Sept. 13, 1927.

1,642,259

D. F. MORSE

MOTOR DRIVEN SHEARS

Filed June 30, 1926

3 Sheets-Sheet 1

Fig. 1.

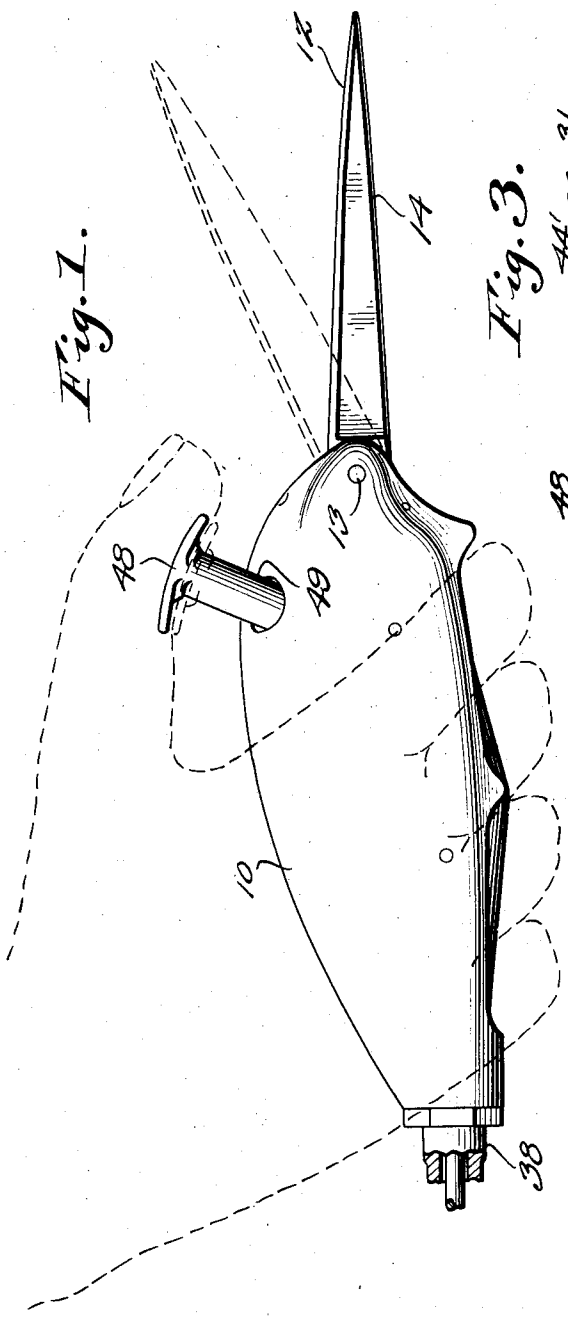


Fig. 3.

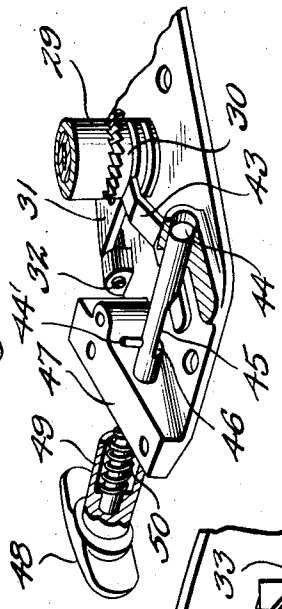
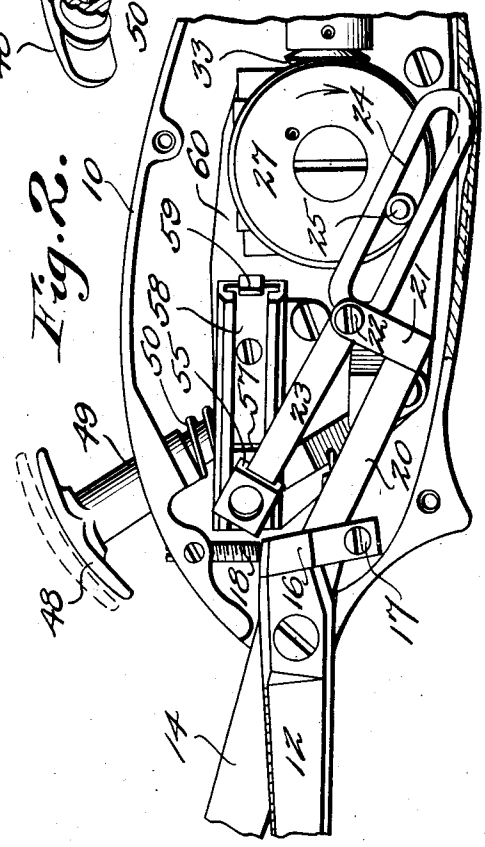


Fig. 2.



