(No Model.) 4 Sheets—Sheet 1.

G. WOOD.

METHOD OF AND MACHINE FOR FEEDING SCREWS.

No. 510,224. Patented Dec. 5, 1893.

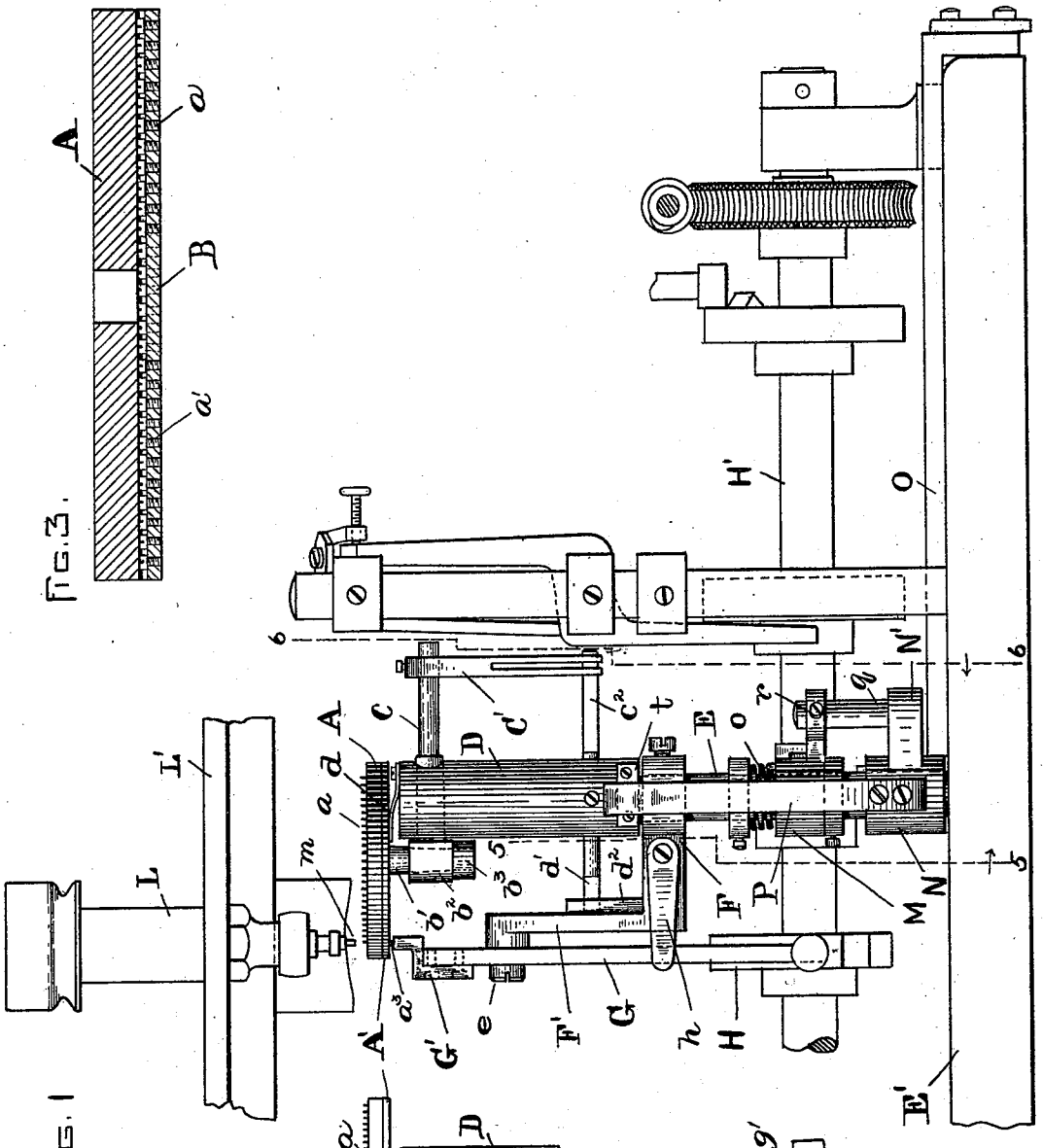

Fig. 3.

