(Model.) 3 Sheets—Sheet 1.

# E. WOODWARD & M. BROCK.

## Machine for Making Tack Strips.

No. 230,386. Patented July 20, 1880.

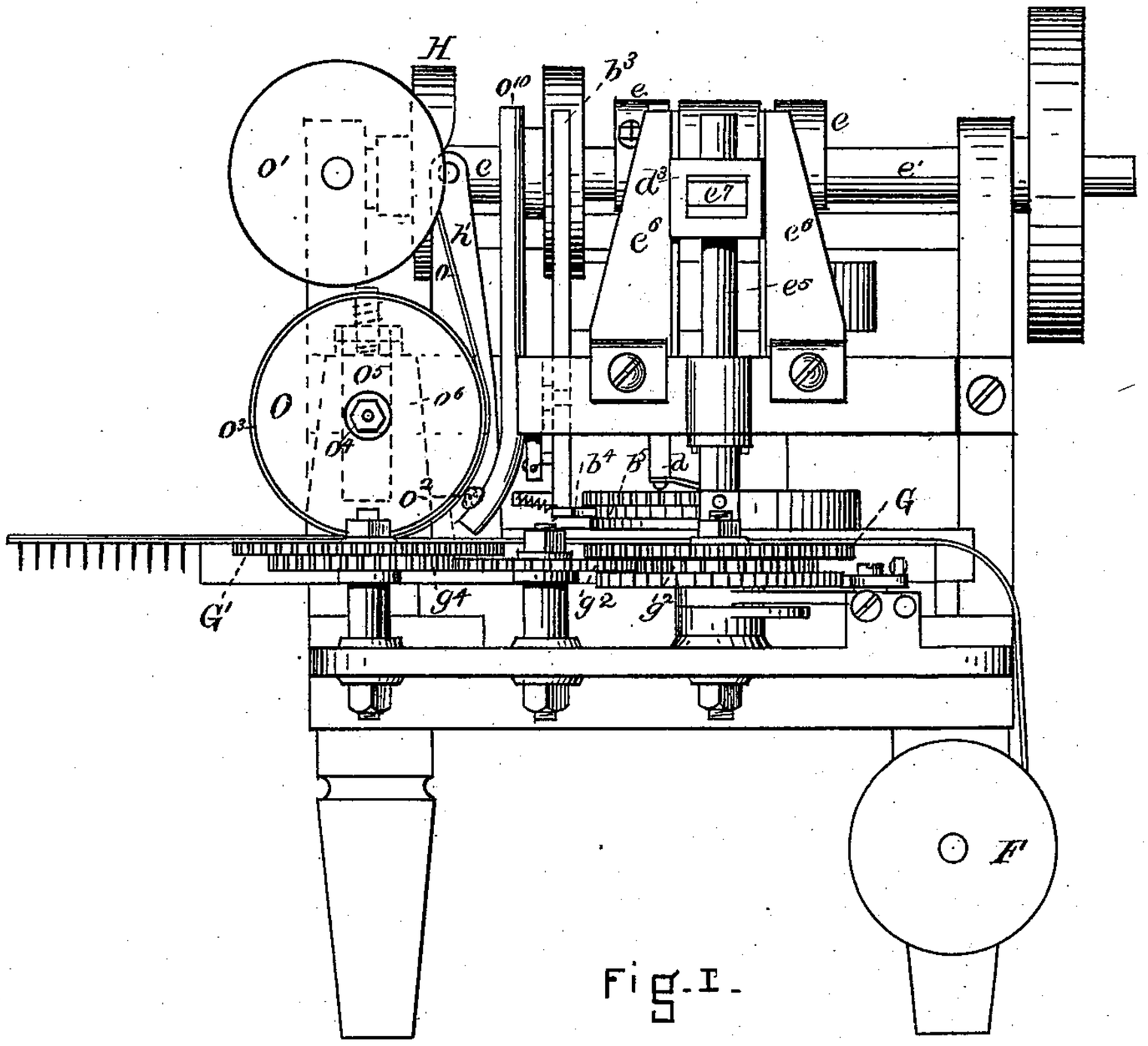


Fig. 1.

