

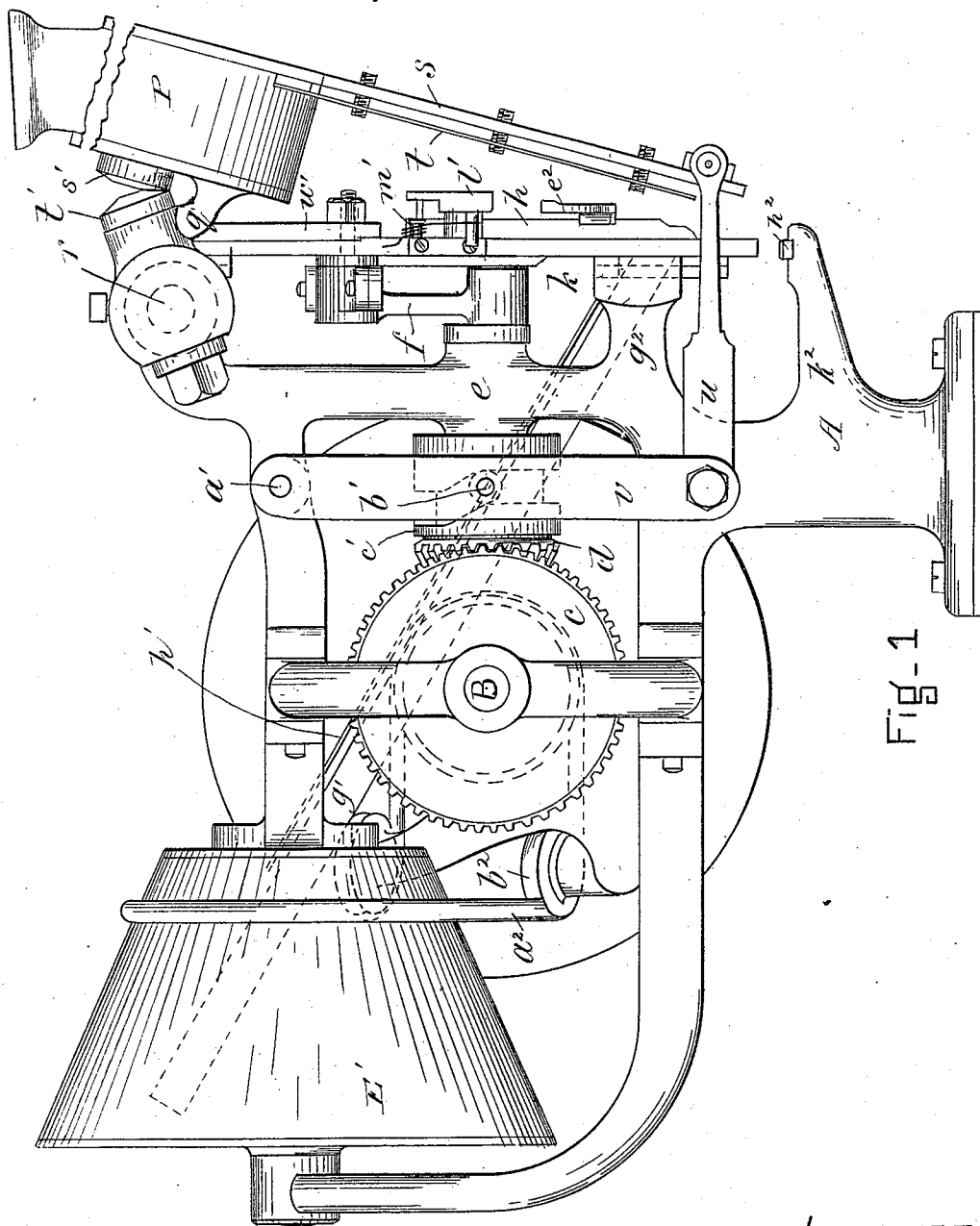
(No Model.)

7 Sheets—Sheet 1.

E. H. TAYLOR.
BUTTON SETTING MACHINE.

No. 558,234.

Patented Apr. 14, 1896.



WITNESSES

Robert Wallace.
C. E. Folte

INVENTOR

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his atty.