Delbert F. Morse

INVENTOR

BY Victor J. Evans

ATTORNEY

R. E. Wise

WITNESS:

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D. F. MORSE

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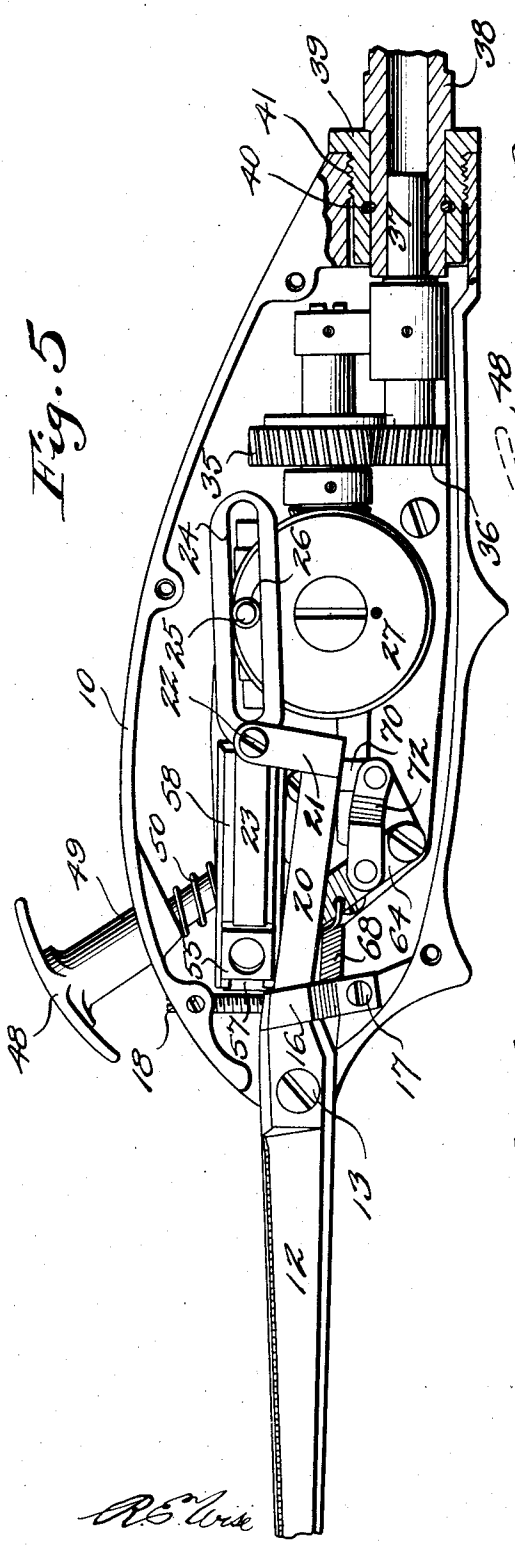


