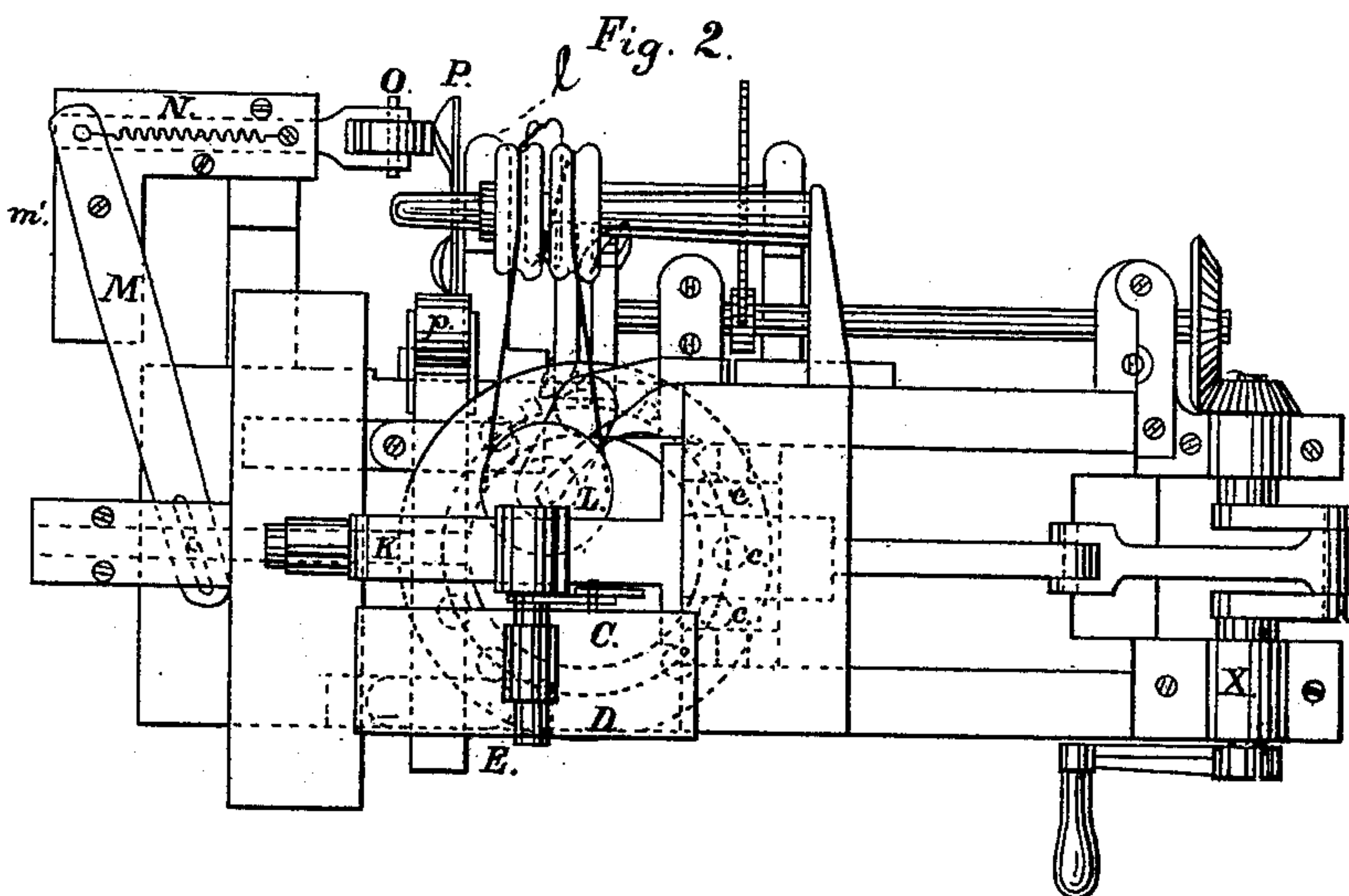
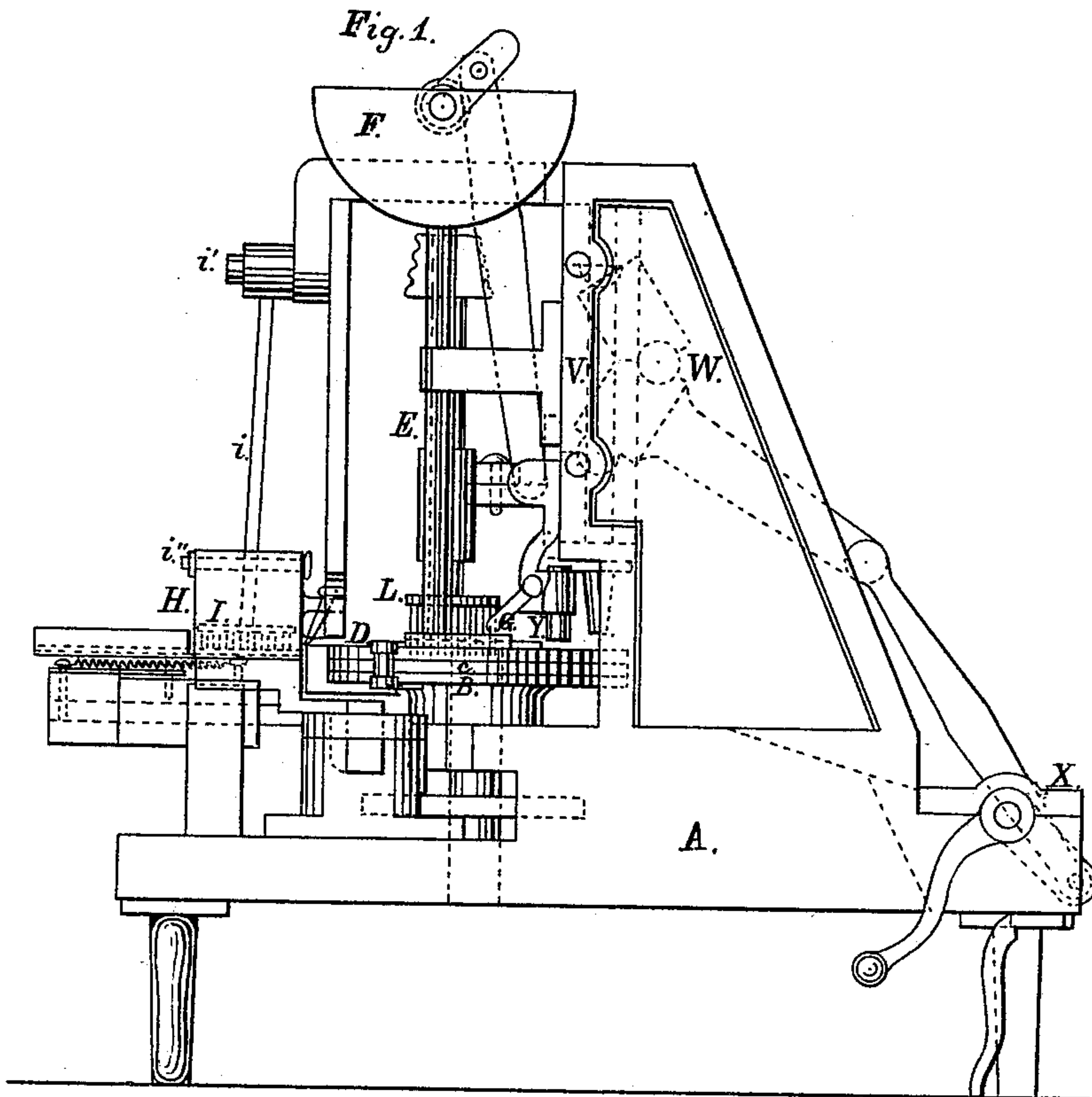


