(No Model.) 2 Sheets—Sheet 1.

A. EPPLER, Jr.

MACHINE FOR FEEDING AND SETTING LACING HOOKS.

No. 255,076. Patented Mar. 14, 1882.

Fig. 3.

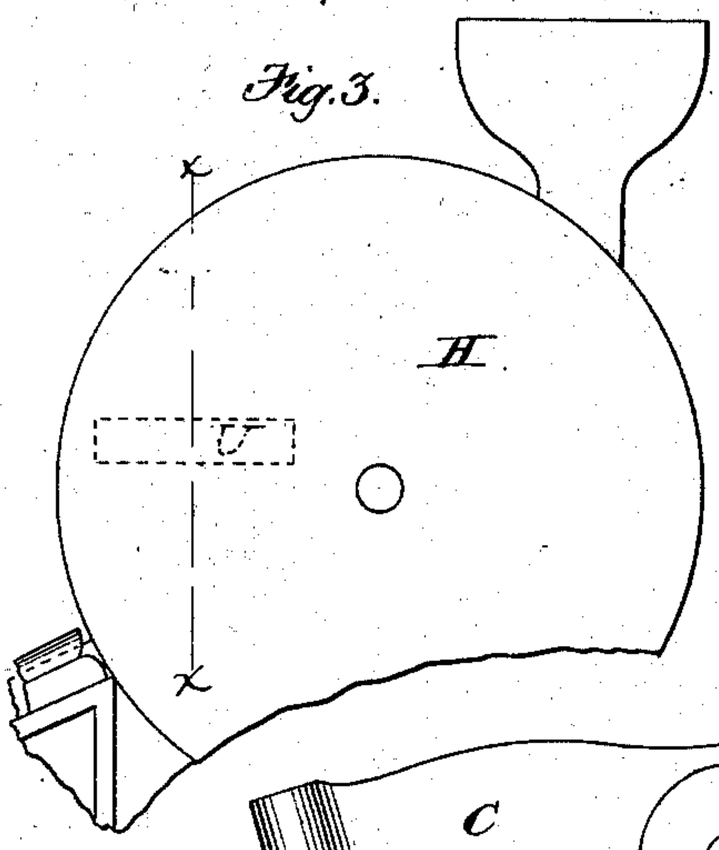


Fig. 4.

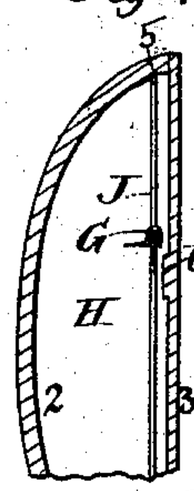


Fig. 5.

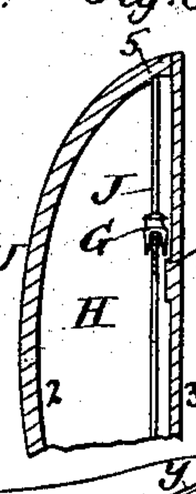
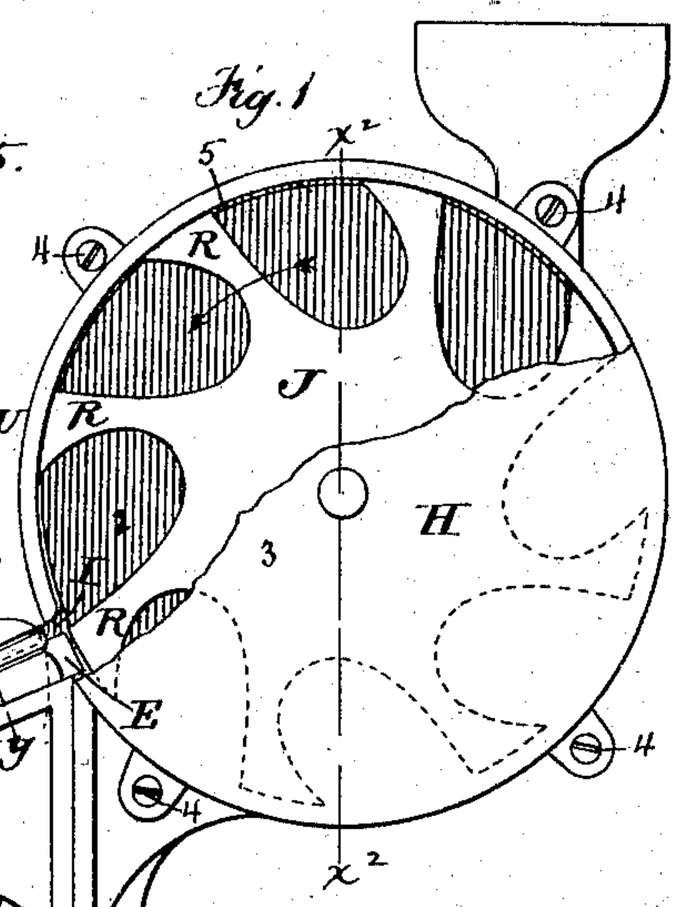


Fig. 1.