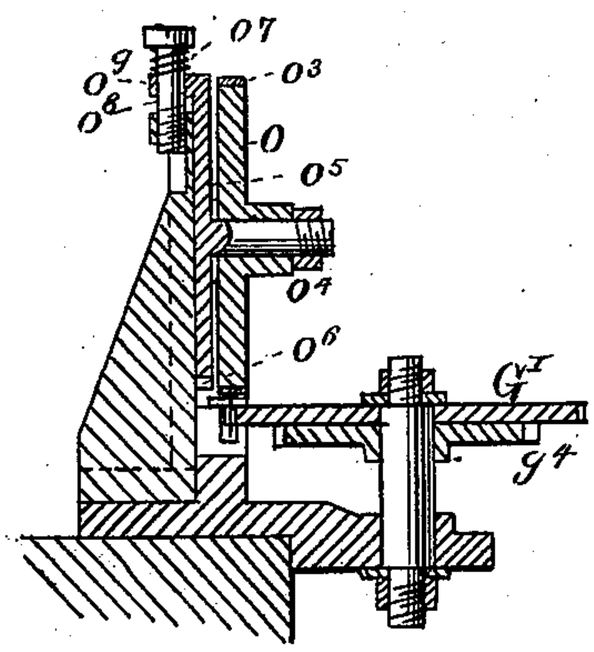


Fig. 2.

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(Model.) 3 Sheets—Sheet 2.

# E. WOODWARD & M. BROCK.

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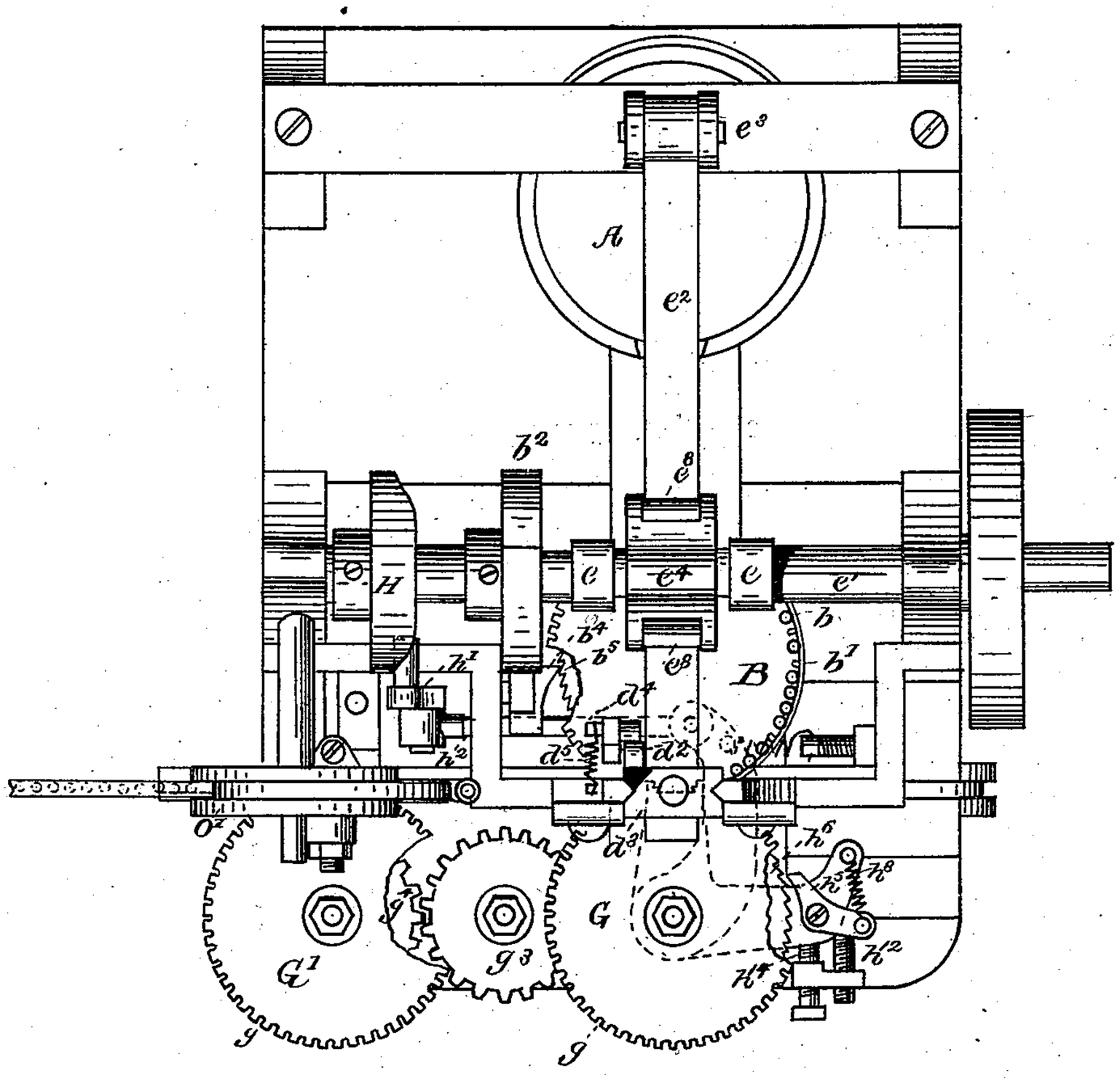


