

3 Sheets—Sheet 1.

MACHINE FOR SHARPENING RAZORS, SHEARS, &c.

Patented Mar. 6, 1894.



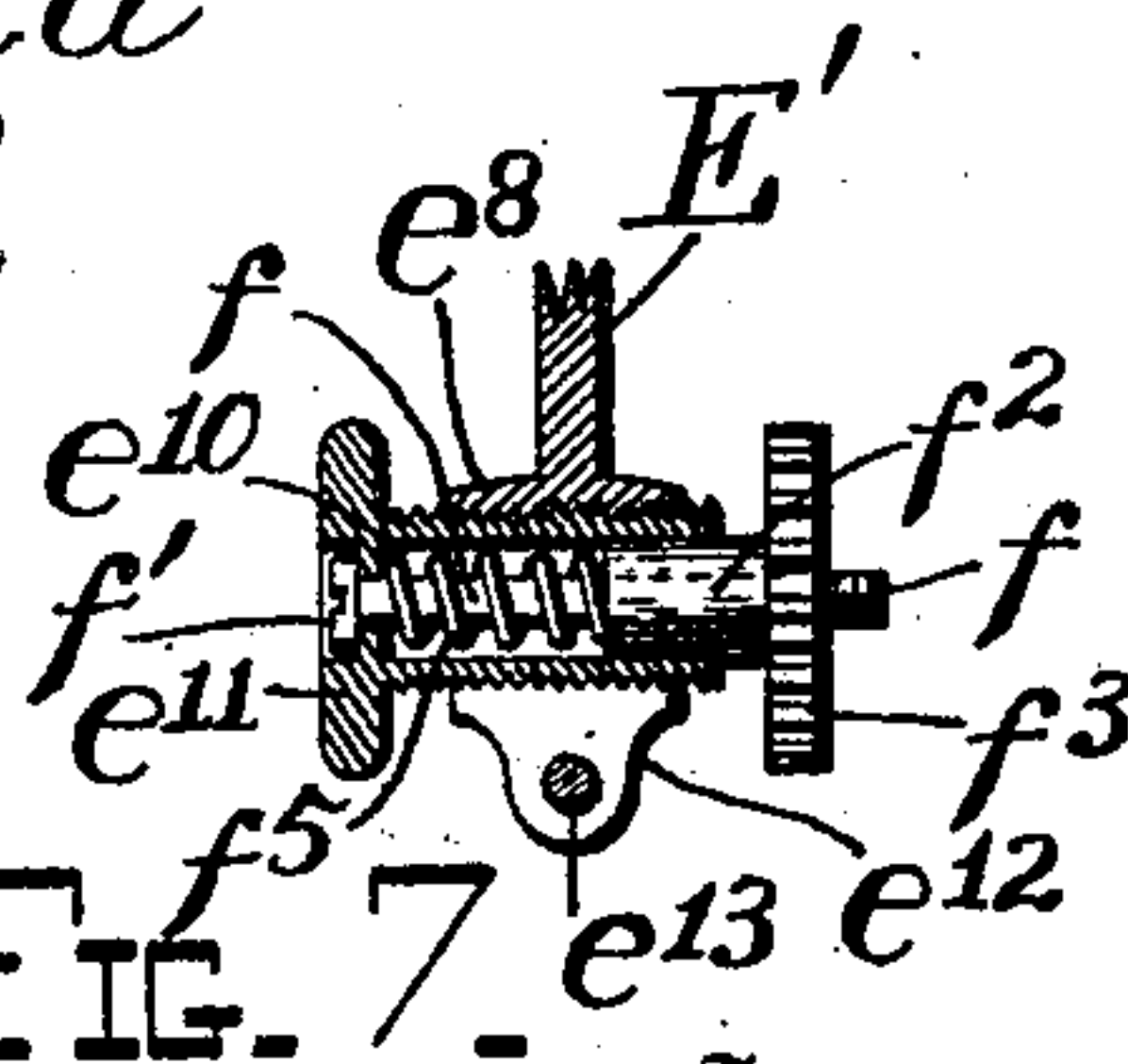
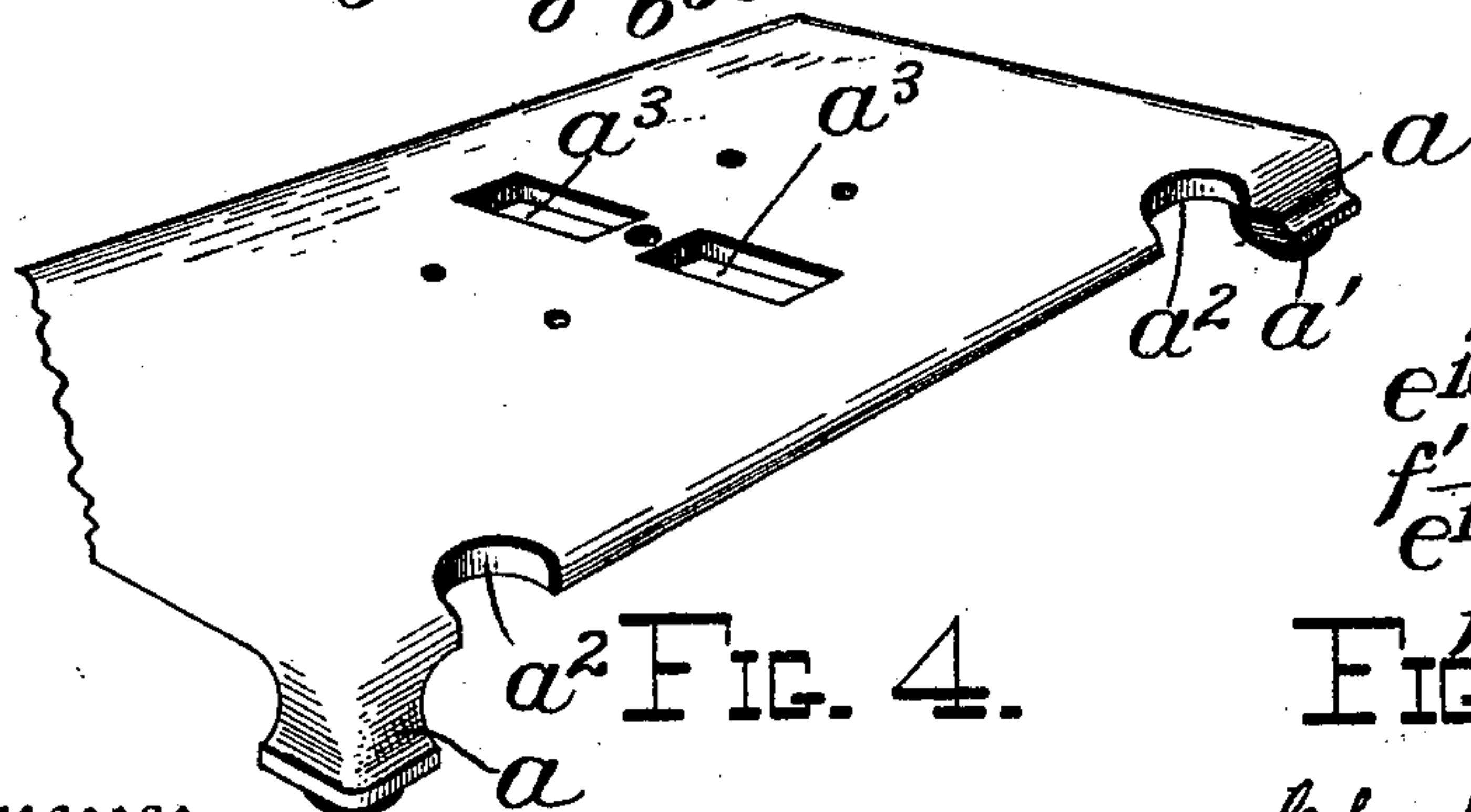