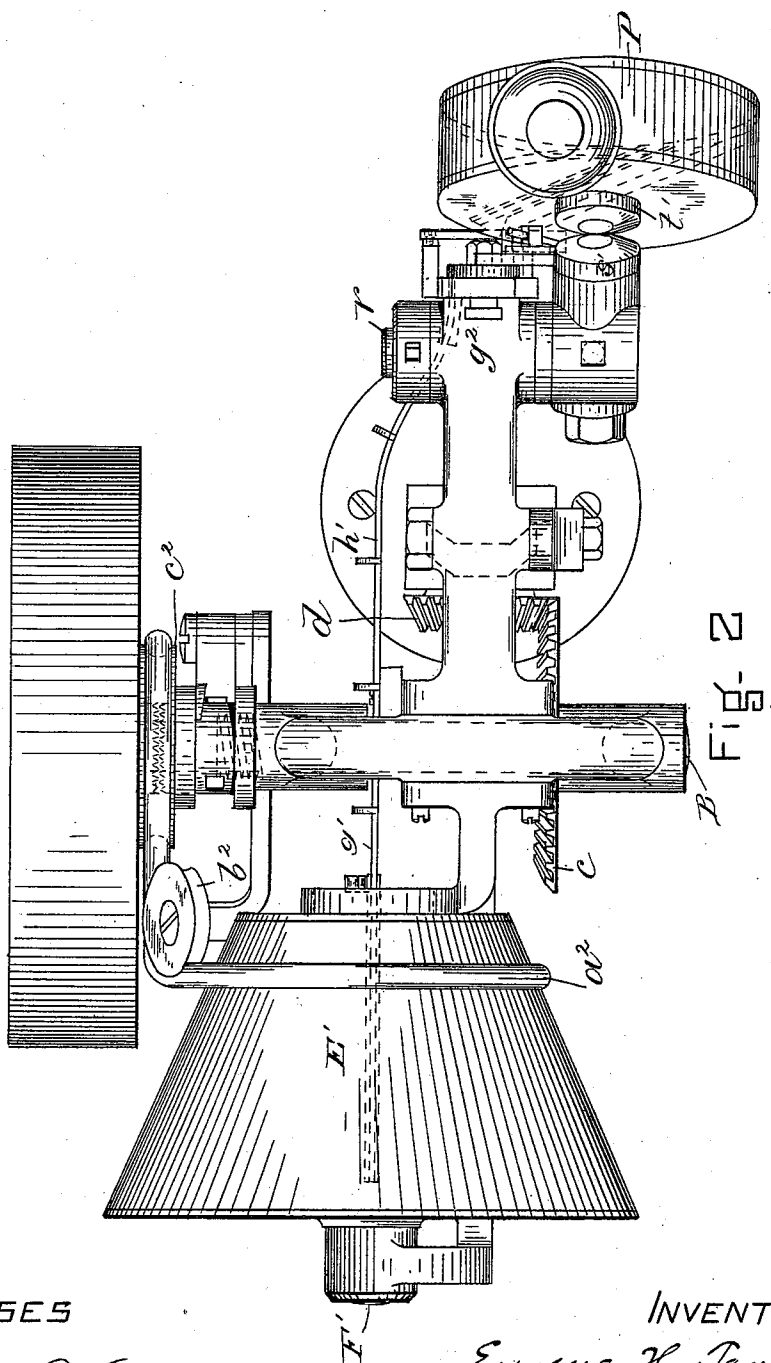
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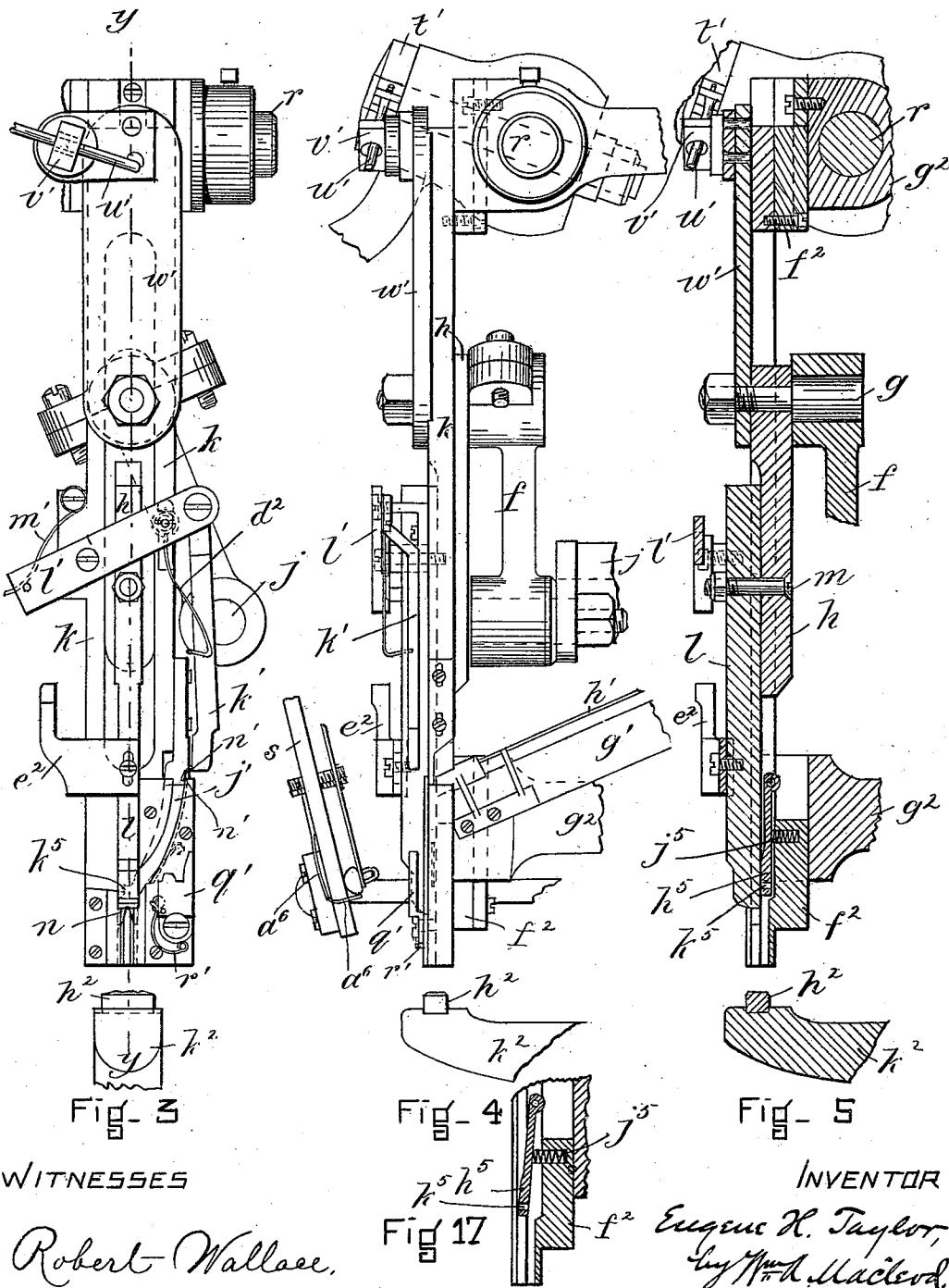
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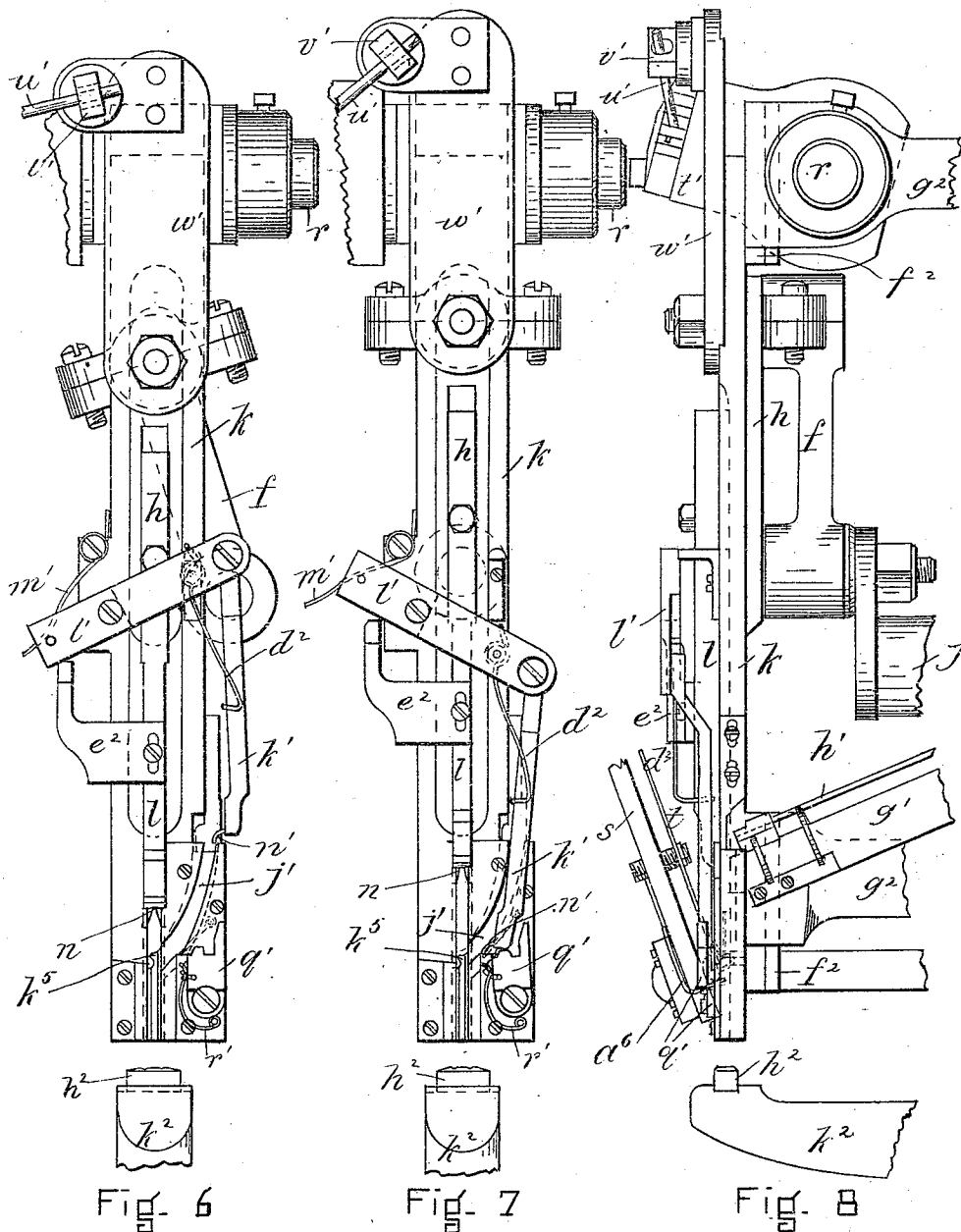


