positions of the lateral cams q' relative to that of the eccentric cam, is such, that the jaws are made to approach each other at the moment that the forming rod k' has reached its forward position. When the forming block has receded, and the jaws are open, a square piece of iron plate is placed vertically and transversely between the jaws, and in rear of the two shoulders r' r'. When the forming rod advances, the plate is thereby bent and forced forward to the semicircular cavities s' s' in the jaws, and is by them compressed nearly to a tubular form.

The horizontal lever R′ rests upon a horizontal cross bar T′ a little forward of the cam shaft; and on the under side of the lever is an inclined plane m', by means of which the lever is elevated when it moves forward; but when it approaches its most rearward position, it descends and forces down the tube l' by which the newly bent plate or roller is detached from the forming rod k'.

The fourth department of this machine is arranged and employed for forming the buckle tongues. (The machinery for this department is arranged to front the end of the platform.) See Fig. 14. A horizontal frame consisting of side bars A″ A″, cross-bars B″ B″, head piece C″ and projecting bars D″ D″, is attached to the platform. Near the rearward end of the frame, is a transverse horizontal shaft E″, having a crank a' central between its bearings, on the right end a band wheel F″, and on the left end a miter gear wheel b''. Connected to the crank is a shackle-bar G″, which connects to the rear end of a sliding bar H″, supported by the two cross-bars; and to the front end of the sliding bar, is adjusted a swage die d''; the corresponding stationary die e'' being attached to the head-piece, c''. The form of the die d'' is shown in Fig. 17, and the form of the stationary die e'' may be understood by the shape of the swaged tongue represented in Fig. 23. The projecting bars D″ D″ serve as supporters and guides to a vibrating feeding plate I″, in the longitudinal center of which is a groove f'', which serves as a channel through which is passed the wire of which the tongues are made.

A feeder shaft J″ extends from the rear projecting bar, to the projecting end of the rear cross-bar; and on the rearward end of this shaft is mounted a miter gear-wheel g'' to which motion is communicated by the wheel b''. On the front end of the feeder shaft, is an eccentric cam h'', a horizontal binding lever K″ is connected to the feeding plate by a fulcrum pivot n'' and has a pin projecting downward at o''. The eccentric cam in its revolution forces the rearward end of the binding lever to the right, till the pin o'' comes in contact with the wire within the groove, when both the feeding plate and wire are forced to the right. This lever is connected by a wire to a bent spring j'' by which the feeding plate is drawn to the left as often as the cam recedes. But the wire is not carried back; for on the left end of the front projecting bar, is a holding lever k'' connected to the bar by a fulcrum pivot i'' and the front end is drawn to the right by a helical spring m'' which extends from the holding lever to the head piece c'' and by means of which, the right rear corner of the lever is made to press against the wire, and prevent its receding to the left. The wire being thus conducted and passed between the two dies, is cut off by a sharp projection on the left of the stationary die at the moment, and by the operation of swaging the same. The stationary die has a central longitudinal orifice through it, in which is inserted a horizontal detaching rod l'' the front of which is connected to a vertical plate spring c'' the head of which is connected by a wire w'' to a short vertical lever p'' which is connected by a fulcrum pivot, near the head thereof, to a short post q'' erected upon the right side-bar; and a pin u'' projects from the shaft, and in the progress of each revolution thereof, impinges upon the vertical lever, and thus draws back the vertical spring and detaching rod, which detaches the newly swaged tongue from the die.

The machinery of the fifth department consists of two vertical presses of the same form and construction, each consisting of a standard post L″ Fig. 16, with two horizontal projections T″ T″ in front, through which slides a vertical sliding bar M″, to the bottom of which is attached a die u'' which works into, or upon a stationary die s'' adjusted upon the platform below. The head of the sliding bar is connected by a pair of connecting bars N″ to the front end of a vibrating lever O″ which passes through a slot in the head of the post, and has its fulcrum bearings in the two vertical prongs or branches t'' t'' of the post head. The rearward end of the lever rests upon, and

is operated by an eccentric cam P″, mounted on the shaft R″ R″ in the rear, and which has its bearings in two posts S″ S″ Fig. 1. The dies employed in these presses are various. The pair represented in Fig. 16, are employed in closing the roller upon one side of the buckle square, as represented in Fig. 18, another pair are employed to bend the buckle tongue, as represented in Fig. 19. A third pair are employed in closing the buckle tongues upon one side of the buckle square, as represented in Fig. 20.

The modes of communicating motion from the driving shaft R″ R″ to the several departments of the machine, is rendered sufficiently obvious in the drawing Fig. 1 without explanation.

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

1. The combination of the virbating carriage F, (in which is placed the die *c*), the toggle levers or benders K K, the gage bars L L, detacher *e*, holders M and N, and cutting lever O, the whole constructed and operating substantially as herein described, and by means of which a four sided buckle is formed.

2. The combination of the sliding frame J′ and the vibrating hook *i*′ (Fig. 10) with the grooved die H′ and the fly punch *c*′, the whole constructed and arranged substantially as described.

3. The combination of the vibrating jaws U′, the cam P′, and levers V′, with the forming block and rod Q′ *k*′, and sliding bar O′, the whole constructed, arranged and acting substantially as herein described.

ALVIN NORTH.
OLIVER B. NORTH.
STEPHEN FRINK.

Witnesses:
E. A. BULKELEY,
HENRY PERKINS.