Fig. 1

Fig. 2.

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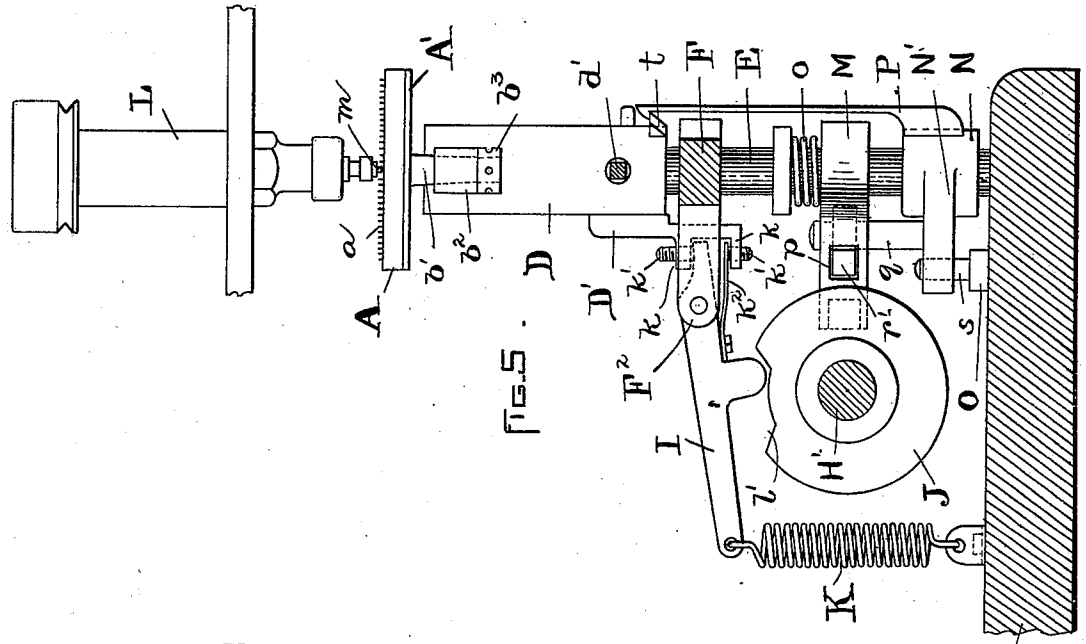

FIG. 5.