Fig. 6

Fig. 7

Fig. 8

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(No Model.)

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E. H. TAYLOR.
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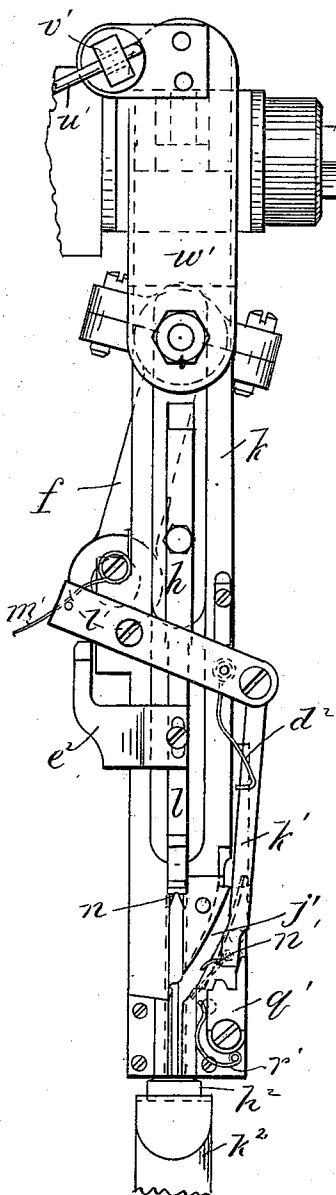