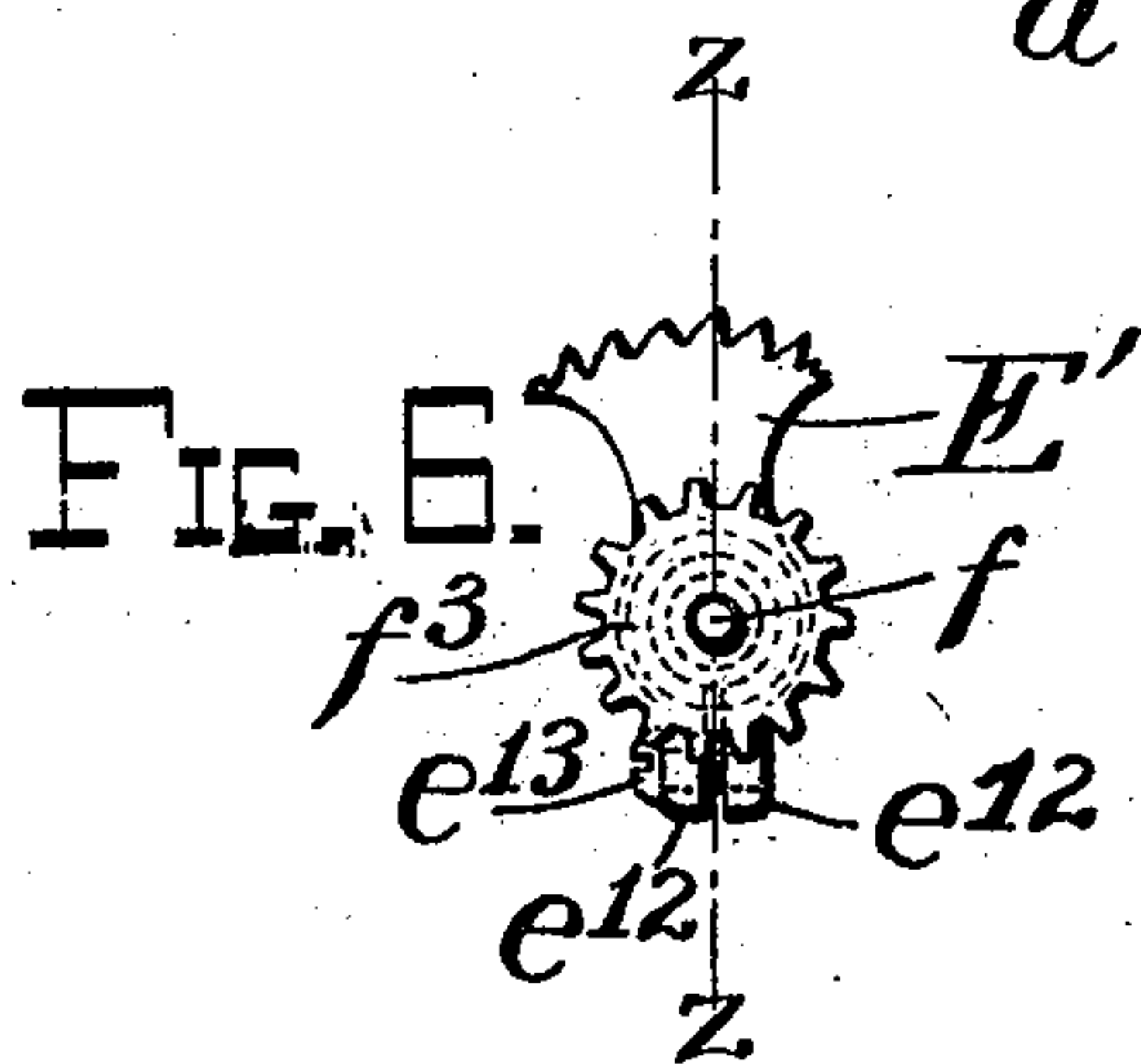
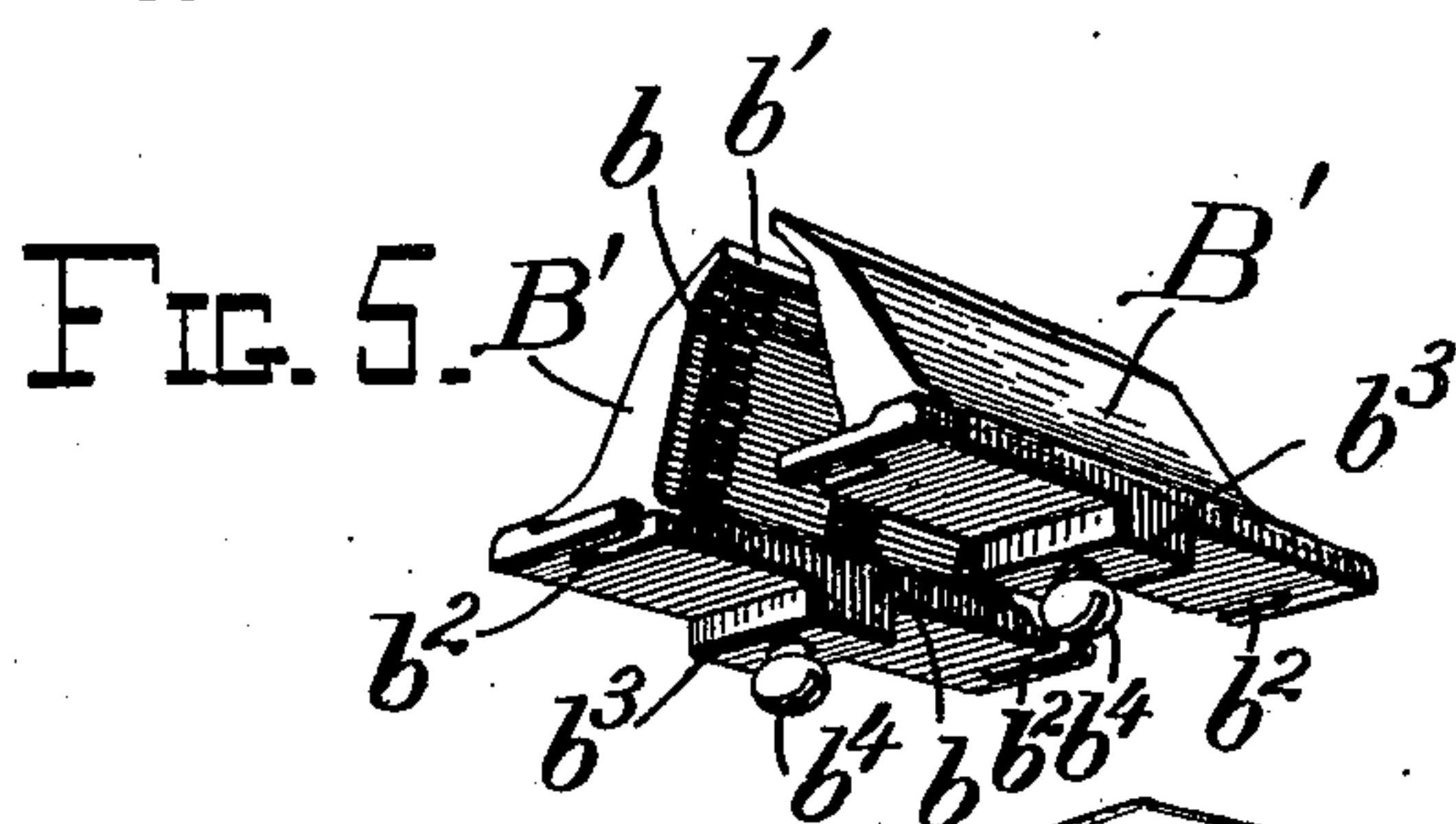
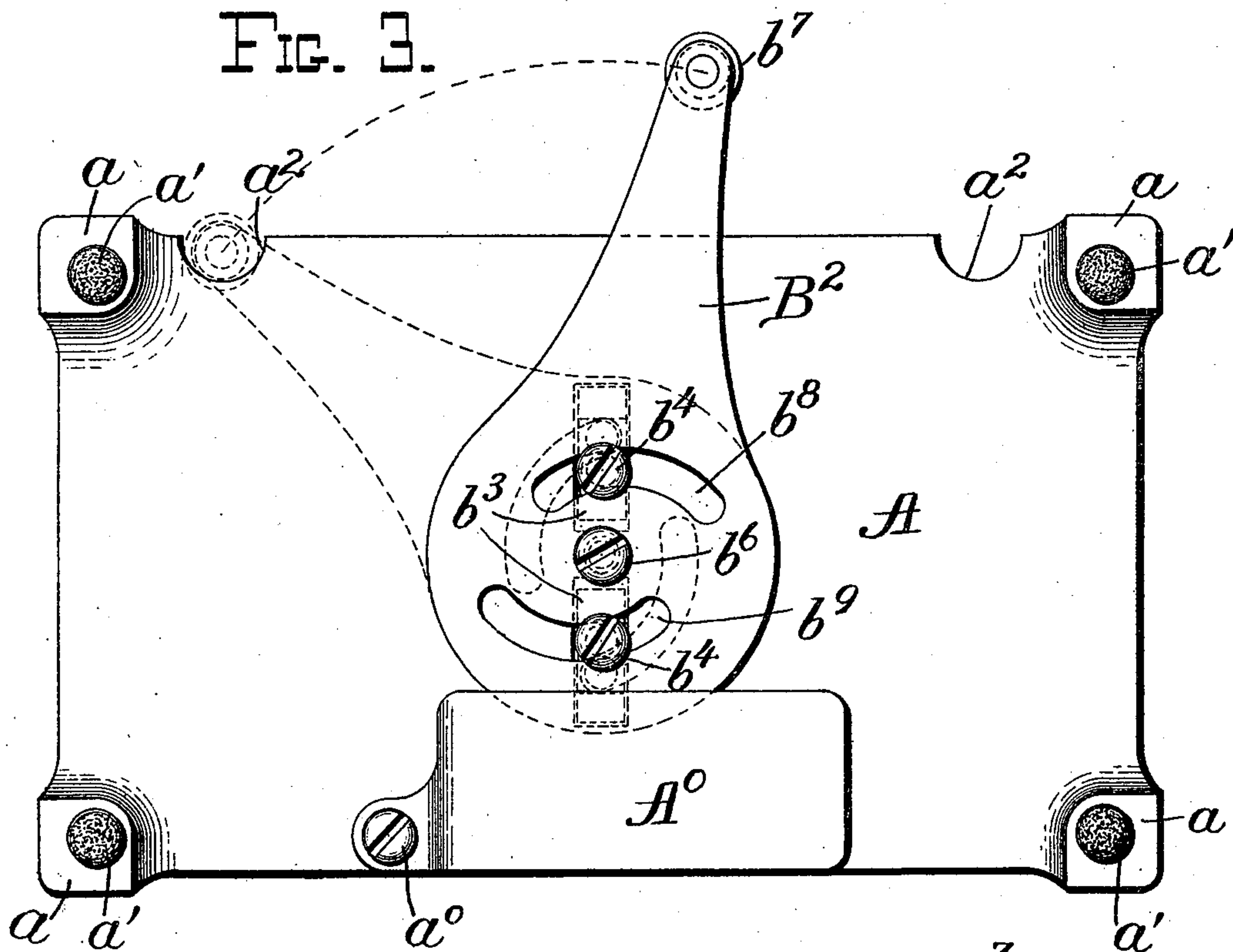
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C. A. WORDEN.