Fig. 3.

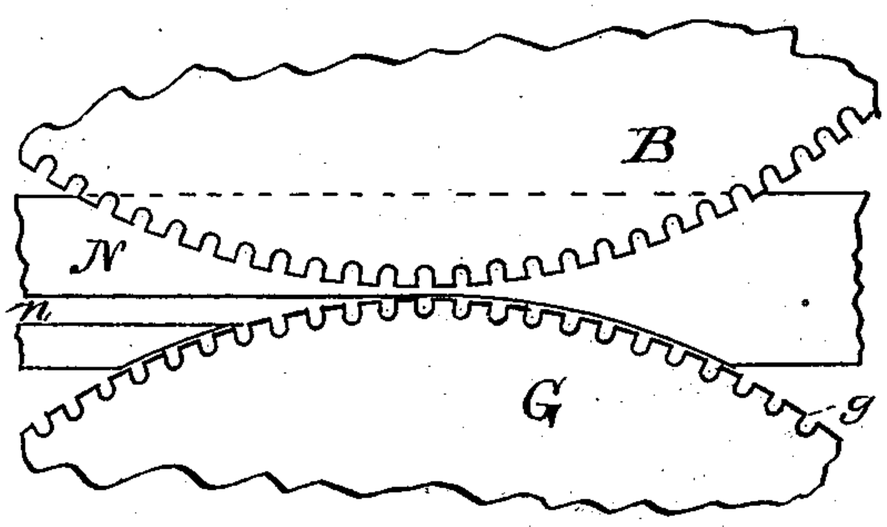


Fig 7

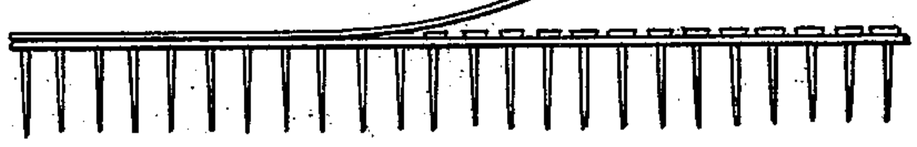

Fig 8

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(Model.) 3 Sheets—Sheet 3.