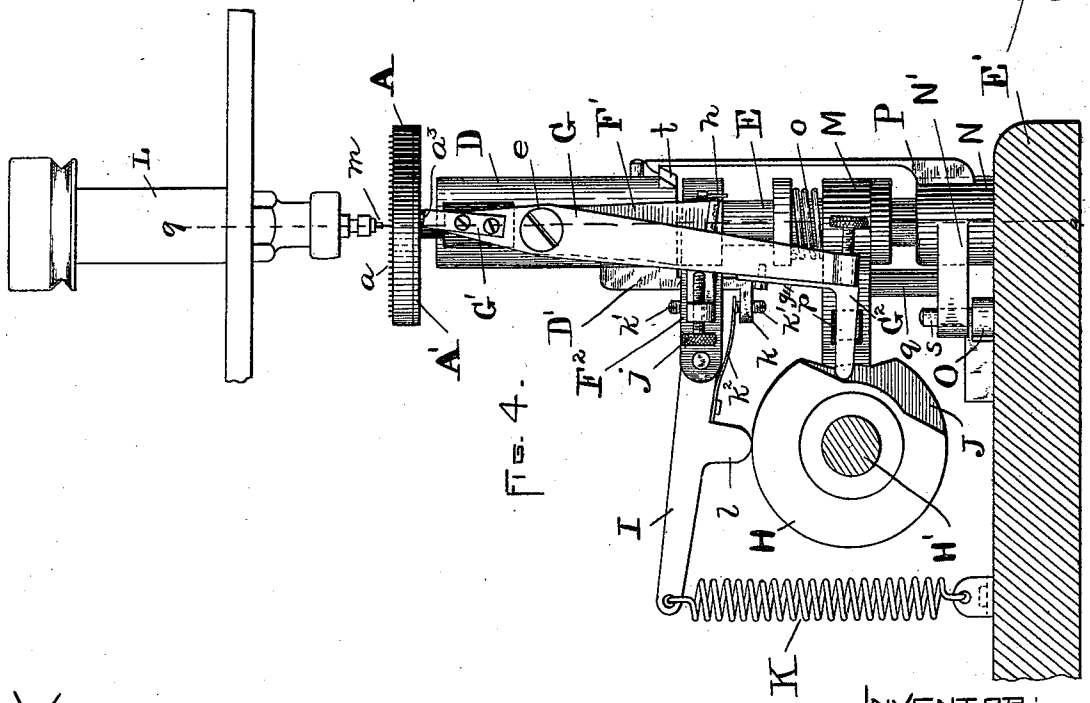

FIG. 4.

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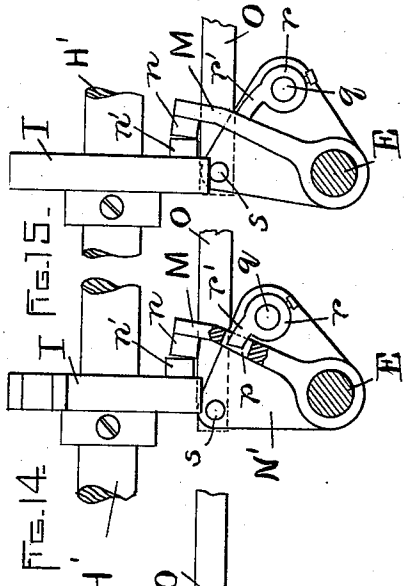

Fig. 15.

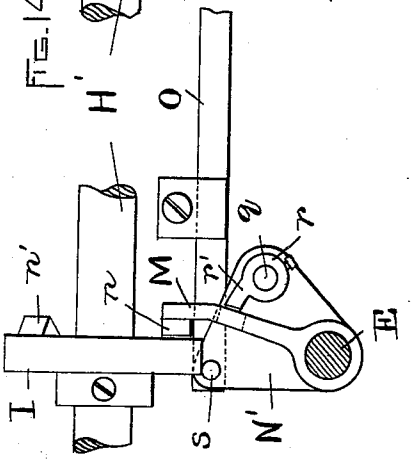

Fig. 14.

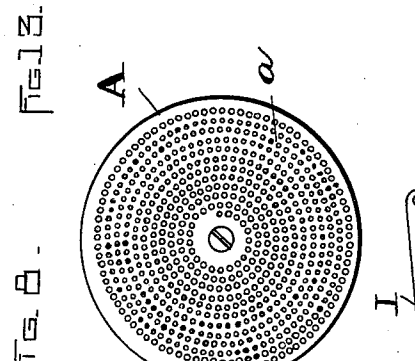

Fig. 13.

Fig. 8.

