

No. 765,699.

PATENTED JULY 26, 1904

A. CARTER.
MACHINE FOR BURNISHING REFLECTORS.

APPLICATION FILED JAN. 2, 1904.

NO MODEL.

3 SHEETS—SHEET 1

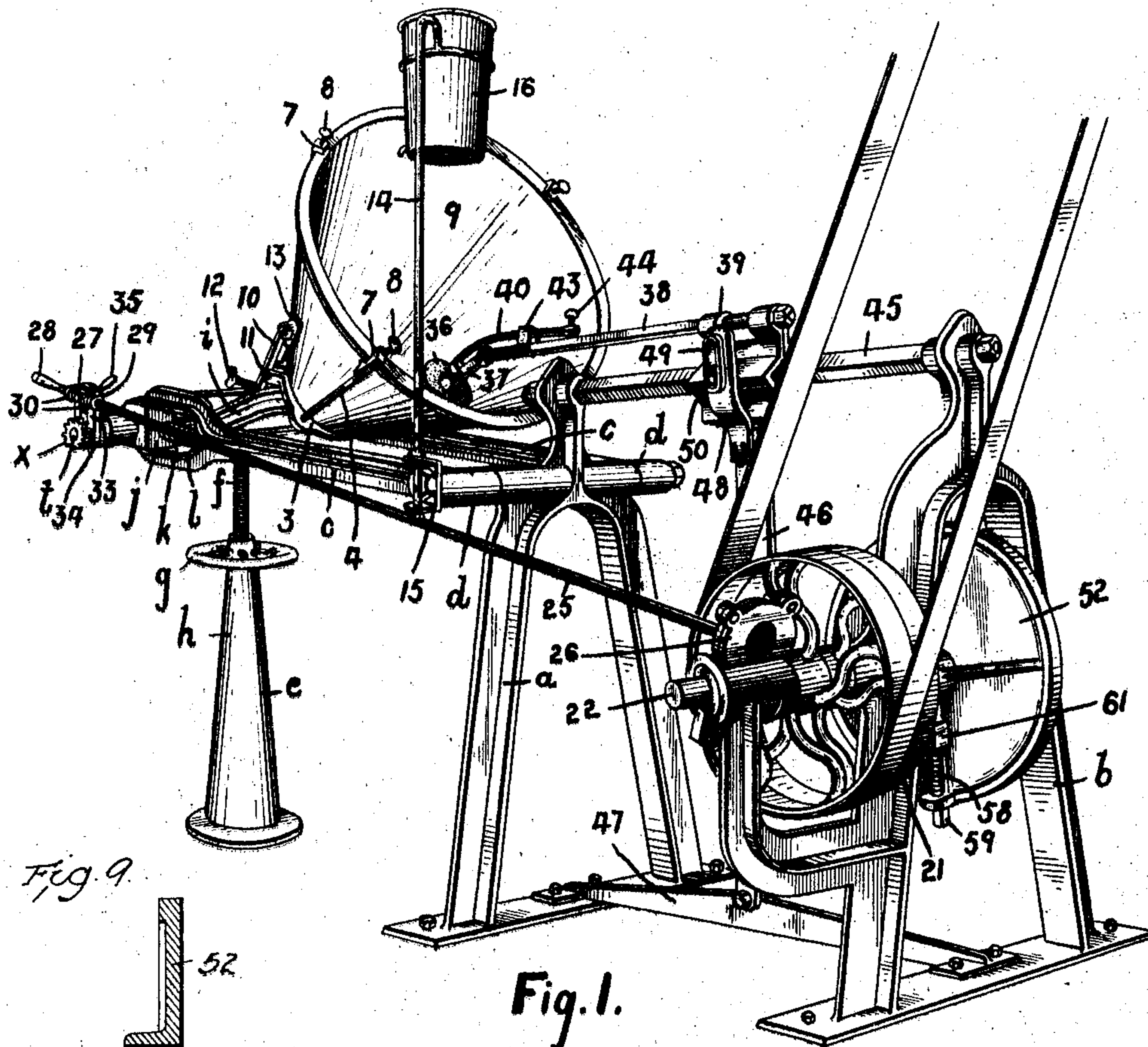


Fig. 9.