MACHINE FOR SHARPENING RAZORS, SHEARS, &c.

No. 516,146.

Patented Mar. 6, 1894.



Witnesses  
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(No Model.)

3 Sheets—Sheet 3.

C. A. WORDEN.

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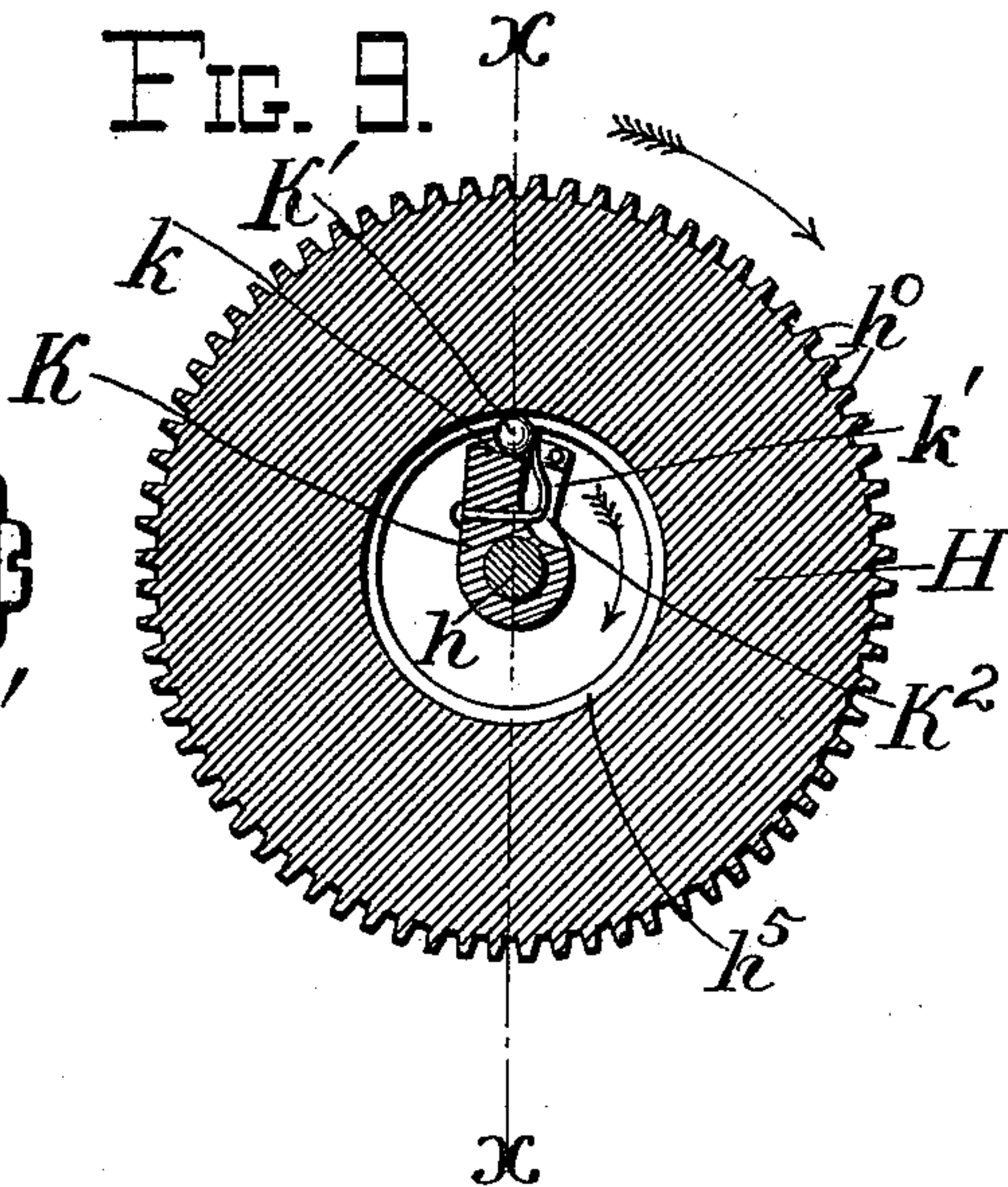
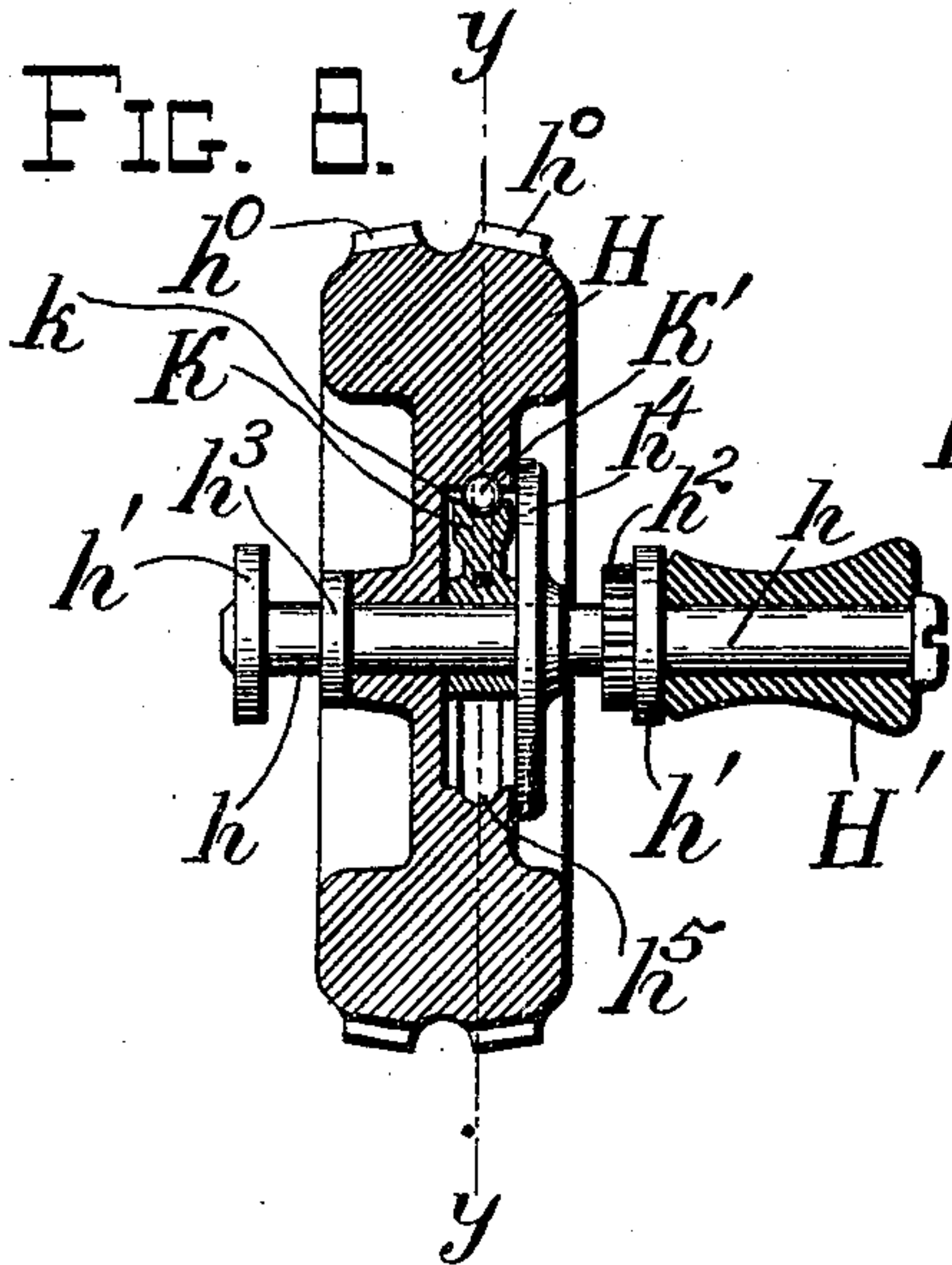


FIG. 12.

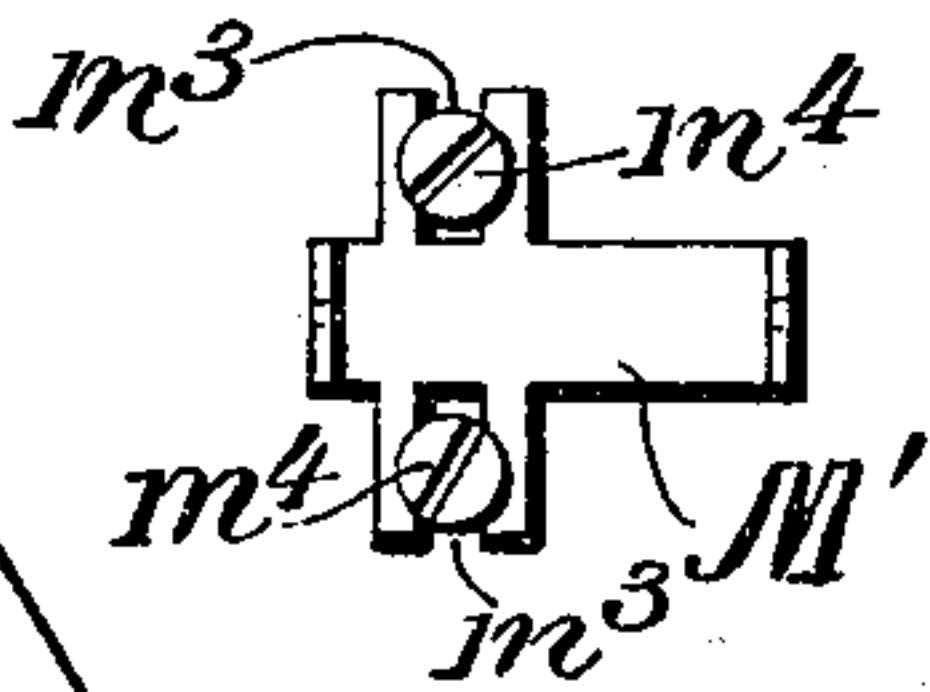


FIG. 10.