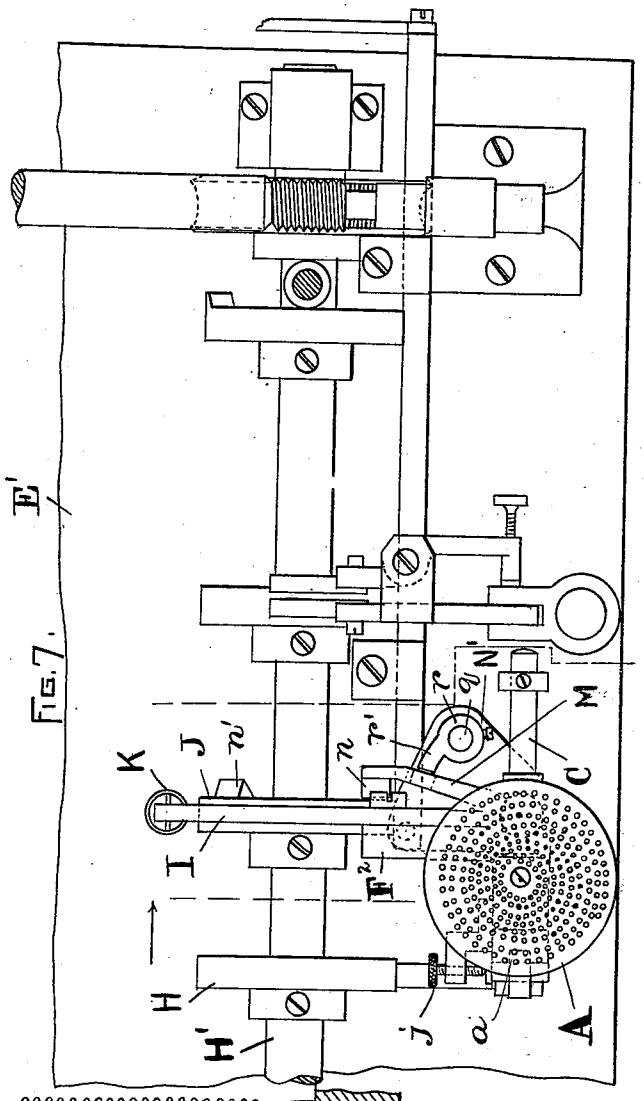

Fig. 7.

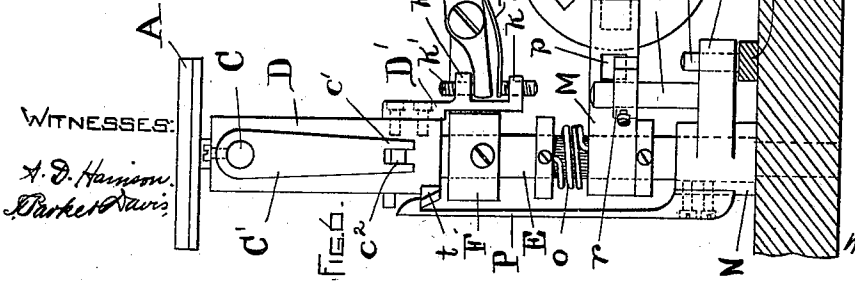

Fig. 6.

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(No Model.) 4 Sheets—Sheet 4.