**C. RADCLIFFE.**  
**MACHINERY FOR MANUFACTURING BUTTONS.**  
 No. 188,944. Patented March 27, 1877.



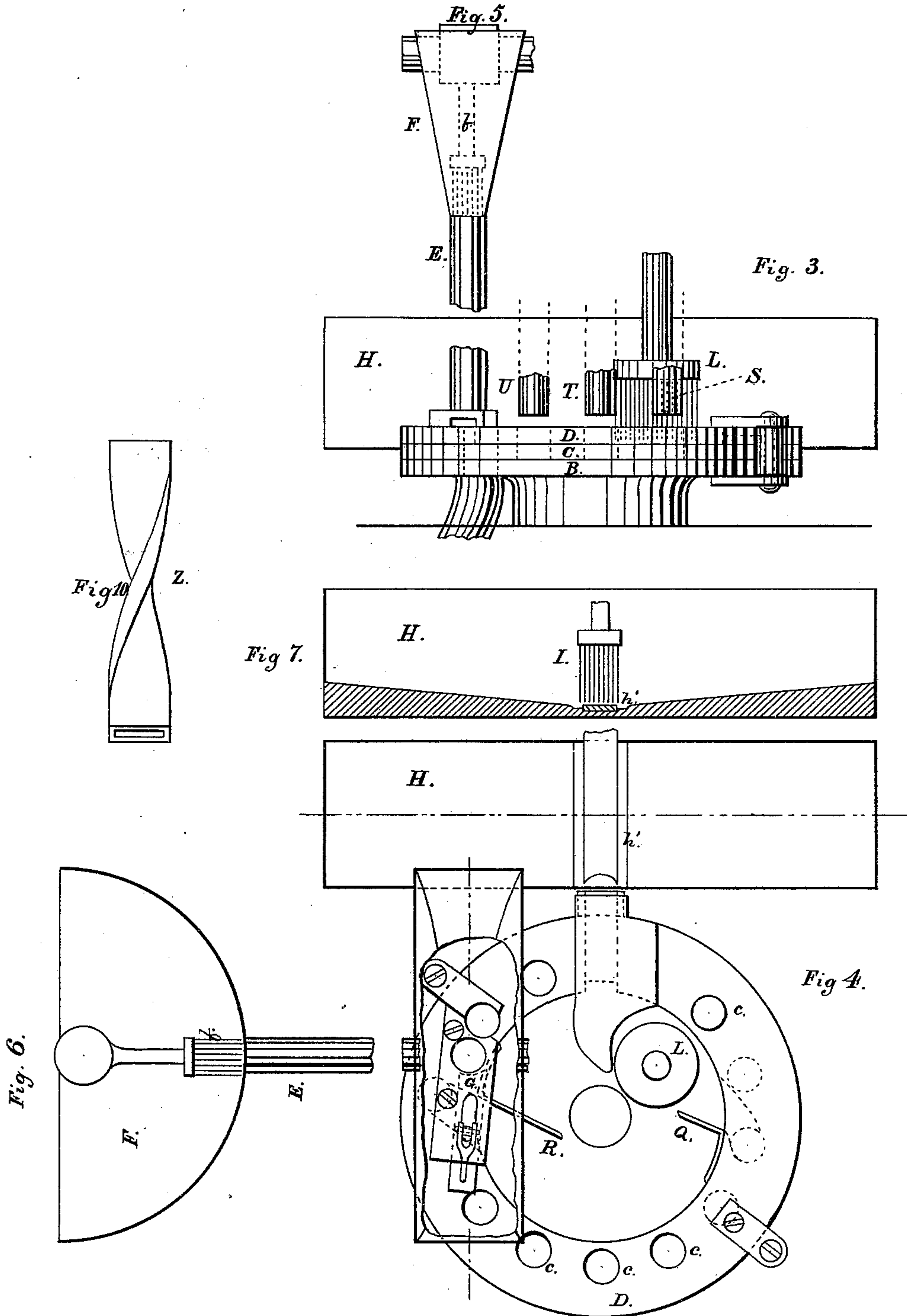
Witnesses;