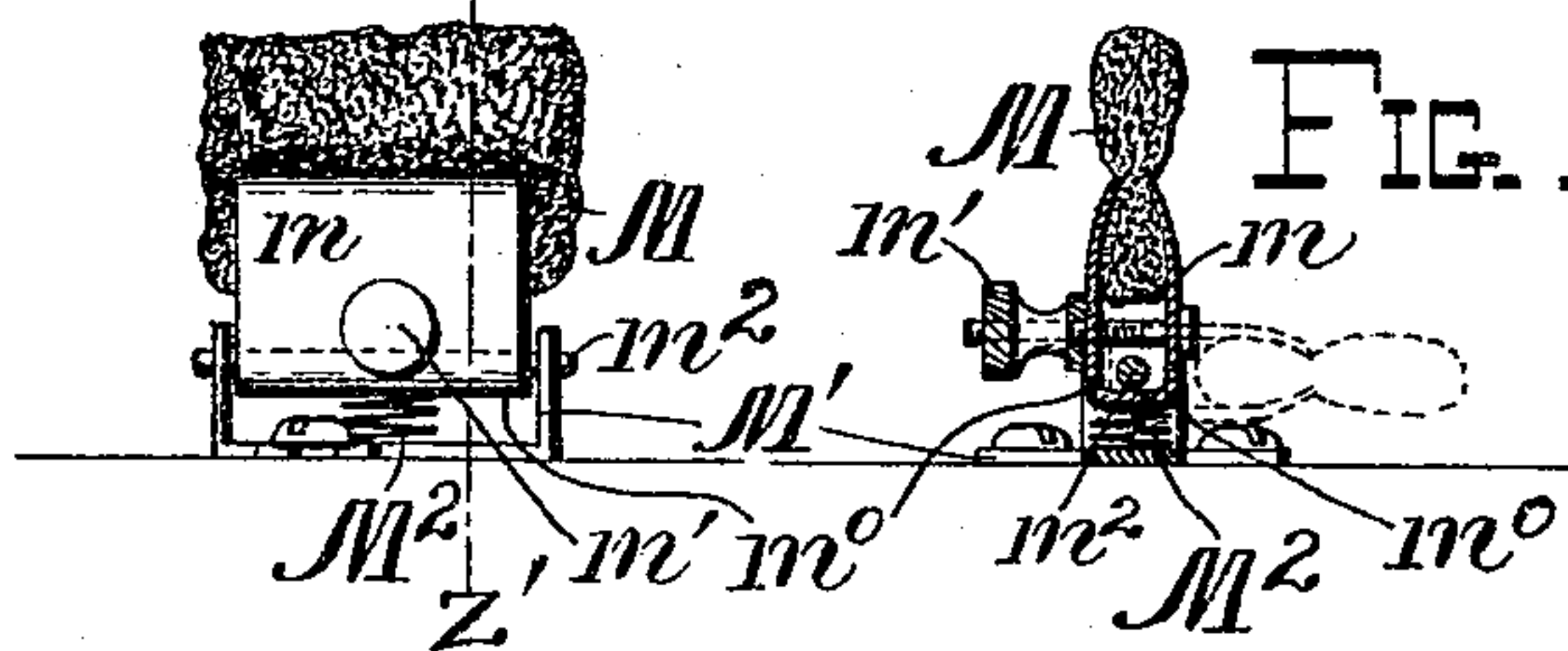
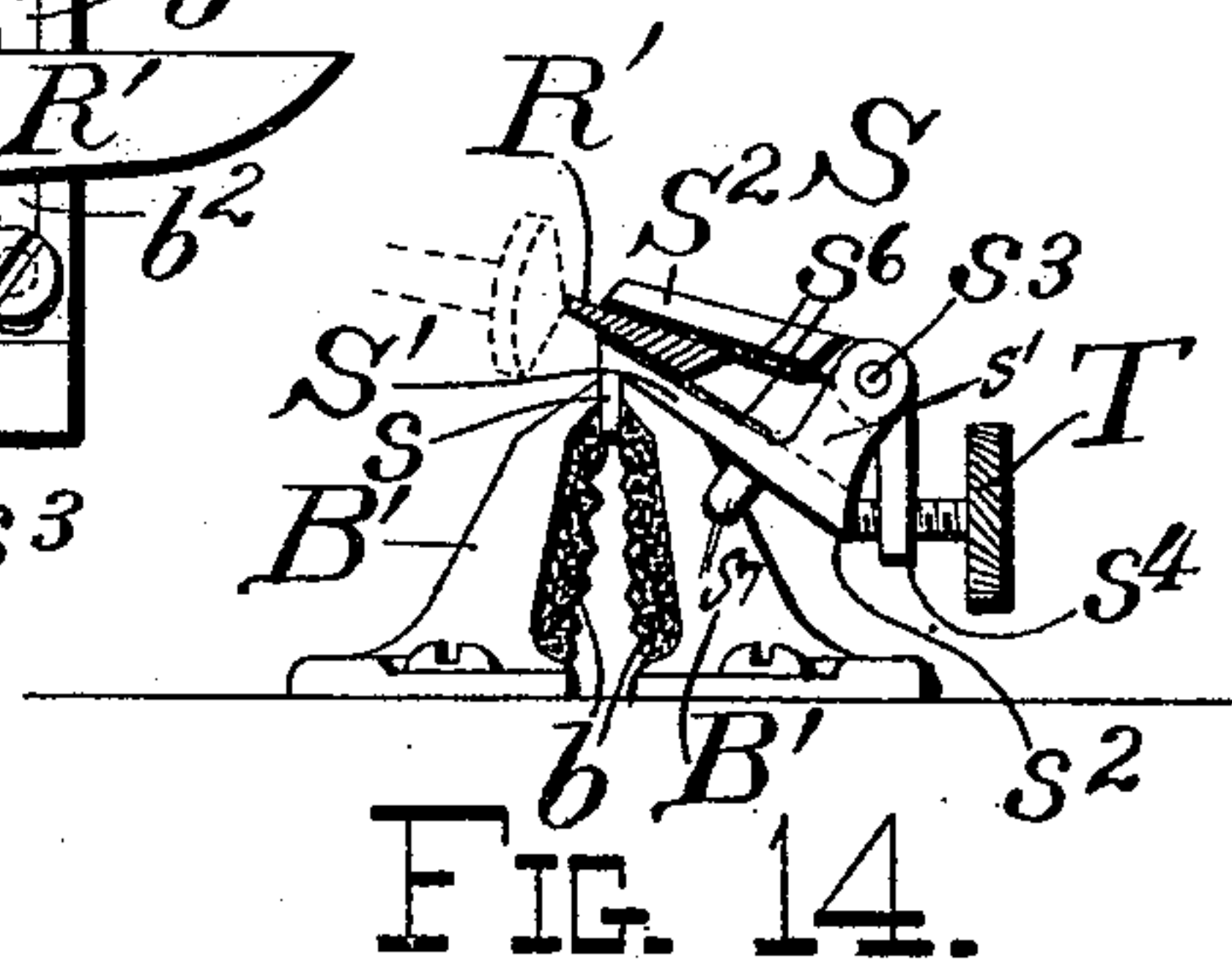