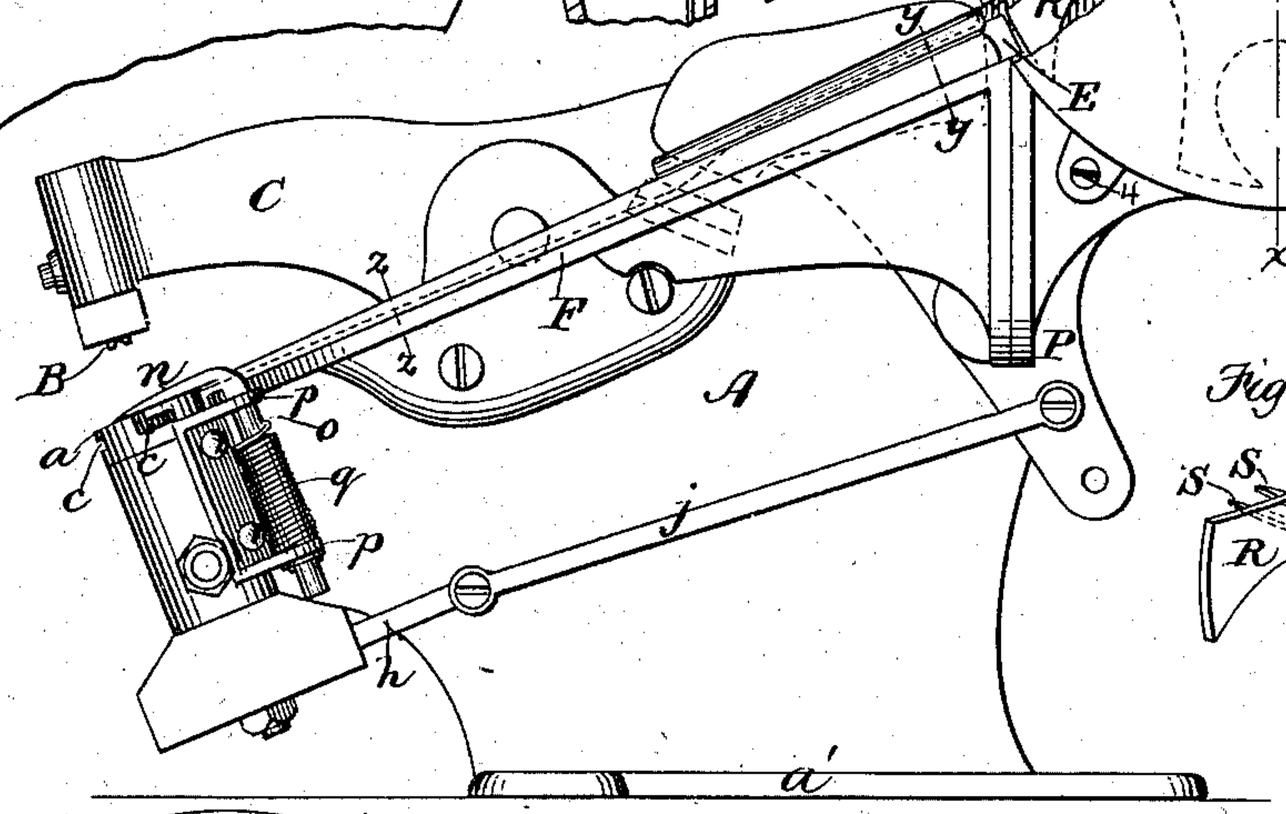


Fig. 6.

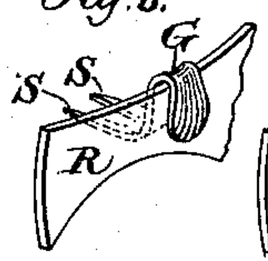


Fig. 7.

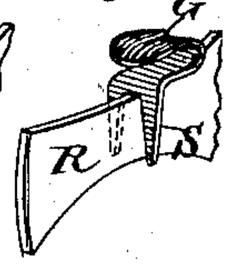


Fig. 8.

Fig. 9.