*Alonzo H. Hetcher*  
*Edward Heaton.*

Inventor;

*Charles Radcliffe*

**C. RADCLIFFE.**  
**MACHINERY FOR MANUFACTURING BUTTONS.**  
 No. 188,944. Patented March 27, 1877.



Witnesses;  
 Almy Hotchkiss  
 Edward Heaton.

Inventor;  
 Charles Radcliffe

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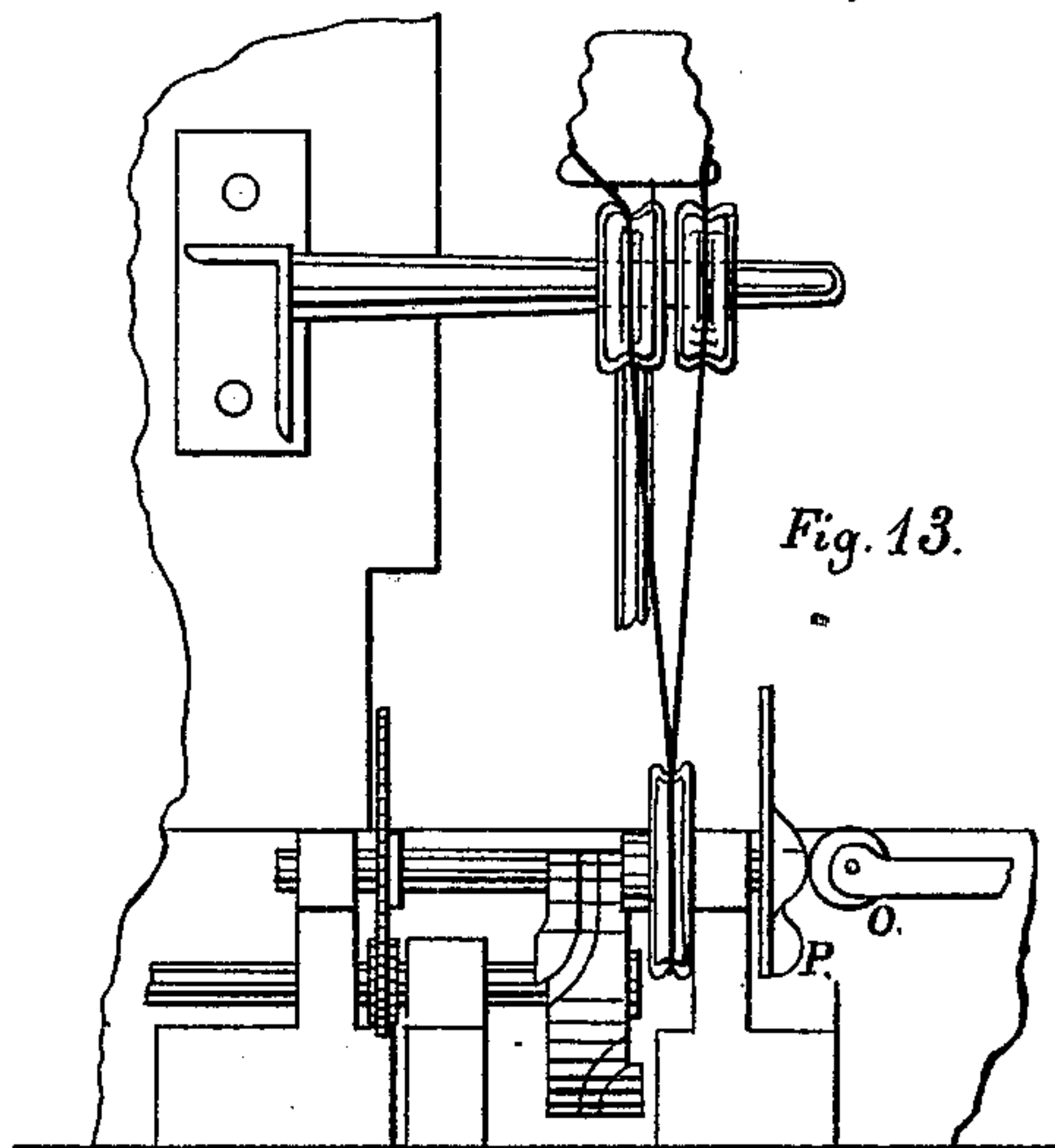


Fig. 13.