# E. WOODWARD & M. BROCK.

## Machine for Making Tack Strips.

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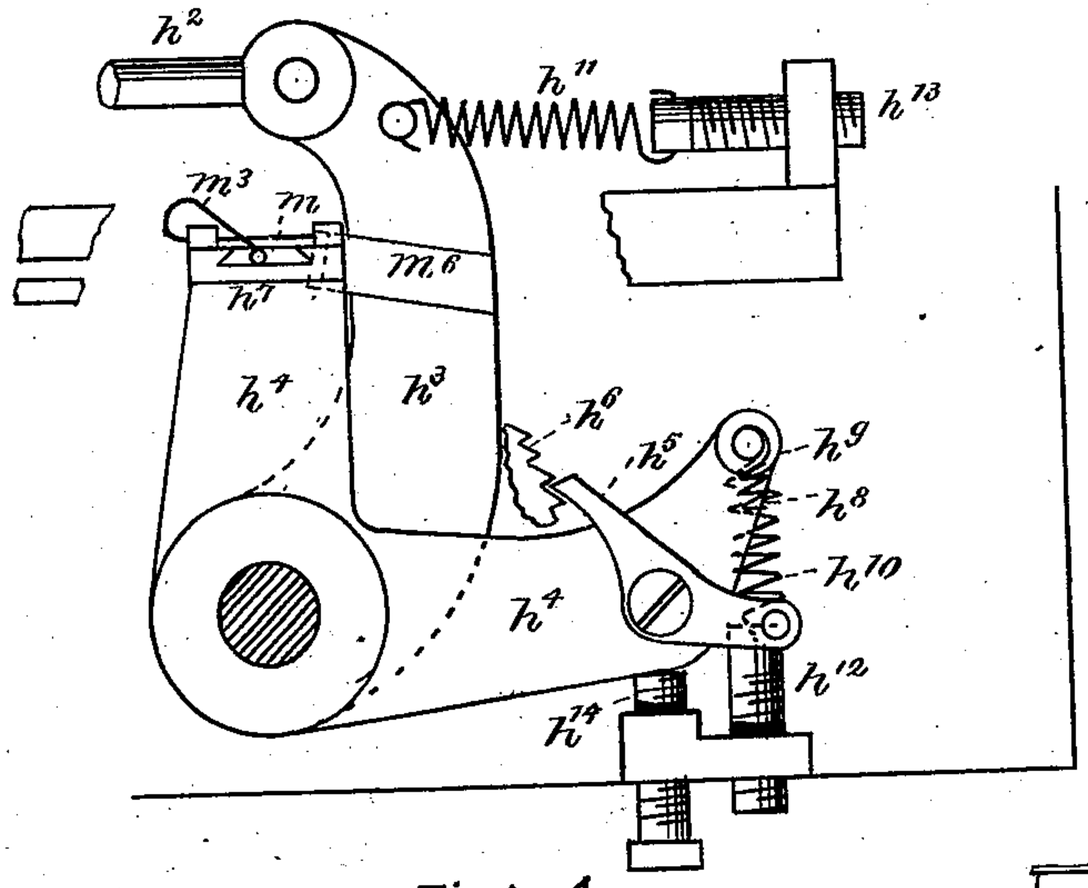


