No. 815,685. PATENTED MAR. 20, 1906.

J. R. CURLEY.

STROPPING MACHINE.

APPLICATION FILED AUG. 24, 1905.

3 SHEETS—SHEET 1.

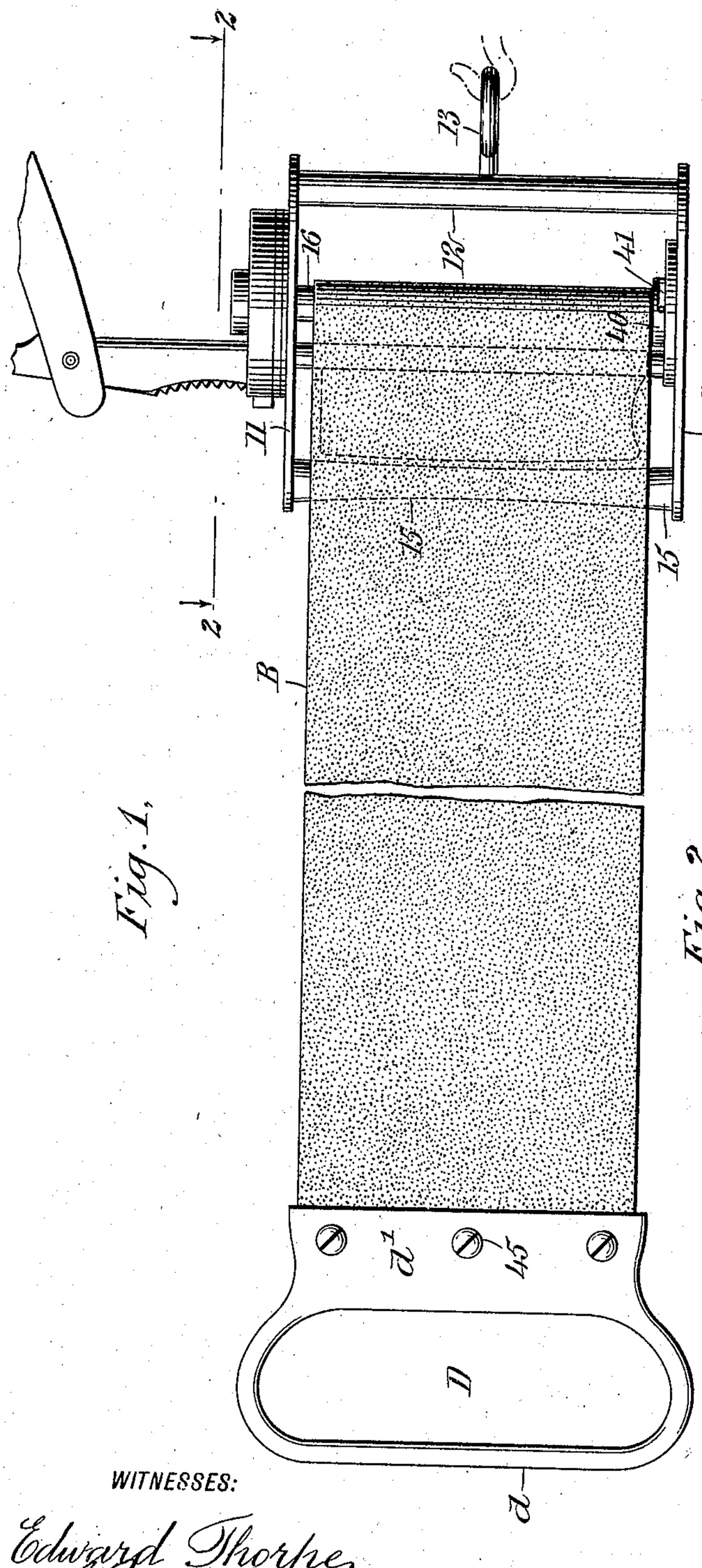

Fig. 1.

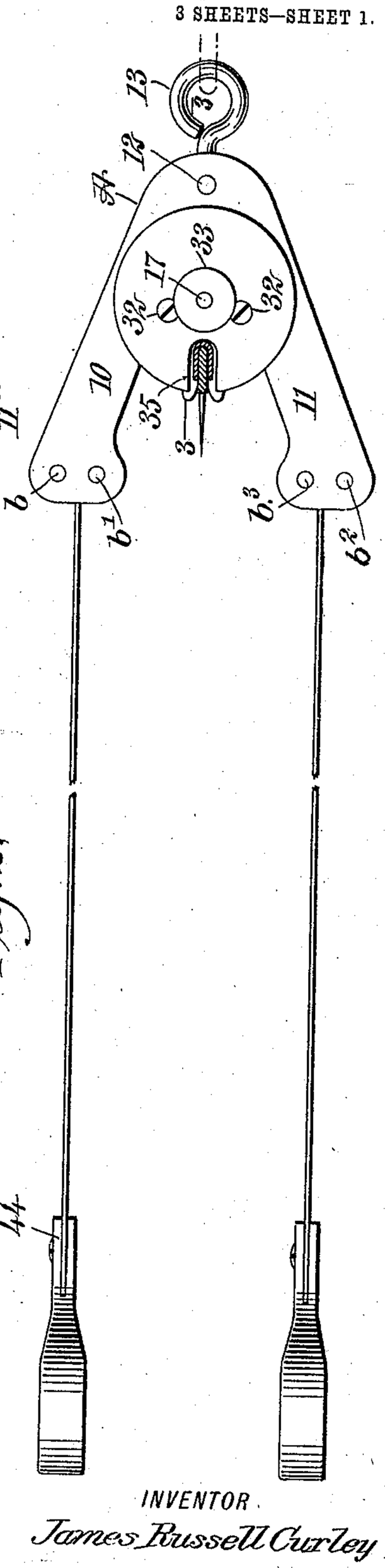

Fig. 2.

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3 SHEETS—SHEET 2.

