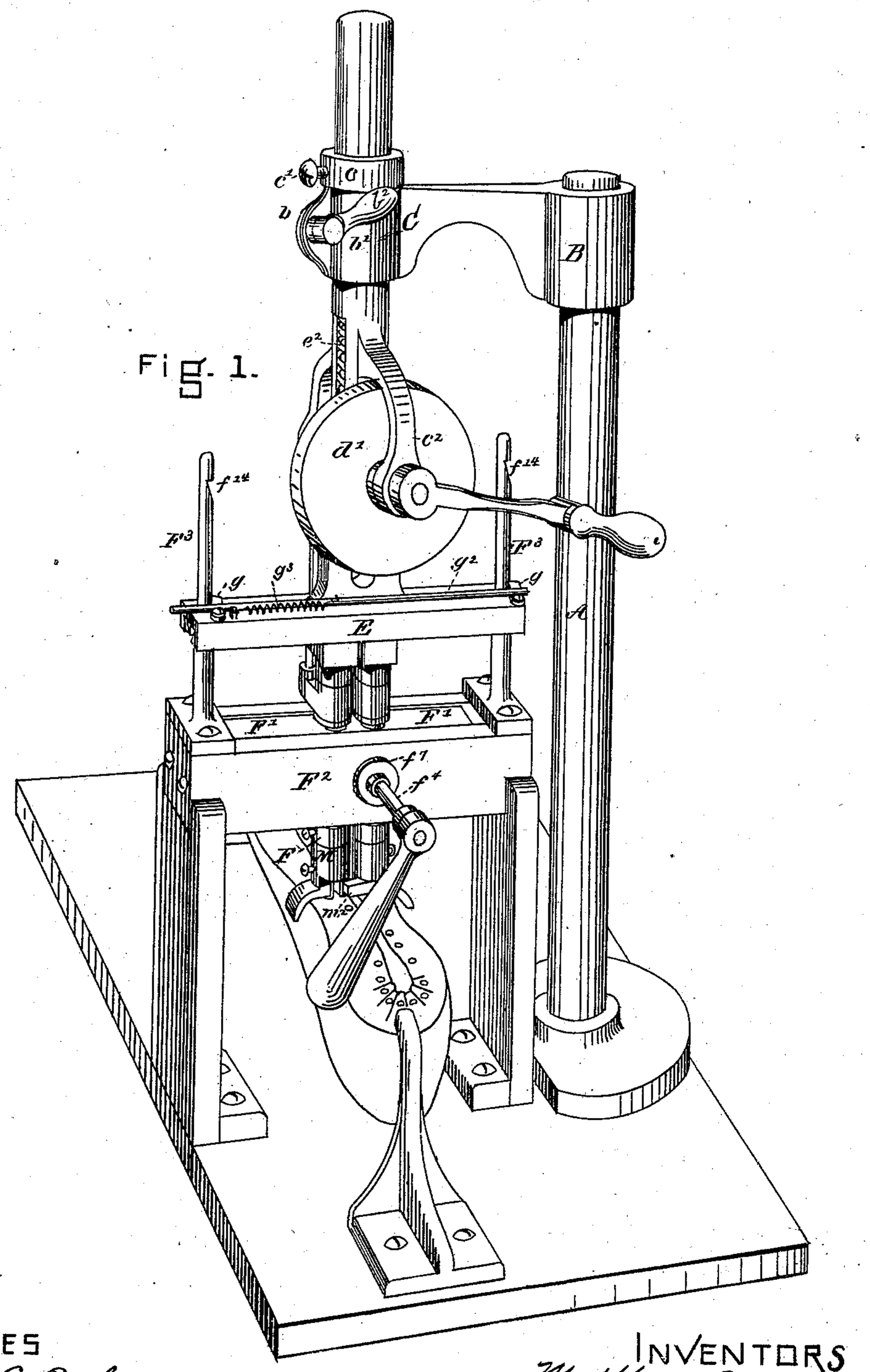
3 Sheets—Sheet 1.

M. BROCK, E. WOODWARD & G. W. COPELAND.

Gang Tacking-Machine.

No. 214,754. Patented April 29, 1879.

Fig. 1.