G. WOOD.

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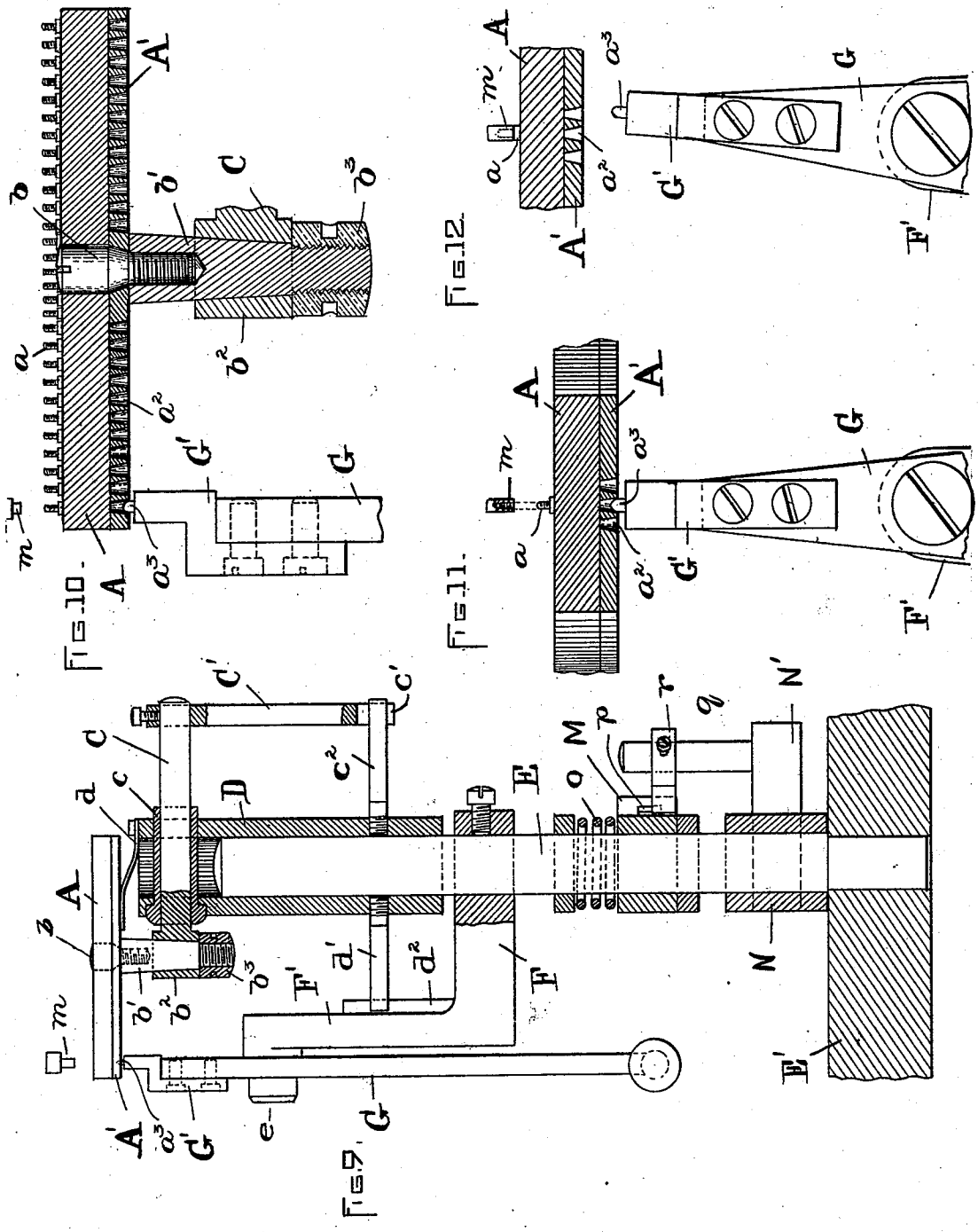

WITNESSES:

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A. D. Harrison.

INVENTOR:

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UNITED STATES PATENT OFFICE.

GLEASON WOOD, OF WALTHAM, MASSACHUSETTS, ASSIGNOR TO THE AMERICAN WALTHAM WATCH COMPANY, OF SAME PLACE.

METHOD OF AND MACHINE FOR FEEDING SCREWS.

SPECIFICATION forming part of Letters Patent No. 510,224, dated December 5, 1893.

Application filed January 13, 1893. Serial No. 458,218. (No model.)

To all whom it may concern:

Be it known that I, GLEASON WOOD, of Waltham, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Methods of and Machines for Feeding Screws of which the following is a specification.

This invention relates to a method of and machine for feeding screws to a polisher which is to act on the heads of such screws.

One object in view is to provide an improved method of feeding the screws, which method will insure their uniform delivery to the polisher in regular order.

Another object is to provide automatically operating mechanism to carry out the invention.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 shows a front elevation of the complete mechanism. Fig. 2 shows a side view of the platen which carries the screws, the feed-dog which operates the platen, and the cam for actuating said feed-dog. Fig. 3 shows a sectional view of a guide-plate and the platen illustrating the manner of attaching the screws to the platen. Fig. 4 shows a side or end view of the complete mechanism. Fig. 5 shows a vertical section on line 5—5, of Fig. 1, the platen being represented in its raised position. Fig. 6 shows a vertical section taken on line 6—6 of Fig. 1. Fig. 7 shows a plan view of the machine. Fig. 8 shows an enlarged plan view of the screw-carrying platen with screws properly arranged thereon. Fig. 9 shows an enlarged vertical section taken on the line 9—9 of Fig. 4. Fig. 10 shows an enlarged sectional detail of the screw-holding platen. Fig. 11 shows an enlarged detail of one end of the feed-dog represented in engagement with the screw-carrying platen. Fig. 12 shows the same parts out of engagement. Fig. 13 shows a plan view of the automatic stop-parts in their normal relation. Fig. 14 shows a similar view of the same parts, illustrating the action during the regular operation of the machine. Fig. 15 shows a similar view illustrating the function of these stop parts.