Fig. 3,

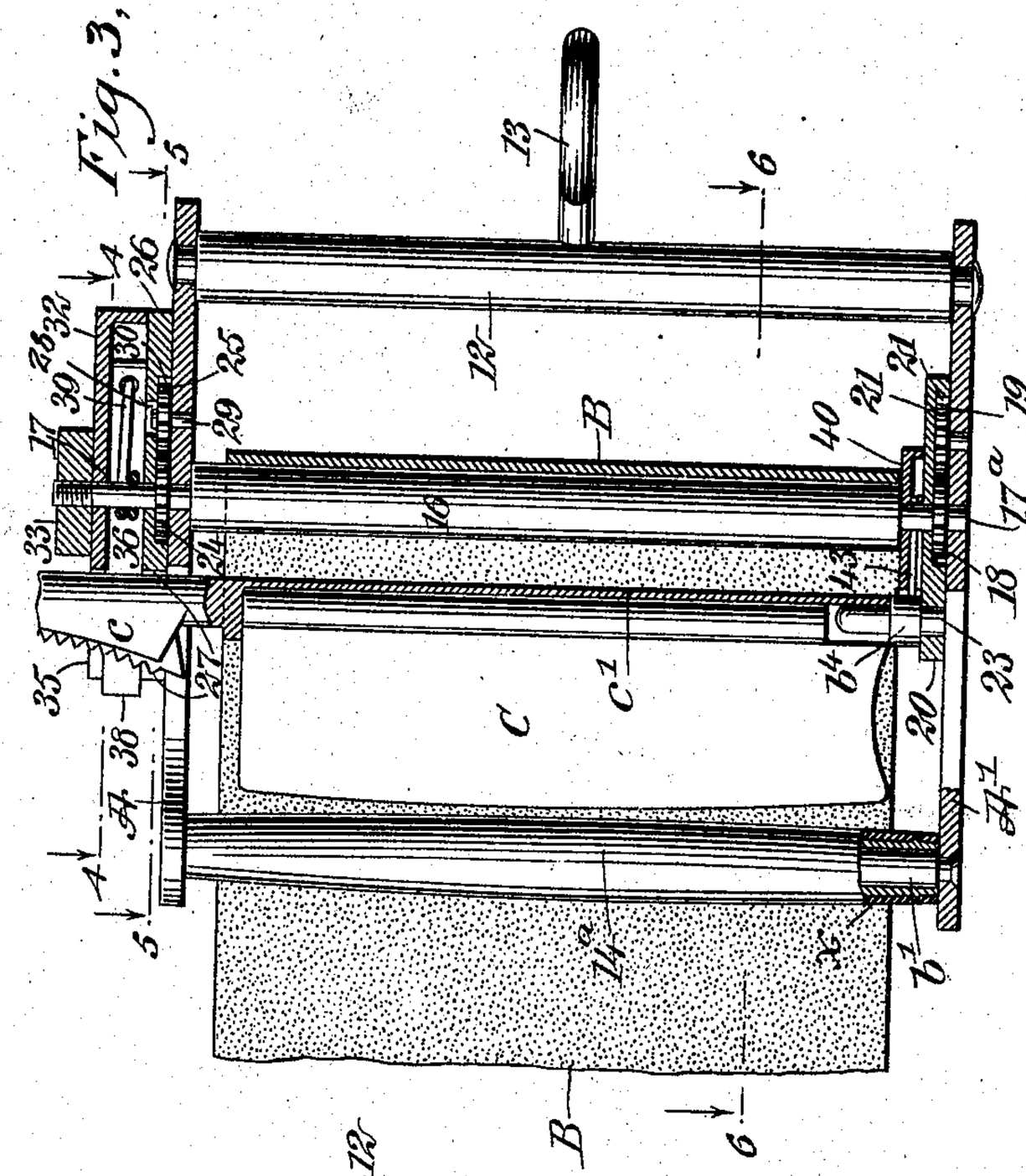

Fig. 4,

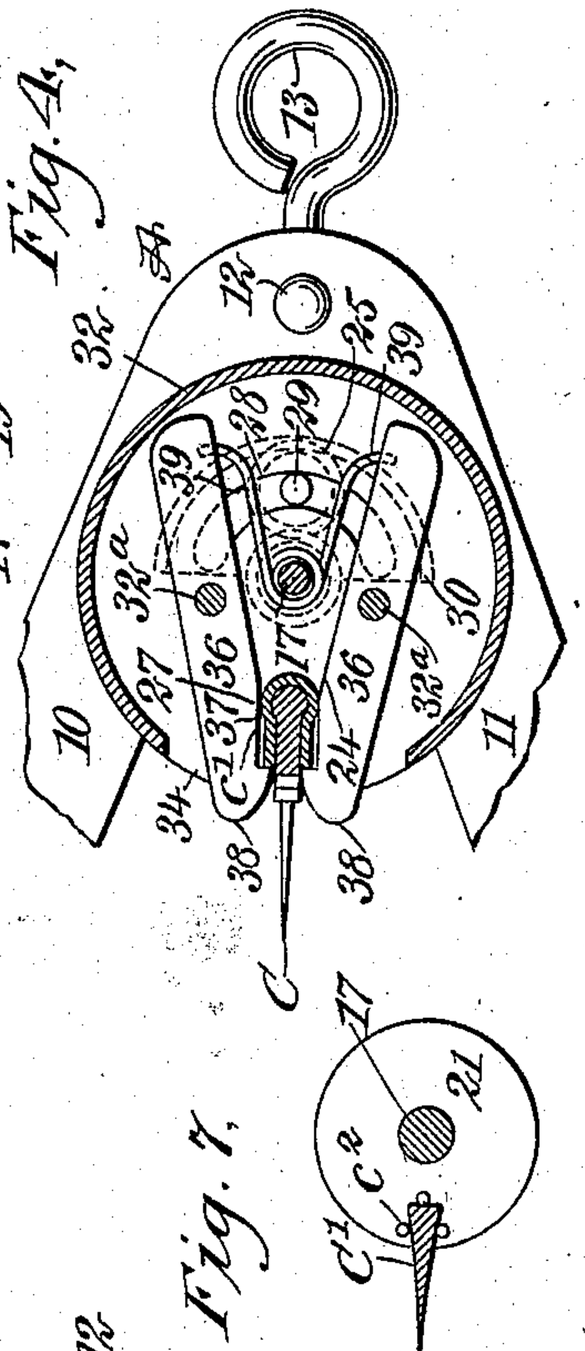

Fig. 5,

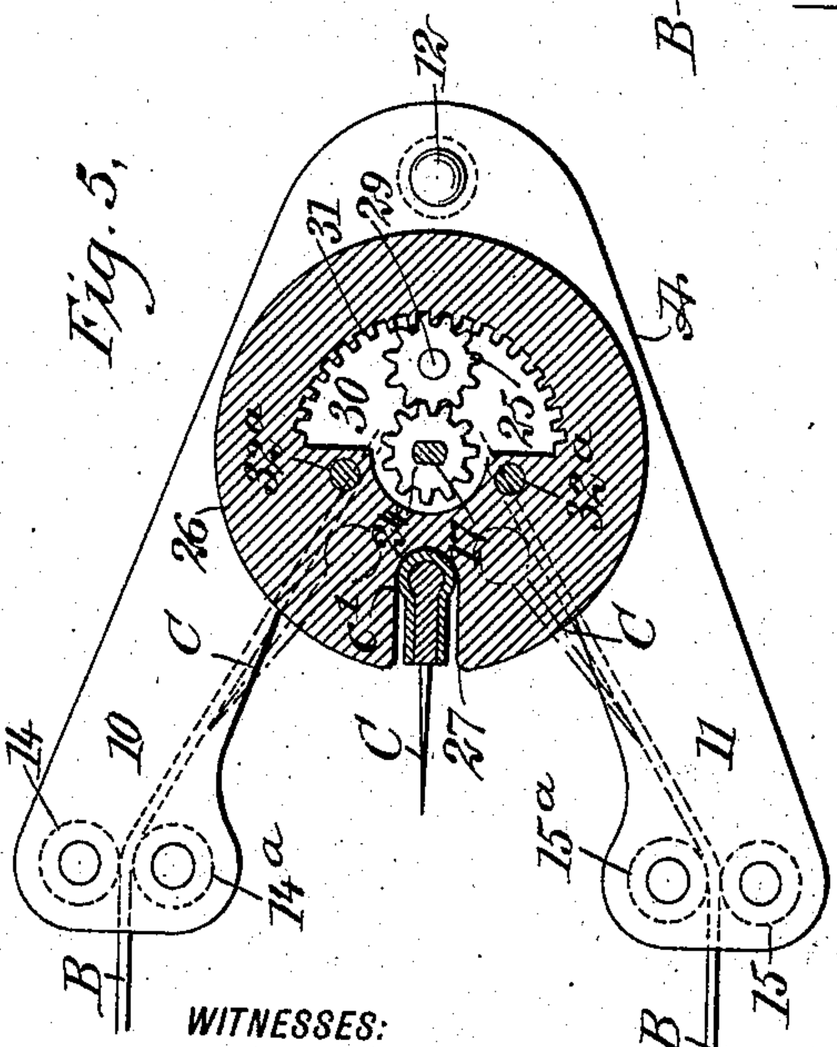