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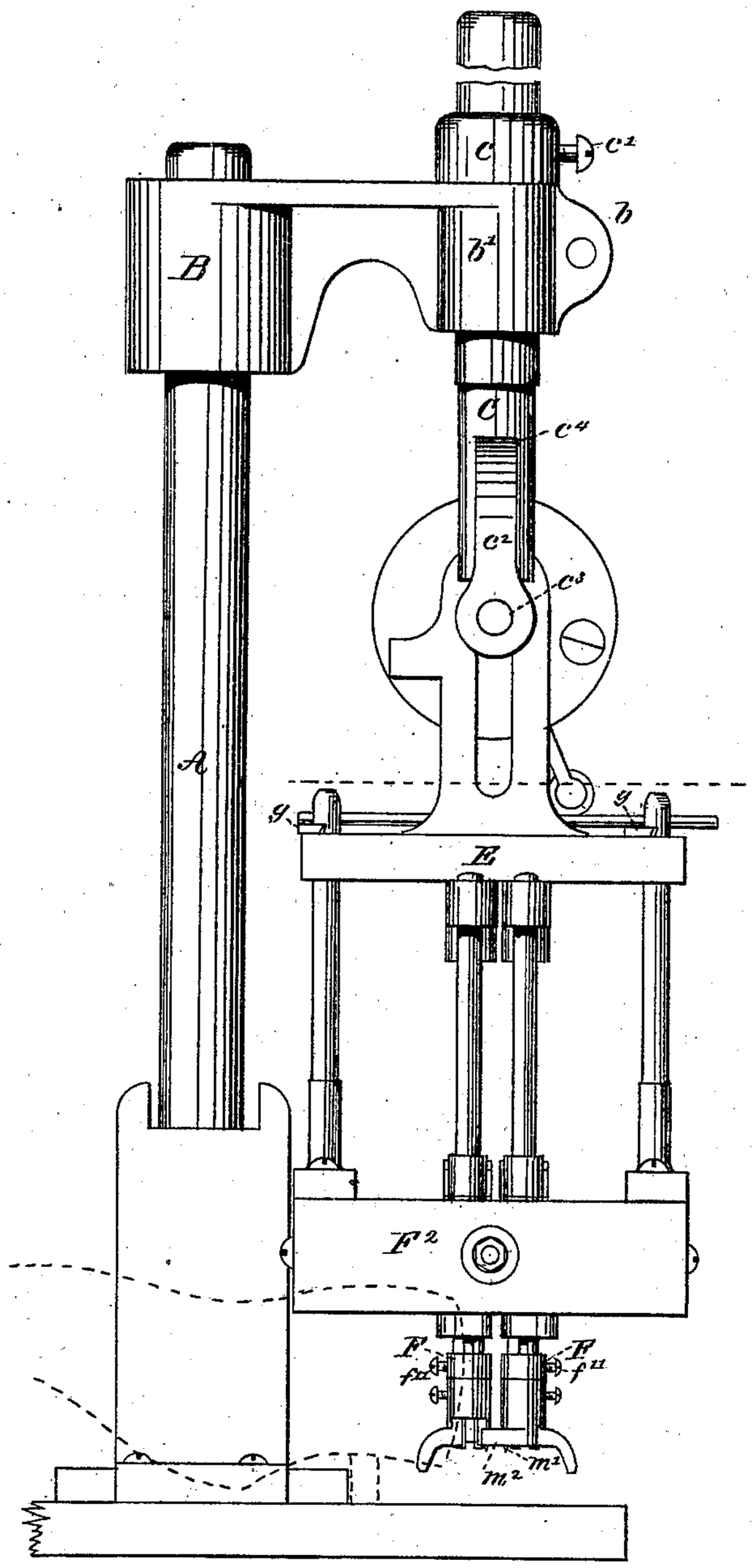

Fig. 2.

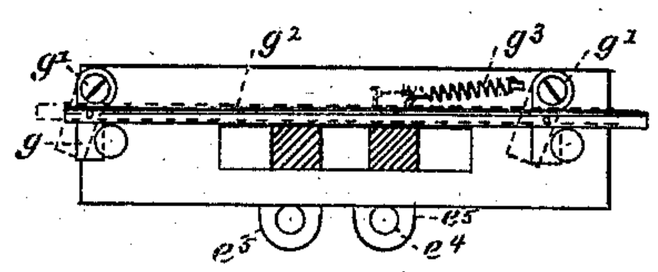

Fig. 5.