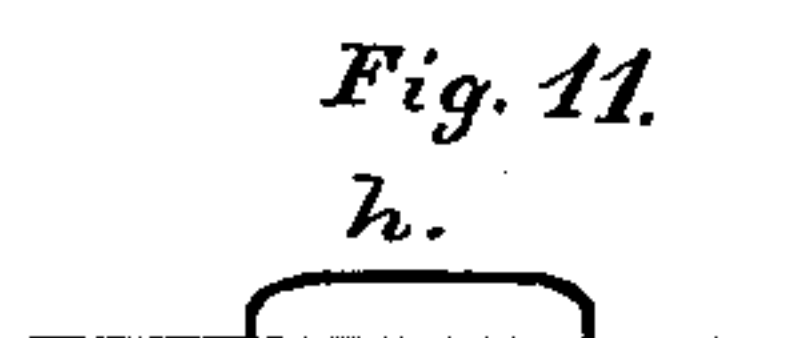


Fig. 11.

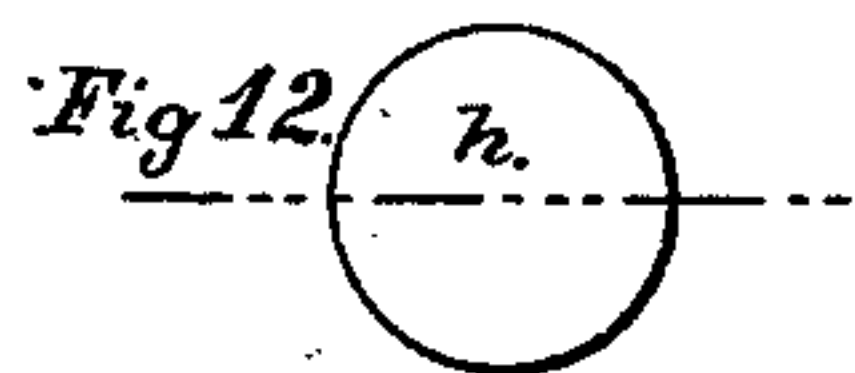


Fig. 12.

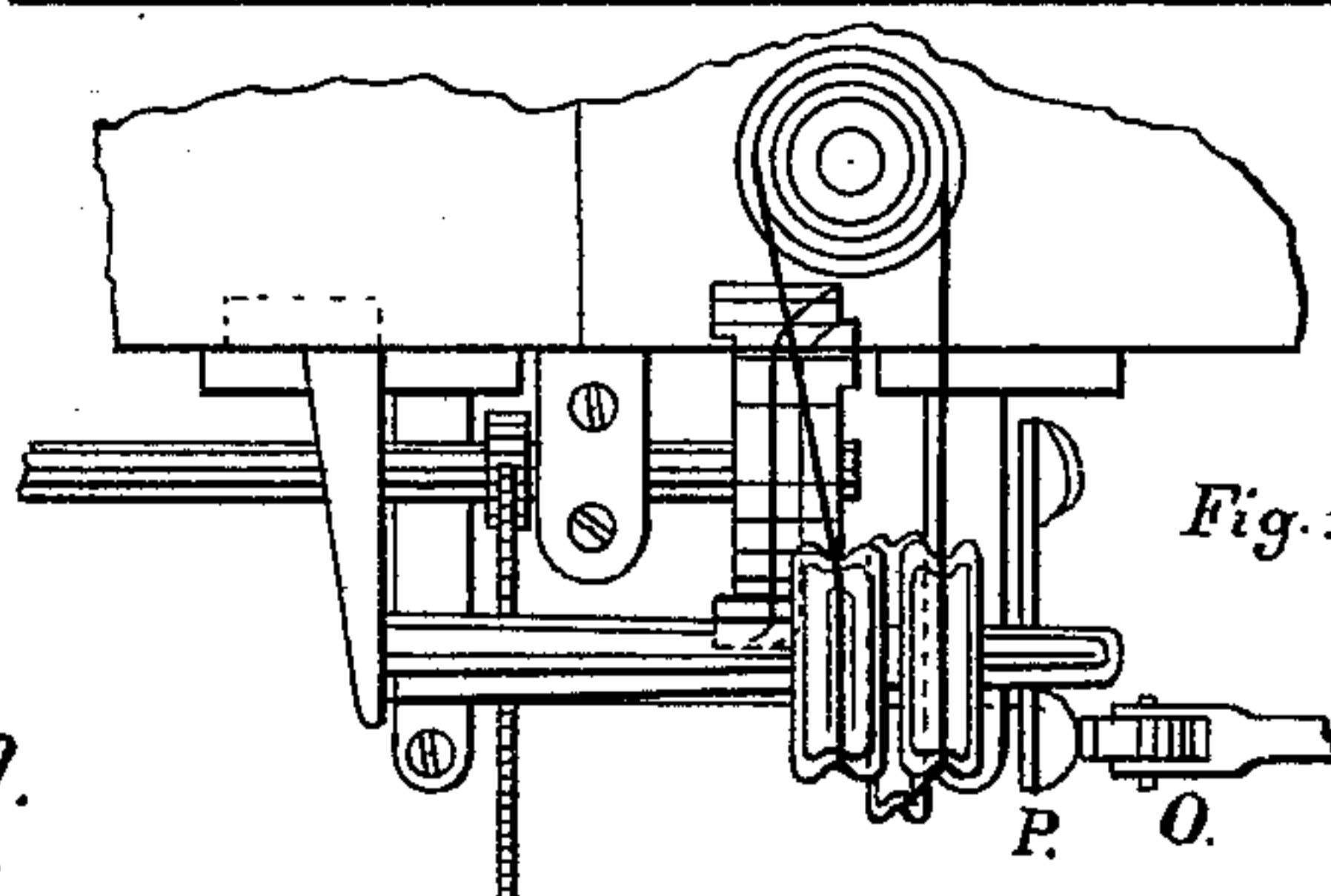


Fig. 14.