Fig. 6,

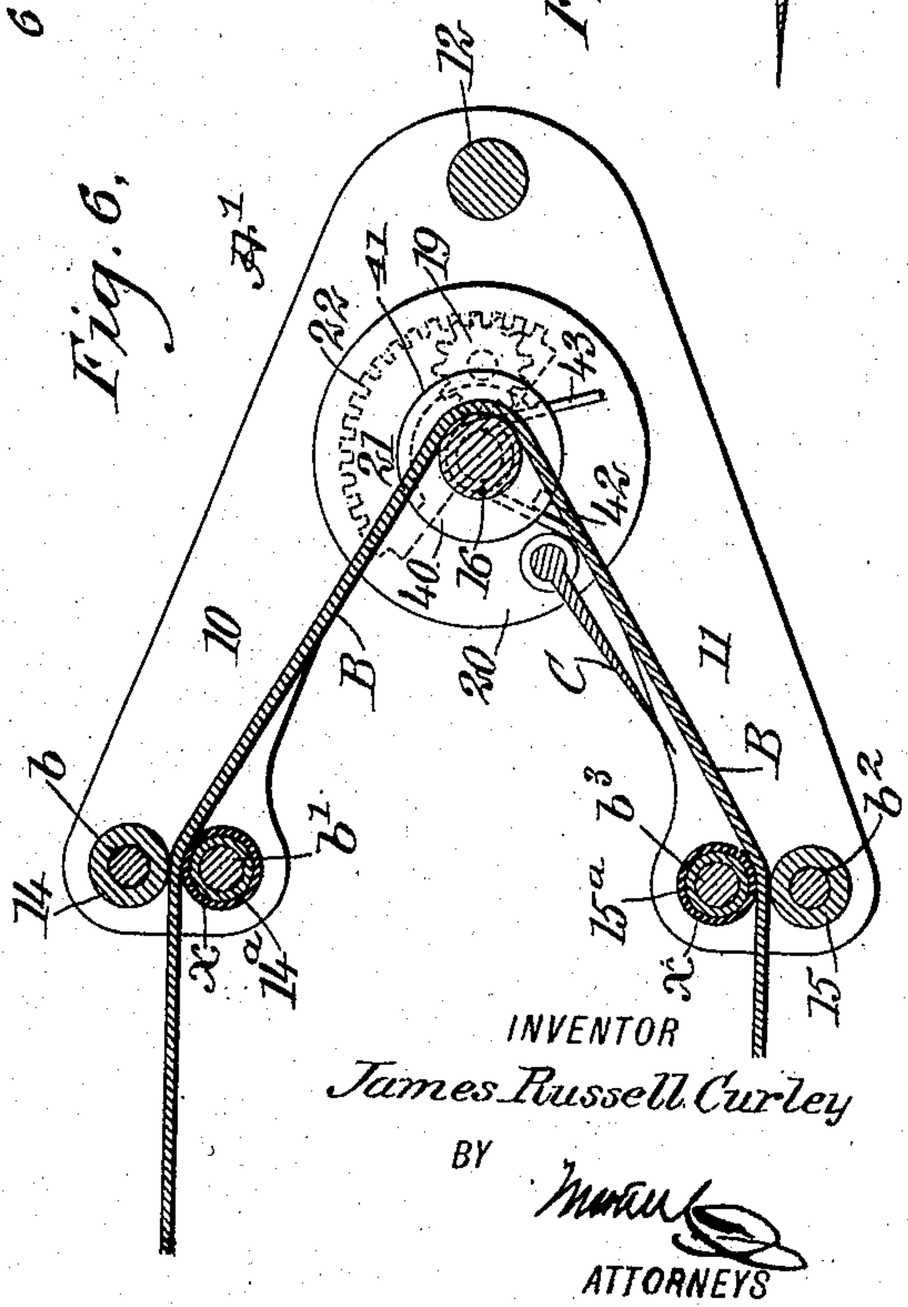

Fig. 7,

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3 SHEETS—SHEET 3.