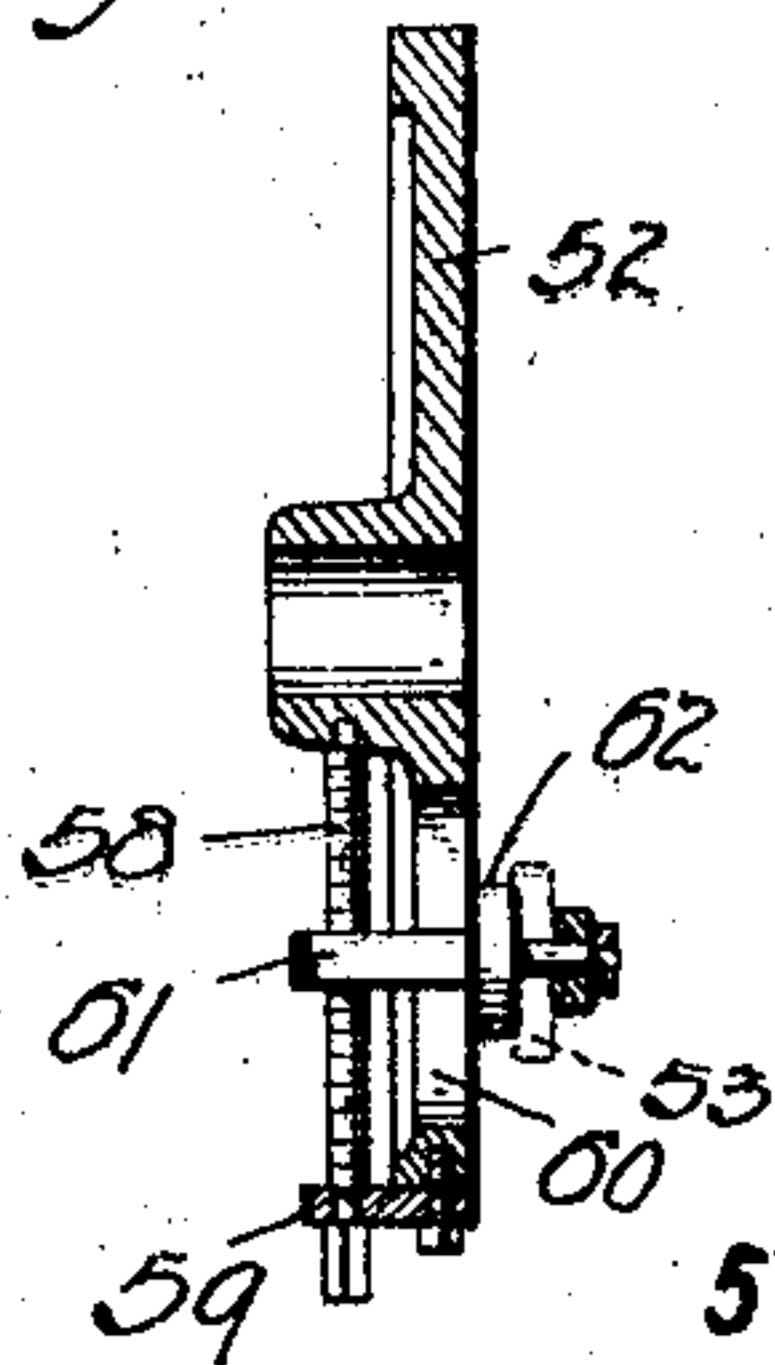
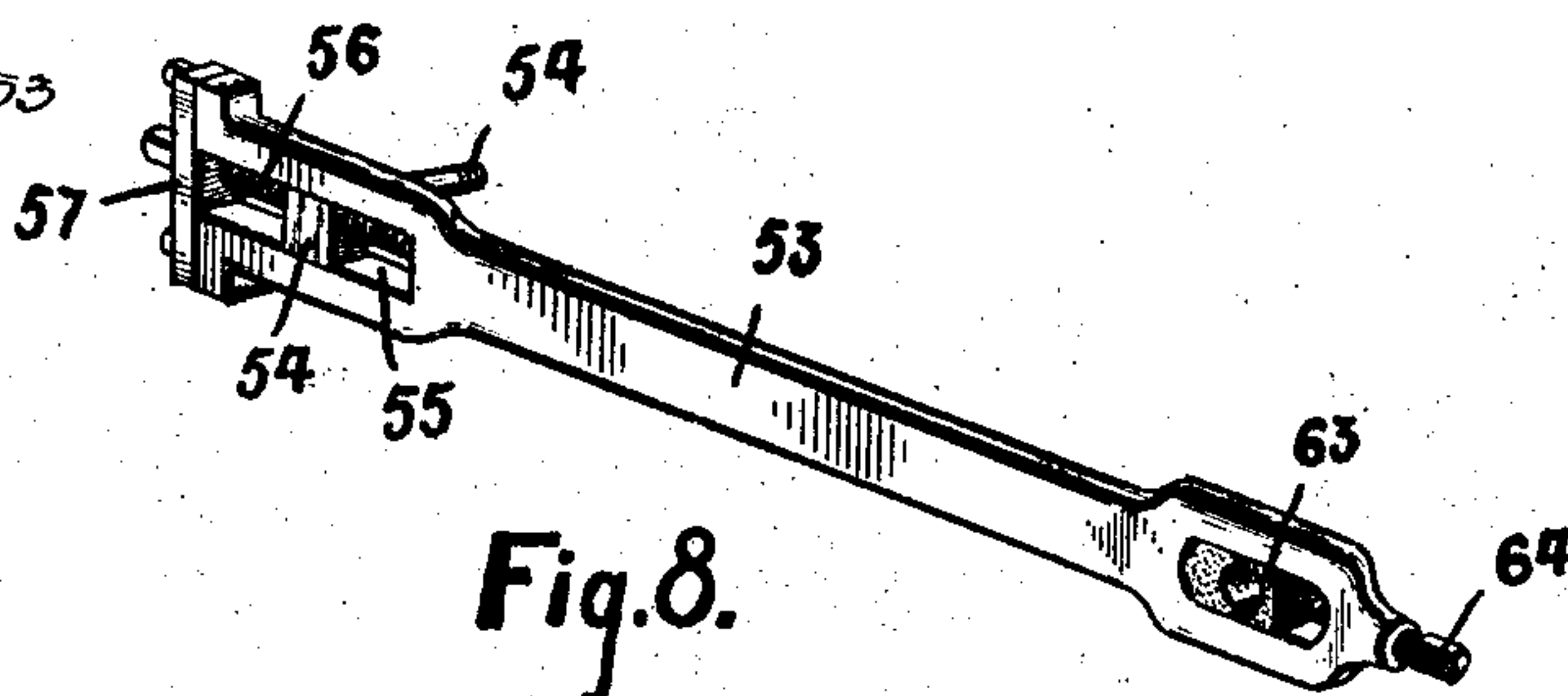


Fig. 8.



Witnesses.