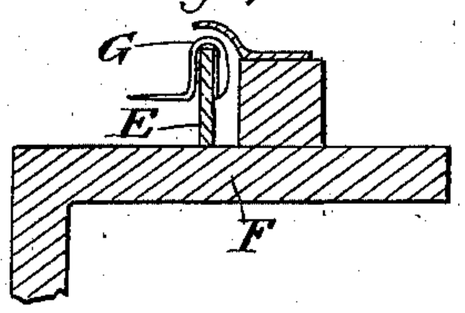
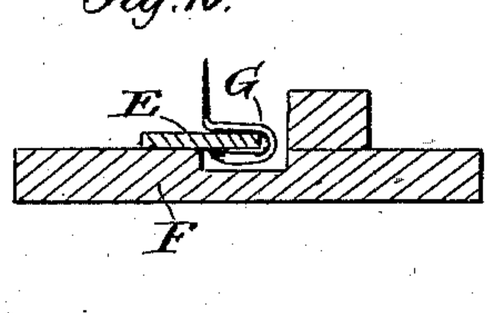


Fig. 10.



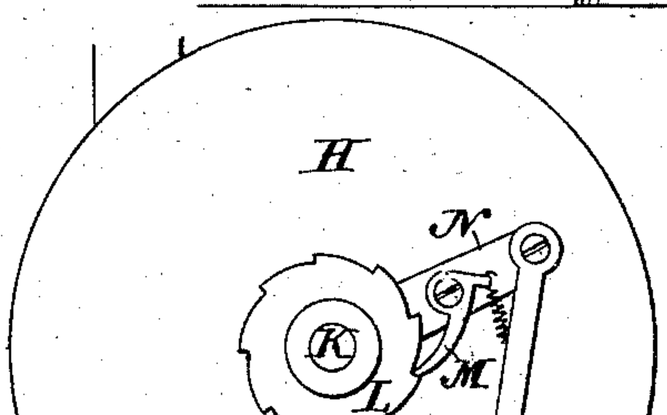
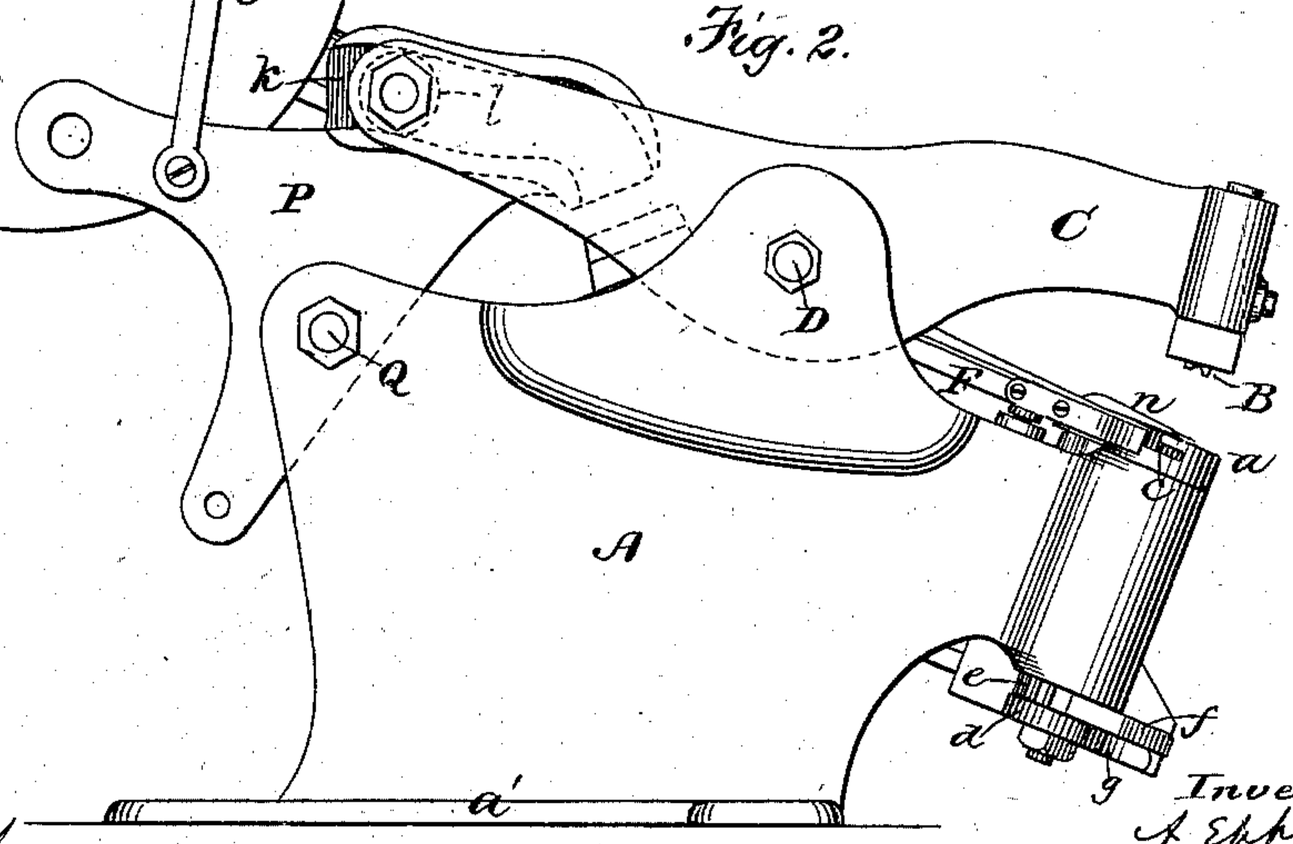