Fig. 8,

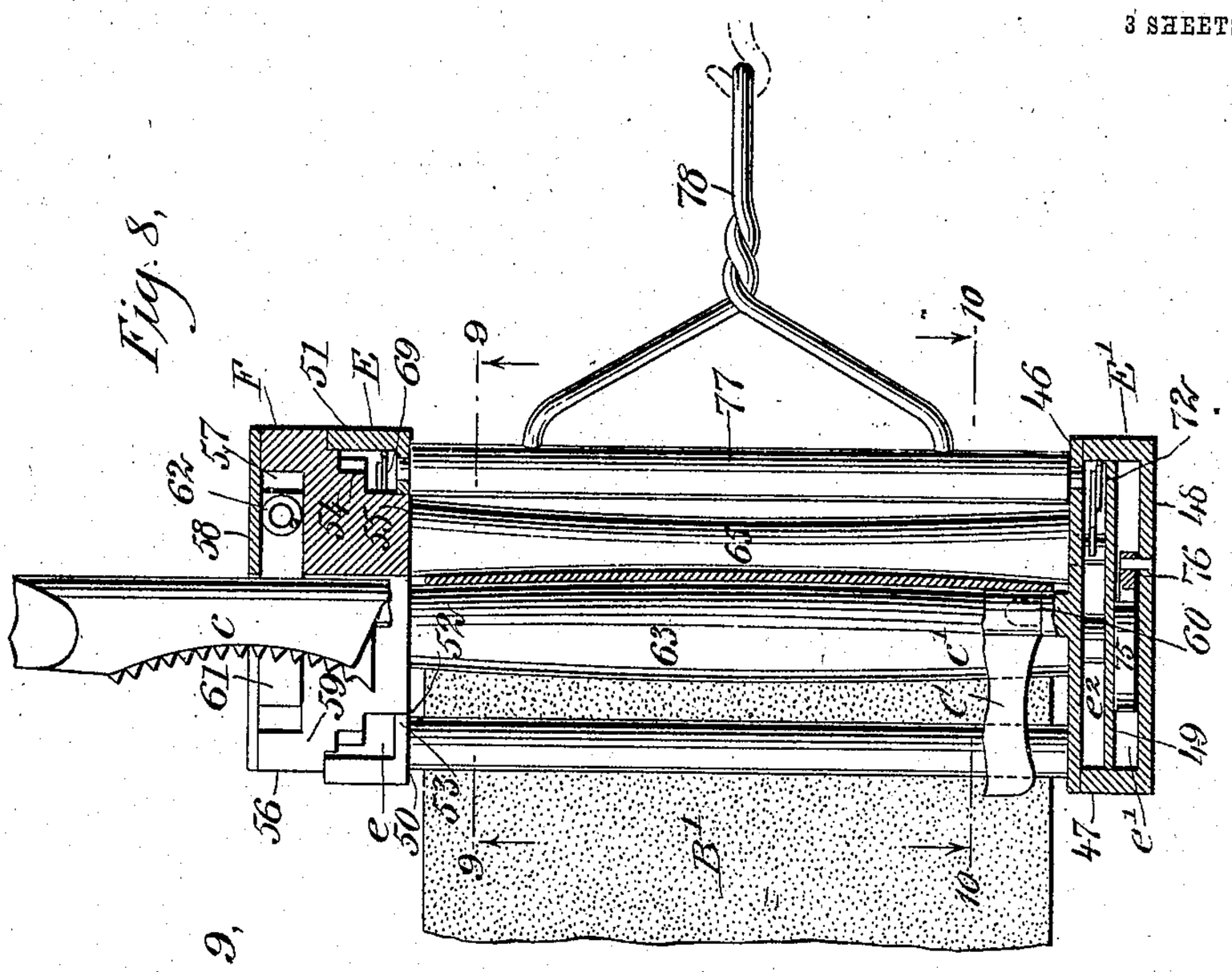


Fig. 9,

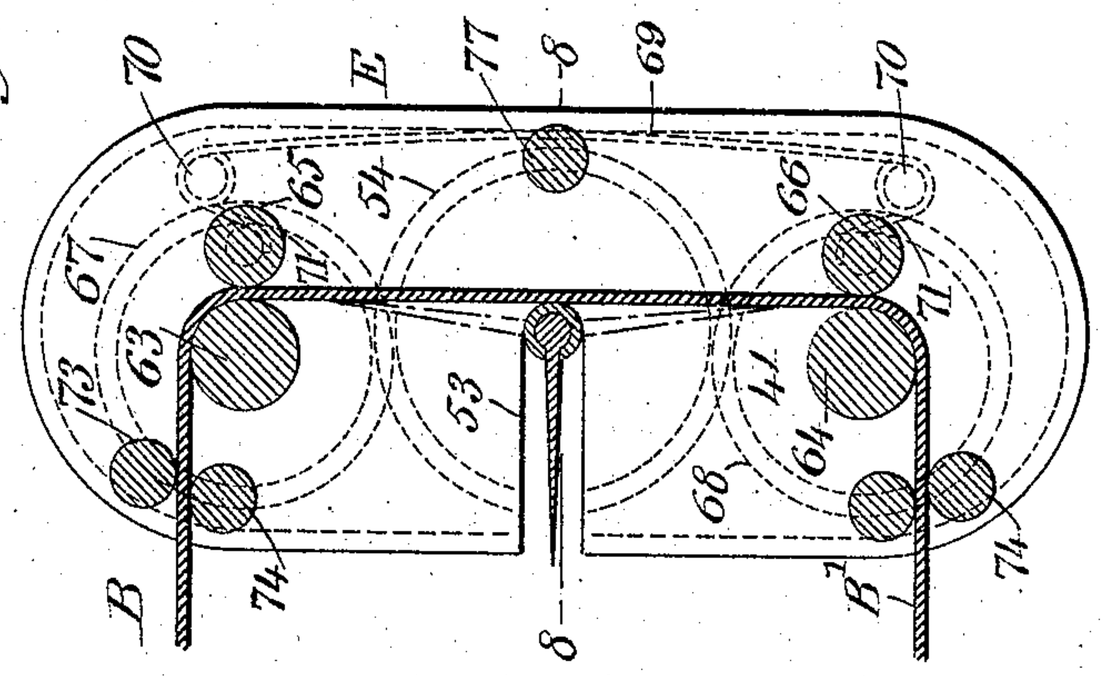
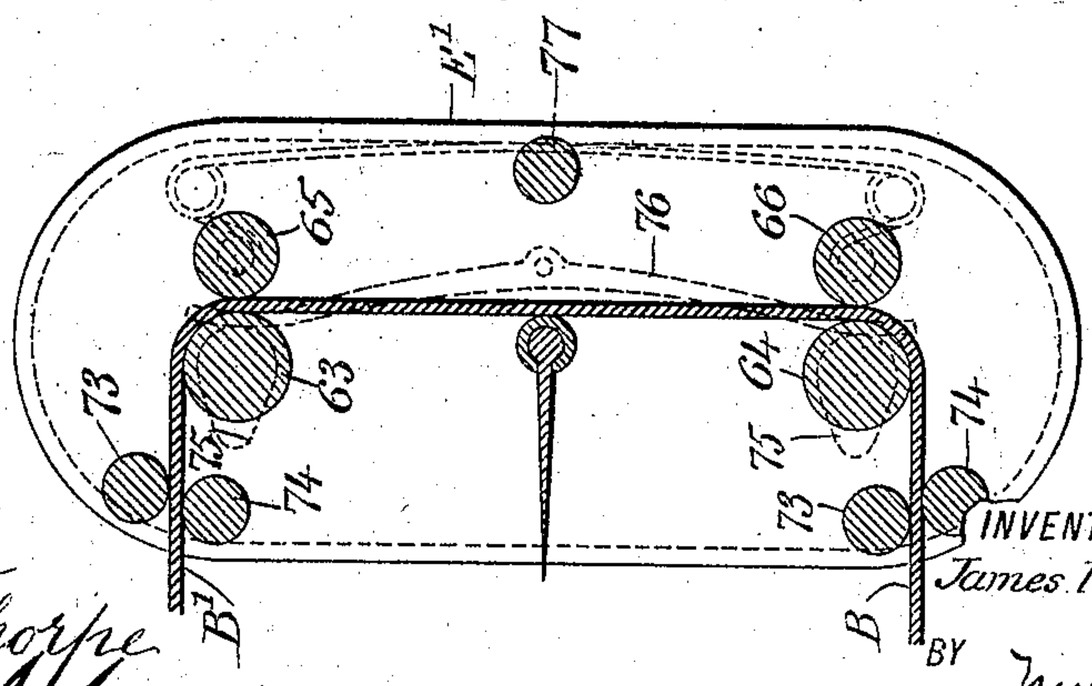


Fig. 10.



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UNITED STATES PATENT OFFICE.

JAMES RUSSELL CURLEY, OF NEW YORK, N. Y.

STROPPING-MACHINE.

No. 815,685. Specification of Letters Patent. Patented March 20, 1906.

Application filed August 24, 1905. Serial No. 275,604.

To all whom it may concern:

Be it known that I, JAMES RUSSELL CURLEY, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Stropping-Machine, of which the following is a full, clear, and exact description.

The purpose of the invention is to provide a stropping-machine by means of which a razor is stropped at the same angle as it is stropped by hand and every stroke at the same angle and the strop is so shaped as to conform to the shape of the razor edge, insuring the entire edge being stropped the full length of the stroke, thereby enabling the razor to be properly stropped in fewer strokes than when stropped by hand, wherein the different parts of the blade are stropped but for a small portion of each stroke and no part is stropped the entire length of the stroke unless done so at the expense of some other part.

A further purpose of the invention is to provide jaws for holding the tang of the razor and means for holding the back of the razor at its outer end, such jaws being so constructed that the tang of the razor must be snapped therein, but wherein the razor must be drawn through the jaws, thus preventing the edge being damaged upon the removal of the razor from the machine.

Another purpose is to provide means to deaden the force with which the razor edge strikes the strop at the commencement of the stroke and also to provide means to take up any lost motion in the gears and to lift the edge of the razor off the strop at the finish of the stroke and before the commencement of the return stroke, thereby preventing the strop from rubbing against the razor edge in the wrong direction.