Fig. 4

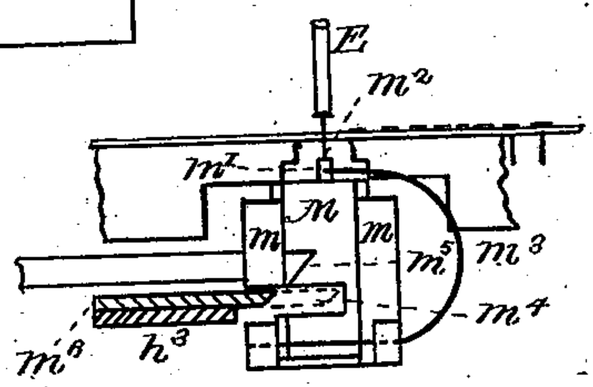


Fig. 6

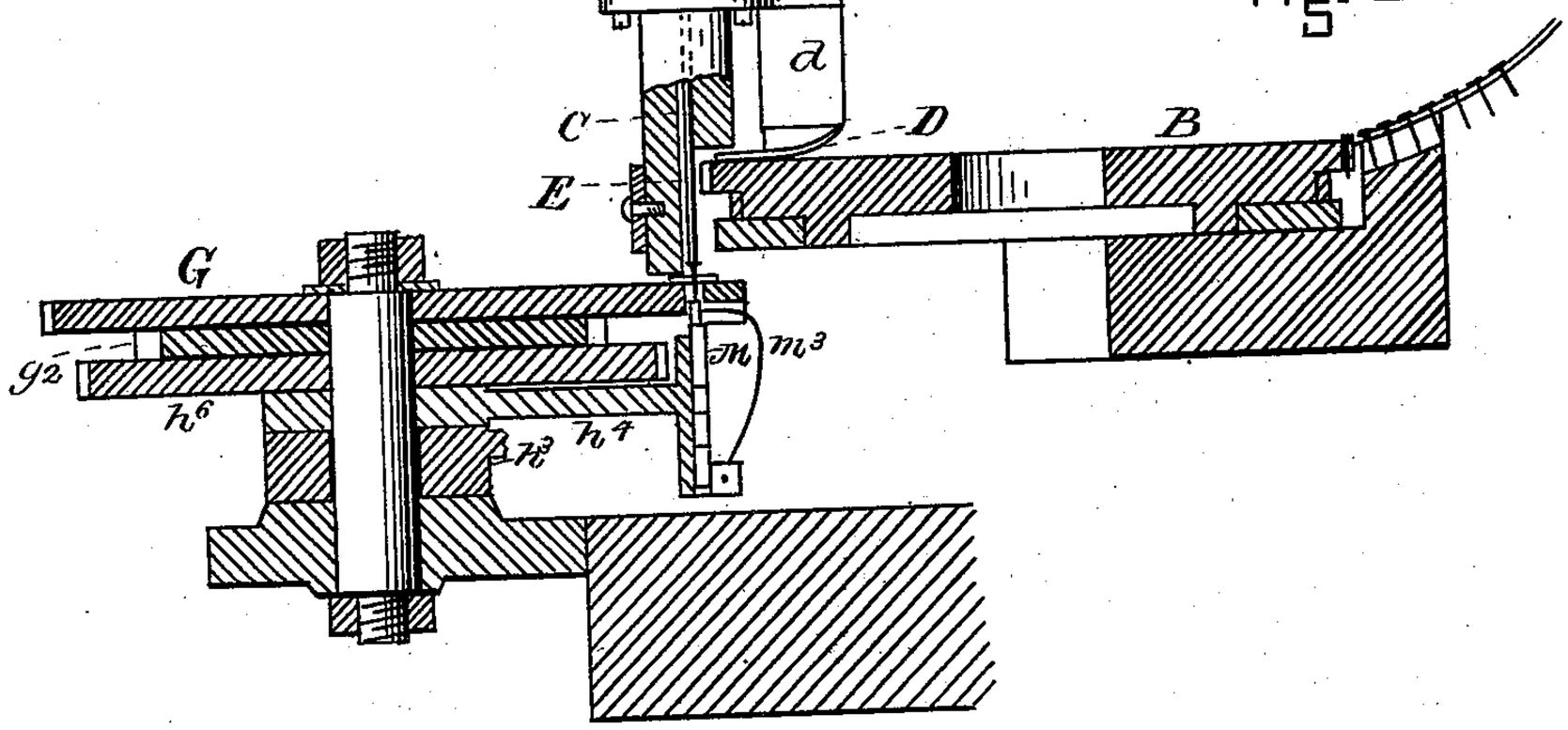


Fig. 5.

WITNESSES

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# UNITED STATES PATENT OFFICE.

ERASTUS WOODWARD AND MATTHIAS BROCK, OF BOSTON, MASS.

## MACHINE FOR MAKING TACK-STRIPS.

SPECIFICATION forming part of Letters Patent No. 230,386, dated July 20, 1880.

Application filed March 29, 1880. (Model.)

*To all whom it may concern:*

Be it known that we, ERASTUS WOODWARD and MATTHIAS BROCK, both of Boston, in the county of Suffolk and Commonwealth of Massachusetts, have invented a new and useful Improvement in Machines for Making Tack-Strips, of which the following is a specification.

This invention relates to a machine for making the tack-strip described in Letters Patent to George W. Copeland and Matthias Brock, assignor to said Copeland, numbered 197,609, dated November 27, 1877, and it embraces means for receiving loose tacks from a reservoir or hopper and for carrying them to a position for insertion into a supporting and connecting strip; means for feeding said strip and for inserting therein, at a uniform distance part, the tacks; means for preventing the feed- of the strip, except when a tack is inserted; and means for applying and cementing a thin strip of paper or other flexible material to the tack-connecting strip, all which will hereinafter be more fully described.