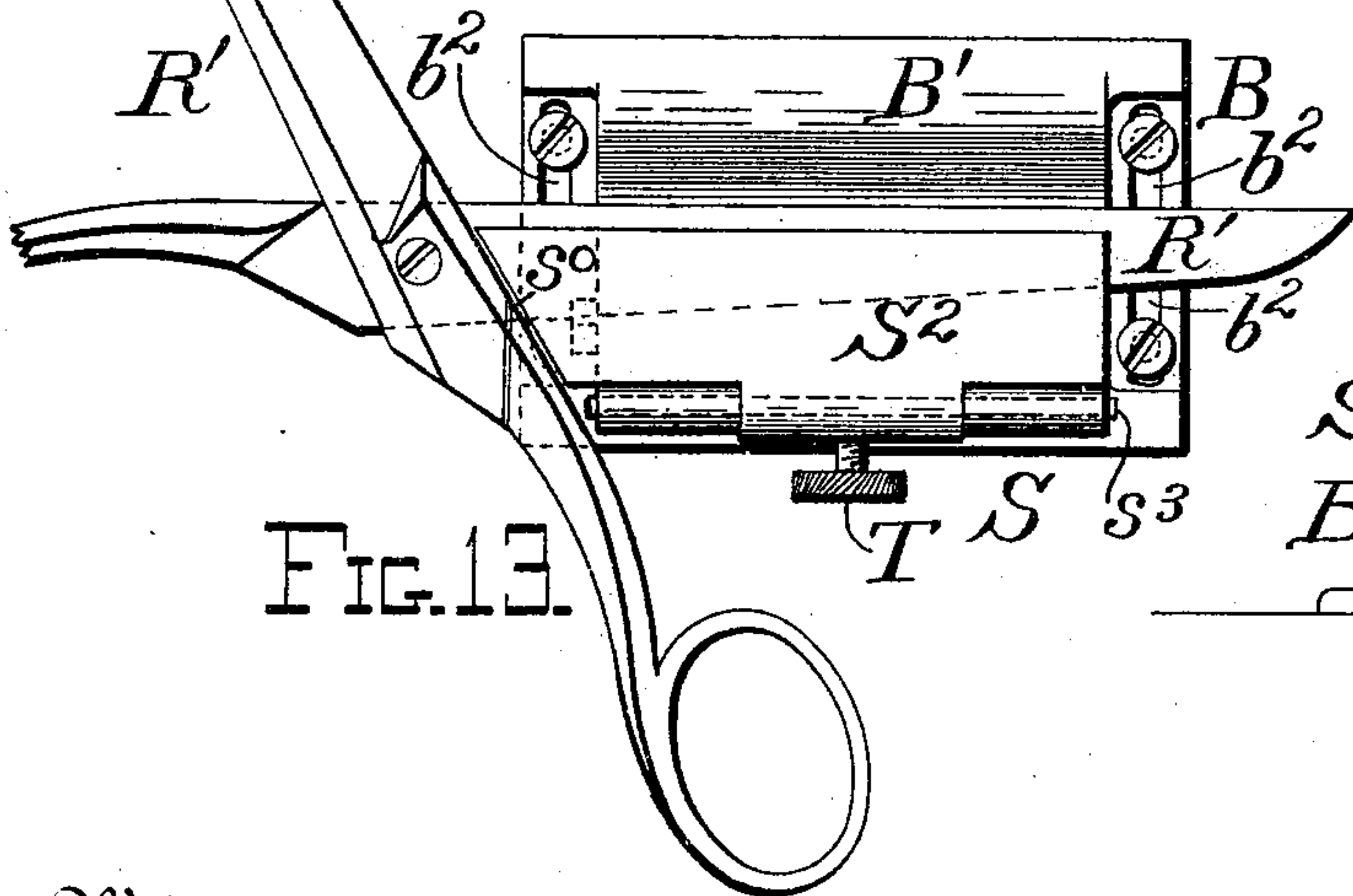
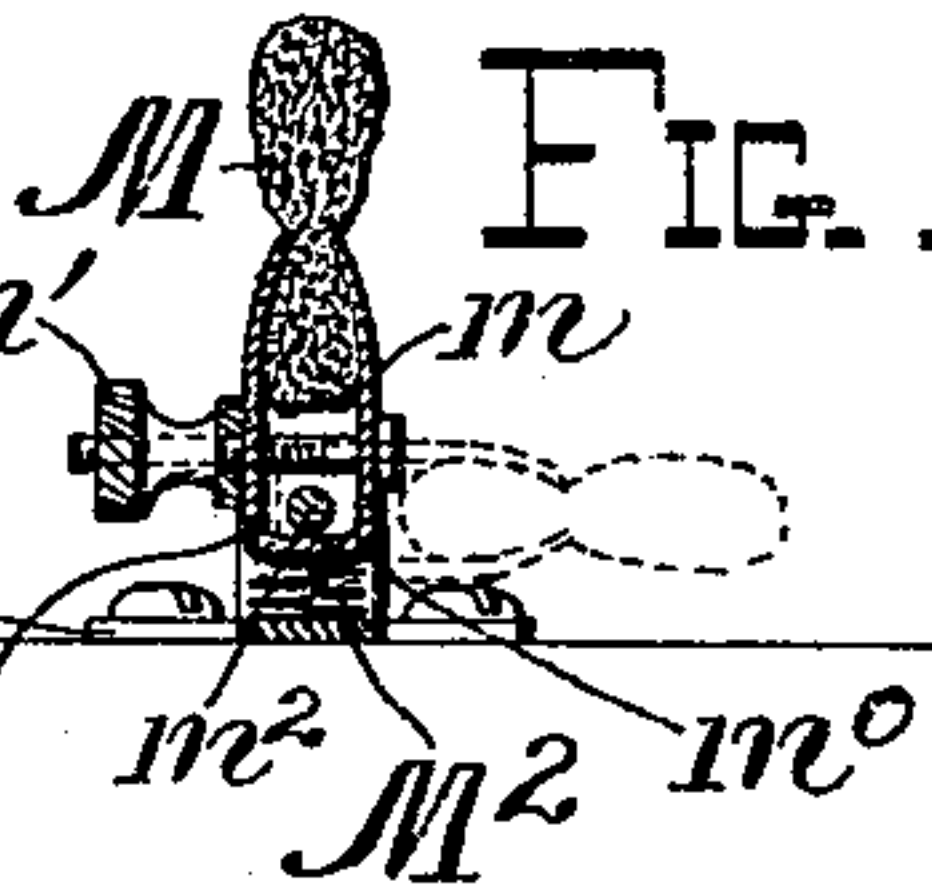