In carrying out my invention I fasten a number of screws, *a*, heads downward upon a movable platen A, and my preferred method of attaching the screws is to first deposit them upon a guide-plate B, provided with a series of holes or sockets, *a'*, arranged in the form of an involute spiral and adapted to receive the shanks of the screws. The shanks of the screws are worked into the holes or sockets and when the platen A, which has been previously coated with shellac or some other suitable adhesive substance and warmed to soften such substance, is placed face downward on the screw-heads which will adhere to the shellac, and upon lifting the platen the screws are brought with it and will be found adhering to its face and in regular spiral order, as best illustrated in Fig. 7.

A plate A' containing a series of tapered holes a^2 corresponding with the screws *a*, *i. e.* in involute spiral order and one for each screw, is fitted against the under side of the platen and both the platen and this perforated plate are mounted on a stud *b*, the perforated plate being suitably connected with the platen to prevent it moving independently thereof. The stud *b* screws into a spindle *b'*, which engages through a bearing b^2 on one end of a horizontal supporting rod C, the spindle having a threaded end which receives a nut b^3, to hold it in the bearing. The horizontal rod C fits through a transverse slide-way *c* in the upper end of a sleeve D on the main shaft or standard E of the machine, which standard is fastened on a suitable base E'. The platen may be rotated and a brake in the form of a flat spring *d* is fastened to the top end of the sleeve D, and bears against the under side of the platen. The platen may also move laterally, the supporting rod C sliding in the slide-way *c*, and is held true during its lateral movement by means of an arm C' fixed on the rod C, and having a slotted lower end *c'* which engages a guide-pin c^2 fastened on the sleeve D. Said sleeve may move on the standard E and is guided in such movement by a pin *d'*, fastened to the sleeve and engaging a vertical guide-way d^2 on the vertical arm F' of a bracket F which is fixed on the standard E.

An intermittent combined rotary and lateral motion is imparted to the platen by a feed-dog in the form of a lever G pivoted at

e to the arm F′ and carrying a head G′ at the upper end, said head having a finger a^3 projecting from its outer end and provided with a tapered extremity which is adapted to engage the holes a^2 in the plate on the under side of the platen. The lever G carries a heel-piece G^2 at its lower end, said heel-piece having a flexible shank g, one end of which is fastened to the lever; and adjustment screw g' bears against the rear side of the heel-piece, whereby wear may be taken up. The heel-piece of the feed-lever is held by a spring h against the periphery of a cam H mounted on the drive-shaft H′ of the machine, and having a recess i for the heel-piece to enter and permit the desired movement of the feed-lever. An adjustment screw j is carried by the bracket F and by it the movement of the feed-lever may be regulated.

A lever I is pivoted to an arm F^2 of the bracket F, and one end of the lever has position between arms k of a bracket D′ on the sleeve D, each of said arms k carrying an adjustment screw k'. The lever bears against the adjustment screw of the upper arm, and a flat spring k^2, fastened to the lever bears against the adjustment screw of the lower arm. The lever has a shoe l which bears on the periphery of a cam J having a recess l' for said shoe to enter. A spiral spring K connects the outer end of the lever with the base E′ and holds said lever against the cam.

An internally threaded chuck m is carried by a rotary spindle L and has position over the platen. This chuck is to take the screws from the platen and carry them to the polisher and the table L′ which carries the chuck has an intermittent movement.