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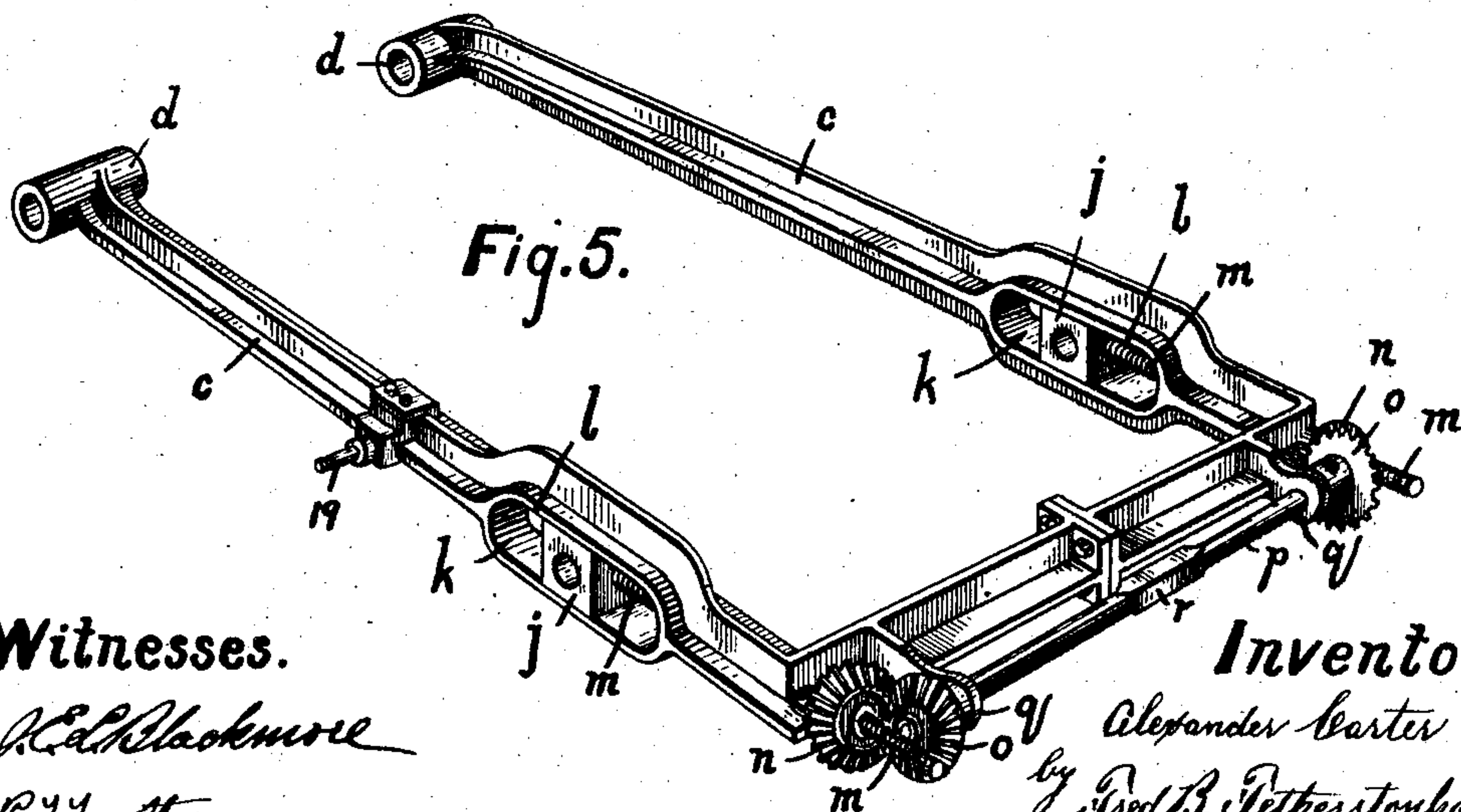
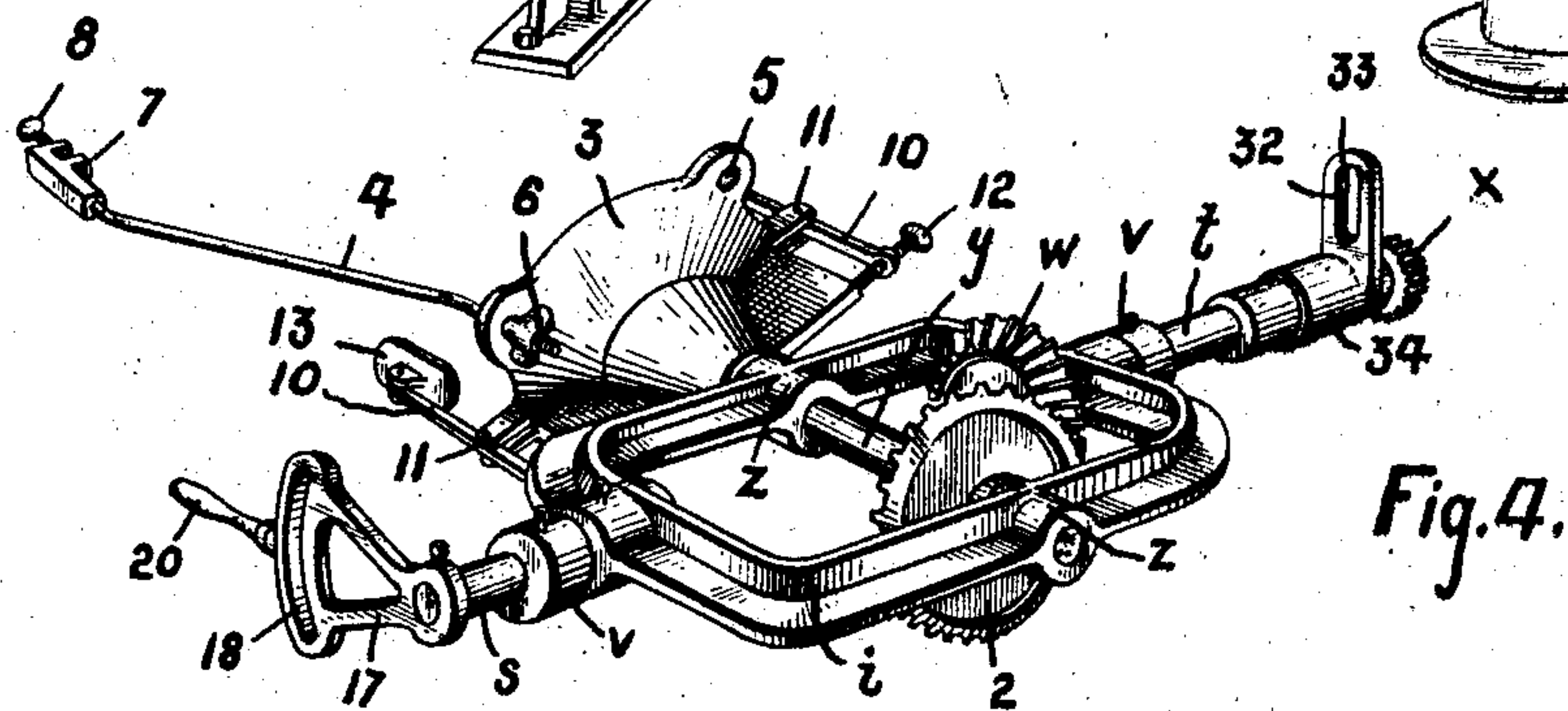
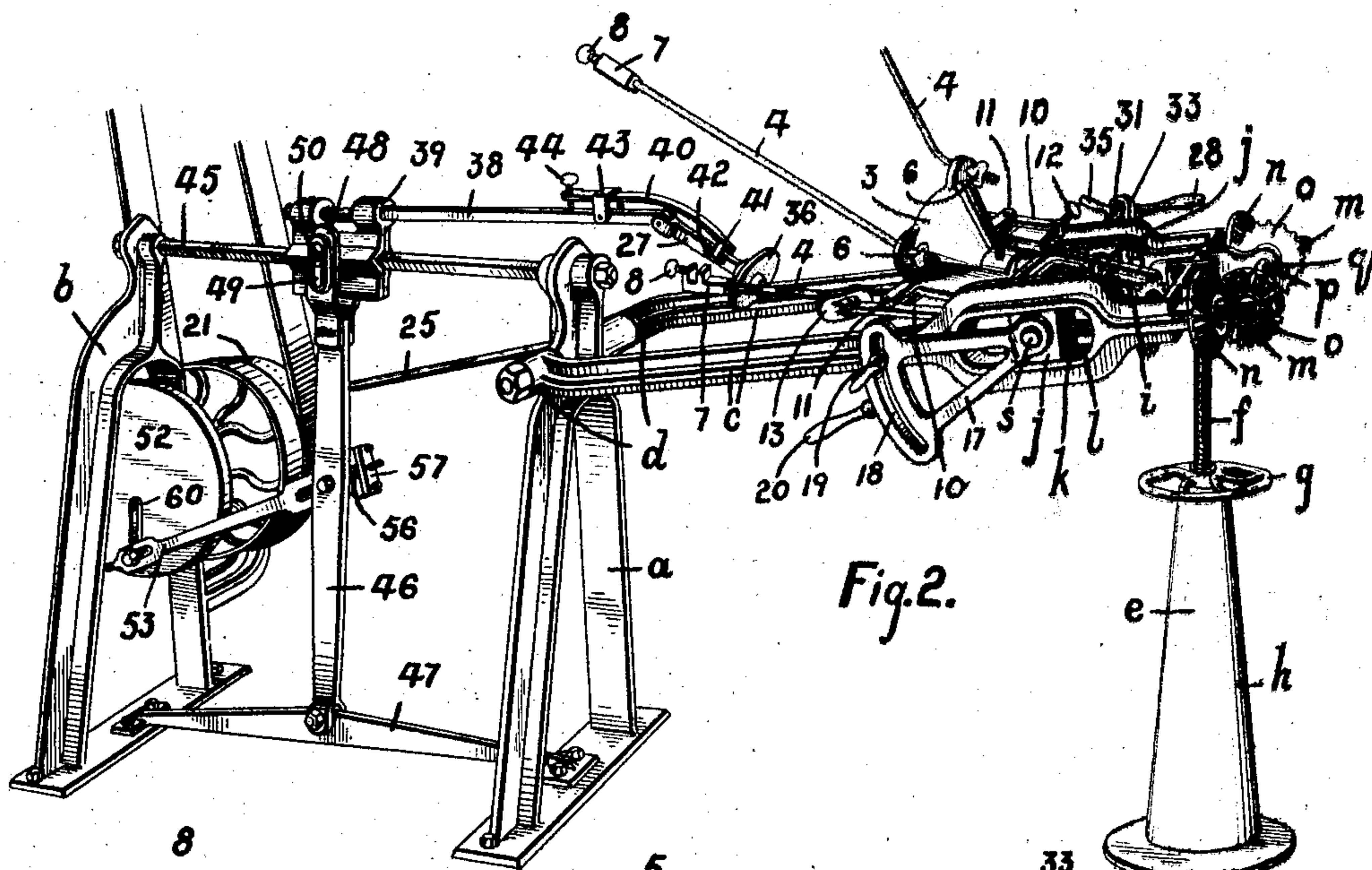
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3 SHEETS—SHEET 2.



