

No. 784,164.

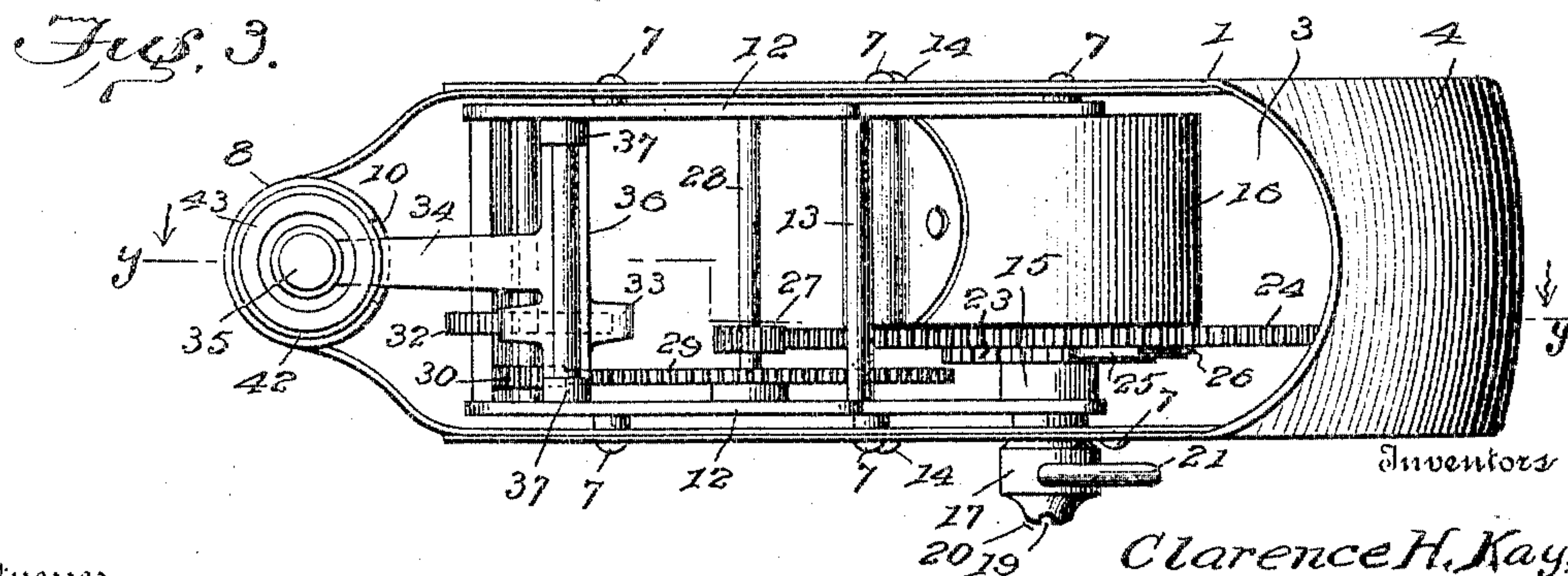
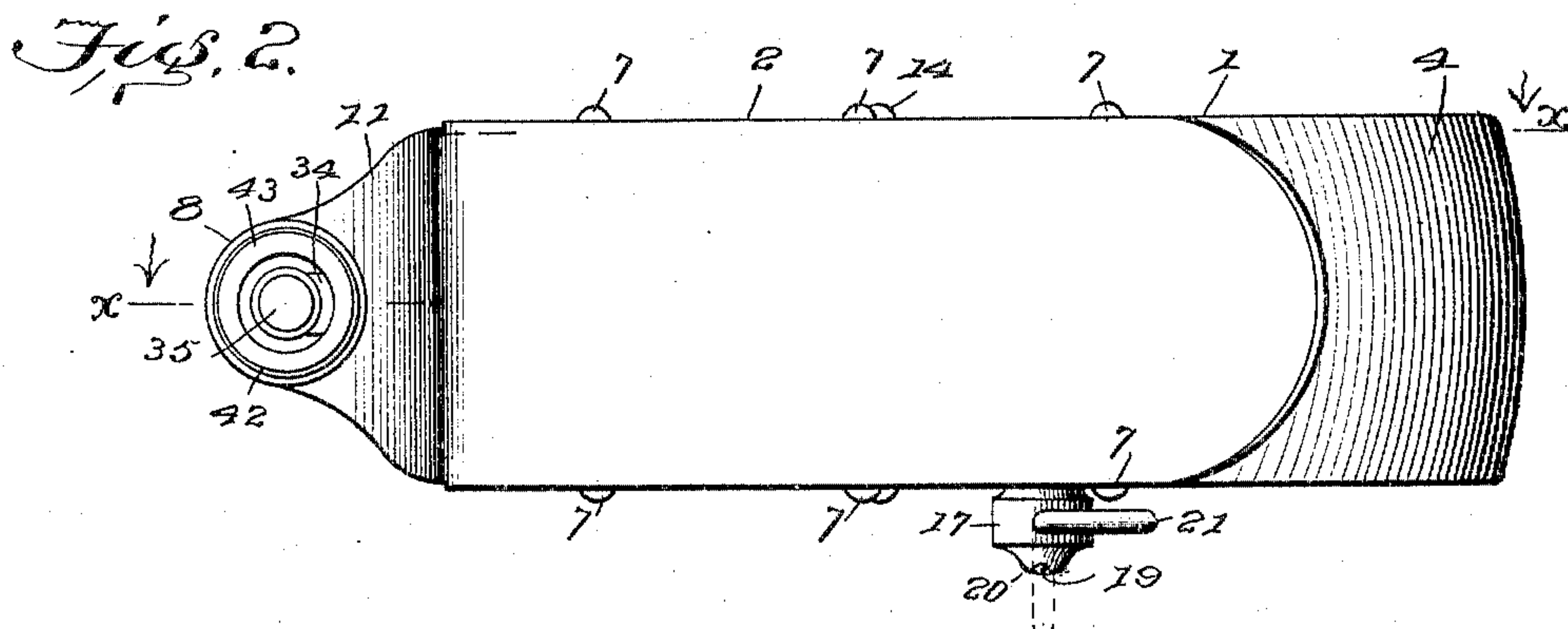