Fig. 9

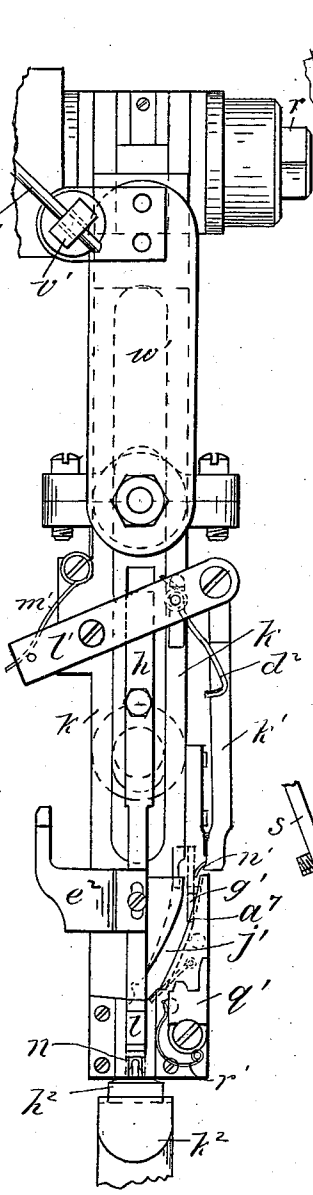


Fig. 10

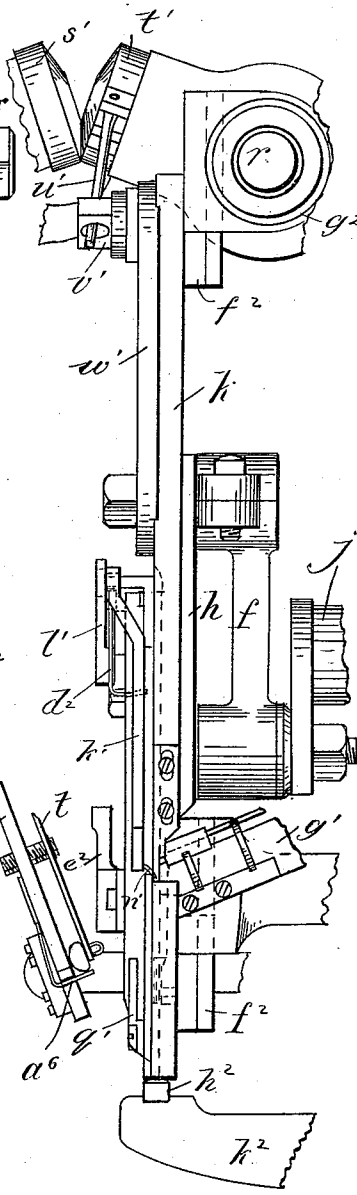


Fig. 11

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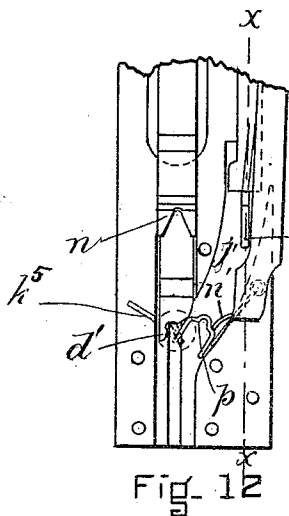


Fig- 12

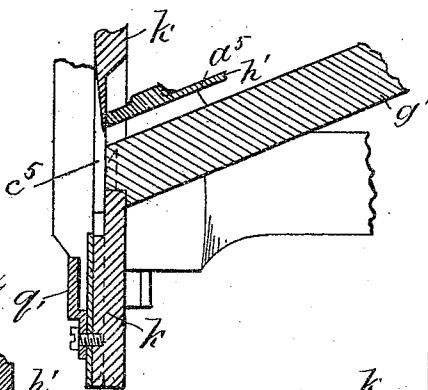


Fig- 13

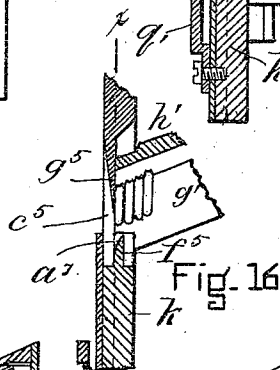


Fig- 16

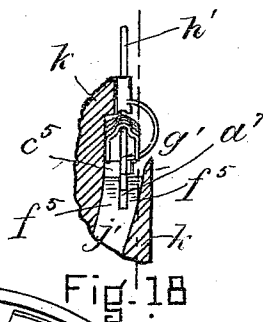


Fig- 18

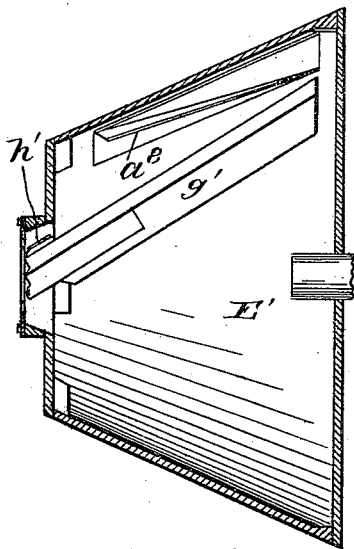


Fig- 14

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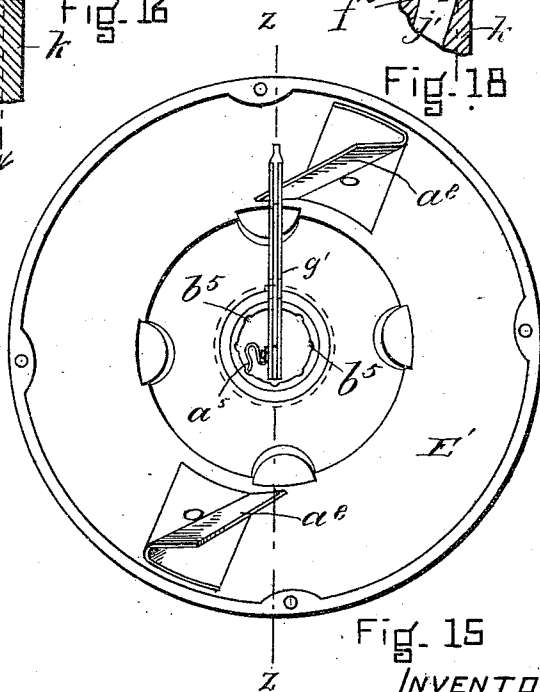


Fig- 15

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(No Model.)