Witnesses.

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3 SHEETS—SHEET 3.

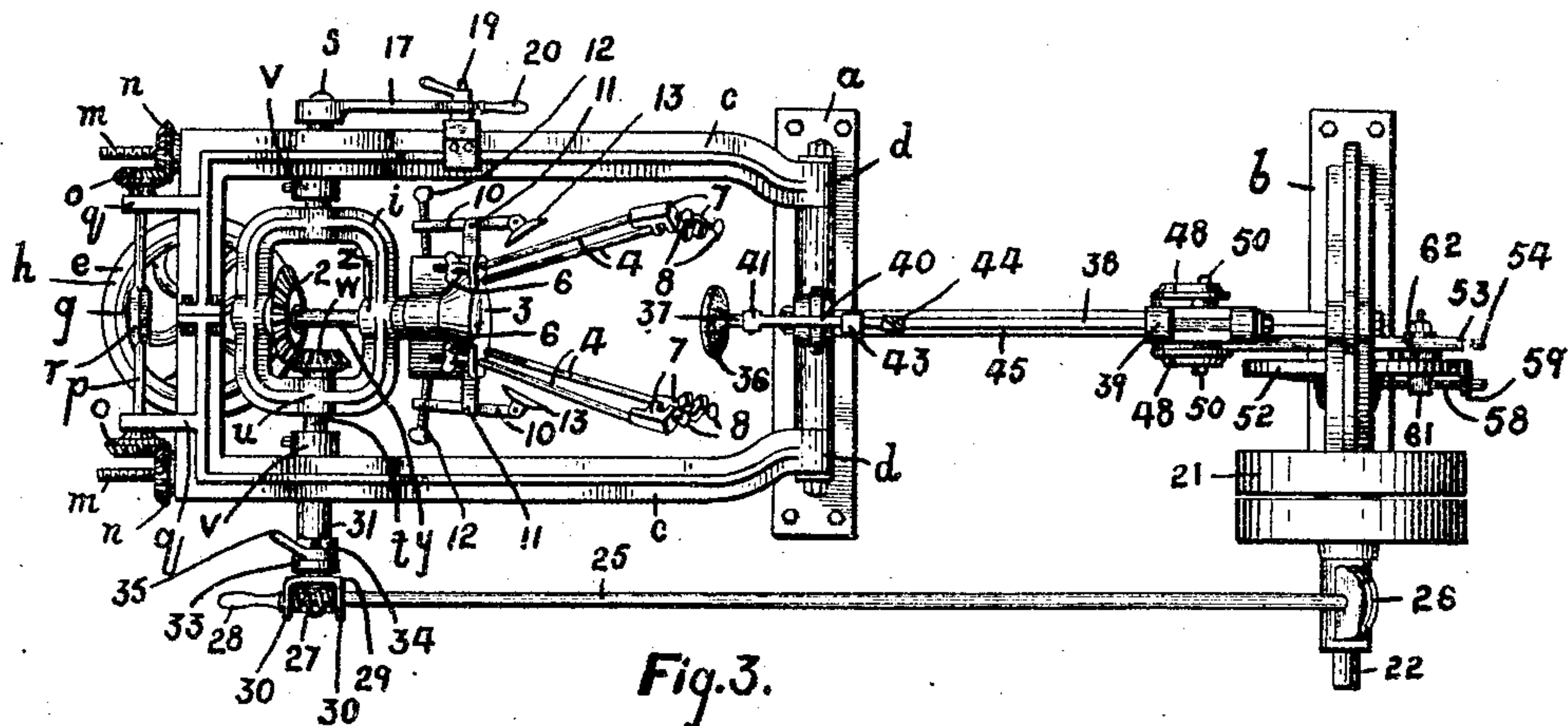


Fig. 3.