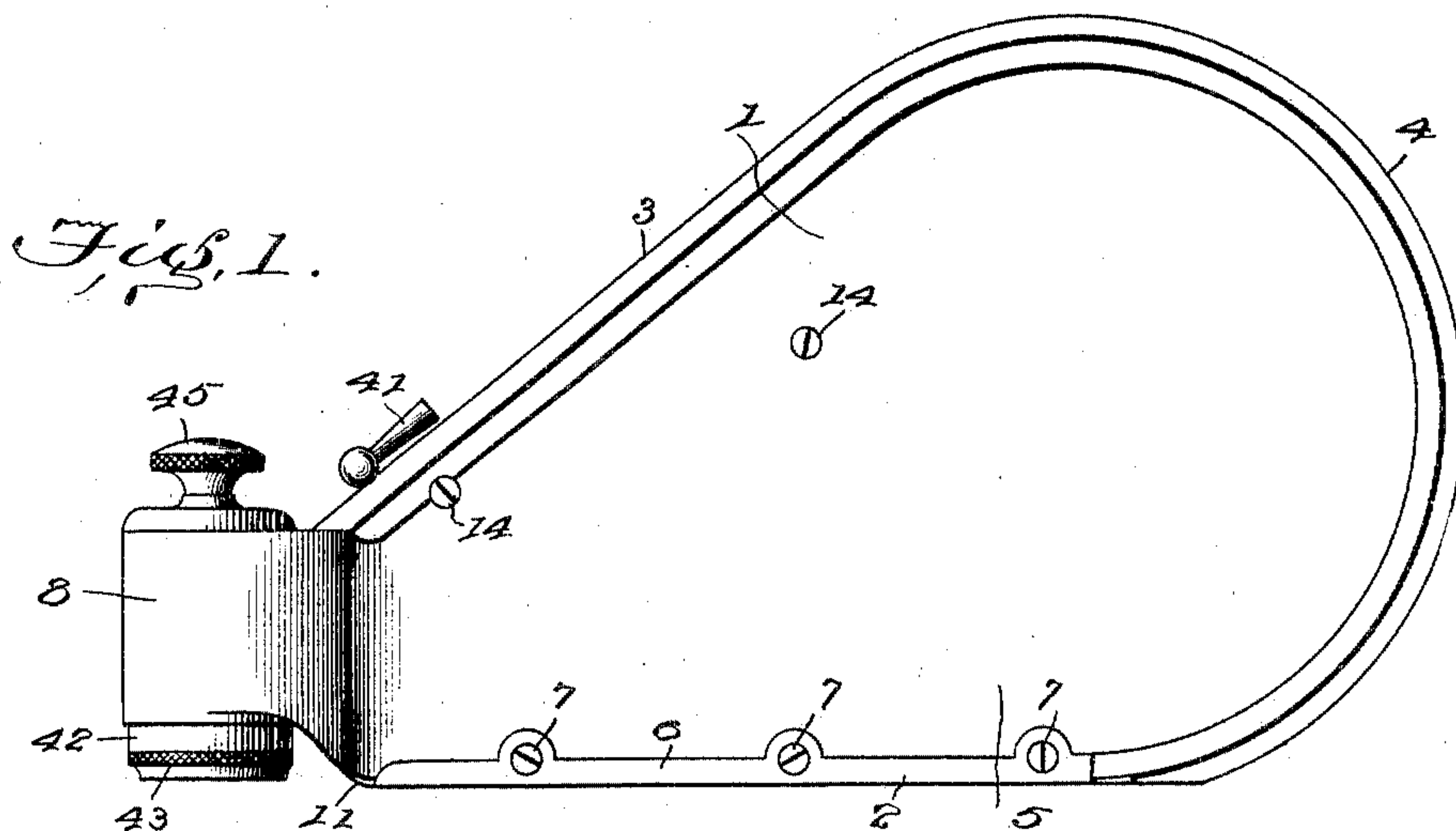
PATENTED MAR. 7, 1905.