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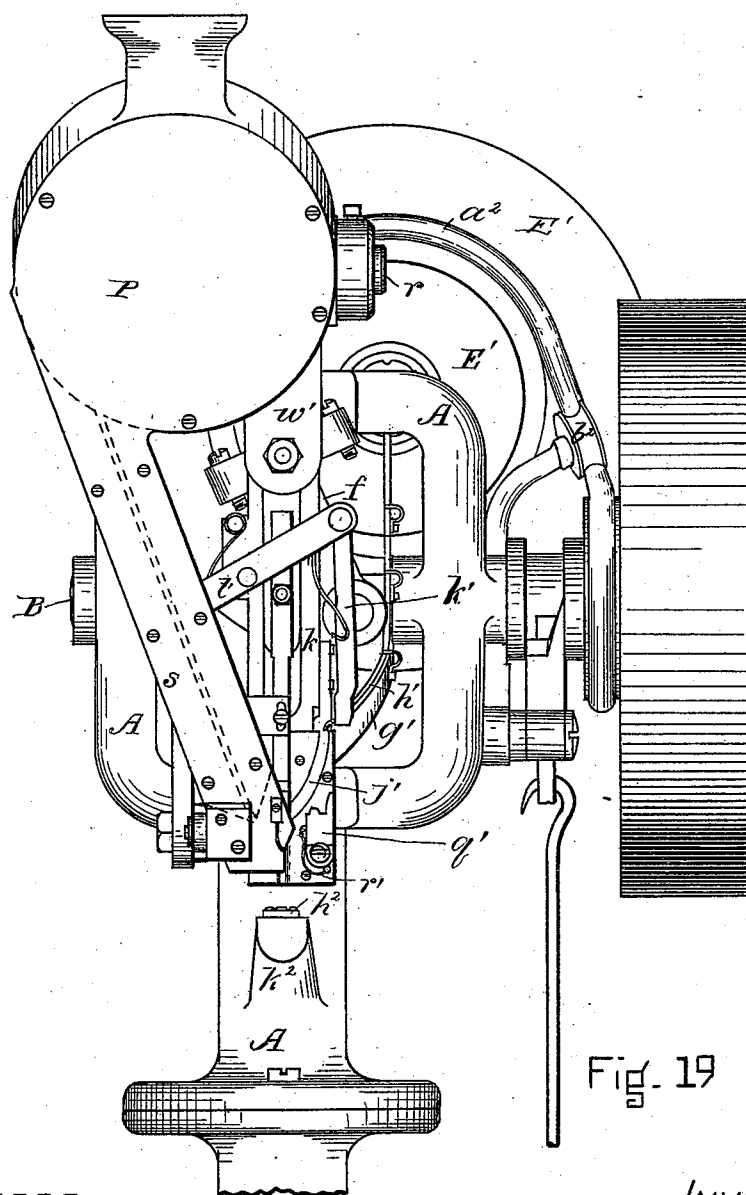


Fig. 19

WITNESSES

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C. E. Holtz

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his atty

UNITED STATES PATENT OFFICE.

EUGENE H. TAYLOR, OF LYNN, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE HEATON-PENINSULAR BUTTON FASTENER COMPANY, OF RHODE ISLAND.

BUTTON-SETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 558,234, dated April 14, 1896.

Application filed January 14, 1890. Serial No. 336,876. (No model.)

To all whom it may concern:

Be it known that I, EUGENE H. TAYLOR, of Lynn, county of Essex, State of Massachusetts, have invented certain new and useful
5 Improvements in Button-Setting Machines, of which the following is a specification.

The object of my invention is the production of a machine adapted to operate automatically to attach buttons to leather or similar material by means of metallic staples or fasteners. Machines for this purpose which
10 are partially automatic—that is, which act automatically after being supplied with a chute or raceway which has been filled with buttons and attached fasteners—are now in
15 use, and I am also aware that machines designed to act wholly automatically have hitherto been constructed; but I am not aware that any of the latter class of machines are
20 capable of practical operation.

My machine hereinafter described is wholly automatic—that is, it receives and sorts the buttons by means of proper machinery and also receives and sorts the staples, then brings
25 the two together and inserts a staple in the eye of a button, and finally drives the staple with its attached button and clenches the staple.

My invention consists not only in the mechanism for performing each of the necessary operations above described, but also in the combination of such mechanism so as to constitute an organized machine.

I have shown my invention as embodied in the best form now known to me in the machine represented in the accompanying drawings, and the construction and operation of the same will be clear from the following description, in which like parts thereof are
40 designated in said drawings by like letters of reference.

In the drawings, Figure 1 is a side elevation of the operative parts of the machine, the standard or support therefor being broken away. Fig. 2 is a plan view of the same. Figs. 3, 4, and 5 are respectively a front elevation,
45 a side view, and a vertical central section of the driving mechanism as also of the button and staple delivery mechanism in the position which the parts occupy just before they pre-

sent a button to receive a staple, said Fig. 5 being a section on line $y y$, Fig. 3. Fig. 6 is a front elevation of the same parts, the driver-bar being at that point in its upward movement at which the staple-inserting mechanism begins to act. Fig. 7 is a front elevation
55 of the same parts, the driver-bar being very near the end of its upward movement. Fig. 8 is a side elevation of the same parts in the position shown in Fig. 7 and showing a portion of the button-raceway. Fig. 9 is another
60 view of the same parts in slightly changed positions, the staple-inserting mechanism being below the center of its movement. Figs. 10 and 11 are similar views showing the position
65 of the same parts when the button has been set and the driver is at the lowest point of its movement, and Fig. 11 also shows the next succeeding button in position to be presented to the staple-chute to receive a staple. Fig. 12 is a detail, on a larger scale, showing
70 a staple being inserted in the eye of the button. Fig. 13 is a vertical section on line $x x$, Fig. 12. Fig. 14 is a section on line $z z$, Fig. 15; and Fig. 15 is an end view of the staple-hopper. Fig. 16 is a vertical section showing
75 the construction of that portion of the front plate which operates to take the lowermost staple from the staple-raceway. Fig. 17 is a vertical section of the lower end of the guideway, showing the spring-impelled plate, which is notched at its lower end to receive the eye of the button when the button is delivered in the guideway from the lower end of the button-raceway. Fig. 18 is a section on line $x' x'$,
80 Fig. 16; and Fig. 19 is a front elevation of the machine.

A represents the stationary frame of the machine, which may be bolted or otherwise secured to a standard of proper height and
90 which is of a shape suitable to support the various parts of the mechanism, as shown.