A further purpose of the invention is to provide a means to prevent the razor from turning over upon its edge, thereby rounding or dulling the same.

Another purpose of the invention is to provide handles for the strop capable of being quickly placed in position or removed and which will receive several fingers of the operator's hand.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improved stropping-machine. Fig. 2 is a sectional plan view of the machine, the section being taken practically on the line 2 2 of Fig. 1. Fig. 3 is an enlarged vertical section taken practically on the line 3 3 of Fig. 2. Fig. 4 is a horizontal section taken practically on the line 4 4 of Fig. 3. Fig. 5 is a horizontal section taken practically on the line 5 5 of Fig. 3. Fig. 6 is a horizontal section taken substantially on the line 6 6 of Fig. 3. Fig. 7 is a detail sectional view of an ordinary razor-blade and the main spindle of the machine and a plan view of a locking-disk for the outer end of such razor. Fig. 8 is a vertical longitudinal section through a modified form of the machine, the section being taken practically on the line 8 8 of Fig. 9. Fig. 9 is a horizontal section taken substantially on the line 9 9 of Fig. 8, and Fig. 10 is a horizontal section taken substantially on the line 10 10 of Fig. 8.

The frame of the device under the construction shown on Sheets 1 and 2 consists of a skeleton triangular top plate A and a corresponding lower plate A′, the said plates at their contracted rear ends being solid for a moderate distance forward, the forwardly-extending arm-sections 10 and 11 being of any desired length. These arm-sections 10 and 11 of the plates are preferably much wider at their outer ends than at any other point. The two plates A and A′ are connected at their rear central portion by a bar 12, riveted thereto, as is shown especially in Fig. 3, and this bar 12 is provided with an outwardly-extending eye 13 or its equivalent, whereby the frame may be removably secured to any support when the device is to be operated.