Fig. 2.



Witnesses.
Joseph Cutler
A. L. White.

Inventor
A. Eppler Jr.
by Wright Brown
Attys.

(No Model.)

2 Sheets—Sheet 2

A. EPPLER, Jr.

MACHINE FOR FEEDING AND SETTING LACING HOOKS.

No. 255,076. Patented Mar. 14, 1882.

Fig. 12.

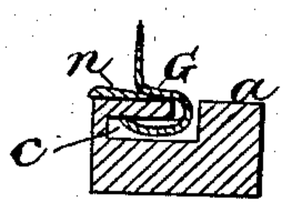


Fig. 11.

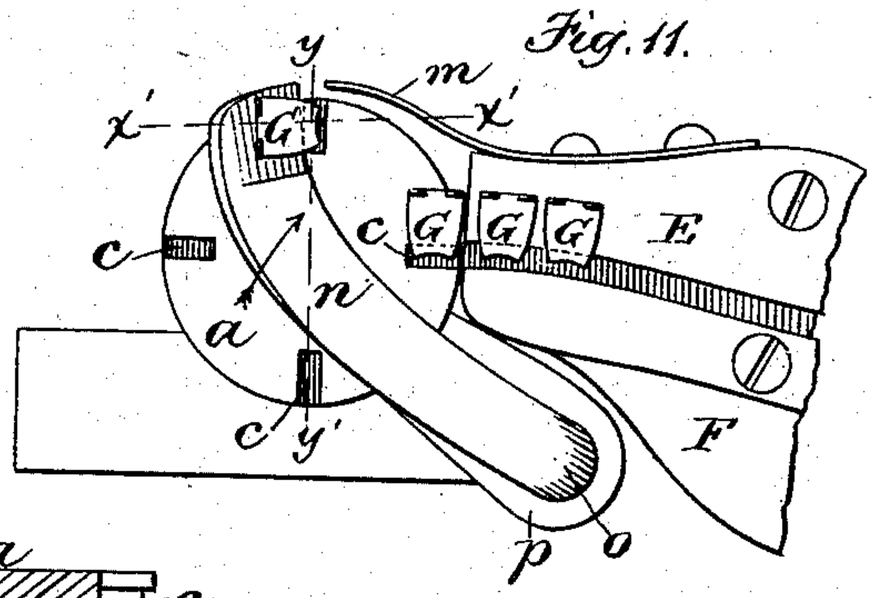


Fig. 13

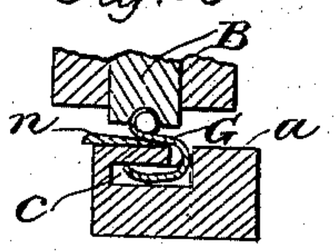


Fig. 14.