B is the main shaft, which is provided with a suitable pulley for the reception of a driving-belt. On the shaft B is secured a beveled gear c , which meshes with a beveled pinion d , fast on a secondary shaft j , (see Figs. 3, 8, and 11,) which is journaled in the upright portion e of the frame A. The other end of this shaft is provided with a crank, on
100

which is journaled one end of the connecting-rod *f*, (see Fig. 1,) the other end of which is pivoted on a pin *g*, (see Fig. 5,) projecting from the rear of the upper member *h* of the driver-bar. As the shaft *j* rotates it will be clear that the driver-bar will be reciprocated vertically. The driver-bar is mounted in vertical ways in the piece *k* on the front of the machine and consists of two members *h* *l*, secured together for purposes of adjustment by a bolt *m*. The lower of these members *l* carries at its lower end the driver *n*, which is notched or cut away centrally to accommodate an upward projection on the crown of the staple, as also the eye of the button, and so that it may bear only on the shoulders of the staple directly above the prongs in a well-known manner. The driver reciprocates vertically through a grooved channel or guideway, which is open centrally front and rear to allow the eye and head of the button to project, the eye of the button being substantially at right angles to the prongs of the staple when the driver is acting on the staple to drive it through the material.

It will be clear that if a staple with a button on it be placed in the guide or channel way below the driver the downward movement of the driver will force them out of the guide or channel way and the staple into the material held against the lower end of the guide or channel way. It will also be clear that means must be provided for taking a button and staple from their respective receptacles, inserting the staple in the eye of the button, and placing the staple and its attached button in position in the guideway below the driver in order that the staple may be driven and set.

The mechanism which takes the staples and buttons from their respective receptacles, guides them to a point under the driver, inserts the staple through the eye of the button, and places the staple and attached button in the guideway will now be described.

The buttons are placed in a hopper or receptacle *P*, (see Figs. 1 and 2,) which is mounted on a rocking arm *q*, which can oscillate on the shaft or pin *r*, so that the hopper *P* can oscillate in order to move the raceway *s*, which is secured to it, toward and from the front of the machine. This raceway is provided with two guides *t*, between which the eye of the button projects, while the body of the button rests against the piece *s*, as shown in Fig. 4. These guides *t* and piece *s* in fact constitute the raceway and guide the button from the hopper to the lower end of the raceway. This raceway does not hang vertically, but inclined to the horizon, preferably at an angle of about thirty degrees. Consequently a plane passing through the eye of any button in the raceway is not vertical, but inclined to the horizon. A link *u* (see Fig. 1) connects the lower end of this raceway with the lower end of the lever *v*. This lever is pivoted at its upper end at *a'* to the frame of the

machine and is provided about midway of its length with a pin *b'*, which is received in the groove of a cam *c'*, secured on the shaft *j*. As the shaft *j* revolves the lever *v* will oscillate and the raceway *s* will be moved toward and from the front of the machine.

When a button has descended the raceway to the lower end thereof, as shown in Fig. 4, the raceway is moved toward the front of the machine and the eye of the button is caused to project into an opening in the front of the guideway and to lie in said opening diagonally across the guideway, as shown at *d'*, Fig. 12. In this position it is presented to one prong of the descending staple.

The staple-hopper is shown at *E'* and is journaled on a stud *F'*, secured to the frame. (See Figs. 1 and 2.) The hopper *E'* is a frustum of a hollow cone closed at its front and rear ends. The front end has a central aperture, through which a thin strip of metal *g'* projects. Said strip of metal is inclined to the horizon and extends nearly from the rear of the hopper to the place where the staples are delivered into the guideway, being bent sidewise at its lower end, as shown in Fig. 2, thus forming the raceway down which the staples are carried. As the hopper *E'* revolves by the operation of a belt (shown in Figs. 1 and 2) or by any other suitable means the staples are lifted by wings *a''*, secured to the inside of the hopper, as shown, and dropped upon the edge of the guide-strip *g'*, and such of them as straddle the strip will slide down the same by gravity and accumulate at the lower end thereof. In order to prevent their clogging on the strip, the strip may be jarred by means of a spring *a'''*, oscillated by notches *b'''* on the edge of the opening at the small end of the hopper *E'*. A narrow piece or rod *h'* is placed over the guide-strip *g'* outside the hopper *E'* to prevent the staples from being displaced. The lower end of the raceway *g'* enters a recess *c''* in the front plate *k*, which recess forms the upper end or mouth of the staple channel-way *j'*, leading to the button. This plate prevents the staples from passing off the raceway until they are one by one picked off. The manner in which the lowermost staple is picked off or taken from the raceway and placed in the mouth or upper end of the channel-way *j'* will be clear upon reference to Fig. 16, which shows the raceway with some staples at its lower end, as also a section of the front plate *k*, in which the channel-way *j'* is cut. The front plate reciprocates vertically, as will be hereinafter described, and, considering it to be in the position shown in Fig. 16, as it moves upwardly the beveled projections *f''* pass up between the lowermost staple on the raceway *g'* and the staple next above it and separate the lowermost staple from the adjoining one, at the same time preventing the adjoining staple and those above it from passing farther down. As soon as the downwardly-projecting beveled portion *g''* has passed above the crown of the staple the lowermost staple drops into the recess *c''*, which

forms the mouth of the channel-way j' . When the front plate k passes downwardly again, carrying the projection f^5 below the staples on the raceway g' , the staples slip down a distance equal to the breadth of one staple and are prevented from falling by the projection g^5 , which descends with f^5 . This is an ordinary way for picking out articles one by one from the bottom of a raceway, and other known ways for performing the same duty may be substituted therefor. On the next reciprocation of the plate k the operation is repeated, and thus the staples are removed one at a time from the raceway g' and drop into the channel-way j' . This channel-way j' is an upwardly-extending branch of the guide or channel way in which the driver acts, and the eye of the button, when in the position shown in Fig. 12, (and heretofore described,) lies across this raceway, with the hole in the eye of the button in a position to receive the uppermost prong or leg of the staple.

