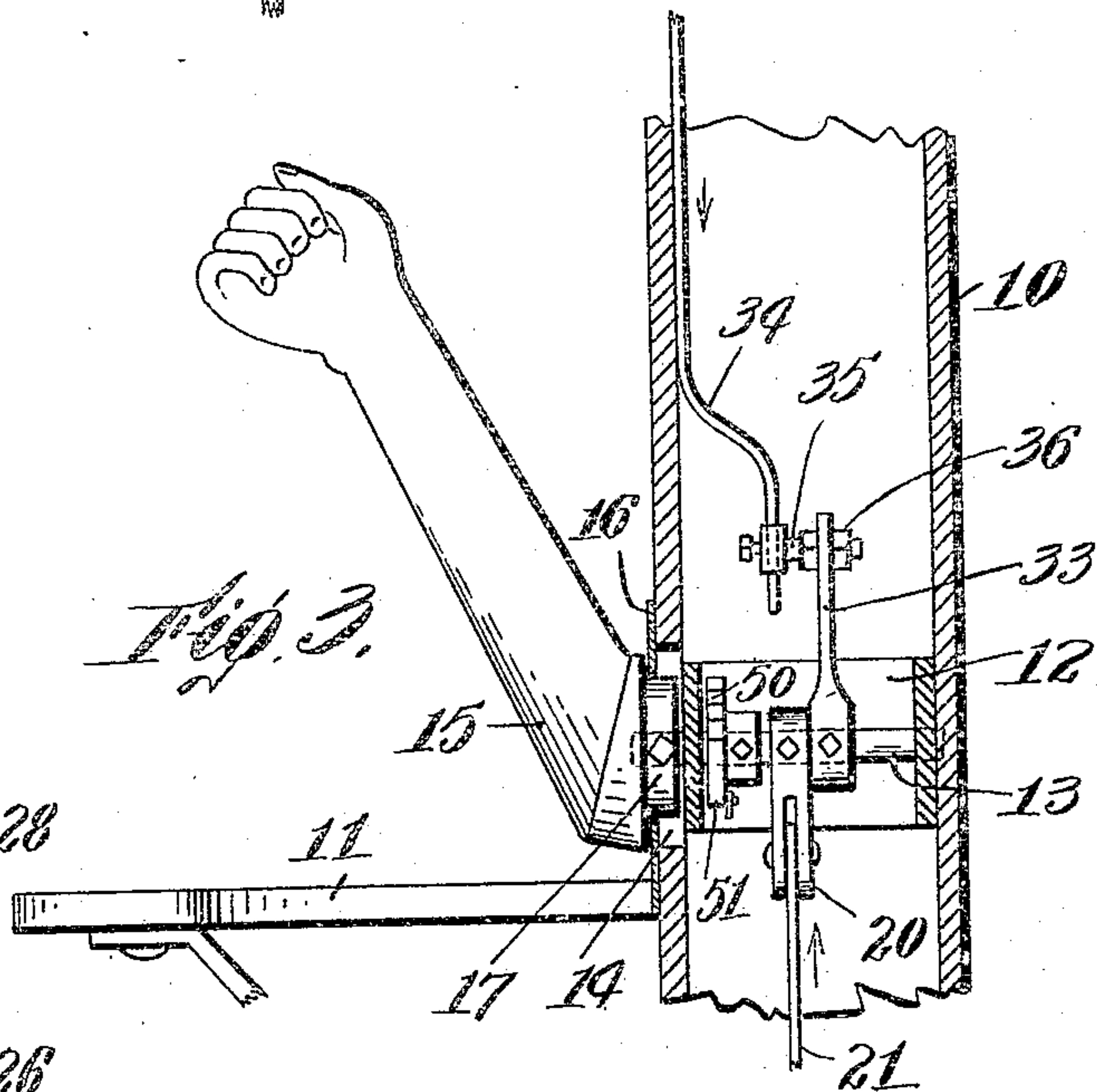