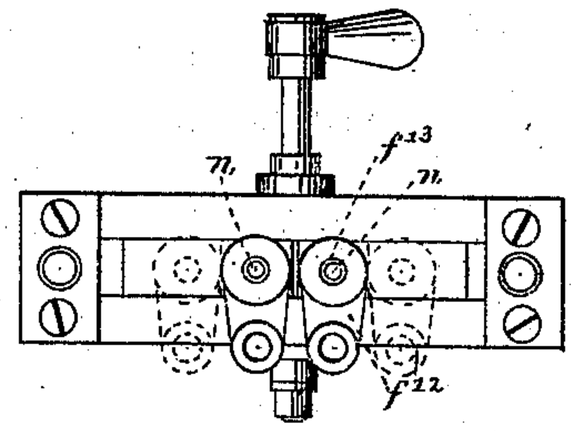

Fig. 4.

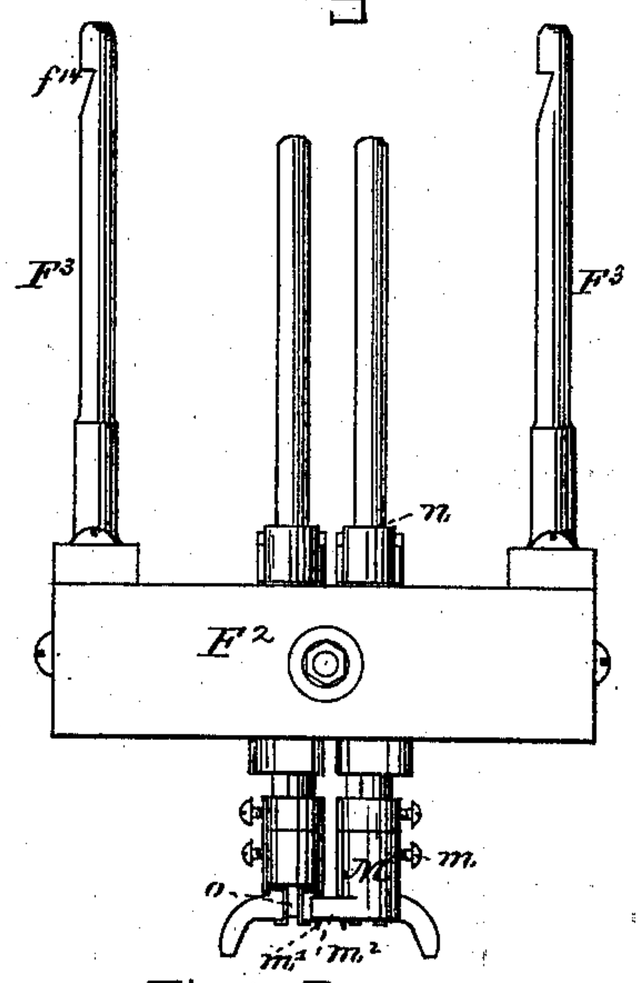

Fig. 3

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3 Sheets—Sheet 3.