The device for placing the staple which has been dropped into the channel-way j' through the eye of the button consists of a finger n' , which is actuated by an arm or follower k' , pivoted at its upper end to a lever l' , which is journaled at one end to the vertical front plate k of the machine. This lever is operated in one direction by a striker e^2 , which is secured adjustably to the front of the driver-bar l . (See Figs. 3 and 5.) As the driver-bar moves upward the striker e^2 comes in contact with the projecting tail of the lever l' , forcing this tail upwardly against the pressure of the spring m' and throwing downwardly the other end of the lever and the arm k' , while, when the driver-bar descends, carrying down the striker, the spring m' operates to reverse the movement of the lever l' and to raise the arm k' . The lower end of the arm k' carries firmly secured thereto a finger n' , which projects downwardly and rearwardly from the lower end of the arm or follower k' , and thus projects into the channel-way j' . This finger rides against the lower side of the channel-way j' , is oscillated up and down by the movement of the lever l' , and when it comes in contact with the staple in the channel-way forces it downward and through the eye of the button, the end of the movement of finger n' causing the button to turn so that its eye will be vertical and the staple p' will hang centrally upon it. The last portion of the downward movement of the finger n' should be nearly crosswise or horizontal to accomplish the turning of the button, and to get this horizontal movement of the arm k' and its finger n' a pivoted tilting plate q' is secured to the lower end of the front plate k of the machine. A spring r' , also secured to the front plate, serves to hold the tilting plate normally in an upright position, as shown in Fig. 3; but as the arm k' in its downward movement comes in contact with the tilting plate (see Fig. 7) the plate is tilted to one side and

carries the arm or follower in a direction substantially across the face of the machine.

Fig. 7 shows the arm in contact with the pivoted tilting plate q' just after the plate has begun its movement. On its upward movement the arm k' is thrown sidewise by means of a spring d^2 , fast at its upper end to a pin on the lever l' and at its lower end so bent as to bear on the arm and cross it sidewise away from the center of the machine, thus causing the finger n' to follow the lower edge of the channel-way j' .

For the purpose of agitating the buttons in the hopper P, I provide inside the hopper a brush or equivalent device secured to a shaft s' , one end of which projects through the rear of the hopper and has a beveled end provided with a single tooth or projection, which is received in a recess in the correspondingly beveled end of the shaft t' , which is journaled in the rock-shaft arm q . (See Fig. 1.) To the shaft t' is secured loosely a pin u' , (see Figs. 2, 5, &c.,) which projects through a hole in the block v' on the upper end of the vertically-moving plate w' , which is in fact a continuation of the driver-bar. As the driver-bar reciprocates the extension w' will be moved vertically and the shaft t' will be rocked through the agency of pin u' , thus rocking the shaft s' and moving the brush in the hopper P so as to agitate the buttons therein. The staple-hopper E' is given a rotary movement by means of a belt a^2 , (see Figs. 1 and 2,) which passes around the hopper in the groove cut in the exterior thereof, thence over grooved idle-rolls b^2 and thence around the grooved boss or hub c^2 of the driving-pulley. By this means the hopper is revolved when the main shaft is driven.

The front plate k is slotted vertically, the slot being provided with grooved ways to receive the driver-bar, which is set therein and which has a vertical movement independently of the front plate k . It is necessary that the staple and attached button, which are located in the guide underneath the driver and are in position ready to be set, should be placed near to or upon the surface of the material upon which the button is to be set. Otherwise the staple would not be guided as it is driven into the material, and it is also necessary that the guide which holds the staple should, when the material is being placed under it, be a sufficient distance from the anvil against which the staple is clenched to permit of the material being freely inserted and withdrawn. To accomplish this object, I make the front plate vertically movable, so that after a button and staple are in position below the driver the guideway in which they are located and which consists of the lower portion of what I have called the "front" plate k is moved down to bring its lower end into contact with the material in which the button is to be set. The driver then descends, driving the staple, after which the front plate k and driver move

up together by friction of the driver-bar thereon, as hereinafter described, the front plate, when it has completed its upward movement, stopping and the driver continuing in its upward movement. The upward movement of the front plate is stopped by the bottom of the vertical slot a^7 in said plate coming in contact with the end of the staple-raceway g' , the driver continuing its upward movement, as previously stated. The frictional contact between the driver-bar and the face-plate k , by which the movement of the plate is effected, is produced by clamping the plate k between the flanges or side portions of the upper member h of the driver-bar and the extension w' by means of bolt g , that portion of the bolt which extends forward and passes through the driver-bar, plate k and extension w' being of less diameter than the rearward portion thereof and being provided with a nut in front of the extension w' , as shown. As will be clear, the driver-bar, plate k and extension w' may be clamped securely between the shoulder on the bolt g and the nut on the forward end of the bolt. The front plate k is provided with rearwardly-projecting blocks f^2 at the upper and lower ends thereof and slide in grooves or T-slots cut in the forwardly-projecting arms g^2 of the frame of the machine. This arrangement forces the plate k to move in vertical lines, as described, the extent of movement being governed by the anvil h^2 below or the goods resting thereon and upwardly by the contact of the bottom of the slot a^7 with the end of the raceway g' . The exact time in which this movement is effected is not essential, and in the machine represented in the drawings I have shown it as produced by means of the friction of the driver-bar extension w' against the plate k , as described. The operation of the driver-bar and plate k relatively to each other is as follows: The parts being in the highest position, (see Fig. 5,) the connecting-rod f begins to descend and carries the driver-bar and plate with it. They descend together until the lower end of the plate rests on the material on the anvil. The face-plate k then rests, and the further movement of the connecting-rod f moves the driver-bar down relatively to the plate k , thus causing the driver to set the staple and button. At the time the button is set the connecting-rod f has reached the lowest point of its movement and begins to rise, and during the first part of its upward movement the plate k and driver rise together until the bottom of the slot a^7 in the plate k is in contact with the end of the staple-raceway g' . Then the upward movement of the plate k is arrested, and the further upward movement of the connecting-rod f carries the driver up to its highest point.