Fig. 5

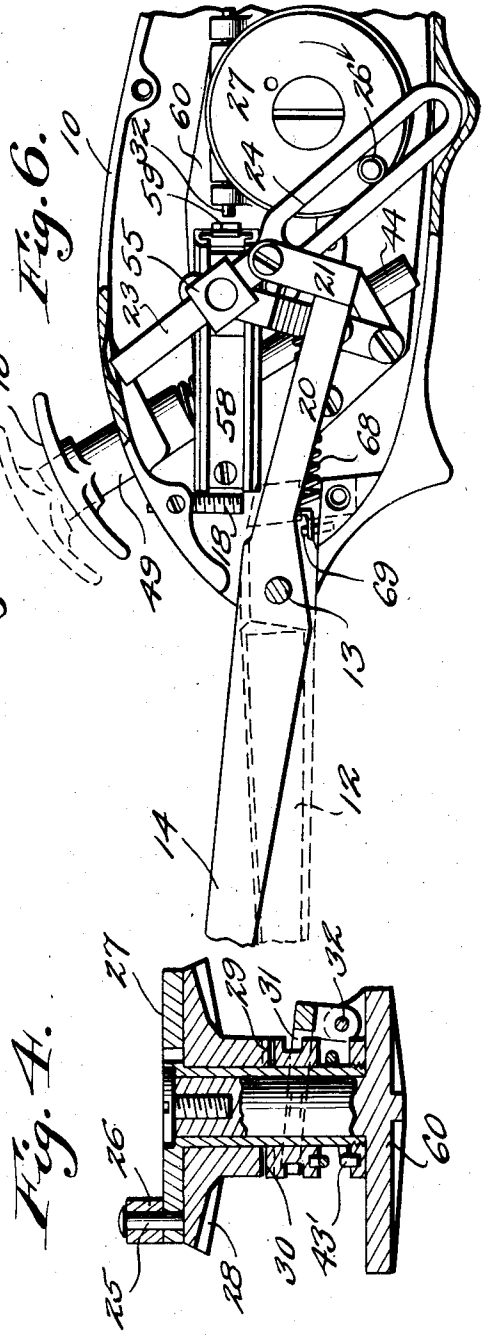


Fig. 6.

Fig. 4.

WITNESS:

Delbert F. Morse
INVENTOR

BY Victor J. Evans
ATTORNEY

Sept. 13, 1927.

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D. F. MORSE

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3 Sheets-Sheet 3

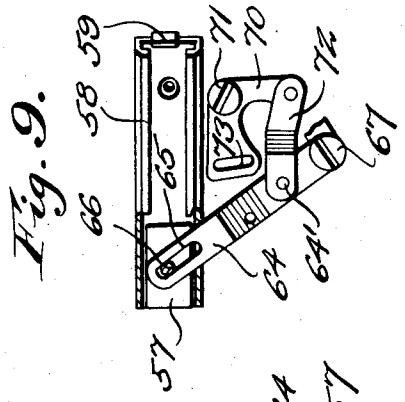


Fig. 9.

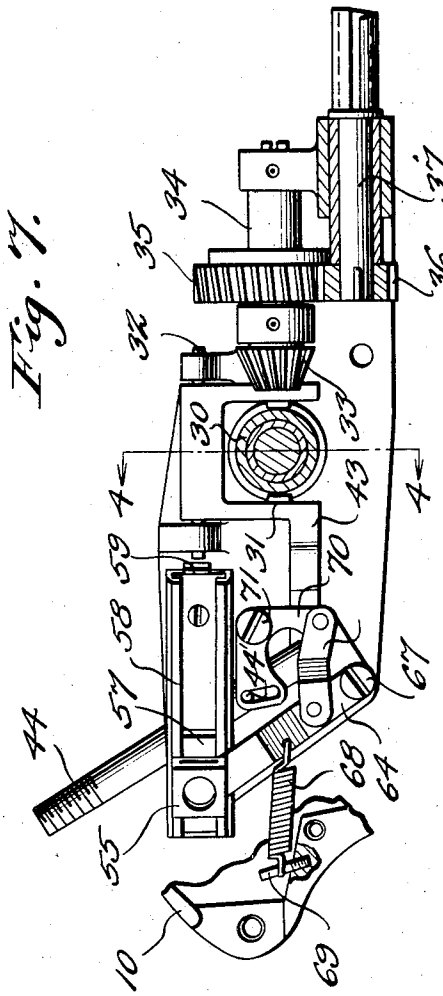


Fig. 7.

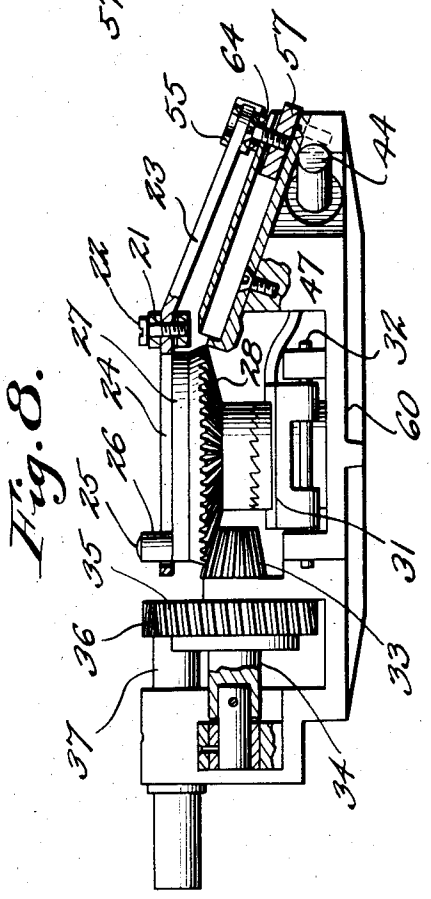


Fig. 8.