The plates A and A′ are further connected by fixed spindles, two of which extend from the outer end portions of corresponding arms 10 and 11, the spindles connecting the arms 10 being designated as b and b' and the spindles connecting the arms 11 being designated as b^2 and b^3. Each inner spindle b' and b^3 is provided with a roller, which runs loosely thereon. These rollers are made to taper from their centers in direction of their ends and are therefore of greatest diameter at their central portions and may be termed "convexed." The roller on the spindle b' is designated as 14^a, and the roller on the spindle b^3 is designated as 15^a. A roller is

likewise mounted on each outer spindle b and b^2, the roller on the spindle b being designated as 14 and the roller on the spindle b^2 as 15. These rollers 14 and 15 are concaved at their central portions, so that the concaved faces of the outer rollers 14 and 15 are presented to the convexed surfaces of the inner rollers 14^a and 15^a. Consequently a strop drawn between the opposing sets or pairs of rollers will be bellied between its longitudinal edges, so that the strop will conform to the shape of the cutting edge of the razor as it passes over the said edge in a manner to be hereinafter described. The rollers, however, need not of necessity be concaved and convexed, but can be of any shape necessary to make the strop conform to the edge of the razor being stropped. For example, two perfectly-straight rollers would be used to make the strop conform to a straight-edged razor.

What may be termed a "drive" or "operating" shaft 16 is mounted to turn in the central forward portions of the upper and lower body-plates A and A′ near the front edges of said plates or where the arms 10 and 11 are connected, as is shown in Fig. 2. This shaft 16 is provided with a trunnion 17, which extends well upward beyond the upper body-plate A, and with a lower trunnion 17^a, which latter trunnion does not extend beyond the outer face of the lower body-plate A′. A gear-wheel 18 is secured on the trunnion 17^a, being substantially in engagement with or just above the upper face of the lower body-plate A′, and the gear 18 meshes with a gear 19, mounted on a suitable spindle carried by the said lower body-plate A′, the gear 19 being at the rear of the gear 18. A disk 20 is loosely mounted upon the lower trunnion 17^a of the shaft 16, being adapted to turn on the upper face of the bottom body-plate A′, as is also best shown in Fig. 3. In the under face of the disk 20 at its rear portion a segmental recess 21 is produced, (best shown in Fig. 6,) the curved or rear wall of which recess is provided with teeth 22, which engage with the gear 19. The recess 21 at its straight or forward edge is provided with a suitable depression to accommodate the gear 18, so that as the shaft 16 is turned the gear 18 will turn the gear 19, and the gear 19 will act upon the disk 20 to turn it, and as the shaft 16 is rotated a half-revolution in one direction and then a half-revolution in the opposite direction a half-revolution only at each section of the shaft 16 is imparted to the disk 20. The gears are constructed as above described in order to prevent the razor turning too far, and thereby dulling the blade.

At what may be termed the "forward" portion of the disk 20 a pin 23 is secured, extending some distance above the upper face of the said disk, and the said pin just above the disk is provded with a collar b^4, as is shown in Fig. 3.

The upper trunnion 17 of the shaft 16 has a gear 24 secured thereto just above the top body-plate A, the said gear 24 corresponding to the lower gear 18. The gear 24 is made to mesh with a gear 25, which turns on a spindle 29, carried by the said upper plate A, the gear 25 being located at the rear of the gear 24, and it corresponds to the lower gear 19 described. A disk 26, corresponding to the disk 20, is loosely mounted on said upper trunnion 17 of the shaft 16 and is provided at what may be termed its "forward central" portion when the disk is in normal position with a radial slot 27, as is shown in Figs. 3 and 5, and at the rear of its center the disk 26 is further provided with a segmental slot 28, (shown in Fig. 4,) which receives the upper or projecting end of the spindle 29 on which the gear 25 turns. The disk 26 is also provided upon its under face at the rear of its center with a segmental chamber or recess 30, as is best shown in Fig. 5, the rear or straight wall whereof is provided with a depression to receive a gear 24, and the rear or curved wall of said recess 30 is provided with teeth 31, which mesh with the teeth of the gear 25, so that as the shaft 16 is turned it imparts simultaneous movement in the same direction to both the lower disk 20 and the upper disk 26. A box-casing 32 is made to fit snugly at the peripheral portion of the disk 26, and this box-casing at its forward portion is provided with a circumferential slot 34 below its upper member, the said box-casing being open at its bottom, and the upper member of the box-casing 32 at its forward central edge when the casing is in normal position is provided with a radial slot 35, and the box-casing is so set that the slots 35 and 37 in the upper revoluble structure register, and said two slots register with the pin 23, carried by the lower disk 20.

The box-casing 32 is secured to the upper disk 26 by means of pins or screws 32^a passed through the said box-casing into the said disk and also through the medium of a nut 33, which is screwed upon the upper end of the trunnion 17 of the said shaft 16 to an engagement with the upper face of the box-casing 32.

Two opposing jaws 36 are pivotally mounted in the chamber which is formed between the box-casing and the disk 26, the screws or pins 32^a serving as fulcrums for the said jaws. These jaws extend from the rear portion of such chamber out through the slot 34 at the forward portion of the box-casing, as is shown in Fig. 4, and are located just below the radial forward slots 27 and 35 in said upper disk 26 and the box-casing 32.

It may here be stated that when the tang c of the razor-blade C is connected with a tu-

bular razor-back c', as is shown in Fig. 3, the outer end of the back is received by the upper end of the pin 23, resting upon the shoulder b^4, and then the tang c is forced horizontally between the jaws 36 until the outer edges of the back engage with the offset portions of the heads of said jaws, as is shown in Fig. 4, thus locking the razor in position and holding the blade vertically between the inner rollers 14^a and 15^a. It will also be observed that it is utterly impossible to remove the razor from the jaws in the same manner in which the razor was introduced, as the offset portions of the jaws effectually prevent the razor being drawn horizontally outward. Therefore in removing the razor it must be moved upward or vertically, thus preventing the edge of the razor after having been sharpened striking any object to dull it or break the edge. The jaws 36 are normally forced together at their heads by a spring 39. (Shown best in Figs. 3 and 4.)

When the razor to be stropped is provided with a solid back, as is shown at C′ in Fig. 7, the pin 23 is replaced by a grouping of small pins or offsets c^2, between which the back of the razor is introduced when placed in position for stropping.