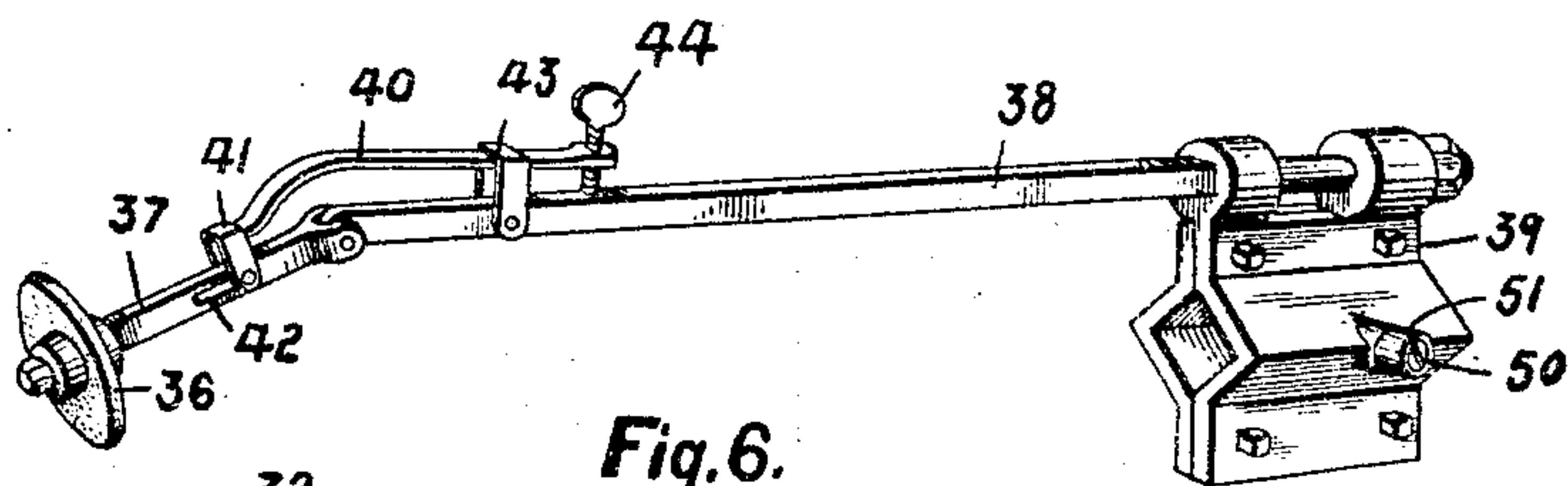


Fig. 6.

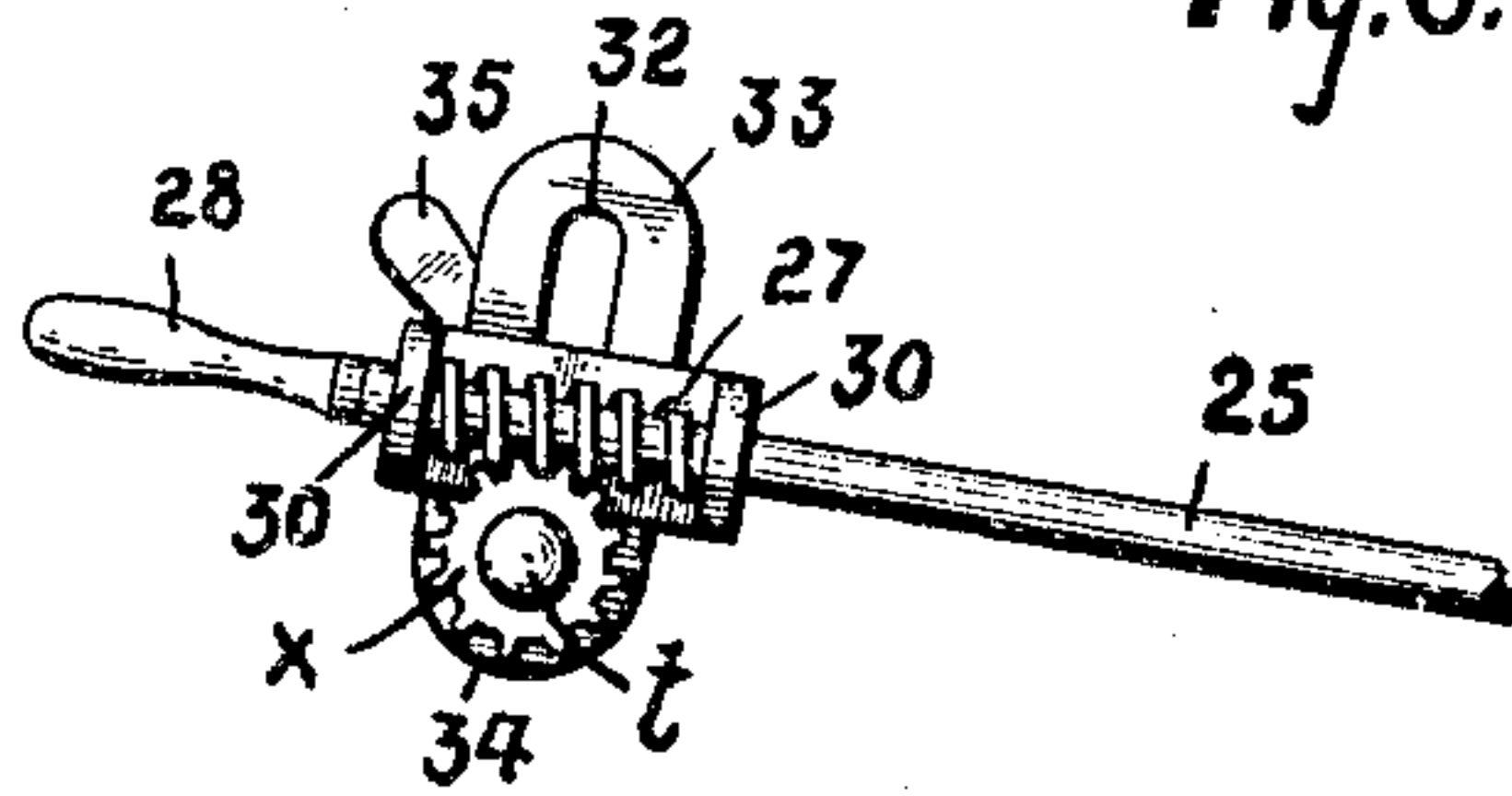
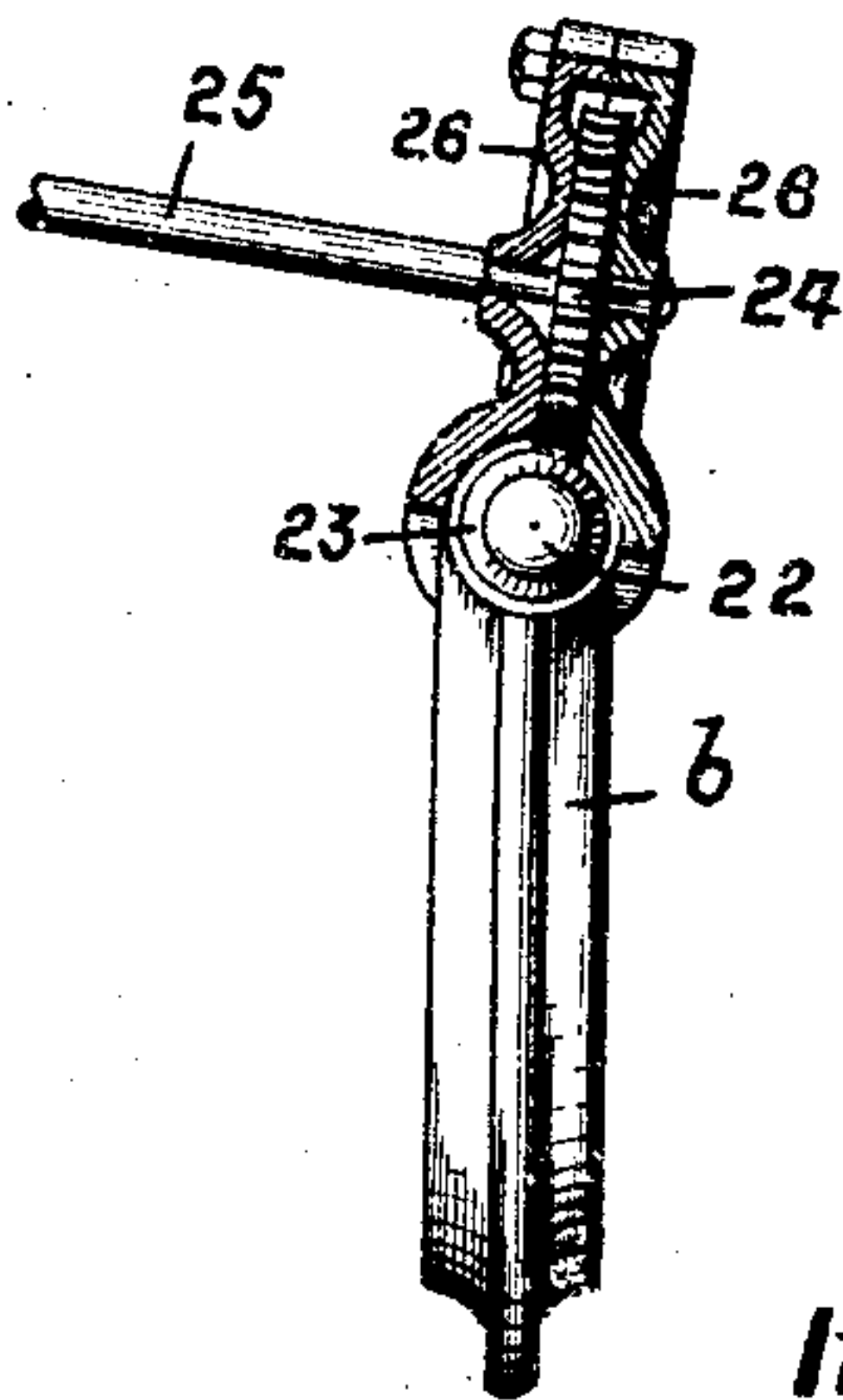