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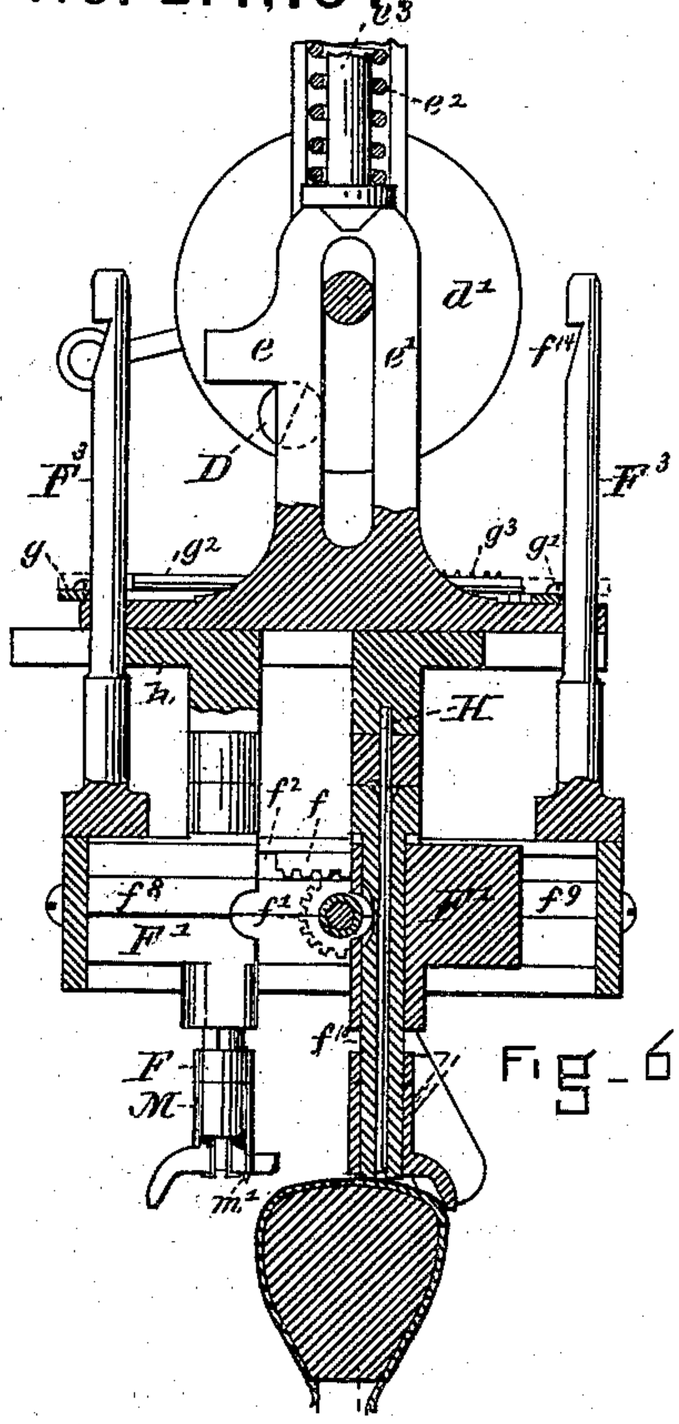

Fig. 6.