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VIBRATOR.

APPLICATION FILED MAR. 31, 1904.

2 SHEETS—SHEET 1.



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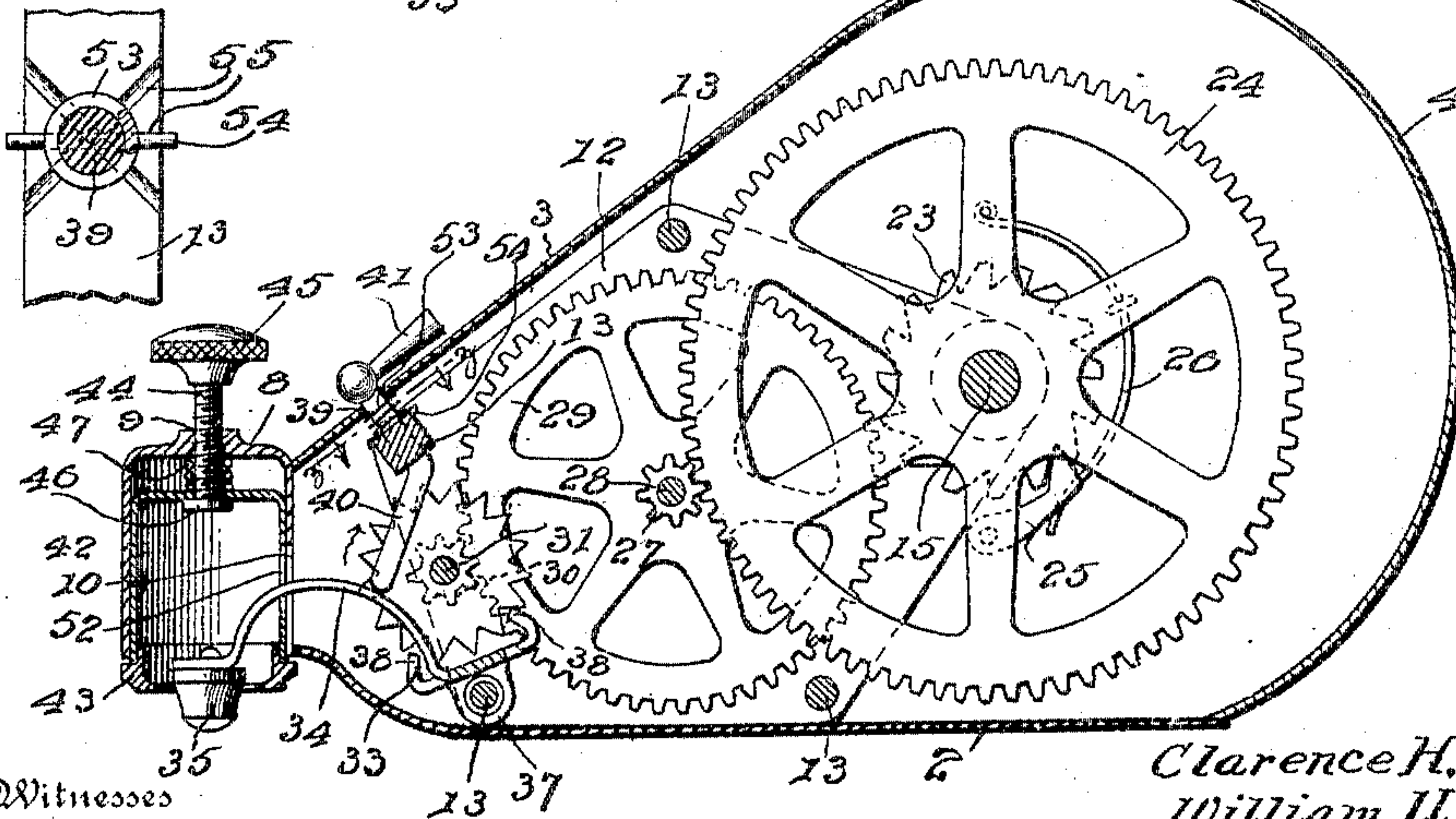
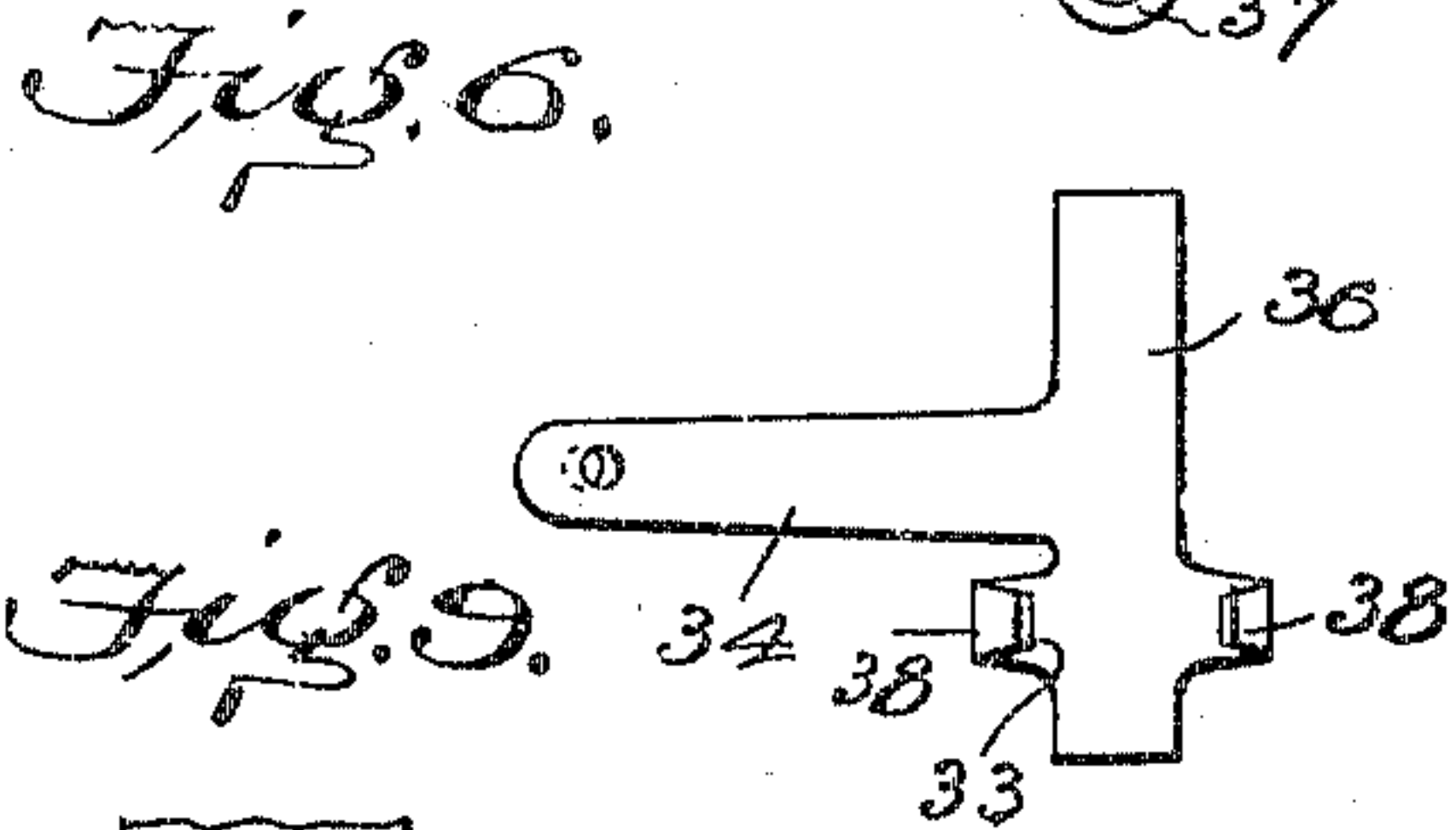
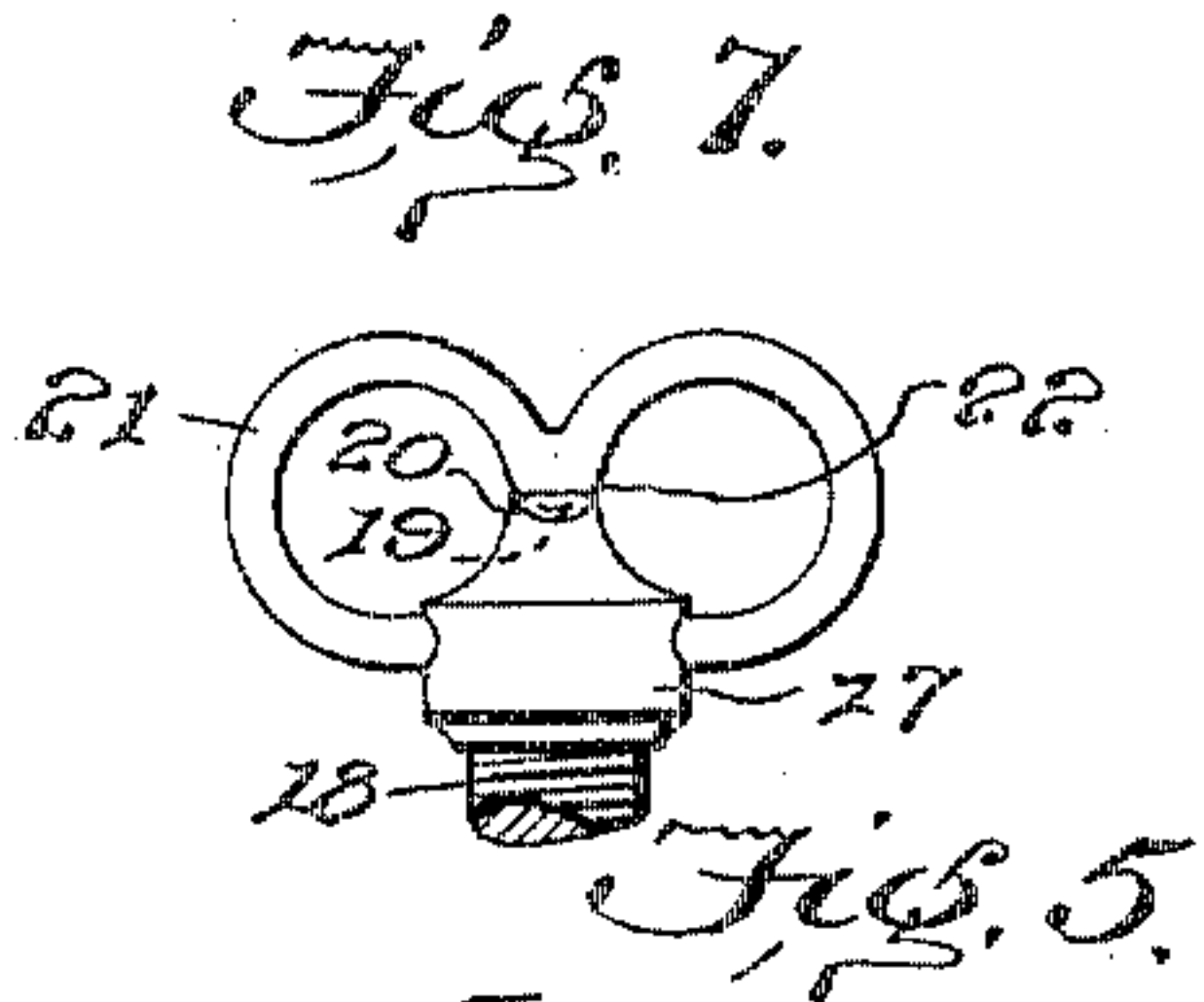