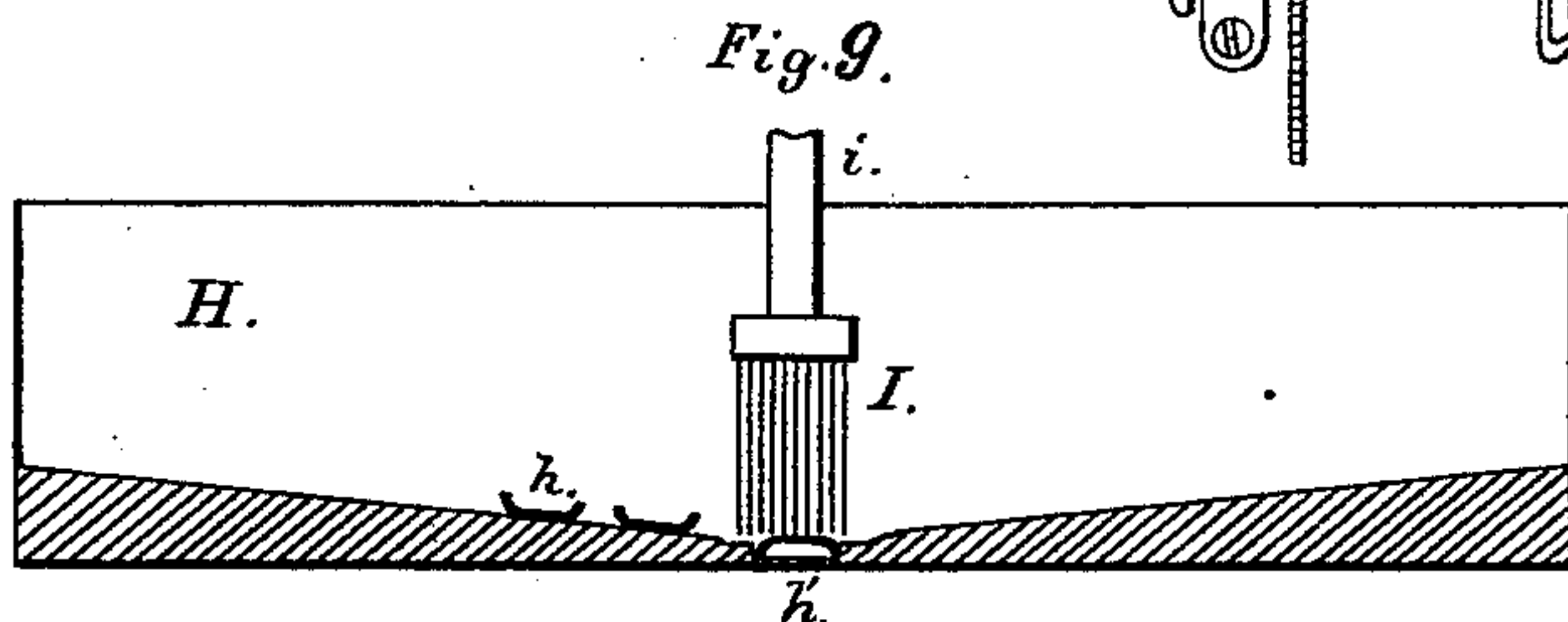


Fig. 9.