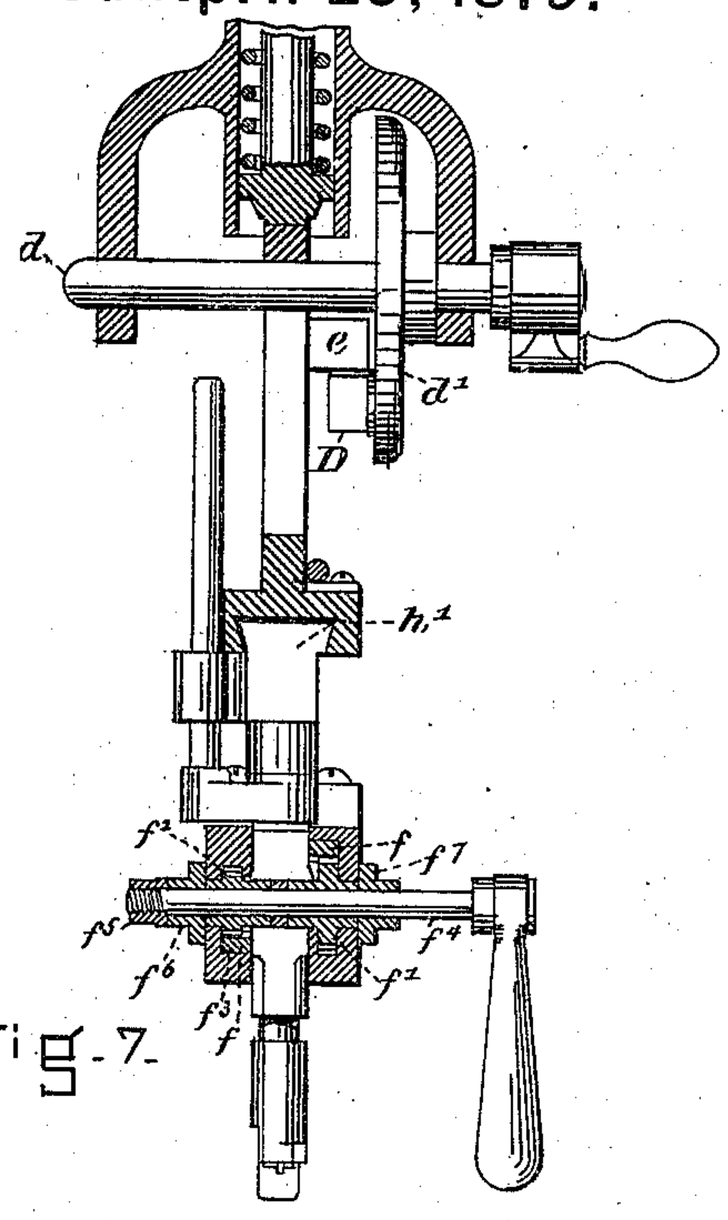

Fig. 7.

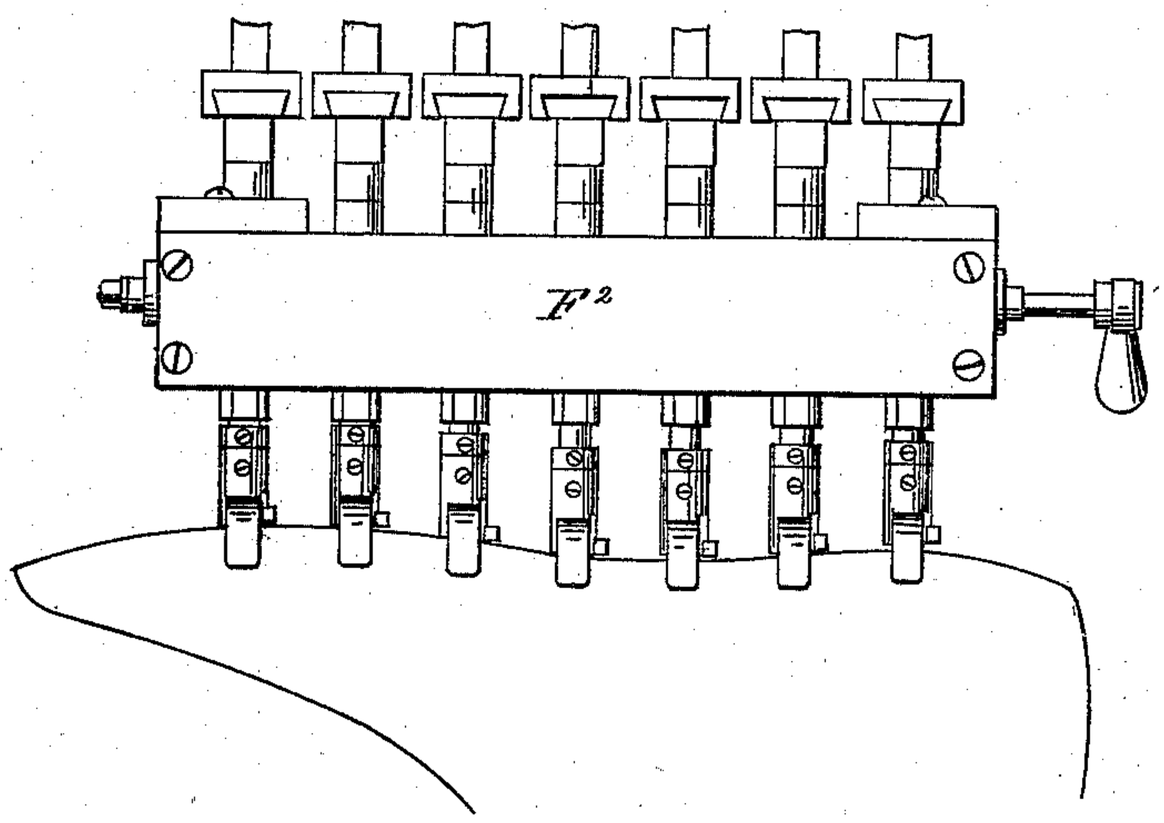

Fig. 8.