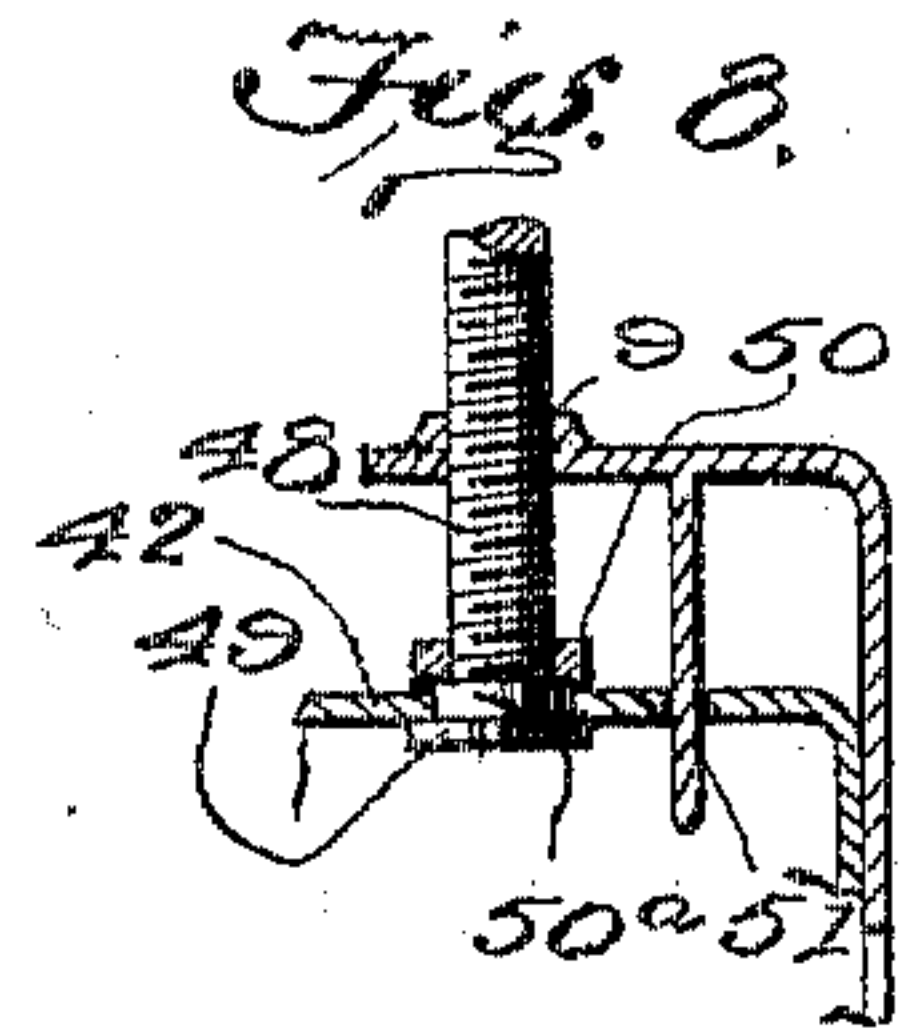
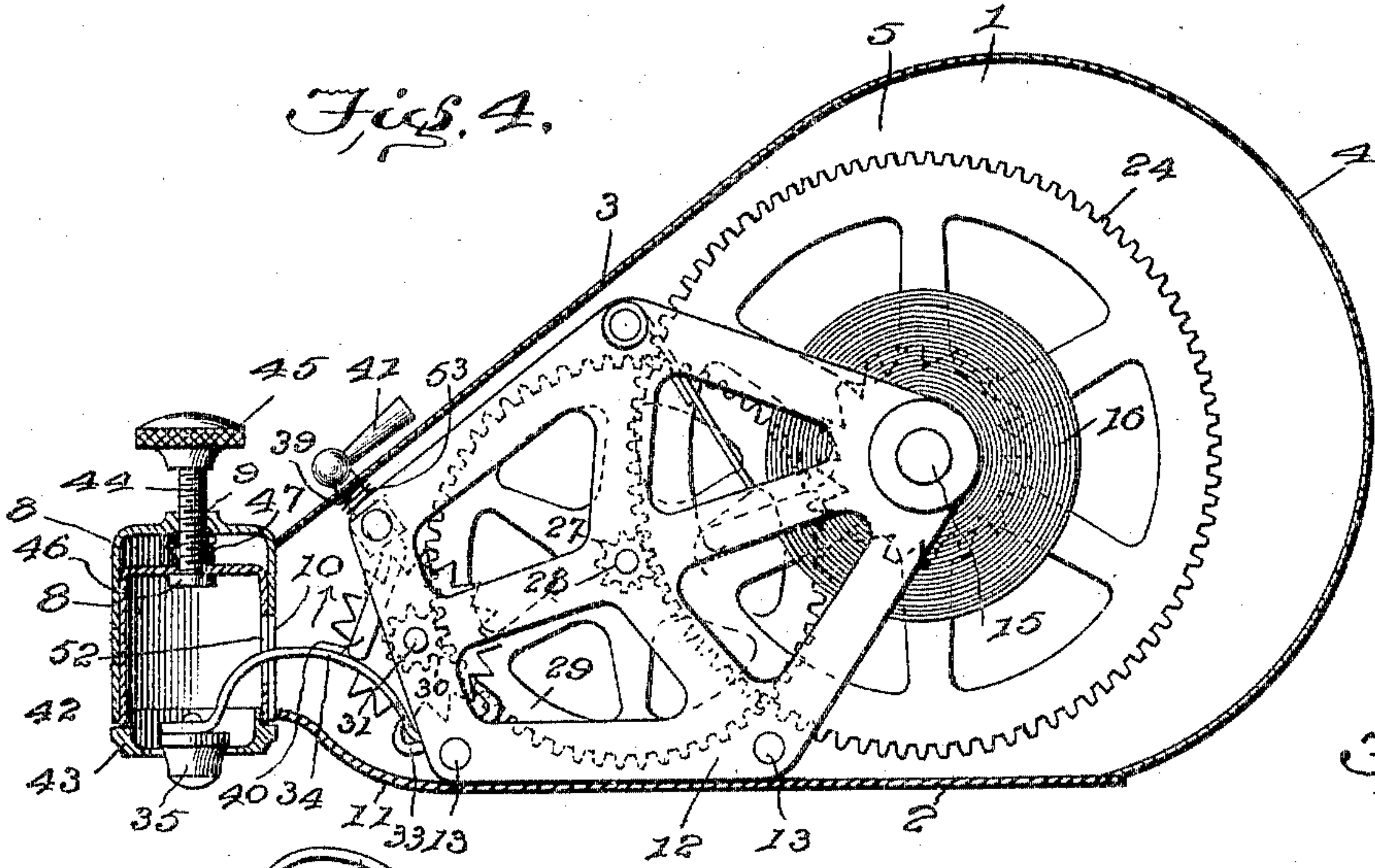
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VIBRATOR.