When the lowermost button in the raceway s is carried rearward and its eye thrust into the opening made at the upper end of the guide to receive it, (see Figs. 6, 7, and 8,) it is held in that position by the raceway s until

the staple is thrust through its eye, thus holding the button securely in position, after which the driver descends and the raceway moves forward toward its normal position, the button being pulled out of the lower end thereof and remaining with the staple in the guide underneath the driver. When the button-eye is thrust into position by the movement of the raceway s to receive the prong of the staple, it lies directly in the path of the driver, and it is necessary to provide means for steadying the button-eye when it is placed in that position which shall act to steady it until the prong of the staple is inserted in it, and which shall also be movable, so that it may not prevent the driver from coming in contact with the staple which rests in the eye of the button. To attain this object, I provide a plate h^5 , pivoted at its upper end on the front plate k , as shown in Figs. 5 and 17. The pivot of this plate is immediately behind the driver-bar, and a spring j^5 is set behind the plate in a recess in the block f^2 , the front end of the spring bearing on the back of the plate. This spring tends to throw the plate forward, and as the driver moves up after a button is set past the lower portion of said plate the plate is thrown outward or forward and when the driver is in its raised position (at which time its lower end is opposite or slightly below the pivot of the said plate h^5) the lower end of the plate is farther forward in position to receive the eye of the next button. The shape of said plate, viewed from the front, will be clear from Figs. 6 and 7 and on a larger scale in Fig. 12, it being inclined at its lower end and provided with a notch h^5 to receive and steady the eye of the button. As will be clear, the downward movement of the driver presses the plate h^5 back into a vertical position, or substantially so, out of the line of the driver, thus allowing the driver to pass down and set the button. The lower end of the plate h^5 is inclined, as above stated, and forms one side of the channel-way down which the staple passes when it is thrust through the eye of the button, so that this plate not only performs a function with relation to the button, but also with relation to the staple, serving as a guide thereto while the staple-prong is passing through the eye of the button.

At the lower end of the button-raceway s a spring a^6 is provided, secured to the under side thereof and curved at its lower end, so as to prevent the button from falling out of the raceway. After the button has been delivered in position and the prong of the staple has been thrust through its eye the driver descends, forcing the button and staple downward, and the raceway s moves back, and the button is pulled out of the lower end thereof, this spring a^6 yielding to allow the button to escape. The lower ends of the guide-pieces t , between which the eyes of the buttons project, may yield slightly, being of thin material; but I do not consider this essential.

The anvil h^2 is of common construction, having depressions in its face to turn and clench the prongs of the staple, and is mounted on an arm k^2 , projecting from the upright portions of the frame.

The driving-pulley is, by preference, so mounted on the main shaft by means of a toothed clutch mechanism of common construction that the machine may be quickly stopped and started by depressing a treadle which operates a shipper. As will be obvious, any form of clutch and shipper mechanism may be employed, and this feature is not essential.

What I claim is—

1. In a button-setting machine, the following instrumentalities, a guide for a button having a staple threaded through its eye provided with a groove to receive and guide the legs of the staple and a slot to accommodate the eye of the button, a staple-driver to straddle the eye of the button and engage the crown of the staple and adapted to enter said guide to force the staple and button therethrough, and a clenching member, combined with a button-raceway having a movement toward and from said guide and adapted to place the eye of its lowermost button in the slot of said guide and in the path of the staple to be fed into the guide, a staple-raceway, a staple channel-way leading from the staple-raceway to the staple-groove in said guide, and a transfer-finger to force a staple along said channel-way and thread it into the eye of the button in position to be acted upon by the staple-driver, substantially as described.

2. In a button-setting machine, the following instrumentalities, a guide provided with a groove to receive and guide the legs of a staple and a slot to accommodate the eye of a button, a staple-driver adapted to enter said guide and force a connected staple and button therethrough and a clenching member, combined with a button-raceway having a button-arrester to maintain the lowermost button in predetermined position said raceway having a movement toward and from the guide and adapted to place the eye of its lowermost button in the button-eye slot of the guide, a staple-raceway, a staple cut-off between the staple-raceway and staple channel-way, and a transfer-finger to force a staple along said channel and thread it into the eye of the button in position to be acted upon by the driver, substantially as described.

3. A guide having a passage therethrough to receive and guide a staple, a slot in one wall thereof at right angles to the staple passage-way to receive that portion of the button-eye between the staple-crown and button-

head, and a slot or clearance-passage in the opposite wall to admit the passage of that portion of the button-eye which is back of the staple-crown; a staple-driver notched or cut away centrally at its lower end to fit the crown of the staple and to straddle the eye of a button strung on said staple, and adapted to enter the guide and force a staple and button therethrough; and mechanism to reciprocate said driver; combined with a staple-raceway; a channel-way leading from said raceway to the staple-passage of the guide; a transfer-finger adapted to enter said channel-way; connections between said transfer-finger and the staple-driver whereby upon the upward stroke of the staple-driver the finger is oscillated in a downward direction in said channel-way; and a spring to return said finger to its elevated position during a downward stroke of the staple-driver, substantially as described.

4. In a button-setting machine, the combination with the driver of a staple-raceway, a movable button-raceway connected to and intermittently operated upon by the mechanism which reciprocates said driver for moving said button-raceway toward and from the staple-guideway at each movement of the driver.

5. A guide having a groove to receive and guide a staple and a slot to accommodate the eye of a button, a staple channel-way leading upward and outward from the grooved and slotted guide, a reciprocating and oscillating transfer-finger to enter said channel-way from the top and force a staple along said channel-way toward and into the guide, combined with a tilting plate, as q' , substantially as and for the purpose set forth.

6. In a button-setting machine adapted to automatically insert a staple in the eye of a button, place the button and attached staple in the guideway and set the same, a raceway for the staples in combination with a movable plate provided with a channel-way leading to the button, said plate being recessed or cut away opposite the lower end of said raceway to form a downwardly-projecting part g^b and a beveled upwardly-projecting part f^5 , the edge of the part f^5 being below and behind the end of the part g^b and normally below the lowermost staple on the raceway, whereby as the plate k moves up, the part f^5 will enter between the lowermost staple on the raceway and the next staple thereto and said lowermost staple will be moved into the mouth of the channel-way leading to the button, all as set forth.

EUGENE H. TAYLOR.

Witnesses:

WM. A. MACLEOD,
ROBERT WALLACE.