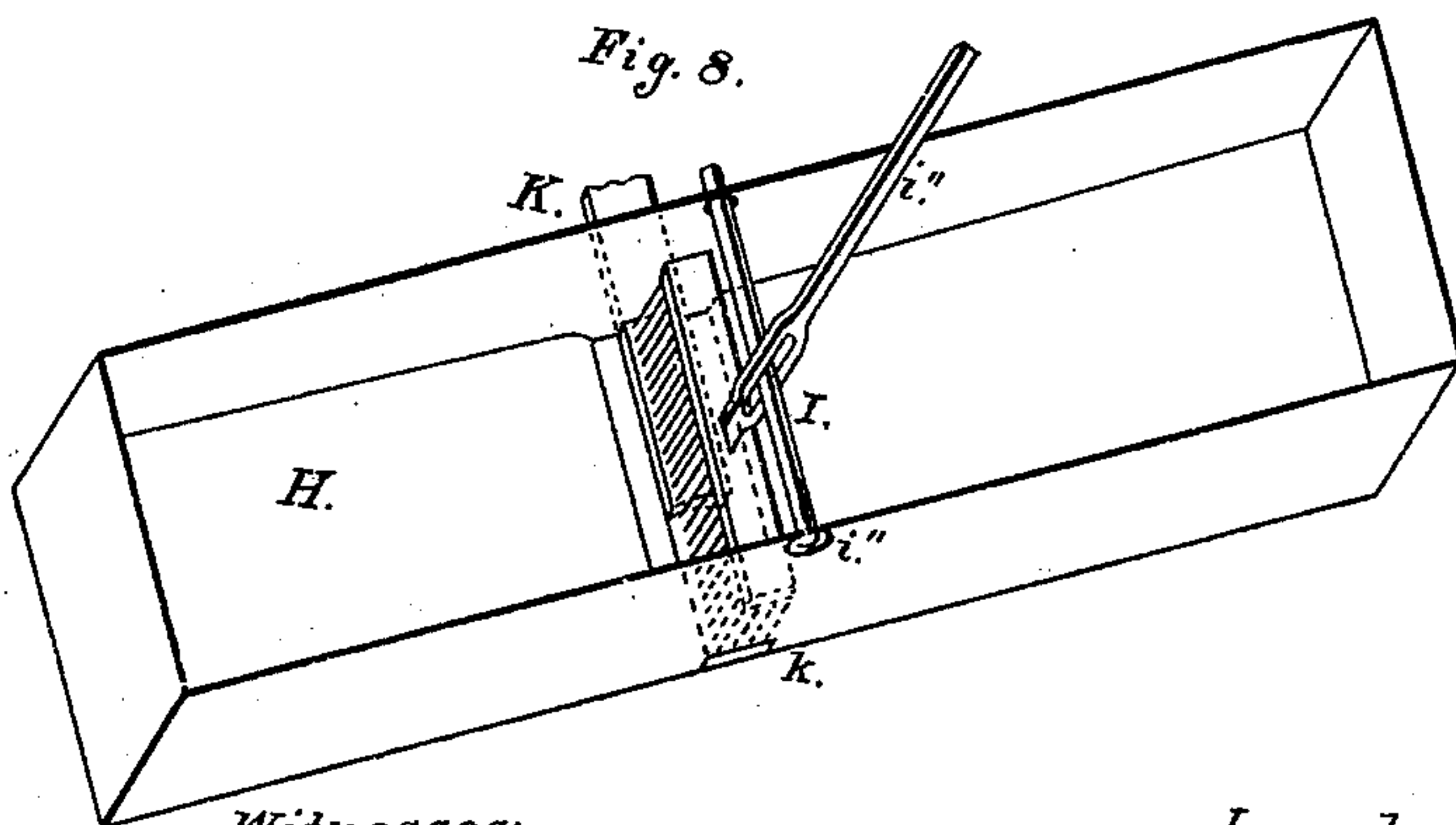


Fig. 8.

Witnesses;

Alonzo Hitchcock  
Edward Heaton.

Inventor;

Charles Radcliffe.



# UNITED STATES PATENT OFFICE.

CHARLES RADCLIFFE, OF NEWARK, NEW JERSEY, ASSIGNOR TO NEW JERSEY MANUFACTURING COMPANY, OF SAME PLACE.

## IMPROVEMENT IN MACHINERY FOR MANUFACTURING BUTTONS.

Specification forming part of Letters Patent No. 188,944, dated March 27, 1877; application filed July 1, 1876.

### *To all whom it may concern:*

Be it known that I, CHARLES RADCLIFFE, of the city of Newark and State of New Jersey, have invented a new and useful Machine for Manufacturing Buttons and Similar Articles, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

My invention has been applied by me in the manufacture of suspender-buttons. These buttons have a metal face or faces with a filling or body of paper or other substance. Heretofore, in making such buttons, so far as I am aware, the faces of the buttons have been stamped out of metal of a round form, with the edge turned up all around, and then the faces or filling of the body or paper, also stamped in round form to go within the metal, have been put together or in juxtaposition by hand, and then the pieces so put together are carried to a machine, where they are stamped, the edges of the faces clinched or pressed down so as to inclose the paper filling, and then pressed into form and punched with the necessary holes. My invention enables me to perform all of the operations of manufacture, after the stamping out of the parts, automatically by machinery, which is hereinafter described.

I provide, upon a suitable standard, A, operated by suitable mechanical means, a horizontal table, consisting of an under solid plate, B; immediately above it, and turning in contact with it, a rotating plate, C, having near its outer edge a series of holes, *c c c*, of the size or slightly larger than the button to be made; and above this second plate a ring, D, of the same size as the two circular plates, which is held stationary, but is perforated with holes corresponding with those in the second plate. The bases of the holes in the plate C, being closed by the lower stationary plate, form a series of depressions, in which the buttons are to be formed. The plate C is caused to revolve, with an alternate motion, by a suitable cam or ratchet wheel, the movements being timed to correspond with the action of the other parts, hereinafter described. At one side of this table, and above it, in the line where the said holes or depressions *c c c* revolve, I place a vertical tube, E, terminat-

ing above in a hopper, F. In this hopper there are placed the fillings for the buttons stamped or cut of the proper size. A brush, *f*, is arranged, by suitable connections, (shown in the drawings,) to vibrate backward and forward in said hopper over the mouth of the vertical tube E among the fillings, the effect of which is, after the tube is full of fillings, to keep it always just full, and lay the fillings in position flat in the said tube, so that they may fall down the same, one after the other. The base of said tube is closed; but I arrange a slot in one side at the base just large enough to permit the exit of one filling at a time, and by a reciprocating bar, G, which is caused to enter the opposite side of the base of said tube, the fillings are pushed out of the slot, one after another, so as to fall successively through the holes in the upper ring D into the holes or depressions *c c c* of the revolving plate C as it turns with its alternating motion beneath said tube. The action of the reciprocating bar G is timed so as to push a filling into each successive hole *c* as it comes in position at the side of the base of the vertical tube E. A little beyond said tube of fillings I arrange a hopper, H, for the metal faces of the buttons.