SPECIFICATION forming part of Letters Patent No. 784,164, dated March 7, 1905.

Application filed March 31, 1904. Serial No. 200,995.

To all whom it may concern:

Be it known that we, CLARENCE H. KAY and WILLIAM U. COLTHAR, citizens of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Vibrators, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to vibrators, and has for its object to provide a device for use in the treatment of certain forms of disease by means of a mechanical manipulation or percussion of a character somewhat similar to
15 massage. Implements of a somewhat similar character are now in common use as toilet accessories, being employed by barbers for massaging the face. So far as we are aware, however, these devices have always been em-
20 ployed in connection with a motive force external to the implement itself, electricity being a commonly-employed means for actuating these implements. This materially limits the field of utility of such devices when em-
25 ployed in therapeutics, for the reason that the electricity or motive power is not everywhere available, and it is not always possible or even convenient to bring the patient to the place where a supply of power to operate the
30 instrument can be obtained.

The primary object of our invention is to provide a small, compact, and self-contained implement which may be readily carried in the pocket and which contains and provides
35 its own motive power, so that it may be used anywhere or at any time.

To these and other ends our invention consists in certain novel features, which we will now proceed to describe and will then particularly point out in the claims.

40 In the accompanying drawings, Figure 1 is a side elevation of an implement embodying our invention in one form. Fig. 2 is a side view of the same. Fig. 3 is a bottom plan view with the bottom plate removed. Fig. 4
45 is a sectional view taken on the line *xx* of Fig. 2 and looking in the direction of the arrows. Fig. 5 is a similar view taken on the line *yy* of Fig. 3 and looking in the di-

rection of the arrows. Fig. 6 is a view illus- 50
trating in elevation and plan that part of the machine comprising the vibrating arm and the escapement-anchor. Fig. 7 is a detail view of the handle or finger-grasp in opera-
55 tive position. Fig. 8 is a detail view illustrating a modification of a portion of the structure, and Fig. 9 is a detail sectional view taken on the line *zz* of Fig. 5 and looking in the direction of the arrows.

In the said drawings, 1 indicates a suitable 60
casing in which the mechanism is inclosed, said casing being of a size to adapt it to be conveniently grasped in the hand during the operation of the device, while it may be readily carried in the pocket when not in use. Said
65 casing has preferably the piriform shape shown in the drawings, having a flat bottom 2 and inclined top 3, converging with the bottom at the front of the machine, and a rounded back 4, with flat sides 5. The sides, 70
top, and back are preferably permanently united, while the bottom 2 is removable to give access to the mechanism inclosed within the casing. To this end the bottom is provided with upwardly-extending flanges 6, em- 75
bracing the lower edges of the sides 5 and connected therewith by screws 7, thus leaving the under side of the bottom 2 smooth and unobstructed, so that it is adapted to rest upon and move over the part of the human 80
body to be treated when necessary or desirable.

At the front of the machine there is provided a vertical cylindrical housing 8, united to the front end of the main casing 1, of which 85
it may be considered as an extension, said housing 8 being open at its lower end, which is located above the level of the bottom 2 of the main body of the casing. Said housing is provided with a threaded opening 9 in its 90
top and with a vertical slot 10, communicating with the interior of the body of the casing 1. It will be observed that the bottom plate 2 is curved upward at its forward end, as indicated at 11, to extend it to the lower 95
end of the housing 8 and at the same time form a smooth and rounded termination at the front of the bottom plate.