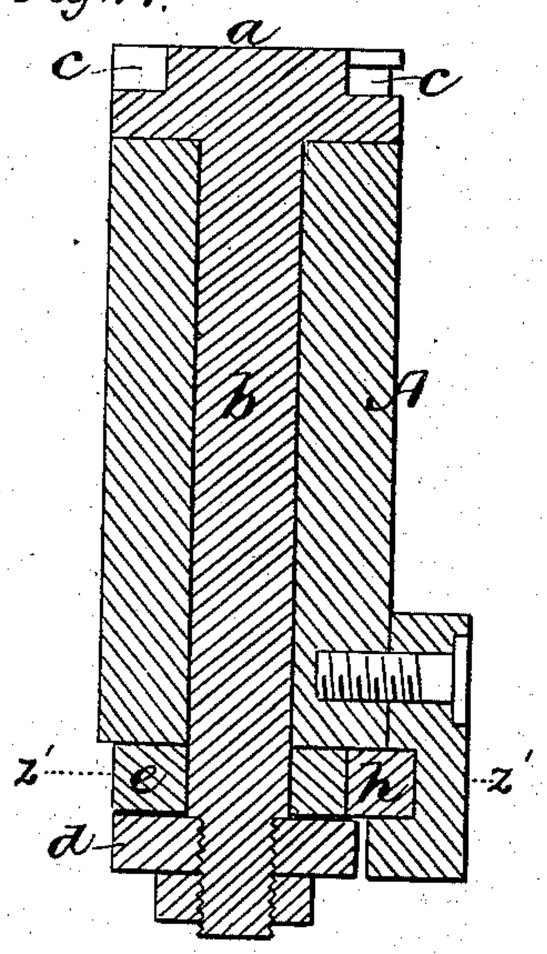


Fig. 15.

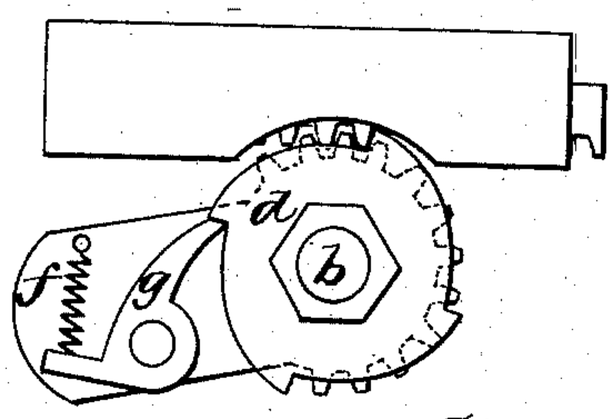


Fig. 16.

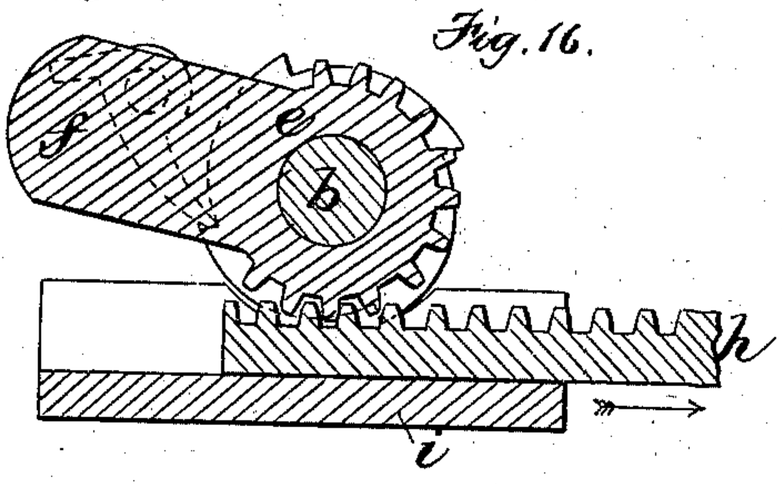


Fig. 17.

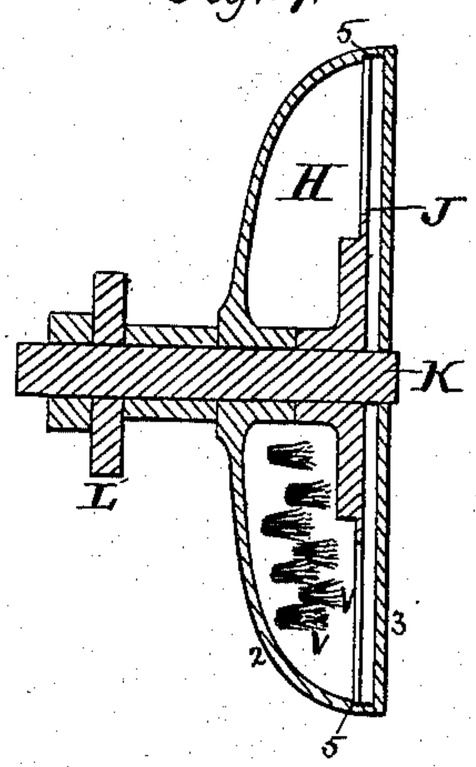


Fig. 18.

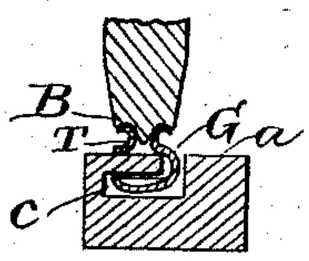
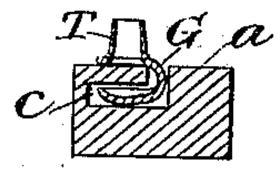


Fig. 19.