These metal faces, as shown in Figures 11 and 12, are round, and have the edges turned, the corners where the edge is turned being slightly rounded, as shown in the drawing. These metal faces so formed are placed in the hopper H, the bottom of which may be flat, but is preferably inclined toward the center from each end, as shown in section in Fig. 9. In the center of the bottom is a slot-shaped depression, *h'*, running across the hopper in the direction toward the revolving plate, which turns beside it. This depression is but little larger than the metal faces, and just deep enough to allow the faces to catch and rest in it. The hopper is connected with suitable machinery, which causes it to tilt first in one direction and then in the other, causing the metal faces in it to slide backward and forward over the slot-like depression in its bottom. The machinery for causing the tilting shown in the drawings is a cam-wheel, P, which operates in opposition to a spring (not shown) against a roller, *p*, on the end of a connection,



with an arm fastened to the hopper, and projecting below the point at which it is pivoted, so as to tilt.

Owing to the fact that the edges of the faces are turned, thereby causing the turned edges to present a sharp line on the side of the button toward which they are turned, and owing to the fact that the opposite side of the faces from which the edges are turned have a rounded corner, the said faces, in sliding backward and forward in the hopper, will only catch and rest in the slot-like depression when the turned edges are downward. The result is, that by each tilting motion of the hopper the slot-like depression is filled, or partly filled, with metal faces, all of which have their turned edges downward. In the drawing, Fig. 9, one of the metal faces is shown in section, resting in the slot-like depression in this position. In the hopper is arranged a vibrating brush or pad, I, which is actuated to swing or vibrate by means of the arm *i*, pivoted at *i'*, the pin *i''* passing through an elongated slot in *i*. (See Figs. 1 and 8.) The lower surface of this brush or pad comes in close contact with the bottom of the hopper, and operates to sweep off from the slot-like depression any of the metal faces which are not lying flat and in proper position in such depression.

On the side of the slot-like depression *h'* toward the revolving plate there is a slot, *k*, Fig. 8, in the side of the hopper H, through which slot the metal faces pass when they are arranged, as before mentioned, in the slot-like depression. After each tilting motion the hopper pauses in a level position, owing to the shape of the cam-wheel P, which operates it; and the vibrating brush I being then also immediately over the slot-like depression, and the metal faces being thus lightly held in their position, they are pressed out of it by a reciprocating bar, K, through the slot *k*, onto the surface of the revolving plate, where they all lie with their turned edges downward. While the hopper is tilting, the slot in the side may be kept closed by a spring (not shown in the drawings) or other suitable contrivance, which may also be arranged to lift or open the slot when the hopper comes to a level position. The reciprocating bar K is shown in the drawings, Fig. 2, actuated by a lever, M, pivoted at *m'*, motion in one direction being given by the cam-wheel P, having projecting cams at proper points on its face, which bear upon a roller, O, in the end of a connection with the lever M. Motion in the opposite direction is given to the lever by a spring, N. Instead of a tilting hopper with its slot-like depression and the reciprocating bar, a hopper similar to the hopper F may be used, if desired; and metal faces may be placed in it, or in the mouth of a vertical tube descending from it, with their edges all turned in the same direction, and from it be delivered into the holes in the revolving plate by mechanism similar to that by which the fillings are delivered; but, as this arrange-

ment would necessitate the adjustment of the edges of the faces all in one direction by hand, I prefer to use a tilting hopper, as hereinbefore described.

As the revolving plate turns, these metal faces are brought underneath a revolving brush, L, standing above said plate, and turning on a vertical shaft arranged in suitable bearing connected with the frame of the machine. The revolving motion of the brush L may be given by cords or belts from wheels *l*. The operation of the brush L is to sweep the metal faces into a guide on the surface of the revolving plate Q, Fig. 4, which, by the motion of the revolving plate, conducts them, one by one, to the holes or depressions in the upper surface of such plate, into which the paper fillings have already been put, as hereinbefore described.

By this means into each of the holes or depressions in the upper surface of the revolving plate there is placed a paper filling, and immediately over it one of the metal faces, with its edge turned down so as to embrace the sides of the paper filling. In case the revolving brush brings the metal faces to the entrance of the guide, (which conducts them to the depressions in the revolving plate more rapidly than the guide delivers them,) the surplus metal faces pass off by the side of the guide, and are carried around by the turning or revolving plate to the opposite side of the machine, where they are swept off into a receptacle, or may be guided off by the guide R, Fig. 4, and may then be placed again in the hopper H.

Each depression in the revolving plate carrying the paper filling, with the metal face thus placed above it, is next carried, by the revolution of the plate, under a punch, the location of which is indicated in the drawing, Fig. 3, at S, which is arranged, by suitable reciprocating machinery, to descend into each depression as it comes beneath said punch, and the punch, by a touch, adjusts the metal face over the paper, so that the edges of the metal will inclose the paper filling. Immediately adjoining this punch is arranged another punch, T, also arranged to reciprocate by suitable machinery, and by the descent of which, as successive depressions containing the fillings and faces fall beneath it, each metal face is firmly pressed down into the depression over the metal filling, and its edges clinched around the paper filling. By the shape of the same punch any desired configuration, such as a central depression, may be given to the button thus formed by clinching the metal face around the paper filling. Immediately adjoining this second punch is arranged a third punch, U, having at its extremity one, two, three, or more pointed instruments, (not shown,) which is also caused to reciprocate by suitable machinery, and which descends into each depression in the circular turning-plate as such depression comes beneath it, and by the sharp



points on its end punches the necessary holes through each button.