Reference is made to the accompanying drawings, forming a part of this specification, in explaining the nature of this invention, in which—

Figure 1 is a front elevation of the machine. Fig. 2 is a vertical section of the device for applying the covering-strip to the head-connecting strip. Fig. 3 is a plan of the machine with a portion of the carrying and feed wheels broken out to show the construction beneath. Figs. 4, 5, and 6 show the mechanism for feeding the tack-strip, and also for preventing the feeding unless a tack is inserted in the strip. Fig. 7 is an enlarged plan of the index, feed-wheel, and grooved bed. Fig. 8 shows the tack-strip in process of construction.

The mechanism for feeding the tacks from the hopper A to the intermittently-revolving tack-carrying disk B is shown and described in Letters Patent (among others) to Reed, No. 41,125, of 1864.

The tack-carrying disk B is provided with the grooves or notches *b* upon its periphery, each of which is adapted to receive a tack from the feed race or chute, and to deliver it to a point adjacent to the throat, through which it is driven into the tack-strip.

A curved plate, *b'*, extending partially around the disk B, serves to hold the tacks in place in the grooves or notches.

As the tack-carrying disk revolves horizontally, it is necessary that there should be a device for dislodging the tack from the groove or notch when it has been advanced to a point opposite the vertical throat C, and for this purpose we arrange the transferrer D, which is curved, substantially as represented, and provided with an intermittent motion to and from the throat, so timed that upon the presentation of the tack by the carrying-disk to a position opposite the throat the transferrer, by a slight horizontal movement, pushes the tack from the notch (which opens into the throat) into the throat. It is provided with this intermittent reciprocating movement by means of the lever *d*, pivoted at *d'* to a bracket extending outwardly from the frame of the machine, and the cam $d^2$ on the cross-head $d^3$, the pin $d^4$, and spring $d^5$.

A driver, E, is reciprocated in the throat C by means of the crank *e* upon the main shaft *e'*, the lever $e^2$, which is pivoted at $e^3$ to the frame of the machine, and which is reciprocated vertically by means of the crank and a connecting-block, $e^4$, which slides thereon, and the rod $e^5$, to the lower end of which the driver is fastened, and which is attached to the end of the lever $e^2$.

The cross-head $d^3$, which slides upon the ways $e^6$, and which is provided with the slot $e^7$, in which the end of the lever $e^2$ projects, forms the connection between the rod $e^5$ and the operating-lever.

As the movement of the end of the lever is upon an arc of a circle, and as the rod $e^5$ has a direct vertical movement, it is necessary that the connection between the two should be loose in order to allow a slight horizontal movement of the lever.

The strip for receiving the tacks is drawn from the supply-roll F over a horizontal bed beneath the throat by means of the feed-wheels G G', each of which is provided with grooves or notches *g*, which are adapted to engage with the shanks of the tacks, and the wheels have a revolving movement in unison with that of the tack-carrying disk B.

The feed-wheel G operates the feed-wheel G' by means of the gear-wheels $g^2$ $g^3$ $g^4$, and

is itself operated by means of the face-cam H on the disk $h$ on the main shaft $e'$, the lever $h'$, which is pivoted at midway of its length to the frame of the machine, and the connecting-bar $h^2$, lever $h^3$, lever $h^4$, pawl $h^5$, ratchet-wheel $h^6$, and a connecting mechanism between the levers $h^4$ and $h^3$, which is operated by the tack as it is driven into the tack-strip. If the tack is not driven, the lever $h^3$ is moved, but the lever $h^4$ remains stationary. This connecting mechanism consists in the latch M, which is provided with a slight vertical movement in suitable ways $m$ on the end of the arm $h^7$ of the lever $h^4$. This latch carries a small post, $m'$, having a socket, $m^2$, in its upper face, and it projects into the lower end of the throat C. A spring, $m^3$, serves to hold the latch in position. The latch is further provided with a long recess, $m^4$, and with a notch, $m^5$, and they are so arranged that the recess $m^4$ is on a line with the projecting part $m^6$ of the lever $h^3$, so that unless the latch M is moved downwardly the lever $h^3$, by moving into the recess $m^4$, fails to operate the lever $h^4$. In case, however, the tack is inserted into the strip, its point comes in contact with the socket $m^2$ on the post $m'$ before the head is seated upon the strip, and by its further descent the latch M is driven downwardly against the stress of the spring $m^3$, and the notch $m^5$ then comes in line with the lever $h^3$, and upon the movement of the last-named lever the lever $h^4$ is caused to move, thereby enabling the pawl $h^5$ and ratchet $h^6$ to turn the feed-wheel G and the train of gear-wheels connected therewith the distance between two notches or grooves.