Witnesses.
Joseph Cutler
A. L. White.

Inventor
A. Eppler Jr.
by Wright Brown
Attys

UNITED STATES PATENT OFFICE.

ANDREW EPPLER, JR., OF QUINCY, MASSACHUSETTS, ASSIGNOR TO DAVID WHITTEMORE, OF SAME PLACE.

MACHINE FOR FEEDING AND SETTING LACING-HOOKS.

SPECIFICATION forming part of Letters Patent No. 255,076, dated March 14, 1882.

Application filed January 31, 1882. (No model.)

To all whom it may concern:

Be it known that I, ANDREW EPPLER, Jr., of Quincy, in the county of Norfolk and State of Massachusetts, have invented certain Improvements in Machines for Feeding and Setting Lacing-Hooks, of which the following is a specification.

This invention has for its object to provide an improved machine for securing lacing-hooks or equivalent fastening devices to the material or article to which they pertain, the hooks being automatically fed from a reservoir and conducted automatically to the setting or compressing device.

The invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figures 1 and 2 represent elevations of opposite sides of a machine embodying my invention. Fig. 3 represents a side elevation of the reservoir. Figs. 4 and 5 represent sections on line *x x*, Fig. 3. Figs. 6 and 7 represent perspective views of lacing-hooks in different positions on the arm of the feed-plate. Fig. 8 represents a perspective view of another form of hook adapted to be used by the machine. Figs. 9 and 10 represent respectively sections on lines *y y* and *z z*, Fig. 1. Fig. 11 represents an enlarged top view of a part of the machine. Figs. 12 and 13 represent sections on line *x' x'*, Fig. 11. Fig. 14 represents a section on line *y' y'*, Fig. 11. Fig. 15 represents a bottom view of the feed-operating mechanism. Fig. 16 represents a section on line *z' z'*, Fig. 14. Fig. 17 represents a section on line x^2 x^2, Fig. 1. Figs. 18 and 19 represent sections on line *x' x'*, Fig. 11, showing the adaptation of the machine to the hook shown in Fig. 8.

The same letters of reference indicate the same parts in all the figures.

In the drawings, A represents the supporting-frame of the machine, adapted to be secured by its base *a'* to a table or support.

B represents the setter or compressor to secure the fastening devices to the material. The setter is supported on the end of a lever, C, which is pivoted at D to the frame A, and is oscillated by suitable means to alternately raise and lower the setter.

E represents the roadway or guide for the lacing-hooks, said roadway being composed of a metallic guiding-strip, secured to an inclined flange, F, formed on the frame A. Said guide is set edgewise on said flange, at its upper end, as shown in Figs. 1 and 9, so that a lacing-hook, G, may bestride its upper edge, the hook being in a vertical position. Part-way down the guide is given a quarter-twist, so that it lies flat upon the flange F, as shown in Fig. 10, and changes the position of a hook sliding upon its edge, so that the hook becomes horizontal. The flange F is provided with a channel under the flat portion of the guide E, for the reception of the outer arm of the hook.

H represents the reservoir for the lacing-hooks, said reservoir being secured to the frame A at the upper end of the guide or roadway E, the latter projecting into an orifice, I, in the reservoir. One side of the reservoir is preferably flat and the other side dish-shaped, as shown in Figs. 4 and 5. Within the reservoir H is a rotary feeding-plate, J, which is rotated, step by step, by a shaft, K, journaled in the reservoir, a ratchet, L, on said shaft, a dog, M, pivoted to an arm, N, journaled on said shaft, and a connecting-rod, O, which connects the arm N with one of the arms of an operating-lever, P, which is pivoted at Q to the frame A. The plate J is provided with a series of arms, R. One edge of each arm is curved, so that it meets the adjacent edge of the next arm without an angle, such adjacent edge being approximately straight. The plate J rotates in the direction of the arrow in Fig. 1, and the forward curved edge of each arm R, passing through the accumulated lacing-hooks in the lower portion of the reservoir, engages with one or more hooks which bestride said edge. As the plate rotates and the arms move upwardly, so that the curved edges become inclined downwardly, the hooks slide inwardly by gravitation, and finally slide outwardly upon the straight rear edges of the arms. Said edges are arranged to coincide with the guide E when they attain a considerable downward and out-

ward inclination, as shown in Fig. 1, so that the hooks will slide from each arm R onto the guide and pass down the latter. It will be seen, therefore, that the front or curved edges of the arms act as collectors and the rear or straight edges as chutes to discharge the hooks upon the guide E, the hooks being thus supplied to the inserting mechanism with sufficient rapidity.