It may here be stated that the strop B is passed between the rollers 14 and 14^a and the rollers 15 and 15^a and over the back portion of the shaft or spindle 16, and in order to deaden the force with which the razor edge strikes the strop at the commencement of a stroke and also to provide means to take up any lost motion in the gears and to lift the razor off the strop at the finish of the stroke and before the commencement of a return stroke, thereby preventing the strop from rubbing against the razor edge in the wrong direction, a mechanism is provided, which is shown best in Figs. 3 and 6. This mechanism consists of a small box-sleeve 40, open at the bottom and which is secured to the lower trunnion 17^a of the spindle or shaft 16, and the lower edge of this box-sleeve has bearing and free movement upon the upper face of the lower disk 20. The rear portion of this box-sleeve 40 is provided with a peripheral slot 41, (shown best in Figs. 1 and 6,) and this slot is divided about centrally between its ends by a downwardly-extending tongue 42. (Shown in Fig. 6.) A spring 43, which is usually a coil-spring, is coiled loosely around the trunnion 17^a of the spindle or shaft 16, and the ends of the said springs 43 are made to pass out through the slot 41 at each side of the partition or tongue 42, as shown in Fig. 6. The ends of the spring extend far enough out so that in the operation of the shaft or spindle 16 one or the other of the ends of the spring will be in engagement with the collar b^4 of the pin 23, thus serving as a cushion to ease up the blade of the razor and carry it from the strop just slightly prior to the return stroke being made, thus preventing the possibility of the edge being injured by striking the strop when drawn in the wrong direction. The rollers mentioned, particularly the inner rollers, may be provided with a covering of a soft material, such as felt or leather, as is shown at x in Figs. 3 and 6.

The handles D for the ends of the strop B are of peculiar construction, having a loop-section d of sufficient size to receive, for example, the four fingers of the hand, and a body-section d', which is provided with a slot 44, produced at its inner longitudinal edge and extending from end to end of the body, as is shown in Fig. 2, and the ends of the strop are introduced into said slots and are held securely therein by passing screws 45 or their equivalents through the said body-section from side to side, thus enabling the ends of the strop to be readily secured to the handles or to be readily removed therefrom.

In the operation of the device it is attached to a support in any approved manner. The razor-blade is then inserted in the device in the manner described, and the operator grasps the two handles, one with each hand, and moves the ends of the strop alternately backward and forward, thus giving the rotary reciprocating movement to the disks through the medium of the gearing between the shaft or spindle 16 and the said disks.

In Figs. 8, 9, and 10 I have shown a slight modification of the construction illustrated in the other drawings. In such modification two opposing heads E and E′ are provided of elongated construction and having parallel longitudinal sides and rounded ends. The lower head E′ comprises an upper or inner plate 46, a marginal flange 47, and a lower or outer bottom plate 48, together with a central partition 49, which divides said head into a lower compartment e' and an upper compartment e^2. The upper head E consists of a bottom plate 50 and an upwardly-extending marginal flange 51, together with a cover-plate, (not shown,) but which corresponds to the bottom plate 48 of the lower head, whereby a single chamber e is formed in the said upper head E.

A vertical slot 53 is made in the front central portion of the head, extending through from top to bottom, and a central opening 52 is made in the central portion of the said head E between its sides, which opening 52 is smaller at the bottom than at the top and is circular in order to accommodate the downwardly-extending hub portion of a gear 54, the gear being located within the said chamber e, and the upper portion 56 of the hub 55 is increased in diameter to such an extent that it turns over the flanges 51 of the said head, as is shown in Fig. 8, and the said gear and its hubs are provided with a vertical slot 59, extending through from top to bottom from its center to its forward edge, which slot 59 is

adapted to register normally with the slot 53 in the head, and in the further construction of the gear 54 the upper hub 56 is provided with a chamber 57 at its upper portion closed by a cover-plate 58. The slot 59 also extends through the said cover-plate. These parts just enumerated constitute a revolving razor-retaining device or carrier F, which corresponds to the spring 39 in the other construction.

A pin 60 is located on the upper face of the lower head E′ of the frame, corresponding to the pin 23 in the other construction, and in operation the tang *c* of the razor is made to enter the slot 53 in the upper head of the slot 59 in the receiving-head F, and the end of the tubular back *c* of the blade C of the razor is received by the said pin 60. The tang of the razor is held in position by means of jaws 61 of corresponding construction to the jaws 36 described as located in the recess or chamber 57 of the razor-receiving head F. The heads of said jaws 61 are normally held together by an interposed spring 62, which corresponds to the spring 39 in the other construction.

About centrally between the sides of the heads E and E′, near the ends thereof, the trunnions of convexed rollers 63 and 64 are mounted to turn, and opposite and to the rear of each convexed roller 63 and 64 the trunnions of concaved rollers 65 and 66 are mounted for rotary movement and for movement to and from the trunnions of the convexed roller. The rollers 63, 64, 65, and 66 correspond to the rollers 14, 14ª, 15, and 15ª shown in Figs. 5 and 6, and the rollers 63 and 64 act in the same capacity as the roller 16 shown in Fig. 6.

A gear 67 is secured to the upper trunnion of the convexed roller 63, being located in the chamber 57 of the said razor-receiving head F, and the gear 67 meshes with a gear 54, and a gear 68 is similarly mounted on the upper trunnions of the opposing convexed roller 64, meshing likewise with the said gear 54. The gears 67 and 68 are of the same diameter; but the gear 54 is of larger diameter.

A spring 69 is located within the chamber *e* of the upper head E at the rear, and the end portions of the said springs are coiled around studs 70, located in the said chamber, as is shown in Fig. 9. The ends 71 of the said spring have bearing against the upper trunnions of the concaved rollers 65 and 66, normally forcing said rollers to practically an gagement with the convexed rollers. A similar spring 72 is located in the rear portion of the upper chamber e^2 of the lower head E′ and acts in a similar manner upon the lower trunnions of the said concaved rollers 65 and 66.

A pair of guide-bars 73 and 74 are located in front of each of the convexed rollers 63 and 64, which guide bars or rods 73 and 74 serve likewise to connect the heads E and E′. These guide-bars 73 and 74 may, however, be in the form of rollers, if desired. It will be understood that although the convexed and concaved rollers are shown solid they may be tubular and mounted to turn on suitable spindles connecting the heads E and E′. Under this construction the razor-strop B′ is passed between the convexed and concaved rollers 64 and 66 and 63 and 65 and then out forwardly between the guide-rods 73 and 74, as is particularly shown in Figs. 9 and 10.