A spring, $h^8$, one end of which is fastened to the outer end of the pawl and the other end to the outer end of the arm $h^9$ of the lever $h^4$, serves to keep the pawl in contact with the ratchet, and the spring $h^{10}$, connecting the outer part of the arm $h^9$ with the frame of the machine, serves to return the lever $h^4$ to its original position after its movement by the lever $h^3$.

The spring $h^{11}$, connecting the end of the lever $h^3$ with the frame of the machine, serves to hold the upper end of the lever $h'$ in contact with the cam H.

The tension of the spring $h^{10}$ may be regulated by the set-screw $h^{12}$, and that of the spring $h^{11}$ by the set-screw $h^{13}$.

An adjustable stop, $h^{14}$, is provided for the purpose of limiting the range of movement of the lever $h^4$.

A bed, N, provided with a groove, $n$, furnishes the support for the tack-strip and a guide for the tacks, the upper surface of the bed furnishing the support and the groove the guide; and by means of the feed-wheels G G′ and the tacks the strip is fed over this bed to the pressure-roll O, which is arrangd immediately above the edge of the feed-wheel G′. This pressure-roll is used for compressing the strip $o$, which is taken from the supply-roll $o'$, and covered with cement by the brush or sponge $o^2$ upon the upper surface of the tack-strip. The said pressure-roll is provided with an elastic or compressible working-surface, $o^3$, and has a bearing upon the stud $o^4$, which projects outwardly from the plate $o^5$, which is arranged to slide in the post $o^6$, and which is held down by the spring $o^7$, which surrounds the screw $o^8$ and bears upon the projecting portion $o^9$ of the said plate. The screw screws into the post, and with it the tension upon the spring is adjusted. The covering-strip passes from the supply-roll between the pressure-roll and the device for applying paste or cement, and is then compressed upon the strip by the pressure-roll. The paste or cement is fed to the point $o^2$ by means of the tube $o^{10}$.

The tack-carrying disk B is revolved by means of the edge cam $b^2$ upon the main shaft, the lever $b^3$, pivoted about midway its length to the frame of the machine, and the pawl $b^4$ and ratchet $b^5$. Suitable springs maintain the contact of the pawl with the ratchet and the lever with its operating-cam.

As the block $e^4$ slides upon the lever $e^2$, it may be desirable to relieve the friction by means of anti-friction rolls $e^3$.

The operation of the machine is as follows: The loose tacks are deposited in the hopper. They are fed from thence to the tack-carrying disk, and by the notches upon its periphery are advanced in regular order to a point opposite the throat, and are then thrown into the throat by the transferring mechanism, and driven, upon the descent of the driver, into the tack-strip beneath it.

The notch in the carrying-disk, the center of the feedway, and the notch in the feed-wheel G must register—that is, they must be upon the same vertical line.

The tack-strip is fed at first by the feed-wheel G, and finally by the feed-wheels G G′. The notches therein engage with the shanks of the tacks. The feed-wheel G′, of course, must have the same movement that is provided the feed-wheel G, and the notches be the same distance apart as the notches in the said wheel G. The covering-strip is then cemented and applied.

If for any reason a notch or groove in the carrying-disk B is unprovided with a tack, the feeding of the tack-strip is stopped until the next tack in order is inserted into the strip.

It will be observed that the feature in this machine that provides for the stopping of the mechanism for feeding the tack-strip in case the tack is not inserted into the strip is of very great importance, as without it it would be impossible to place the tacks in the strip with that regularity and precision which alone render the strip of value.