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UNITED STATES PATENT OFFICE.

MATTHIAS BROCK AND ERASTUS WOODWARD, OF BOSTON, AND GEORGE W. COPELAND, OF MALDEN, MASS., ASSIGNORS TO THE COPELAND LASTING MACHINE COMPANY, OF HARTFORD, CONN.

IMPROVEMENT IN GANG-TACKING MACHINES.

Specification forming part of Letters Patent No. **214,754**, dated April 29, 1879; application filed January 31, 1879.

To all whom it may concern:

Be it known that we, MATTHIAS BROCK and ERASTUS WOODWARD, both of Boston, in the county of Suffolk and Commonwealth of Massachusetts, and GEO. W. COPELAND, of Malden, in the county of Middlesex, in said Commonwealth, have invented an Improvement in Gang-Tacking Machines, of which the following is a specification.

This invention relates to an improvement in machines for driving a gang or group of tacks simultaneously or in rapid succession.

As it is particularly adapted for uniting the margin of an upper to the insole in the lasting process, we have illustrated it as applied to what we term a side-group machine.

It embraces, first, means for supporting the tack-driving devices, and for adjusting them to that portion of the last upon which they operate; second, two gangs of throats or nozzles parallel, or substantially parallel, provided with horizontal adjustment in relation to each other to a line coincident with the edge of the last bottom or insole, and with vertical adjustment to the slopes, curvatures, or inclinations of a last's bottom; third, a reciprocating driving-bar for each nozzle; fourth, means for lateral adjustment of the nozzles and driving-rods; fifth, means for vertical adjustment of the nozzles and driving-rods.

In the drawings, Figure 1 represents a perspective view of a section of our machine for driving two tacks into position upon the last. Fig. 2 is a side elevation, showing the manner of supporting and moving the device and its position when removed from the last. Fig. 3 is a side elevation of a section of nozzles removed from the driving mechanism. Fig. 4 is a plan of the blocks carrying the nozzles. Fig. 5 is a plan to illustrate the method of securing the removable nozzle-frame to the rest of the machine. Fig. 6 is a view, part in elevation and part in section, of the driving mechanism, showing the means for horizontal and vertical adjustment. Fig. 7 is a view, in elevation and section, showing the construction. Fig. 8 is a side elevation of seven sections, representing the invention as applied for the entire side groups.

The post A, carrying the swinging bracket B, which supports the tack-driving mechanism, may be secured to the lasting-machine proper, or to a bench, or any suitable support, in such close proximity to the lasting-machine that the tacking device may be swung into place upon the last.

The driving mechanism is suspended from the bracket B upon the sleeve C, which is provided with a vertical adjustment in the bearing *b* at the end of the bracket, regulated in extent by the position of the collar *c* and the set-screw c^1. The bearing *b* is composed of the two parts b^1, which encircle the spindle or sleeve, and almost but not quite abut, and they act in connection with the screw-lever b^2 as a clamp. The sleeve is provided with the brackets c^2, which furnish the bearings c^3 for the short shaft *d*, which carries the cam-projection D on the disk d^1. The revolution of the disk causes the cam-projection to contact with the projection *e* upon the slotted bar e^1, and thereby lift the cross-plate E, carrying the driving-rods in opposition to the driving-spring e^2, which surrounds the rod e^3 within the sleeve C.

The lower portion of the sleeve C is provided with recess c^4, extending across the same, whose sides act as guides in connection with that part of the bar e^1 which reciprocates therein.

The nozzles F are supported by the blocks F^1, which have a horizontal movement in the frame F^2, by means of the racks *f* and pinions f^1. The pinions are provided with long bearings upon the operating-shaft f^4, and they revolve with the shaft sufficiently to adjust the nozzles by moving the blocks, but allow the shaft to continue its revolution after the nozzles have so been adjusted. They have a loose bearing upon the shaft, and are clamped thereto between the clamping-collars f^6 f^7, the nut f^5 regulating the extent of the clamping action.

It is desirable that the pinions should revolve sufficiently to adjust the nozzles horizontally by moving the blocks, and this can only be obtained by giving them such a bearing on the shaft as described.