One variety of lacing-hook G is secured to the material or article to which it belongs by means of prongs S S. (See Figs. 6 and 7.) In another variety the hook is secured by means of a tubular shank, T, (see Figs. 8, 18, and 19,) which is inserted into the material and upset like an eyelet. Each of these varieties can be used in this machine. The pronged hook is liable, however, to bestride the arms R of the rotary feed-plate in the improper position shown in Figs. 5 and 7, instead of the proper position shown in Figs. 4 and 6. When the hook is thus improperly placed one of its edges projects laterally toward the flat side of the reservoir H farther than the head of the hook projects when properly placed, as will be seen by reference to Figs. 4 and 5.

U represents an inwardly-projecting piece or shoulder attached to the flat side of the reservoir H, in the position shown in dotted lines in Fig. 3, and in section in Figs. 4 and 5, and arranged to collide with the projecting edges of improperly-placed hooks and dislodge them from the arms of the plate J, thus preventing such hooks from reaching the roadway E. The properly-placed hooks pass by the shoulder U without touching it.

V V represent tufts of bristles set in one side of the lower portion of the box H, to prevent the hooks from becoming clogged or interlocked in the lower portion of the reservoir.

The reservoir H is composed of two parts—viz., the concave or dish-shaped side 2, which constitutes the body of the reservoir, and is attached to the support A, and the flat side or cover 3, which is detachably secured to the part 2 by screws 4. The dish-shaped part 2 has a groove, 5, at the margin of its concave side, in which groove the outer ends of the arms R move when the plate J is rotated. Said groove prevents any portions of the lacing-hooks from lying in such position that they will get between the outer ends of the arms R and the proximate surfaces of the reservoir over which said ends move when the plate J is rotated. The groove therefore makes it impossible for the hooks to clog or obstruct the plate and to wear the outer ends of the arms R. The inner sides of the arms of the plate J bear against the shoulder formed by the groove 5, as shown in Figs. 4, 5, and 17. When the tubular-shanked lacing-hooks shown in Fig. 8 are employed, the projection U (shown in Figs. 3, 4, and 5) is not used, and only sufficient space is provided between the outer side of the plate J and the cover 3 of the reservoir to properly receive the head or outer portion of the hook. This space may be varied to suit different-sized heads or hooks by tightening or loosening the screws which secure the cover 3 to the part 2, suitable washers being inserted between the part 2 and cover 3 to hold the cover at the desired distance from the part 2.

At the lower end of the roadway E and under the setter B is a disk or plate, *a*, attached to a vertical spindle, *b*, which is adapted to rotate in a bearing in the frame A. The plate *a* is provided with a series of radial recesses or pockets, *c*, each of which is of sufficient size to receive the neck and head of one of the hooks G, as shown in Figs. 12 and 13. The spindle *b* is provided with mechanism, whereby it is rotated step by step, and each step or rotation is of sufficient length to move a recess or pocket, *c*, of the plate *a* from the lower end of the roadway E to a point under the setter B. The mechanism employed in the present instance for rotating the spindle and plate is composed of a ratchet, *d*, rigidly attached to the lower end of the spindle, a segmental pinion, *e*, journaled to rotate loosely on said spindle, and having an arm, *f*, to which is pivoted a pawl, *g*, engaging with the teeth of said ratchet, and a reciprocating rack, *h*, sliding in a fixed guide, *i*, and engaging with the teeth of the pinion *e*. The rack *h* is connected by a rod, *j*, with the three-armed operating-lever P, and is reciprocated by the oscillation of said lever on its pivot. The lever P is provided on one of its arms with a curved groove, *k*, which receives a stud or friction-roller, *l*, on the rear end of the setter-carrying lever C. The third arm of the lever P is connected with a treadle or other device by which said lever is oscillated. The setter and the feed-plate are therefore both operated by the lever P.

m represents a thin metal plate attached to the flange F, and having its outer end in close proximity to the plate *a*, as shown in Fig. 11, and occupying such a position that it will force the hooks G into their proper place as they come under the setter, as hereinafter described.

n represents an arm resting upon the upper surface of the plate *a*, and adapted to oscillate thereon, said arm being attached to a rod, *o*, which is journaled in lugs *p p* on the frame A.

q represents a spring adapted to rotate the rod and impel the arm *n* in the direction indicated by the arrow in Fig. 11. The outer end of the arm *n* has the form of a thin wedge, as shown in Figs. 12 and 13, and this wedge-shaped portion is adapted to support each of the pronged hooks when it is brought under the setter, as hereinafter described.