FIG. 11.



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# UNITED STATES PATENT OFFICE.

CHARLES A. WORDEN, OF THE UNITED STATES ARMY, ASSIGNOR TO THE  
WORDEN MACHINE COMPANY, OF NEBRASKA.

## MACHINE FOR SHARPENING RAZORS, SHEARS, &c.

SPECIFICATION forming part of Letters Patent No. 516,146, dated March 6, 1894.

Application filed December 26, 1893. Serial No. 495,024. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES A. WORDEN, a captain in the United States Army, stationed at Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Machines for Sharpening Razors, Shears, Scissors, Surgical Implements, &c.; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in devices for sharpening razors, shears, scissors, surgical implements and the like, and it consists of certain improvements upon the device shown in my Patent No. 487,140, dated November 29, 1892.

Reference is had to the accompanying drawings, wherein the same parts are indicated by the same letters.

Figure 1 represents a side elevation of my improved machine for sharpening razors, shears, scissors, surgical implements and the like, and illustrates its use for sharpening razors. Fig. 2 represents an end view of the same. Fig. 3 represents an inverted plan view of the device. Fig. 4 represents a perspective view of the base plate of the machine, parts being broken away. Fig. 5 represents a perspective view of the device for holding the razor or the scissors holder, as detached from the base plate. Fig. 6 represents a front view of the holder for one of the revolving buttons carried by the carriage. Fig. 7 represents a section of the same along the line  $z$  of Fig. 6. Fig. 8 represents a section of the fly wheel along the line  $x x$  of Figs. 1 and 9. Fig. 9 represents a section along the line  $y y$  of Fig. 8, and looking to the right in the said figure. Fig. 10 represents a side elevation of the sponge holding attachment. Fig. 11 represents a section of the device shown in Fig. 10 along the line  $z' z'$  of the said figure and looking to the left. Fig. 12 represents a plan view of the base plate for the pivoted sponge holder, the latter being detached therefrom. Fig. 13 represents a plan view of the scissors holder as held in position on the machine; and Fig. 14 represents an end view of the said scissors holder showing the scissors blade be-

ing sharpened in section, and illustrates the method of attaching the same to the machine.