Within the casing 1 there is mounted a supporting-frame which carries the operating mechanism and which comprises two side plates 12 and connecting cross-bars 13. This frame is held in place partly by the screws 7 and partly by other screws 14, so as to adapt it to be readily removed from and replaced in the casing. In said frame there is mounted a shaft 15, to which is connected one end of a coiled spring 16, the other end of which is connected to one of the cross-bars 13 or any other fixed point of support. This shaft is adapted to rotate in suitable bearings in the frame, its rotation being effected to wind the spring by means of a handle comprising a head or body 17, having a threaded shank 18 extending through an aperture in the side 5 of the casing 1 and screwing into a correspondingly-threaded recess in the end of the shaft 15. This head or body 17 has its outer portion provided with a transverse notch or groove 19, on each side of which are located inclined or beveled surfaces 20. 21 indicates a hand or finger grasp having its extremities aligned and pivoted in the body 17 of the handle, as shown more particularly in Fig. 7, the central part of the bow of said finger-grasp 21 being deflected inward in the form of a projection 22, which is adapted to engage either one of the inclines 20 when said finger-grasp is being moved into position, forcing said projection 22 outward until the said projection comes opposite the notch or groove 19, in which it will seat itself, owing to the elasticity of the body 21 of the finger-grasp, which is made of a suitable material for this purpose, such as resilient wire. The engagement of the projection 22 with the groove 19 acts as a detent to hold the finger-grasp in the operative position (shown in full lines in Fig. 7 and in dotted lines in Fig. 2) during the operation of winding the spring. The finger-grasp may be folded back against the casing into the position shown in full lines in Fig. 2 by exerting sufficient pressure thereon to disengage the projection 22 from the groove 19.

On the shaft 15 there is secured a ratchet-wheel 23, adjacent to which there is mounted loosely on the shaft 15 a large gear 24, carrying a pawl 25, held by a spring 26 in engagement with the ratchet-wheel 23. The gear 24 meshes with a pinion 27 on a shaft 28, mounted in the frame and having a gear 29, which rotates in unison with the pinion 27. The gear 29 meshes with a pinion 30 on a shaft 31, said shaft 31 having secured thereon a star-wheel 32, which constitutes the escapement-wheel of the gear-train. Coöperating with this escapement-wheel is an escapement-anchor 33, to which is connected a resilient vibrating arm 34, the free end of which carries the percussive implement or hammer 35. As a convenient way of constructing these parts they may be made in the manner shown in

detail in Fig. 6, in which a cross bar or plate 36 has its ends turned down and apertured, as shown at 37, to form bearing-lugs by which the escapement-anchor and vibrating arm are loosely mounted on the front lower cross-bar 13, so as to be free to rock thereon. Other lugs of the bar 36 are bent up to form the pallets 38 of the escapement-anchor, while the resilient arm 34 is formed integrally with the bar 36, from which the remaining parts are also formed.

The implement proper, 35, may be of any suitable form and material; but we prefer to make it of brass or other suitable metal having the rounded under working surfaces shown, it being secured to the free end of the vibrating arm 34 in any suitable manner. It will be understood that the vibrating arm 34 extends through the slot 10 into the housing 8, its free end, bearing the implement 35, being located in the open mouth at the lower end of said housing.

The stopping and starting of the mechanism may be controlled in any suitable manner; but we prefer to employ for this purpose a stop-arm 39, pivotally mounted in the upper front cross-bar 13 and having its lower end (indicated by the numeral 40) so bent that it may be swung into the path of and over the vibrating arm 34, as shown in the drawings, in which position it locks said arm against movement, holding one of the pallets of the escapement-anchor in fixed engagement with the star-wheel 32. The stop-arm 39 may also be so turned that its bent portion 40 lies out of the path of the vibrating arm 34, in which position of the parts said arm is free to vibrate. The stop-arm 40 extends through the top of the casing, near the front thereof, and is provided with an operating-lever or finger-piece 41, which lies within convenient reach of the fingers of the operator as he grasps the body of the casing while using the device. In order to hold the stop-arm 39 in whatever position it may be moved to, we provide therefor a detent mechanism. (Shown more particularly in Figs. 5 and 9.) The straight portion of the arm 39, which is pivotally mounted in the upper front cross-bar 13, is capable of longitudinal play in said cross-bar, being normally moved downward toward the same by means of a spring 53, which bears at its upper end against the top 3 of the casing 1, while its lower end bears against a pin 54, which passes through the arm 39 immediately above the cross-bar 13 and projects beyond said arm on each side thereof. The upper surface of the cross-bar is provided with grooves 55, adapted to receive the pin 54, which is held seated therein by the action of the spring and acts as a detent to hold the stop-arm either in a central position in the path of the vibrating arm or on either side of the central position out of the path of said arm. To this end the central groove 55 is at right angles to the

cross-bar 13, while the two other grooves are inclined thereto, as shown in Fig. 9.

The housing 8 contains a blow-regulating mechanism. This comprises a hollow cylindrical guide 42, fitting and vertically movable in the housing 8 and provided at its lower end with a guard or shield 43, preferably in the form of an annulus removably threaded into the guide 42 and surrounding the percussion or impact member 35. The guide 42 is vertically movable in the housing 8, its adjustment being effected by a screw-shaft 44, swiveled in the head of the guide 42, passing through and engaging the threaded aperture 9 in the top of the housing 8 and provided at its exposed upper end with a knurled operating-head 45. In the particular form of construction shown in Figs. 4 and 5 the screw-shaft 44 is provided at its lower end with a head or enlargement 46, and the guide 42 is held in contact with said head 46 by means of a spring 47, interposed between the upper surface of the top of the guide and the under surface of the top of the housing. Where this construction is employed, the shield and guide are capable of yielding relatively to the housing when the instrument is pressed with sufficient force against the surface treated. In the form of construction shown in Fig. 8 the spring is dispensed with, the screw-shaft (here indicated by the reference-numeral 48) being provided with a head 49, against which the top of the guide is held by a lock-nut 50, mounted on the threaded end of the screw-shaft. The nut 50 bears against a collar 50^a, which is of larger diameter than the threaded body of the shaft, but of smaller diameter than the head 49, said collar fitting within an aperture in the top of the guide 42, so as to turn therein freely. Said collar 50^a is of a thickness or height slightly greater than the thickness of the material of which the top of the guide 42 is made, so that the nut will not bear directly on the top of the guide, but on the collar, thus leaving the shaft 48 free to rotate relatively to the guide. Where this construction is employed, the guide moves positively with the screw-shaft and does not have the capacity of yielding characterizing the structure shown in Figs. 4 and 5. To prevent the guide from rotating along with the screw-shaft, we may employ a pin 51, extending downward from the top of the housing through an aperture in the top of the guide. It will be understood that the guide is provided with a vertical slot 52, registering with the slot 10 in the housing and provided for the passage of the vibrating arm 34.