The operation is as follows: The setter being raised, as shown in Figs. 1 and 2, the plate *a* is held so that one of its recesses or pockets will receive a hook from the roadway E, as shown in Fig. 11. The lever P is then turned on its pivot, so as to force the setter downwardly upon the prongs or the tubular shank of the hook, upsetting said prongs or shank, as shown in Figs. 13 and 18. The lever P is

then turned so as to raise the setter, and at the same time moving the rack *h* in the direction indicated by the arrow in Fig. 16. The rack is thus caused to rotate the pinion *e*, and cause the pawl *g*, pivoted to the arm of said pinion, to engage with the ratchet *d*, and rotate the latter a distance equal to the length of one tooth, thereby giving the plate *a* a sufficient rotation to simultaneously bring to the front the recess or pocket containing the hook last secured, so that the button can be removed, move the pocket which last received a hook from the roadway into position under the setter, and move another pocket into position to receive a hook from the roadway. In case the hook sliding into the pocket of the plate *a* from the roadway does not reach the inner end of said pocket, the spring *m* bears against the hook while the latter is being brought under the setter, and pushes it properly into the pocket of the feed-plate. The feed-plate J of the reservoir H is rotated step by step by its described connection with the lever P.

As before stated, the machine is capable of operating with either pronged or tubular shanked hooks.

The wedge-shaped arm *n*, above described, is intended for use only in connection with pronged hooks. When such a hook is being brought forward to its position under the setter the portion of the hook resting on the upper surface of the plate *a* is moved by the motion of said plate upon the inclined surface of the arm *n*. The entire hook is thus slightly lifted, so that the portion of the hook that is in the pocket below the upper surface of the plate *a* is pressed tightly against the upper surface of said pocket. The hook is thus firmly held, so that its prongs cannot wabble or be accidentally displaced while the setter is descending and curling them over, as shown in Fig. 13. After the prongs have been upset and the setter rises the hook, with the material to which it is attached, may be moved laterally out of the pocket in which it rested. In case the plate *a* is rotated before the inserted hook is removed, the spring *q* enables the arm *n* to yield and move with the plate, so that no injury is caused to the hook or to the arm.

The setter used in connection with the pronged hooks has a concavity which acts on the prongs, as shown in Fig. 13.

When the machine is to be used with tubular-shanked hooks the arm *n* is removed and a setter such as is used for upsetting eyelets is employed, as shown in Fig. 18.

I do not in this application claim the mechanism for operating the rotary feed-plate and the setter, as said mechanism is shown and claimed in another application.

I claim—

1. In a machine for feeding and attaching lacing-hooks, the reservoir having the rotary feeding-plate provided with arms, substantially as described, adapted to collect and discharge lacing-hooks, as set forth.

2. The reservoir having upon one of its sides an inwardly-projecting shoulder, whereby the lacing-hooks, when improperly placed upon the rotary feeding-plate, are dislodged from said plate, as set forth.

3. The combination of the reservoir having an aperture, I, the inclined guide or roadway set edgewise and projecting at its upper end into said opening, and the substantially vertical intermittently-rotating feeding-plate having arms R, adapted to collect lacing-hooks in the reservoir, each arm coinciding with the roadway when in an inclined position, whereby the hooks collected upon said arms are caused to slide upon the roadway, as set forth.

4. In a machine for feeding and attaching lacing-hooks, the reservoir having the substantially vertical intermittently-rotating feeding-plate having arms R, and the fixed tufts of bristles, whereby the accumulated hooks are prevented from interlocking and impeding the action of the feeding-plate, as set forth.

5. The combination, with the rotary feeding and supporting plates, of the spring-impelled yielding wedge, adapted to insert itself under the neck of a pronged lacing-hook, when the latter is moved forward by said plate, and thereby firmly hold and support said hook for the action of the compressor, as set forth.

6. The reservoir having the rotary armed feed-plate J and a groove, 5, receiving the outer ends of the arms of said feed-plate, whereby the lacing-hooks are prevented from clogging the plate and from wearing the outer ends of the arms thereof, as set forth.

7. The reservoir having the rotary feed-plate J, the groove 5, receiving the outer ends of the arms of said feed-plate, and the cover 3, secured to the body of the reservoir by screws, whereby the space between the outer side of the plate J and the cover 3 may be regulated, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 30th day of December, A. D. 1881.

ANDREW EPPLER, JR.

Witnesses:
C. F. BROWN,
A. L. WHITE.