Delbert F. Morse

INVENTOR

BY Victor J. Evans

ATTORNEY

R. E. Wise.

WITNESS:

Patented Sept. 13, 1927. 1,642,259

UNITED STATES PATENT OFFICE.

DELBERT F. MORSE, OF LAKEPORT, NEW HAMPSHIRE.

MOTOR-DRIVEN SHEARS.

Application filed June 30, 1926. Serial No. 119,690.

The object of this invention is to provide a device of the type indicated which shall include a stationary blade and a power operated blade the former being adapted to serve as a guiding element and permitting of the safe and accurate use of the article for cutting hair, and in connection with other operations, it being understood that the mechanism is capable of use under various conditions.

A further object is to provide means enabling the operator to have as complete control of the shears as if an instrument of the ordinary hand type were to be employed.

A further object is to provide a single element, operated by the thumb or by one of the fingers of the user, and enabling him to start the mechanism and thereafter to vary the extent of the stroke of the movable blade by continued pressure in the same direction, the complete release of pressure acting to throw out a clutch and stop the machine automatically, avoiding the possibility of damage in the event that the article is dropped or displaced from proper position in the hand of the user.

A further object is to provide for varying the stroke in the opposite direction by the partial release of the controlling device.

With the foregoing and other objects in view, the invention consists in the novel construction and arrangement of elements described, illustrated and claimed, it being understood that modifications may be made within the scope of the claims without departing from the spirit of the invention.

In the drawings forming part of this application,

Figure 1 is a view of the device in elevation, the position of the hand being illustrated in dotted lines, although the instrument may be otherwise held.

Figure 2 shows the main operative elements in elevation.

Figure 3 is a detail view, in perspective, showing the control of the clutch mechanism.

Figure 4 is a detail in section on line 4—4 of Figure 7.

Figure 5 is a view chiefly in elevation, the cover or side plate having been removed.

Figure 6 shows a portion of the structure of Figure 5, under different adjustment.

Figure 7 is a view, with parts broken away, showing details of the drive and of the means for varying the stroke.

Figure 8 is a view of the operative elements, chiefly in plan, with portions in section.

Figure 9 is a detail view showing means for controlling the position of the fulcrum of lever arm 64.

The housing includes a main portion 10 adapted to be closed by a cover plate, or cover section, and provision is made at one end of the housing for connection with the driving means, and at the other end for mounting the blades. The stationary blade is designated 12, and is mounted by means of the pivot element or screw 13, which however constitutes a pivot only for the movable blade 14. A retaining element 16 extends over the shank portion of the stationary blade and is secured to the housing by means of screw 17, and extending thru the housing 10, opposite element 16 is an adjusting screw 18 adapted to determine the extent of movement of the blade 14, so that this element will be correctly positioned with reference to the point of the other blade.

The shank element of the movable blade is designated 20 and an offset element 21 extending from portion 20 has pivotal connection by means of screw 22 with arm 23, constituting an important element in the combination and forming a part of the mechanism by which the extent of the stroke of the movable blade is determined. This element 23 includes a slotted portion 24, and a pin 25 extends thru the slot, a roller 26 carried by the pin directly engaging the walls or edges of the slot 24.

This pin 25 is carried by wheel 27 rotating with gear wheel 28 carrying a clutch face 29 adapted for cooperation with the movable clutch element 30 controlled by a clutch yoke 31 pivoted at 32, as shown in Figures 3 and 4.

The drive for bevel gear wheel 28 is by means of beveled pinion 33 on shaft 34, the latter carrying gear wheel 35 meshing with pinion 36 on shaft element 37 with which a flexible driving shaft, from a motor is to be connected. Shaft 37 is positioned within sleeve 38, and is surrounded by a sleeve 39, a resilient element 40 located in opposite channeled portions serving an obvious purpose.

The sleeve 39 has threaded connection with the housing, as shown at 31.

The movable element 30 of the clutch is controlled by arm 43, and a controlling device including a pin 44 co-operates with arm 43, and is provided with a cutaway portion 45, of the form shown, one end terminating in a shoulder at 46. The pin 44 passes thru a bearing in block 47, and is controlled by a thumb member 48, it being understood that pressure may be applied if preferred, by one of the fingers of the hand. The thumb member includes a shank or tubular portion 49 passing thru an aperture in housing 10, and a coiled spring 50 normally holds the thumb member in an outer position, at which time the clutch element 30 is disengaged from clutch element 29. Pin 44 carries the laterally extending element or pin 44′ adjacent to the wall of block 47, and it may here be mentioned that the initial pressure on the controlling pin causes the clutch elements to engage, and continued pressure thereon is employed for varying the stroke in the manner disclosed below.