The operation of feeding the screws is as follows—In the commencement of the operation, the chuck m stands over the first outside screw of the spiral series. The lever I drops into the recess of the cam J, and being actuated by the spring K raises the platen sufficiently to enter the screw above mentioned, into the chuck, and as the latter rotates, its internal threads engage those of the screw and detach the latter from the plate by breaking the shellac connection. The platen then drops as the lever I rides up on the periphery of the cam, and the chuck takes the screw away, another similar chuck taking the place of the first named one. When the platen lowers, the tapered hole a^2 in the plate on the under side of the platen, which hole corresponds with the second screw of the spiral series, receives the finger a^3 on the feed-dog head and the sides of the hole and the end of the said finger are tapered sufficiently to impart the slight lateral movement of the platen which is necessary to bring the screw to the proper position in view of the spiral arrangement of the screws which brings each screw a slight degree nearer the center of the platen than the screw next in front of it. The heel-piece of the feed-dog now occupying the recess of the cam H, the revolution of said cam moves the feed-dog, and the finger at the upper end of the latter moves the platen one step by reason of its engagement in the hole a^2, and brings the second screw of the spiral series in the proper position under the chuck. Then the platen raises as before and the screw is detached and carried away. This operation continues until all the screws have been taken away, the platen moving a very slight degree laterally with the removal of each screw, and being rotated step-by-step by the feed-dog.

A safety stop-device is provided to throw the mechanism out of gear in case the platen does not move upward the proper distance, as for instance in the event of a screw encountering the end of the chuck by reason of not having been brought to the proper position, or of a screw not having been removed from the chuck. A horizontal arm M is mounted on the standard E and has a lateral lug n at the outer end and held against one side of the cam J by a spring o coiled about the standard E and having one end fixed and the other end connected with the horizontal arm M. The lateral lug n on said horizontal arm stands in the path of a beveled lug n' on the cam J, and the said arm has a square opening p through it. A sleeve N mounted on the standard E below the horizontal arm M has a segment-shaped lateral arm N′ carrying an upright pin q on which a collar r is fastened, said collar having a curved lug r' adapted to enter the square-hole p in the arm M. The segment shaped arm N′ receives a pin s on a shifter bar O, which will be connected with a suitable device for throwing the machine out of gear. The sleeve N is connected with the platen-sleeve D by a long pawl P which is fastened at the lower end to the sleeve N and at the upper end engages the upper side of a lug t on the sleeve D. The platen is designed to move upward a distance exactly equal to that between the lower side of the square opening in the horizontal arm M and the lower side of the lug r' on the collar r, when these parts are in their normal relation with the collar N at the limit of its downward movement. Hence when the platen raises the proper distance, the lug r' is brought up to a position where the square hole p may receive it and when the lug n' on the cam J encounters the lateral lug n on the arm M, the latter moves to the position shown in Fig. 14, the lug r being received by the hole p, and hence the sleeve N and attached parts are not affected. But should the plate from any cause not move upward to the required extent, then the lug r' will not be brought to a position where it may enter the hole p and when the lug n' encounters the lug n and moves the arm M, the latter bearing against the lug r' turns the sleeve N as indicated in Fig. 15, and thereby the shifting-bar O is moved and the mechanism thrown out of gear. When the sleeve N is turned, the upper end of the connecting pawl P slides over the lug t on the sleeve D.

It is evident that the method herein described might be carried out by other means than here shown, and also that the screws might be arranged in some way other than the involute spiral order shown. It is also evident that the construction and arrangement of mechanical parts might be varied without departing from the invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The method of feeding screws, consisting in first fastening them by their heads in regular order on the flat surface of a movable platen, moving said platen step-by-step to bring the screws successively to a certain point, detaching the screws one by one from said platen as they arrive at such point, and conveying them away as they are detached.

2. The method of feeding screws, consisting in first fastening them in involute spiral order on a movable platen, moving said platen step-by-step to bring the screws successively to a certain point, detaching the screws as they arrive at such point, and conveying them away as they are detached.

3. In a machine for feeding screws, the combination of a movable platen carrying the screws having a flat surface to which the screws are fastened by their heads in regular order, an intermittently operating feed device for moving the platen step-by-step to bring the screws thereon successively to a certain point, and a chuck to remove the screws as they arrive at such point.