A represents a platform having legs  $a$ , padded as at  $a'$  and adapted to stand on a table, bureau or other flat surface. This platform is cut away as at  $a^2$ , to receive the handle of the cam lever, and as at  $a^3$  to receive the guide lugs of the sliding jaws for holding the tool or tool holder. A swinging tray  $A^0$  may be pivoted as at  $a^0$  beneath the platform A, for the purpose of holding the spare buttons and any other duplicate parts that it may be considered desirable to supply. Mounted in the center of this platform, are the sliding jaws  $B'$  which together constitute the holding device B for holding the razor, or for holding the scissors holder. These two jaws  $B'$  are provided on the interior with serrated or dentated pads or strips  $b$  of rubber, felt, or other suitable soft and elastic material. The upper parts of said jaws terminate in straight edges  $b'$ , and the lower parts are provided with slots  $b^2$ , guide-lugs  $b^3$ , and screws  $b^4$ . These screws  $b^4$  engage in the cam grooves  $b^8$  of the plate  $B^2$ , which plate is pivoted at  $b^6$ , and has its handle  $b^7$  extending upward at one side of the base plate A and adapted to swing into the grooves  $a^2$  of the said base plate when the jaws are in the extreme open or closed position, as shown in dotted lines in Fig. 3. The guide lugs  $b^3$  travel in the guideways  $a^3$ , and a simple motion of the cam plate  $B^2$  will cause the jaws  $B'$  to approach or to recede from each other. Thus it will be seen that the razor may be securely clamped between the said jaws, and held rigidly therein during the operation of sharpening; and in a similar way the device for holding the shears or scissors to be sharpened may be clamped between the said jaws, as will hereinafter be more fully described.

The mechanism for sharpening the razor is mounted on the four legs C, rigidly secured to the base plate or platform A. Integral with, or securely attached to the upper end of each pair of legs C, are parallel rails D forming tracks for the rollers  $h'$ , and one of the said rails having a rack  $D'$  for the pinion  $h^2$ . Parallel to these tracks, which are curved to approximately correspond with the sharp edge of the razor, but which may be made straight



if desired, are slots  $d$ , which serve as guides to the carriage E, which carriage is fully described and shown in my Patent No. 487,140, dated November 29, 1892, already referred to.

5 This carriage E is provided with openings  $e$  in which the shaft  $h$  of the wheel H revolves freely, the said openings serving rather as guides to the said shaft than as supports therefor, and the said shaft being kept in  
10 said openings by a clamp piece  $e'$  on one or both sides. At the side of the carriage are guide flanges  $e^3$  which move in the guide slots  $d$  in the sides of the tracks D, as hereinbefore described. A thumb screw  $d^2$ , blocks  
15 the end of the said slot, and prevents the carriage from being drawn entirely out of engagement therewith, at the same time affording a ready means for detaching the carriage from the apparatus should that be desired.  
20 A fixed screw  $d'$  is provided at the opposite end of the track which projects into the guide groove, and prevents the carriage from being pushed out at that end.

The plates E' are attached to projecting  
25 pieces on the lower side of the carriage. These plates have slots  $e^4$  near the forward end thereof adapted to engage beneath the head  $e^5$  of a stud attached to the carriage, and they have a slot  $e^6$  adapted to receive the  
30 thumb screw  $e^7$  by means of which they may be readily attached to, removed from, or adjusted on the said carriage. These plates E' terminate in holders  $e^8$  for the journals of the revolving buttons F. The buttons, and the  
35 spindles on which they are mounted, are set at an angle both with a horizontal plane, and with a vertical plane through the axis of the fly wheel, for reasons which will be hereinafter described. The button F is screwed on  
40 to the spindle  $f$ , which spindle carries the pinion  $f^3$  in rear of the button, and is held in the hollow screw  $e^{10}$  by the head  $f'$  of the spindle  $f$ , as will be seen in Fig. 7. The button is normally pushed forward by the spring  
45  $f^5$  while at the same time adjustment may be given by screwing up on the milled head  $e^{11}$ . In order to prevent the male screw  $e^{10}$  from unscrewing in the nut on the interior of the holder  $e^8$ , the said holder is provided with  
50 downwardly-projecting legs  $e^{12}$ , provided with screw threads adapted to engage the screw  $e^{13}$ , by screwing up on which the screw  $e^{10}$  may be firmly clamped in any desired position. The side faces E' are provided with  
55 thumb lugs  $e^{14}$  for convenience in detaching or adjusting the same.

Motion to the buttons is given by the combined fly and gear wheel H, provided with teeth  $h^0$  which may be constructed as shown  
60 in Fig. 2, in order to lessen the cost of manufacture. This wheel gears into the pinions  $f^3$ , and so turns the buttons F. The wheel H is loosely mounted on a shaft  $h$ , which shaft revolves in the openings  $e$  of the carriage, and  
65 carries rollers  $h'$  which roll backward and forward over the tracks D. To insure motion of the shaft  $h$ , as the handle H' is moved

backward and forward, a pinion  $h^2$  is keyed to the shaft, and said pinion engages in the rack D'. The handle H' is revolvably con- 70 nected to the shaft  $h$ , as shown in Fig. 8.

In order that the revolving buttons may always act on the razor in the same direction, or that the descending surface of the button, in its revolution may clear the razor edge, 75 and the ascending portion may give a sharpening action upward and forward, as in the ordinary manner of stropping from heel to toe, the fly wheel H is made to revolve only in one direction. That is, it revolves only 80 in the direction of the arrow in Fig. 9, the inertia given it on the forward stroke of the handle, which is moved backward and forward along the track, being sufficient to keep the wheel revolving during the return stroke of 85 the handle. This is accomplished by the simple arrangement shown in Figs. 8 and 9, where the wheel is represented as journaled on the shaft  $h$  in a collar formed by the disks  $h^3$  and  $h^4$ , both of which are rigidly secured 90 to the shaft. The center of the wheel is hollowed out at one side into a cylindrical chamber around the interior of which an annular groove  $h^5$  is cut, as shown in Fig. 8. Revolving freely in this cylindrical chamber, an arm 95 K rigidly attached to the shaft  $h$  is provided. This arm K is provided with a sloping groove  $k$  adapted to receive the ball K' as shown more clearly in Fig. 9. The side of this arm is hollowed out as shown at  $k'$  to allow the 100 ball to be put into place, and also to give play to the spring K<sup>2</sup> which is bent upward so as to press the said ball K' up the incline  $k$  and wedge it gently between the arm K and the interior of the groove  $h^5$ . Now, if the 105 shaft H be turned in the direction of the arrow it will be evident that the ball K' will be wedged tightly between the arm K and the wheel H, and will cause the latter to revolve in the direction indicated by the arrow in 110 Fig. 9; while if the shaft  $h$  be revolved in the opposite direction, the ball K' will be rolled down the incline  $k$  by the inertia of the wheel H, thus breaking the connection between the arm and the wheel, and allowing the latter to 115 revolve freely. The spring K<sup>2</sup> is made weak, so as to keep the ball in operative position, and to prevent it from falling out of the groove  $k$ , and yet at the same time not to cause excessive friction when the shaft  $h$  is not moving with the wheel H. It will thus be seen 120 that if the shaft be turned in the direction of the arrow, the wheel will turn with it; but if, while the wheel is revolving, in the direction of the arrow, the shaft be revolved 125 in the opposite direction, the direction of motion of the wheel will not be changed. The revolving buttons are lubricated at one end of their travel by a sponge M, which is kept saturated with water, oil, or other lubricant. This sponge is preferably mounted in 130 a holder shown in detail in Figs. 10 to 12. Referring to those figures, the sponge M is held between the resilient jaws  $m$  by means



of the clamp screw  $m'$ . These jaws  $m$  are rigidly attached to a bar or pivot piece  $m^2$ , journaled in a base plate  $M'$  which is slotted as at  $m^3$ , and held down to the platform  $A$  by means of the screws  $m^4$ . The spring  $M^2$  interposed between the bottom of the pivoted sponge holder and the plate  $M'$  tends to keep the sponge in a vertical position, and at the same time allows it an easy lateral motion should pressure be applied from either side. The bottom of the sponge holder  $m$  is rounded as at  $m^0$  so that the sponge may be turned down as shown in Fig. 11 in dotted lines, in which position it is held by the pressure of the spring  $M^2$ . By means of this device the sponge may be turned down out of the way when desired, or may be turned up into operative position. The buttons being set one behind the other, will press the sponge aside at the same time lubricating themselves. The buttons may be either of stone suitable for abrading or grinding the tool, or of leather for stopping the same, and they are preferably constructed as described in my Patent No. 487,140, before referred to. A number of pairs or buttons of various grades may be supplied with each machine, and they may be conveniently stored away in the swinging tray  $A^0$  already referred to.