Each block is further provided with the projecting ways f^8, which fit into the corresponding recesses f^9 in the inner surface of each of the side frames f^2. The nozzle or throat F is formed by or attached to the lower end of the sleeve or tube f^{10}, the driveway extending from one end of the tube to the other. These tubes have a vertical movement in the blocks F^1 to an extent regulated by the collar and set-screw f^{11}, to effect the vertical adjustment of the nozzle.

The upper end of each driveway-tube is provided with a bracket, f^{12}, which carries at its end the adjusting-rod f^{13}, which passes through the hole e^4 in the projection e^5 upon the driving-rod blocks.

Attached to each end of the frame carrying the nozzle-blocks is the guiding-rod F^3, which is notched at its upper end at f^{14}. These rods, when the section is in place, pass through holes in the corresponding ends of plate E, which reciprocate thereon, and the latches g engage with the notches, and prevent the section from being removed from plate E.

The latches are each pivoted at g^1 and connected with each other by the rod g^2, and the spring g^3, which lays hold of the rod and is fastened to the plate, serves to automatically maintain the latches in position over the holes through which the rods F^3 pass, except when pushed aside by the rods as they are passed through the holes. To enable this to be done the sides of each latch which projects over the hole is undercut, so that the end of the rod as it passes through the hole strikes an inclined surface and forces the latch one side.

The driving-rods H are each fastened to the blocks h, arranged to slide horizontally in the plate E. For this purpose the plate is provided with an undercut recess, h', the inclined sides of which serve to retain the blocks h, with corresponding shaped sides, in place, and also act as guides. The outer end of each of these blocks h is recessed to straddle the rods F^3.

The downwardly-curved piece M, attached to the end of each nozzle by the set-screw m, acts as a guide in determining the relation of the nozzle to the edge of the bottom of the last or the edge of the insole.

The nozzle or guide may be provided with a spur, m^1, in which case, by engaging with the edge of the upper, the adjustment of the nozzles may be made to assist in drawing the upper to the last and in maintaining the margin when folded in position.

The under surface of the nozzle may be roughened in order to insure its taking hold of the upper with sufficient friction to prevent its slipping thereon.

Tacks may be fed to the nozzles by the removal of the section represented in Figs. 3 and 4 from the machine, and the depositing of a tack from a feeding device into each of the driveways, to fall through said driveways upon the converging supporting-springs at the bottom of each nozzle.

The section thus charged is replaced in the machine, and the tacks are then driven by the descent of the driving-rods. Each may be provided with the feedway P″ opening upon its side, into which a tack may be dropped to a position below the driving-rod by any suitable device.

We do not intend, however, to confine ourselves to the method of feeding herein described, but propose to use, in connection with the mechanism herein set forth, any desirable means for introducing tacks, either from a reservoir of loose tacks or several from tack-strips, and presented by automatic means to a position in the driveway or nozzle beneath the driving-rods.

It will be observed that two adjustments are essential in the employment of this invention for a side-group tacking device for use in the lasting process, growing out of the differences in width and height of the surface of the last and insole, and it is necessary that each nozzle should have these adjustments independent of the others, and we have therefore provided each nozzle with the following adjustments: first, vertical adjustment, in order that the nozzles may correspond to the varying planes of a last's surface; second, horizontal adjustment for variations in widths.

The first of these adjustments is obtained by giving the tube containing the driveway a vertical movement in the supporting-blocks. The second is obtained by means of the pinions and racks described, which, by turning the handle at the end of shaft f^4 independently, adjust each nozzle in relation to the edge of the last or insole by causing each nozzle-carrying block to be moved horizontally until the curved gage or stop at the end of the nozzle contacts with the side of the last or edge of the insole and sets the same in proper relation to said edge.

In the operation, the last having been properly jacked in a lasting-machine and the upper fitted thereto, and its margin folded upon the surface of the insole by lasting appliances, the tacking device is swung into place across the last, locked to the lasting-machine, and its nozzles adjusted horizontally.

They automatically assume the necessary vertical adjustment by gravity. The disk carrying the operating-cam is then revolved, and the plate which carries the driving-rods is lifted in opposition to the spring e^2 upon the rods F^3 f^{13}, the weight of the frame carrying the nozzles holding it upon the work. The cam by the continued revolution of the disk passes beyond the projection, thereby releasing the spring, which drives downwardly the plate E and the driving-rods.