4. In a machine for feeding screws, the combination of a platen carrying the screws and capable of rotary, lateral and vertical movement, a feed-device for moving the platen step-by step to bring the screws successively to a certain point, a chuck above the platen to remove the screws as they arrive at such point, and a lifting device to intermittently raise the platen for the purpose described.

5. In a machine for feeding screws, the combination of a rotatable and laterally movable platen carrying the screws in regular order on its upper surface and having tapering depressions in the under side corresponding with the screws on the upper side, a feed-dog having a finger adapted to engage the said depressions in the under side of the platen, means for intermittently actuating the said feed-dog whereby the platen may be moved step-by-step to bring the screw successively to a certain point, and a chuck to remove the screws as they arrive at such point.

6. In a machine for feeding screws, the combination of a rotatable and laterally movable platen carrying the screws in regular order on its upper surface and having tapering depressions on the under side corresponding with the screws on the upper side, a feed-lever having a finger adapted to engage the said depressions in the under side of the platen, a cam engaging said feed lever and arranged to intermittently actuate the same whereby the platen may be moved step-by-step to bring the screws successively to a certain point, and a chuck to remove the screws as they arrive at such point.

7. In a machine for feeding screws, the combination of a platen carrying the screws and capable of rotary, lateral and vertical movement, a feed-device for moving the platen step-by-step to bring the screws successively to a certain point, a chuck above the platen to remove the screws as they arrive at such point, a lever for lifting the platen, and a cam engaging said lever.

8. In a machine for feeding screws, the combination of a suitable standard, a sleeve thereon having a transverse slide-way, a horizontal arm engaging said slide-way and having a bearing at one end, a rotatable platen having a spindle in the said bearing and carrying the screws, a feed-device for moving said platen step-by-step to bring the screws successively to a certain point, a chuck arranged to have position above such point, a lever engaging the sleeve on the standard, and means for intermittently actuating said lever.

9. In a machine for feeding screws, the combination of a suitable standard, a sleeve thereon, a movable platen supported by said sleeve and carrying the screws, a feed-device to move said platen step-by-step and bring the screws successively to a certain point, a chuck above such point, a lever engaging the platen-supporting sleeve, a cam engaging said lever and having a lateral projection, a horizontal spring-actuated arm on the standard and having a lateral projection on the path of that on the cam and an opening, a sleeve on the standard connected with the platen supporting sleeve and having a horizontal arm with a vertical pin and a collar thereon having a lug to enter the opening in the horizontal spring-actuated arm, and a shifter-bar connected with the horizontal arm on the sleeve.

10. In a machine for feeding screws, the combination of a suitable standard, a sleeve thereon having a projection, a movable platen supported by said sleeve and carrying the screws, a feed-device to move said platen step-by-step and bring the screws successively to a certain point, a chuck above such point, a lever engaging the platen-supporting sleeve, a cam engaging said lever, and having a lateral projection, a horizontal spring-actuated arm on the standard and having a lateral projection in the path of that on the cam and an opening, a sleeve on the standard connected with the platen supporting sleeve by a pawl which engages the projection on the latter, and having a horizontal arm with a vertical pin and a collar thereon having a lug to enter the opening in the horizontal spring-actuated arm, and a shifter-bar connected with the horizontal arm on the sleeve.

11. In a machine for feeding screws, the combination of a suitable standard, a sleeve

thereon, a movable platen supported by said sleeve and carrying the screws, a feed-device to move said platen step-by-step and bring the screws successively to a certain point, a chuck above such point, a lever engaging the platen-supporting sleeve, a cam engaging said lever, and an automatic stop-device to throw the machine out of gear when the platen does not rise the required distance.

12. The method of preparing screws or other like articles for presentation to an organized mechanism, the same consisting in assembling said articles in regular order with their heads in the same plane, and cementing them by their heads as so assembled to a platen or holder.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 7th day of January, A. D. 1893.

GLEASON WOOD.

Witnesses:
C. H. MANN,
J. H. SNOW.