We do not intend to confine ourselves to the specific mechanism herein described for operating the driver, the transferrer, the tack-carrying disk, and feed-wheels, but may use any of the well-known mechanical contrivances for providing these parts with the movements in relation to each other specified, and with the functions described.

Having thus fully described our invention, we claim and desire to secure by Letters Patent of the United States—

1. In a machine for the manufacture of tack-strips, the combination of a tack-carrying disk for advancing tacks to the throat of the machine, the throat and the tack-driving mechanism, a bed or support for the strip into which tacks are driven, and the notched feeding-wheel which feeds the tack-strip by engaging with the driven tack, substantially as and for the purposes described.

2. In a machine for making tack-strips, the combination of a tack-carrying disk for advancing tacks to the throat of the machine, a device for transferring the tack from the disk to the throat, the throat and the tack-driving mechanism, the bed for supporting the strip into which the tacks are driven, and a notched feeding-wheel for feeding the tack-strip by means of the driven tacks, all arranged to operate substantially as and for the purposes described.

3. In a machine for manufacturing tack-strips, the combination of a device for delivering the tacks at the throat of the machine in regular succession, a driving device for inserting the tacks in the tack-connecting strip, a bed for supporting and guiding the strip to a position to receive the tacks, and a notched feeding-wheel adapted to engage with the driven tack and to feed the strip by means thereof, substantially as described.

4. In a machine for the manufacture of tack-strips, the combination of the mechanism for inserting tacks into the strip, a grooved bed, N, for supporting and guiding the tack-strip, and a device for feeding the tack-strip beneath the tack-inserting mechanism, substantially as and for the purposes described.

5. In a machine for the manufacture of tack-strips, the combination of mechanism for feeding the tacks in succession to the tack-driving devices, the said tack-driving devices, appliances for feeding the tack-strip to the tack-driving devices, and mechanism for preventing the movement of the feeding appliances in case the tack is not inserted into the strip, substantially as and for the purposes described.

6. The combination, in a machine for the manufacture of tack-strips, of a tack-carrying device for advancing the tacks to the tack-driving mechanism, the said tack-driving mechanism, the grooved bed for supporting and guiding the tack-strip to the tack-driving mechanism, the feed-wheel, and mechanism whereby, upon the failure of the tack-carrying device to deliver a tack to the driving mechanism, the movement of the feed-wheel is stopped while that of the tack-carrying device continues, substantially as and for the purposes set forth.

7. In a machine for the manufacture of tack-strips, the combination of devices for feeding and inserting tacks in the tack-strip, and for feeding the tack-strip with the pressure-roll O, and the pasting or cementing device $o^2$, all arranged to operate substantially as described.

8. In a machine for the manufacture of tack-strips, a device for applying a covering-strip to the tack-strip, consisting of the pressure-roll O, pasting device $o^2$, the feed-wheel G′, and bed N, substantially as described.

9. In a machine for the manufacture of tack-strips, the device, substantially as described, located in the throat of the machine, for connecting and disconnecting the mechanism for imparting movement to the device for operating the feeding mechanism, and said last-named device adapted to be moved only by the tack during its insertion into the tack-strip, in making said connection, and to automatically disconnect said operative devices after the insertion of each tack, substantially as and for the purposes set forth.

10. In a machine for the manufacture of tack-strips, the combination of the lever $h^3$, the lever $h^4$, and the latch M, for connecting and disconnecting said levers operated by the tack in making the connection and automatically disconnecting said levers, substantially as described.

11. In a machine for the manufacture of tack-strips, the combination of the lever $h^4$ and the latch M, arranged to be moved on the end thereof, as indicated, and provided with the recess $m^4$ and notch $m^5$ and the lever $h^3$, all arranged to operate substantially as described.

12. In a machine for the manufacture of tack-strips, the latch M, provided with the post $m'$, adapted to enter the throat, and having a cup-shaped recess in its upper surface, substantially as and for the purposes set forth.

13. In a machine for the manufacture of tack-strips, the combination of the lever $h^4$, carrying the latch M, with the adjustable stop $h^{14}$, for adjusting the position of the latch in relation to the throat of the machine, substantially as described.

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Witnesses:
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