In lieu of the spring a cam for operating the plate E, as mechanism for reciprocating the same, may be employed. The driving-rods may be provided with any suitable vertical adjustment in their supporting-blocks h, either automatic or otherwise.

The principal features of the invention, therefore, are the driving of tacks in groups and

the independent vertical and horizontal adjustment of the nozzles; and the advantage arising from its use over single-tack-driving machines is the saving in time effected in driving a given number of tacks, and for lasting purposes precision in placing tacks.

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

1. A tack-driving machine for driving a gang or group of tacks, provided with a horizontal swinging arm or bracket for supporting the same when not in work, substantially as described.

2. In a tacking-machine, the combination of a nozzle-carrying block, F^1, nozzle-tube f^{10}, collar, and set-screw f^{11}, all substantially as and for the purposes set forth.

3. In a tacking-machine, the combination of the nozzle-carrying block F^1 with the throat or nozzle carrying tube f^{10}, having automatic vertical adjustment therein, substantially as described.

4. In a tacking-machine, the combination of the frame F^2, the nozzle-carrying blocks F^1, having a horizontal adjustment with the guides M for regulating the degree of adjustment in the nozzles, substantially as and for the purposes described.

5. In a tacking-machine, the removable curved guide M, adapted to be fastened to the end of a nozzle, for the purpose described.

6. In a tacking-machine, the combination of the horizontally-adjustable nozzle with the curved guides M, provided with a horizontal folding projection, m^2, all as described.

7. As a means for securing an adjustable section to the reciprocating plate carrying the driving-rod, the notched rods F^3 and the automatic latches g, adapted to engage with said notches, substantially as described.

8. The combination of the latches g, connecting-rod g^2, and spring g^3, all adapted to operate substantially as described.

9. The combination of the nozzle-carrying blocks F^1, means for adjusting them horizontally in the frame F^2, with the horizontally-adjustable rod, driving-block h, and suitable connecting mechanism, whereby the adjustments of the nozzle-carrying and rod-driving blocks are simultaneously effected, substantially as described.

10. In a tacking-machine, the combination of the bracket B, provided with a bearing, b^1, sleeve C, and the collar c^1, for adjusting the said sleeve in its bearing, substantially as described.

11. In a tacking-machine, a nozzle or throat with the guide M attached thereto, said guide being adapted to bear upon the edge of the insole or the side of the last in determining the position of the nozzle in relation to said edge or side.

12. In a tacking-machine, the combination of a gang of horizontally-adjustable nozzles or throats, with suitable guides attached thereto, for determining the position of said throats in relation to the edge of the insole or the side of the last, substantially as and for the purposes described.

13. The combination of the bar e^1, which supports the plate carrying the driving-rod block and the frame carrying the nozzles, provided with the projection e, and the spindle or rod e^3, with the cam-carrying disks d^1, the spring d^2, and the recessed sleeve C, all arranged to operate substantially as described.

14. In a tacking-machine, the combination of a sleeve provided with vertical and horizontal adjustments, and supporting the driving-cam, with the tack-driving mechanism fastened thereto in a position to be operated by said cam, and provided with like adjustments, substantially as and for the purposes described.

15. In a tacking-machine, the combination of the supporting-plate E with the rod-carrying blocks h, provided with horizontal movements therein or thereon, for the purposes described.

16. In a tacking-machine, the combination of pinions f^1, clamping-plates f^6 f^7, shaft f^4, and nut f^5, all arranged so that the pinion shall be revolved by the shaft sufficiently to accomplish the adjustment of the nozzle-carrying blocks and allow of the continued revolution of the shaft after the adjustment has been made, substantially as described.

17. A tacking-machine consisting of a gang or group of nozzles, each adapted to be independently adjusted vertically and horizontally with relation to the work-support, in combination with a corresponding group of reciprocating driving-bars, each adapted to be independently adjusted with relation to the other driving-bars, both vertically and horizontally, by mechanism combined with and governed by the adjusting mechanism of the corresponding nozzle, whereby the gangs of tacks or nails may be simultaneously driven to the same depths upon the varying levels and contours of a work-support of irregular surface and of outline, substantially as described.

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