Fig. 7.



Witnesses

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UNITED STATES PATENT OFFICE.

ALEXANDER CARTER, OF MONCTON, CANADA.

MACHINE FOR BURNISHING REFLECTORS.

SPECIFICATION forming part of Letters Patent No. 765,699, dated July 26, 1904.

Application filed January 2, 1904. Serial No. 187,551. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER CARTER, a subject of the King of Great Britain, residing at Moncton, in the county of Westmoreland, in the Province of New Brunswick, Canada, have invented certain new and useful Improvements in Machines for Burnishing Reflectors, of which the following is a specification.

My invention relates to improvements in machines for burnishing reflectors; and the object of the invention is to produce a machine which shall entirely obviate the necessity of manual labor, and thus lessen the cost of burnishing light-reflectors and obtain a more satisfactory finish; and it consists, essentially, of suitable standards, a frame supported thereby, a reflector-holder attached to said frame, means for imparting to the holder a rotatory motion, a burnisher, and means for imparting to the burnisher a reciprocatory motion, the various parts being constructed in detail as hereinafter more particularly described.

Figure 1 is a perspective view of the machine, having a reflector secured in place thereon. Fig. 2 is a perspective view showing the machine from the opposite side. Fig. 3 is a plan view of the machine from above. Fig. 4 is an enlarged detail of the adjustable frame. Fig. 5 is an enlarged detail of the reflector-holder and portions of the rotating and adjusting mechanism removed from the frame. Fig. 6 is an enlarged perspective detail of the burnisher, rod, and traveler. Fig. 7 is an enlarged detail of the worm-and-gear mechanism. Fig. 8 is a detail of the connecting-rod-adjusting mechanism. Fig. 9 is a sectional view of disk, showing adjustable connection of rod.

Like characters of reference indicate corresponding parts in each figure.

a and *b* are standards or supports suitably secured to a base or flooring.

c is a frame hinged at *d* at the top of the standards *a*.

e is an adjustable standard on the principle of a lifting-jack and supporting the outer end of the frame *c*, having the threaded spindle *f* pivotally secured to the frame and the adjust-

ing-wheel *g* raising and lowering the threaded spindle in the base *h*. 50

i is a yoke supported from the bearing-blocks *j*, which are slidably arranged in corresponding guideways *k* in the openings *l* in the sides of the frame *c*.

m represents spindles rigidly attached to the bearing-blocks *j* and projecting through corresponding orifices longitudinally arranged in the frame *c* beyond the end of the said frame. The spindles *m* are threaded outside the frame. 55

n represents miter-wheels having a threaded orifice corresponding to the threaded portions of the spindles *m* and turning thereon. 60

o represents miter-wheels meshing with the wheels *n* and fixedly secured to the shaft *p*, journaled in the projections *q* from the frame. The shaft *p* is suitably squared at *r* to facilitate the turning thereof. The miter-wheels and spindles are provided with right and left hand threads, respectively, which provide for the adjustment of the bearing-blocks *j*, as the wheels *o*, turning with the wheels *n*, move the spindles *m* coincidently inwardly or outwardly as desired for governing the position of the bearing-blocks *j*. 65

s is a shaft rigidly secured to the yoke *i* and journaled in one of the bearing-blocks *j*. 75

t is a shaft turning freely in a bearing *u* in the yoke *i* and journaled in the other bearing-block *j*.

The shafts *s* and *t* support the yoke *i* in the frame. 80

v represents collars suitably secured on the shafts *s* and *t* between the yoke *i* and the bearing-blocks *j*.

w is a bevel gear-wheel fixedly secured to the end of the shaft *t* inside the yoke *i*. 85

x is a spur gear-wheel at the outer end of the shaft *t*.

y is a shaft journaled in the bearings *z* in the yoke *i* at right angles to the shaft *t*. 90

2 is a bevel-gear fixedly secured on the shaft *y* and meshing with the bevel-gear *w* and operated thereby, as will hereinafter appear.

3 is the body of the reflector-holder, fixedly secured to the end of the shaft *y* outside the yoke *i*. 95

4 represents the outwardly-flaring arms extending through the orifices 5 from the body 3 and having the nuts 6 on their inner ends designed to regulate the length of arm projecting.

7 represents jaws at the end of each of the arms provided with the set-screws 8, designed to receive and hold the outer rim of the reflector 9, as shown in Fig. 1.

10 represents adjusting-clamps pivoted in projections 11 from the body 3 and having the threaded pintles 12, turning in the ends and meeting the body 3 to regulate the position of the reflector held by the grips 13.

14 is a rod supported by the bracket 15, suitably secured to the frame *c* and having a turning movement in said bracket.

16 is a drip-pot supported by said rod 14 over the interior of the reflector to be burnished.

17 is a quadrant or segmental adjuster fixedly secured at the end of the shaft *s* and having a slot 18, through which a threaded and slidably-arranged pin 19 projects from the frame *c*.