It will be seen that the force of the blows delivered by the implement may be readily regulated by so adjusting the guide and its attached guard or shield as to regulate the extent to which the percussion or impact member 35 may pass below the lower surface of said guard or shield, it being understood that

in practice the lower surface of the guard or shield bears or is pressed against the surface of that portion of the body being treated.

It will be seen that the implement as a whole is small, compact, and self-contained, may be readily carried in the hand or in the pocket, and may be readily manipulated, stopped, and started, and the effective force of the blows regulated by the use of a single hand of the operator. It may be readily used at any time or place; since it generates its own motive power and is not dependent upon a supply of electricity or of the availability of a mechanical motor to be connected to it to supply the motive power. The form of the casing is such as to permit it to be readily held in the hand and controlled while being used, the location of the stopping and starting lever being such that no change of the hand-grasp is necessary in the manipulation of the said lever. All of the mechanism which imparts movement to the percussion or impact member is entirely inclosed within the casing, so that no injury to the patient or operator can occur, and the under side of the casing forms a smooth bearing-surface on which the implement may rest while being moved over the surface to be treated.

We do not wish to be understood as limiting ourselves to the precise details of construction hereinbefore described, and shown in the accompanying drawings, as the same may obviously be modified without departing from the principle of our invention.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A vibrator for therapeutic use, comprising a portable casing adapted to be held in the hand and having a substantially smooth bottom, a spring-motor wholly inclosed in said casing, and a percussion or impact member located at one end of the casing, working across the plane of the bottom thereof, and having a vibratory motion imparted to it by said motor, substantially as described.

2. A vibrator for therapeutic use, comprising a portable piriform casing adapted to be held in the hand, a spring-motor wholly inclosed in said casing, a housing located transversely at the smaller or front end of the casing, a percussion or impact member working in said housing across the plane of the bottom of the casing, and a stopping and starting lever or finger-piece controlling the motor and located near the small or front end of the casing within convenient reach of the fingers of the hand as it holds said casing, substantially as described.

3. A vibrator for therapeutic use, comprising a portable casing, a spring-motor inclosed therein and composed of a spring and a gear-train terminating in an anchor escapement, and an arm provided with a percussion or impact member at one end and connected at the

other end with the anchor of the escapement so as to vibrate therewith, the percussion or impact member working across the plane of the bottom of the casing, substantially as described.

4. A vibrator for therapeutic use, comprising a portable casing, a spring-motor inclosed therein, and a resilient arm provided at one end with a percussion or impact member working across the plane of the bottom of the casing, said arm having a vibratory motion imparted to it by said spring-motor, substantially as described.

5. In a vibrator for therapeutic use, the combination, with a percussion or impact member, and means for vibrating the same, of an annular guard or shield encircling said impact member and adjustable in the direction of movement of said member to regulate the force of the blows delivered thereby, substantially as described.

6. A vibrator for therapeutic use, comprising a portable casing having a smooth bottom, a spring-motor inclosed in said casing, a percussion or impact member actuated by said spring-motor and working across the plane of the bottom, and an annular guard or shield encircling said impact member, supported from the casing, and adjustable in a direction at right angles to the plane of the bottom thereof, substantially as described.

7. In a vibrator for therapeutic use, the combination, with a portable casing, a spring-motor inclosed therein and a vibrating arm actuated by said spring-motor, extending beyond the body of the casing, and provided with an impact or percussion member on said extension, a housing located at said end of the casing and provided with an adjusting-screw, and a guide located within the housing, connected with the adjusting-screw and having a

guard or shield encircling the impact member, substantially as described.

8. In a vibrator of the class described, the combination, with a vibrating impact member, of a guard or shield surrounding the same, an adjusting screw-shaft provided with means for limiting the movement of said shield toward the surface operated on, and a spring normally holding said guard or shield at said limit of motion, said guard or shield being adapted to yield in the opposite direction, substantially as described.

9. In a vibrator of the class described, the combination, with a casing, a spring-motor inclosed therein, and a vibrating arm provided with an impact member and actuated by said spring-motor, of a stop-arm mounted in the casing, provided externally thereof with means for actuating the same, and having within the casing a portion movable into and out of the path of the vibrating arm to stop or start the motor, substantially as described.

10. In a vibrator of the class described, the combination, with a casing, and a spring-motor located therein, of a main spring or winding shaft having a head located outside the casing and provided with a transverse notch or groove, and inclined or beveled surfaces adjacent thereto, and a bowed finger-grasp of resilient material having its extremities pivoted in the head and provided with a projection to engage said notch and serve as a detent, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

CLARENCE H. KAY.
WILLIAM U. COLTHAR.

Witnesses:

E. O. HAGAN,
IRVINE MILLER.