At the lower end of the lower trunnion of each of the convexed rollers 63 and 64 within the lower chamber *e′* of the lower head E′ a cam is secured, which normally faces in a forward direction, as shown by dotted lines in Fig. 10. A strap-spring 76 is located in the lower chamber *e′* of the lower head E′ at the rear of the trunnions of the convexed rollers, and the ends of the said springs bear upon the said cams, so that what the points of the cams touch the ends of the said springs the movement of the convexed rollers is checked, and the spring 76 acts in the same capacity as the spring 43 in the other construction.

At the central rear portion of the device a post 77 is mounted to turn in the heads E and E′, and a bail 78 is attached to the post 77, as is shown in Fig. 8, whereby to attach the device to a near-by support when it is being used. The operation of the device when constructed as shown in Figs. 8, 9, and 10 is the same as when constructed as shown in Figs. 1, 2, 3, 4, 5, and 6.

Having thus described my invention, I claim as new, and desire to secure by Letters Patent—

1. In a razor-stropping device, a frame, a shaft mounted to revolve in the frame, razor-retaining devices mounted to revolve on the frame, connections between said retaining devices and said shaft, imparting to said retaining devices a rotary reciprocating motion, and guide-rollers arranged in pairs in advance of the shaft and at points beyond its sides, one roller of a pair being convexed and the other roller concaved.

2. In a razor-stropping device, a frame, guide-rollers arranged in pairs and mounted in the frame in advance of and at each side of the shaft, razor-retaining devices mounted to turn on the frame, gearing between the ends of the shaft and the razor-retaining devices, whereby to give the latter rotary reciprocating movement, and a razor-strop which is passed to frictional engagement with the shaft and between and in frictional engagement with the pairs of guide-rollers, whereupon by alternately moving the ends of the strop back and forth the shaft is alternately turned to one side or the other.

3. In a razor-stropping machine, guide-rollers for the strop in substantially close relation, one roller being convexed and the other roller correspondingly concaved to im-

part a bulge or belly to the strop passing between them.

4. In a razor-stropping machine, a frame, guide-rollers for the strop mounted in the said frame in substantially close relation, one roller being convexed and the other correspondingly concaved, one roller being capable of movement to and from the other, and a tension device for the latter roller, normally forcing it toward its mating roller.

5. In a razor-stropping machine, a frame, opposing pairs of guide-rollers, a pivot for a razor located at the lower portion of the frame, a razor-retaining device mounted to revolve at the upper portion of the frame, a strop which is passed between the rollers of the said pairs of guide-rollers, and means whereby upon moving the strop backward and forward a pivotal reciprocating motion is imparted to the razor.

6. In a razor-stropping device, a frame, a shaft journaled in the said frame, gears carried by the said shaft at the top and at the bottom, idle gears carried by the frame, meshing with those on the shaft, disks loosely mounted on the shaft at the top and at the bottom over the upper and the lower gears, the disks being provided with segmental openings having teeth to mesh with the idle gears, a pivot for a razor carried by the lower disk, gripping devices for the tang of the razor carried by the upper disk, and a strop passed in frictional engagement with the said shaft, whereby to rotate the same.

7. In a razor-stropping device, a frame, a shaft journaled on the said frame, gears carried by said shaft at the top and at the bottom, idle gears carried by the frame, meshing with those on the shaft, disks loosely mounted on the shaft at the top and at the bottom over the upper and the lower gears, the disks being provided with segmental openings having teeth to mesh with the idle gears, a pivot for a razor carried by the lower disk, gripping devices for the tang of the razor carried by the upper disk, a strop passed in frictional engagement with the said shaft, whereby to rotate the same, and guide-rollers arranged in pairs, located in front of and to the sides of the said shaft, one guide-roller of a pair being convexed and the other concaved, the said strop passing between the said guide-rollers.

8. In a razor-stropping machine, a rotatable retainer for a razor, comprising a chambered circular member having a vertical slot extending from top to bottom, and a peripheral opening connecting with the slot, opposing jaws pivotally mounted in the said chamber, having heads which extend out through the peripheral slot at the vertical slot in said member, the heads of the jaws having projections at their inner faces, and a tension device normally separating the inner ends of the said jaws.

9. In a razor-stropping machine, a frame, a shaft mounted in the frame, razor-retaining devices rotated by the said shaft, a strop which imparts movement to the said shaft, being in frictional engagement therewith, and a cushion-spring carried by the said shaft, which limits the action of the razor relative to the strop when in the retaining device, preventing the edge of the razor engaging the strop when the strop is traveling in the wrong direction or is on its return stroke.

10. In a razor-stropping device, a frame, a shaft mounted to revolve therein, guides arranged in pairs in front of and beyond the sides of the said shaft, a disk loosely mounted on the shaft at its bottom portion, a socket device carried by the said disk, a second disk loosely mounted on the upper portion of the shaft, the said upper disk being provided with a chamber and with a vertical and a circumferential slot, which slots cross each other, jaws pivoted in the chamber of the upper disk, which jaws are provided with heads extending out through the circumferential opening in the said upper disk beneath the vertical opening therein, the heads of which jaws have their inner faces curved and are provided at their inner marginal edges with opposing offset portions, and means for imparting a rotary reciprocating movement simultaneously to both disks by the rotation of the said shaft, and a strop in frictional engagement with the pairs of guides and with the said shaft, said strop being free at its ends, whereby when a razor is to be stropped it is made to engage the socket member of the lower disk and the tang of the razor is pressed between the said jaws, which are tension-controlled at their rear ends, the razor being thus held locked in position and can be removed only by drawing the razor vertically from the device.

11. In a razor-stropping machine, a frame, an oscillating member at one end of the frame and provided with means for retaining one end of a razor, an oscillating member at the opposite end of the frame and slotted to receive the tang of the razor-blade, and jaws carried by the last-named member and having projections on their inner faces.

12. In a razor-stropping machine, a frame, an oscillating member at one end of the frame and provided with a pin, a chambered oscillating member at the other end of the frame and provided with a radial slot, and pivoted and spring-pressed jaws mounted in the chambered member and having projections on their inner faces.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES RUSSELL CURLEY.

Witnesses:

J. FRED. ACKER,

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