20 is a handle from said quadrant to alter the position of the quadrant on said pin 19, and thus determine the angle at which the reflector 9 is to be held. As the shaft *s* is rigidly secured to the yoke *i*, the position of the latter will be changed at each movement of said quadrant on the pin 19, and consequently the position of the reflector. A suitable fly-nut is provided on the projecting end of the pin 19.

21 is a pulley suitably driven and rotating the shaft 22.

23 is a worm on the shaft 22.

24 is a worm-wheel at the end of the rod 25, the latter being journaled in the casing 26, inclosing the worm and wheel. The casing 26 has a limited turning movement on the shaft 22 to account for the different positions of the rod as the same is raised or lowered in the adjustment of the frame *c*.

27 is a worm at the other end of the rod 25.

28 is a handle just beyond the worm 27 for raising and lowering the rod 25 to and from the worm-wheel *x* at the end of the shaft *t*. At this end the rod 25 is journaled in a bracket 29, which is provided with the two bearings 30, the worm fitting between said bearings. The bolt 31 projects from the back of the bracket 29 through the slot 32 in the lug 33. The lug 33 projects from the sleeve 34, in which the shaft *t* turns freely.

A suitable lever fly-nut 35 is provided on the bolt 31 to secure the bracket 29 in any desired position in the slot 32. It will be thus seen that by loosening the nut 35 the worm 27 may be released from and put into engagement with the worm-gear *x* when the adjustment of the frame *c* is necessary. The rod 25 on the raising or lowering of the frame *c*

assumes a different position, and consequently the teeth of the gear *x* will engage a different part of the worm 27. Therefore while the adjusting is being carried on the rod 25 is raised, as aforesaid, by means of the handle 28 from the gear and held in that raised position by the nut 35, being lowered onto the gear-wheel when the machine is ready for operation again and again held by the nut 35.

36 is a burnishing-wheel suitably held and turning on the end of the rod 37.

38 is a rod projecting from and held rigid by the traveler 39 and having the rod 37 pivotally attached to the end thereof.

40 is a spring adjustably secured to the rod 37 by the strap 41, which is slidably arranged in the slot 42. The free end of the spring 40 passes under the strap 43, secured to the rod 38. A set-screw 44, extending through the end of the spring onto the rod 38, is provided for regulating the pressure of the spring on the rod 37.

45 is a bar extending between the standards *a* and *b* at the extreme top thereof and forming a guide bar or slide for the traveler 39, which is securely bolted therearound, having sufficient freedom of movement to slide easily on the bar.

46 is a lever pivotally secured at its lower end to the cross-piece 47, extending between the standards *a* and *b* and having a forked upper end 48, provided with the longitudinal slots 49, which fit over the pins 50, inserted in the traveler, the said pins moving in the slots according to the position of the traveler on the bar. The pins 50 are preferably provided with the rollers 51, journaled thereon in order to facilitate the movement in the slots 49.

52 is a disk at one of the extreme ends of the pulley-shaft 22, fixedly secured thereto and turning therewith.

53 is a connecting-rod from the disk 52 to the lever 46. The connecting-rod 53 is attached to the lever by a square-headed bolt 54 passing through a longitudinal slot 55 in the connecting-rod and an orifice situated midway in the lever, to which it is suitably held by a nut. The bolt 54 is held in the desired position in the slot 55 by the threaded spindle 56, which turns freely in the removable end 57 of the slot, and a suitable recess at the inner end of the slot which, with the orifice in the removable end 57, form bearings for the spindle. This arrangement will enable the lengthening or shortening of the connection to the lever in order to adjust the same, so that the traveler 39 will slide on such a portion of the bar 45 as is commensurate with the travel desired for the burnishing-wheel.

58 is a threaded spindle journaled in a removable lug 59, which is secured to the disk 52 in alinement with the slot 60 in the said disk.

61 is a square-headed bolt which passes

through the slot 60 and a suitable orifice in the connecting-rod 53, to which it is held by a suitable nut. The threaded spindle 58 turns in a correspondingly-threaded orifice in the bolt-head and turns freely in a recess in the hub of the wheel and removable lug, as aforesaid.

The bolt 61 is provided with the boss 62, which with the nut and the washer retain the split brass 63 in position in the slot in the connecting-rod, as customary in engine construction, the set-screw 64 to hold the brasses being inserted through the end of the connecting-rod.

The threaded spindle 58 is used to regulate the length of the stroke by changing the position of the rod on the surface of the disk.

In the description of the details hereinabove given the operations of the various parts are explained, and I shall now define more clearly the working of the machine as a whole.

The pressure of the spring on the pivoted rod holding the burnishing-wheel is released by loosening the screw at the end of said spring. The reflector-holder is then set in position to receive a reflector, such as would be used in headlights, or, in fact, any reflector, though this machine is more particularly useful for large reflectors. The body of the reflector-holder is adjusted to the proper angle by the moving of the quadrant on the pin, as the moving of the said quadrant determines the position of the yoke. The worm in the meantime has been removed from mesh with the worm-gear x on the shaft on the other side of the yoke. The adjustable frame may then be raised or lowered, as before explained, at its outer end, according to the particular shape of the reflector, in order that it may receive the full benefit of the burnishing-wheel from the edge to the center. The reflector is placed in the holder, as already fully explained, and then, or before, if more convenient, the adjustment of the bearing-blocks j may be made—that is, to run the reflector-holder up closer to the burnishing-wheel or the reverse. The movement of the traveler carrying the rod having the burnishing-wheel at the end thereof must now be regulated—that is to say, the position of the stroke on the guide-bar and the length of that stroke, which is entirely dependable on the regulation of the position of the connecting-rod in relation to the lever and disk, respectively, as fully described in the foregoing. This is accomplished to insure the complete covering of the reflector by the burnishing-wheel according to the position the reflector-holder may be arranged on the table. The burnishing-wheel may now be forced downwardly by compressing the spring with the screw at the end thereof and force the wheel to contact with the surface of the reflector. The adjustment of the burnisher and holder being completed, the

power is applied, operating the traveler through the lever and disk and the bevel-gears in the yoke through the worm and gear mechanism, all deriving their motion from the driven shaft 22. The reflector-holder, and consequently the reflector, on the starting of the bevel-gears begin to rotate, and coincidentally the starting of the traveler imparts to the burnisher a reciprocatory motion. It will thus be seen that the burnishing-wheel is moved inwardly and outwardly on the surface of the reflector, and as the latter is constantly rotating it is thoroughly burnished from edge to center completely around.

The drip-pot shown in the drawings contains a mixture, such as soap and water, which may be turned on at will.

The burnishing-wheel used is made of close-grained steel tempered very hard. It can also be made of bloodstone or agate if they can be procured large enough.

The burnishing-wheel rotates freely on the pivoted rod.

The use of soap and water is that it acts as a lubricant and keeps the burnisher from scratching. The effect of the burnishing is that it hardens the silver plate and at the same time brings the silver to a very high polish. The burnishing-wheel before being used is first polished as fine and smooth as is possible to make it.