The punches should be arranged at the same distance apart as the holes *c c c* in the revolving plate, and may be caused to descend and rise by being attached to a frame or frames sliding in ways *V*, and operated by a knuckle-joint, *W*, moved by connections with the crank-shaft *X*.

The button, by the operation of the punch last mentioned, is finished, except japanning, and, after being carried a little farther by the revolving plate, is dropped through a hole in the under stationary plate into a receptacle beneath the machine; or it may be driven down through the hole in the plate *B* by a pin, *Y*, operated by a sliding frame, the same as or similar to that which operates the punches. I have shown in the drawings a compact arrangement for operating the several parts of the machine hereinbefore described, the vibrating brush *f*, the reciprocating bar *G*, for expelling the fillings from the bottom of the tube *E*, the punches, and the pin *Y*, being all operated by the frame sliding in the ways *V*. The same cam-wheel *P* also causes the tilting of the hopper *H*, and moves the reciprocating bar *K*.

The machine is operated by a crank, or by power applied to the crank-shaft *X*, and motion may be given to the revolving plate or table, and to the cam-wheel *P*, and from it to other parts of the machine through pinion-wheels connecting with the main crank-shaft *X*. When it is desired to make buttons with two metal faces, an upper and a lower one, with a filling of paper or other material between them, the arrangement and combination is modified so as to introduce a second hopper for holding the under metal faces. Both metal faces have turned edges, as before described, and one is made slightly smaller than the other, so as to go within the edges of the other. The fillings are made of a proper size to go within the smallest of the metal faces. The hopper already described feeds to the machine metal faces with their turned edges downward, and a similar hopper is arranged by the side of the revolving plate in case two faces are to be used, which will conduct into each depression in the revolving plate (prior to the operation of dropping the paper filling into each depression, as heretofore described) a metal face with its edge turned upward. The location of the hopper for fillings and that for the upper metal faces will be modified in case of the introduction of this hopper for lower metal faces. The arrangement by which the metal faces to be first dropped into the depressions in the turning plate or table are caused to have their edges turned upward instead of downward, as previously described, is as follows:

The tilting hopper for holding these under faces is the same as previously described for holding the upper metal faces. It has also in its bottom a slot-like depression, and the method of passing the faces arranged in the

slot-like depression through the side of the hopper toward the revolving plate is the same. These metal faces, as they arrange themselves in said slot-like depression in the hopper, all have their turned edges downward, and in order to deliver them from the hopper onto the revolving plate and into the holes *c c c*, they are caused to pass through a screw-formed channel, *Z*, Fig. 10, the arrangement of which, in connection with the hopper, will be readily understood, which turns them once over, and so delivers them upon the upper surface of the revolving plate with their turned edges upward. From this position they may be conducted by means of a revolving brush and guide, similar to that previously described, one by one, into the holes or depressions near the outside edge of the revolving plate. The paper fillings are then dropped on each one of them, in such holes or depressions as before described, and the upper metal faces are also placed in each hole or depression, as before described. The pieces so placed in such depressions are adjusted in position, the edges clinched, the form given to the button, and the holes punched by punches, as previously mentioned.

The edges of the holes in the buttons, being rough from the punching, may be smoothed, and any ornamentation or shape may be given to the button by any of the ordinary means known.

What I claim as my invention, and desire to secure, is—

1. The combination of a hopper, *F*, with a vertical tube, *E*, whose cross-section is of the same size and shape as the fillings to be conveyed by it, a brush, *f*, arranged to vibrate in the hopper close over the mouth of said tube, and thereby lay the fillings one, by one, flat therein, and a revolving plate provided with holes *c c c*, substantially as hereinbefore described.

2. The combination of the tilting hopper with its slot-like depression, the reciprocating bar *K*, and the revolving plate, substantially as hereinbefore described.

3. The combination of the revolving plate and revolving brush and guide, for conducting articles to be stamped or punched to depressions in the edge of said revolving plate, substantially as hereinbefore described.

4. The combination of the tilting hopper, revolving plate, rotating brush, and guide, substantially as hereinbefore described.

5. The combination of the hopper *F*, the tilting hopper *H*, and revolving plate, substantially as hereinbefore described.

6. The combination of the hopper *F*, vibrating brush *f*, tilting hopper *H*, vibrating brush *I*, reciprocating bar *K*, and revolving plate, substantially as hereinbefore described.

7. The combination of the tilting hopper, reciprocating bar, revolving plate, and one or more punches, substantially as hereinbefore described.

8. The combination of the tilting hopper,



reciprocating bar, revolving plate, revolving brush, and one or more punches, substantially as hereinbefore described.

9. The combination of the hopper F, tilting hopper H, revolving plate, revolving brush, and one or more punches, substantially as hereinbefore described.

10. The combination of a revolving plate or table provided with holes or receptacles for faces or fillings, one or more vertical tubes arranged above said plate for conveying such faces or fillings and automatically delivering

the same to said receptacles, and one or more punches, substantially as and for the purposes described.

11. The combination, with the sliding frame, of the punches, reciprocating bar K, and vibrating brush *f*, all deriving their motions from said sliding frame, substantially as hereinbefore described.

CHARLES RADCLIFFE.

Witnesses:

ALONZO HITCHCOCK,  
EDWARD HEATON.