Pivoted arm 23 is slidably connected with block or the like 55 and the latter is connected by pin or screw with slide 57 operating within a channeled element 58 having an end stop 59, the channel member being carried by plate 60 on which the principal driving elements within the housing are mounted.

The slide 57 provides means whereby the position of the fulcrum of arm 23, constituting a lever, may be changed, so that the extent of stroke of the movable blade 14 may be varied as desired, it being recalled that this blade is operated thru the connection at 22 with offset member 21 of shank 20 of said movable blade. In Figure 5 and elsewhere the fulcrum for pivoted arm 23 is shown at the extreme left, or near that point, and in Figure 6 the fulcrum has been shifted to the right, this movement being controlled by thumb member 48, subsequent to the initial movement thereof, and after the clutch elements have been engaged.

The slide or shoe 57 is controlled by an arm 64 having a slot 65 therein engaging pin 66 extending into the slide, and said arm is pivoted at 67 on a post or the like carried by plate 60. A spring 68 is connected with arm 64, this being a tension spring and having its other end connected with a stationary element 69 on the housing 10. An angle arm 70 pivotally mounted at 71, is connected by a pivoted link 72 with arm 64, and at the point 64′ thereon. The angle arm 70 is slotted at 73, and this slot is engaged by pin 44′ on the main pin 44, by means of which the control is effected.

During the initial movement of controlling pin 44 by thumb member 48, the pin 44′ operates in slot 73, and no movement of slide 57 takes place, until the clutch element 30 has been caused to engage clutch element 29. Continued pressure on the thumb member 48, after the lost motion is taken up at 73 produces the movement of angle lever or arm 70 in a counter-clockwise direction, exerting pull on link 72, and shifting the slide 57 toward the right, in Figure 9 and elsewhere, thereby changing the fulcrum point of lever or arm 23, for varying the extent of the stroke of the pivoted blade, as before indicated. In this manner pressure on the thumb member 48 decreases the stroke of movable blade 14, and partial release of thumb member 48 increases the length of the stroke. Complete release of pressure throws out the clutch, and the tool ceases to operate.

The clutch engages under the action of spring 43′ when pin 44 under pressure releases the arm cooperating with the slotted portion of said pin 44.

Having described the invention what is claimed is:—

1. In a device of the class described, a housing, a stationary blade carried thereby, a movable blade cooperating with the stationary blade, mechanism for driving the movable blade, mechanism for varying the extent of stroke of the movable blade, and a controlling device operatively connected with both of said mechanisms.

2. In a device of the class described, a housing, a stationary blade carried thereby, a movable blade cooperatitng with the stationary blade, mechanism for driving the movable blade, mechanism for varying the extent of stroke of the movable blade, and a spring actuated and manually actuated controlling device.

3. In a device of the class described, a housing, a stationary blade carried thereby, a movable blade cooperating with the stationary blade, mechanism for driving the movable blade, mechanism for varying the extent of stroke of the movable blade, and including a lever arm operatively connected with this blade, and means for changing the position of the fulcrum of said arm, and a controlling device operatively connected with both of said mechanisms.

4. In a device of the class described, a housing, a stationary blade carried thereby, a movable blade cooperatitng with the stationary blade, mechanism for driving the movable blade, mechanism for varying the extent of stroke of the movable blade, and a controlling device movable initially for throwing the driving mechanism into operative condition and movable thereafter for controlling the mechanism for varying the extent of stroke.

5. In a device of the class described, a housing, a stationary blade carried thereby and constituting a guiding and steadying element for the operator, a movable blade

cooperating with the stationary blade, driving mechanism for the movable blade and a device operatively connected with the driving means for throwing it into action and varying the extent of stroke of the blade.

6. In a device of the class described, a housing, a stationary blade carried thereby and constituting a guiding and steadying element for the operator, a movable blade cooperatitng with the stationary blade, driving mechanism for the movable blade, means for manually throwing the driving mechanism into operation for imparting motion to the movable blade, devices connected with said means for determining the position of the pivotal point of the movable blade and means for automatically throwing the driving mechanism out of operation upon the release of manual pressure.

In testimony whereof I affix my signature.

DELBERT F. MORSE.