The adaptability of this machine for burnishing locomotive-headlight reflectors may be mentioned here, as where there are such a great number of reflectors to be burnished a machine such as is described herein is much to be desired, for it practically takes the place of several men and has proven to be thoroughly reliable in regard to the work it performs and the efficient finish it gives to the reflector.

What I claim as my invention is—

1. In combination, a frame or yoke supported to rock on a horizontal axis, a holder journaled in said yoke on an axis at right angles to the axis of the yoke, means carried by said holder for clamping thereto a hollow article to be burnished, means for rotating the holder, and a burnisher with means for reciprocating it toward and from the holder, substantially as described.

2. In a machine for burnishing reflectors, the combination with the standards and frame having a rotatable reflector-holder supported thereon, of a burnishing-wheel, a rod carrying said wheel and spring-held, a rigid rod pivotally holding the aforesaid rod, a guide-bar supported by the standards, a traveler having said rigid rod securely attached thereto and sliding on said guide-bar, a lever pivotally secured at its lower end and having a forked upper end, and longitudinal slots therein in which slide projections from the traveler, a driven shaft, a disk secured thereon, and a

connecting-rod between said disk and said lever, as and for the purpose specified.

3. In a machine for burnishing reflectors, the combination with the standards and frame
5 having a rotatable reflector-holder supported thereon, of a burnishing-wheel, a rod spring-held carrying said wheel, a rigid rod pivotally holding the aforesaid rod, a guide-bar supported by the standards, a traveler having
10 said rigid rod securely attached thereto and sliding on the guide-bar, a lever pivotally secured at its lower end and having a forked upper end and longitudinal slots therein in which slide projections from the traveler, a
15 driven shaft, a disk secured thereon, a connecting-rod having longitudinal slots toward the ends thereof and orifices through the ends into said slots, bolts pivotally joining the connecting-rod and lever and disk, respectively,
20 and threaded pintles suitably journaled and turning in correspondingly-threaded orifices in the bolt-heads, as and for the purpose specified.

4. In a device of the class described, in
25 combination, stationary standards, a frame hingedly attached to and extending from one of the said standards, an adjustable support for the outer end of said frame, means for holding a reflector on the frame, and means
30 for burnishing extending within the aforesaid means, as and for the purpose specified.

5. In a device of the class described, in combination, stationary standards, a frame hingedly attached thereto and extending from
35 one of said standards, a support for the outer end of said frame having a threaded spindle pivotally connected to the frame, and an adjusting-wheel turning on said spindle, a base, means for holding a reflector on the frame,
40 and means for burnishing extending within the aforesaid means, as and for the purpose specified.

6. In combination, a reciprocating burnishing device with means for operating it, a swinging frame, a yoke pivotally mounted in said
45 swinging frame, a holder journaled in said yoke and constructed and adapted to hold a reflector in the path of the burnisher, and means for rotating said holder, substantially
50 as described.

7. In a machine for burnishing reflectors, suitable standards, a driven shaft journaled therein, and a reciprocating burnisher operated therefrom, in combination with an ad-
55 justable frame supported by the standards, a reflector-holder having a shaft extending therefrom, a support substantially in the form of a yoke, having bearings for the holder-shaft and suitably supported in the frame on a rigidly-attached shaft and a freely-turning shaft,
60 a gear within the yoke operated from said freely-turning shaft, and means for driving the gear-operating shaft, as and for the purpose specified.

8. In a machine for burnishing reflectors, 65 suitable standards, a driven shaft journaled therein, and a reciprocating burnisher operated therefrom, in combination with an adjustable frame supported by the standards, a reflector-holder having a shaft extending
70 therefrom, a support substantially in the form of a yoke, having bearings for the holder-shaft and suitably supported in the frame on a rigidly-attached shaft and a freely-turning shaft, worm-and-gear mechanisms connecting
75 the aforesaid driven shaft and the freely-turning shaft, and gears connecting the freely-turning shaft and holder-shaft, as and for the purpose specified.

9. In a machine for burnishing reflectors, 80 suitable standards, a driven shaft journaled therein, and a reciprocating burnisher operated therefrom, in combination with an adjustable frame supported by the standards, a reflector-holder having a shaft extending
85 therefrom, a support substantially in the form of a yoke, having bearings for the holder-shaft and suitably supported in the frame on a rigidly-attached shaft and a freely-turning shaft, a gear within the yoke, a worm and
90 gear meshing at the end of said freely-turning shaft, adjustable bearings supported in a slotted lug extending from a sleeve surrounding the gear-shaft, a worm-and-gear mechanism located and operated with the said driven
95 shaft and operating the aforesaid worm and gear, and a casing for the worm and gear, having a limited turning movement on the driven shaft and a connecting-shaft between said worm-and-gear mechanisms, as and for
100 the purpose specified.

10. In a machine for burnishing reflectors, suitable standards, a driven shaft journaled therein, and a reciprocating burnisher operated therefrom, in combination with an ad-
105 justable frame supported by the standards, a reflector-holder having a shaft extending therefrom, a support substantially in the form of a yoke, having bearings for the holder-shaft and supported in the frame on suitable shafts,
110 one of which is rigidly attached thereto, and a segmental adjuster secured to said rigid shaft, as and for the purpose specified.

11. In a machine for burnishing reflectors, suitable standards, a driven shaft journaled
115 therein, and a reciprocating burnisher operated therefrom, in combination with an adjustable frame supported by the standards, a reflector-holder carried by the frame, having a body portion from which projects outwardly-
120 flaring arms adjustably arranged and having jaws and retaining-screws at their outer ends, a pair of adjusting-clamps, pivotally arranged from the body portion and having suitable grips at one end threaded setting-pintles at
125 the other end, and means for imparting to the reflector-holder a rotary motion, as and for the purpose specified.

12. In a device of the class described, in combination, suitable standards, a frame supported thereby having openings and guideways in the sides thereof, a reflector-holder, 5 a support in the form of a yoke for said holder having shafts extending from each side thereof, bearing-blocks slidably arranged in said guideways and in which said shafts are journaled, and means for burnishing extending 10 within the reflector-holder, as and for the purpose specified.

13. In a device of the class described, in combination, suitable standards, a frame supported thereby having openings and guideways in the sides thereof, a reflector-holder, 15 a support in the form of a yoke for said holder having shafts extending from each side thereof, bearing-blocks slidably arranged in said

guideways and in which said shafts are journaled, spindles right and left threaded attached to said bearing-blocks and extending through the frame beyond the end, a miter-wheel on each of said spindles having correspondingly-threaded orifices, coacting miter-wheels secured to a shaft, bearings therefor 25 projecting from the frame, and means for burnishing extending within the reflector-holder, as and for the purpose specified.

Signed at Moncton, in the county of Westmoreland, in the Province of New Brunswick, 30 Canada, this 21st day of December, 1903.

ALEXANDER CARTER.

Witnesses:

ALEXANDER R. JARDINE,
JEAN McOVARMD.