For stropping razors or honing the same, the operation of the device is as follows:—The proper buttons are screwed on firmly against the pinion  $f^3$ , and the razor is clamped firmly in the proper position in the holder  $B$ . If the razor edge is worn a little, the buttons may be raised or lowered somewhat by the clamp screws  $e^7$  and the lugs  $e^{14}$ , but it is preferable that the razor should be simply adjusted by placing it properly in the holder  $B$ .

The position of the razor should be such that the edge of the razor should very nearly coincide with the horizontal diameter of the hole in the center of the button, but the edge of the razor should never come above the horizontal line. This is described in greater detail in the patent to myself, No. 487,140, before referred to. The pressure of the buttons on the razor may be then adjusted by the milled heads  $e^{11}$  if any adjustment be necessary.

Now, having adjusted the various parts, the handle  $H'$  is moved backward and forward along the track  $D$ , and the revolving buttons will sharpen the razor. It will be seen that if the handle be moved with tolerable rapidity, the buttons will revolve rapidly, and will come in contact with every portion of the edge of the razor. Moreover, by having the buttons set at an angle and conical, they will grind bevels on the razor edge whose cross sections are the arcs of circles, thus forming a concaved cutting edge which is superior to that obtained by abrasion in a flat stone, and which it is impossible to imitate by any hand process.

Some practice may be necessary in making the various adjustments; but a few experiments with leather buttons, which cannot be

set so as to injure the razor, will soon enable the operator to ascertain the proper adjustment for the buttons for either stropping or honing.

In using the hones use oil or water to wet the sponge, the sponge wipes off all the gritty particles, presents a fresh clear surface with each stroke, and when wet lubricates at the same time. The handle should never be moved backward without giving it a little push forward first in order to prevent the razor from cutting the button, but a leather button if cut somewhat will operate quite as well as before.

In order to ascertain when the razor is in proper condition when stropping, put the moistened finger in occasionally and touch the edge of the razor. It should stick slightly when in the proper condition.

For sharpening shears, scissors, or other implements not by their shape adapted to be held in the holder  $B$ , a separate holder made so as to be held in the said holder  $B$  should be supplied.

A form of secondary holder adapted for use in sharpening barbers' shears, is shown in Figs. 13 and 14, in which  $S$  represents the secondary holder, having two jaws  $S'$  and  $S^2$  pivoted together as at  $s^3$ . The lower jaw has a hook  $s$  adapted to engage between the jaws  $B'$ , and has an upward projecting arm  $s'$  to which the upper jaw  $S^2$  is pivoted, as at  $s^3$ . This upper jaw is bent downward at its rear end, as at  $s^4$ , and receives the clamp screw  $T$  which bears against the face  $s^2$  of the lower jaw. By screwing down on this clamp screw, the scissors blade  $R'$  is firmly gripped between the pads  $s^6$  on the interior of the jaws  $S'$  and  $S^2$ .

In order that the scissors or shears may be prevented from closing while on the machine, and thus injuring the button, the edge of the upper jaw  $S^2$  is tapered off as shown as  $s^0$ , this tapered portion intercepting the swinging of the blade not being sharpened, as will be evident by an inspection of Fig. 13.

In order that the holder  $S$  may be set at the proper position relative to the longitudinal motion of the traveling button, a stop  $s^7$  is arranged to bring up against the face of one of the jaws  $B'$ . In order to use the secondary holder, one of the buttons should be removed, such, for instance, as is shown in Fig. 1, and the pressure on the other button should be adjusted by turning the milled head  $e^{11}$ .

While I have shown only a special holder adapted for use in sharpening scissors or shears, it will be obvious that secondary holders can readily be so constructed as to be adapted to any special form of tool. Moreover, it may be more convenient to make the track  $D$  straight, or parallel to the edge of the particular class of tool to be sharpened.

It will be evident that various modifications other than the above described, may be made, which could be used without departing from the spirit of my invention.



Having thus described my invention, what I claim is—

1. In a machine of the character described, the combination with a base plate and having guide slots therethrough, of a pair of clamp jaws having lugs projecting into said guide slots, screws or studs mounted in said lugs, and a slotted cam plate pivoted between said lugs and adapted to engage said studs and to move said clamp jaws toward or away from each other, and a lever for operating said cam plate substantially as and for the purposes described.

2. In a machine of the character described, the combination with means for attaching the holder to the machine, of the scissors or shears holder S consisting of the lever S' having the hook s and arm s', the bent lever S<sup>2</sup> pivoted as at s<sup>3</sup> and having the arm s<sup>4</sup>, and the clamp screw T passing through said arm s<sup>4</sup> and bearing against said arm s', substantially as and for the purposes described.

3. In a machine of the character described, the combination with the clamp jaws B', of the scissors or shears holder S, consisting of the lever plate S' having the hook s adapted to engage between said clamp jaws, the stop s' adapted to strike against the front face of one of said clamp jaws, and the arm s' projecting upward; the bent lever S<sup>2</sup>, pivoted at s<sup>3</sup> to said arm s', and having the arm s<sup>4</sup>, and the clamp screw T passing through said arm s<sup>4</sup> and bearing against said arm s', substantially as and for the purposes described.

4. In a machine of the character described, a sponge holder consisting of the jaws m made of resilient material and curved as at m<sup>0</sup>, the clamp screw m', the pivots m<sup>2</sup>, and a base plate and a spring interposed between said base plate and the base of said jaws, substantially as and for the purposes described.

5. In a machine of the character described, a sponge holder consisting of the jaws m made of resilient material and curved as at m<sup>0</sup>, the clamp screw m', the pivots m<sup>2</sup>, an adjustable base plate M' slotted as at m<sup>3</sup> and holding said jaws, and a spring M<sup>2</sup> interposed between said base plate and the base of said

jaws, substantially as and for the purposes described.

6. In a machine of the character described, the combination with a shaft, of a combined flywheel and gearwheel revolubly mounted on said shaft and revoluble buttons adapted to be driven thereby, the said wheel having a cylindrical cavity in the center thereof and an annular groove in the exterior of said cavity, of an arm rigidly attached to said shaft and inclosed within the cylindrical cavity of the wheel, and having an inclined groove on the outer end thereof; and a ball partly contained in each of said grooves, in the wheel and in the arm, and adapted to be wedged between the said wheel and the said arm when the shaft is turned in one direction, and to be released when the shaft is turned in the opposite direction, substantially as and for the purposes described.

7. In a machine of the character described, the combination with a shaft, of a combined flywheel and gearwheel revolubly mounted on said shaft and revoluble buttons adapted to be driven thereby, the said wheel having a cylindrical cavity in the center thereof and an annular groove in the exterior of said cavity, of an arm rigidly attached to said shaft and inclosed within the cylindrical cavity of the wheel, and having an inclined groove on the outer end thereof; and a ball partly contained in each of said grooves in the wheel and in the arm, and adapted to be wedged between the said wheel and the said arm when the shaft is turned in one direction, and to be released when the shaft is turned in the opposite direction, and a bent spring secured in said arm and normally pressing said ball up the said inclined groove in the said arm, substantially as and for the purposes described.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES A. WORDEN.

Witnesses:

AUGUSTUS SMITH,  
J. C. AYRES.