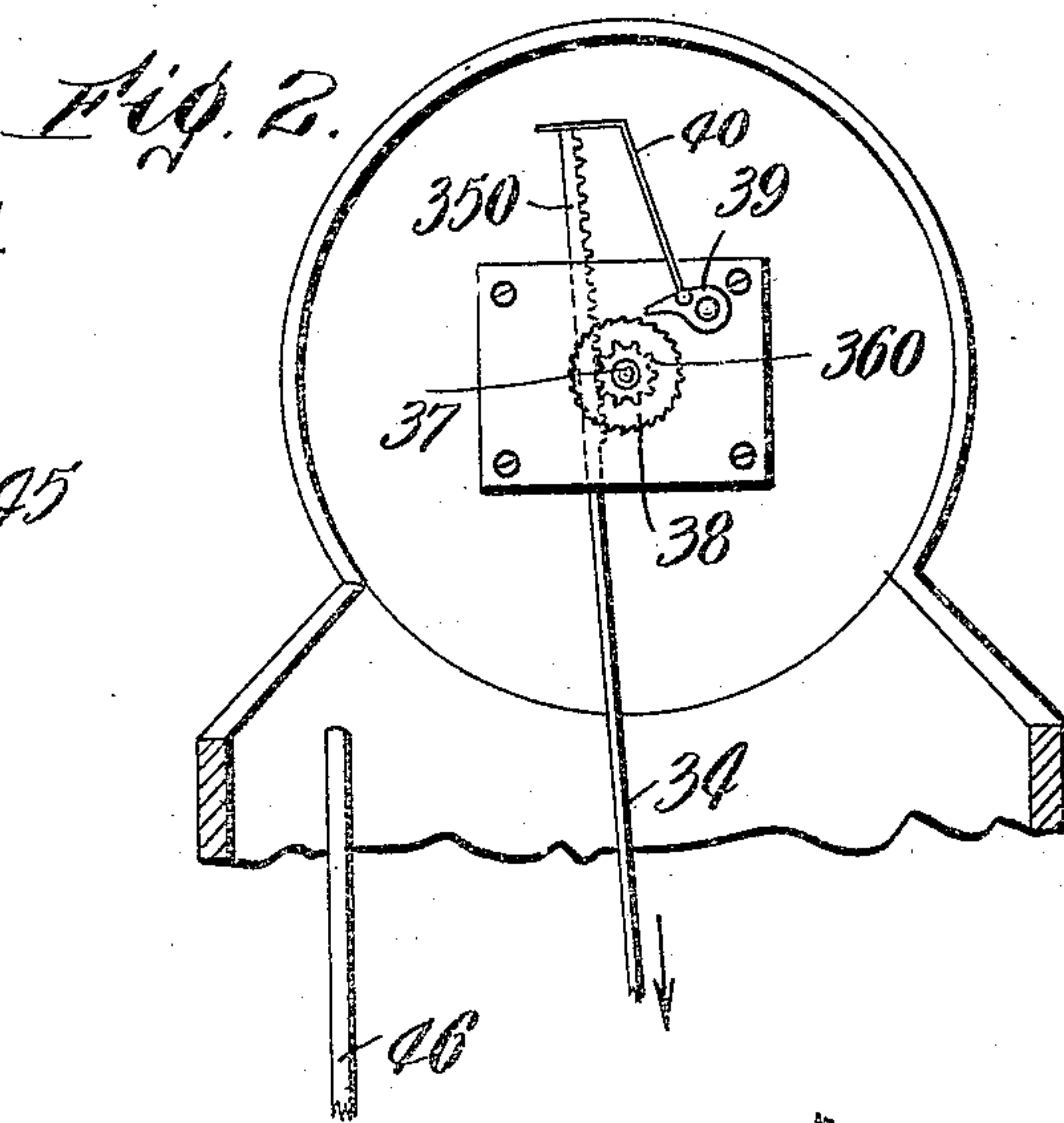
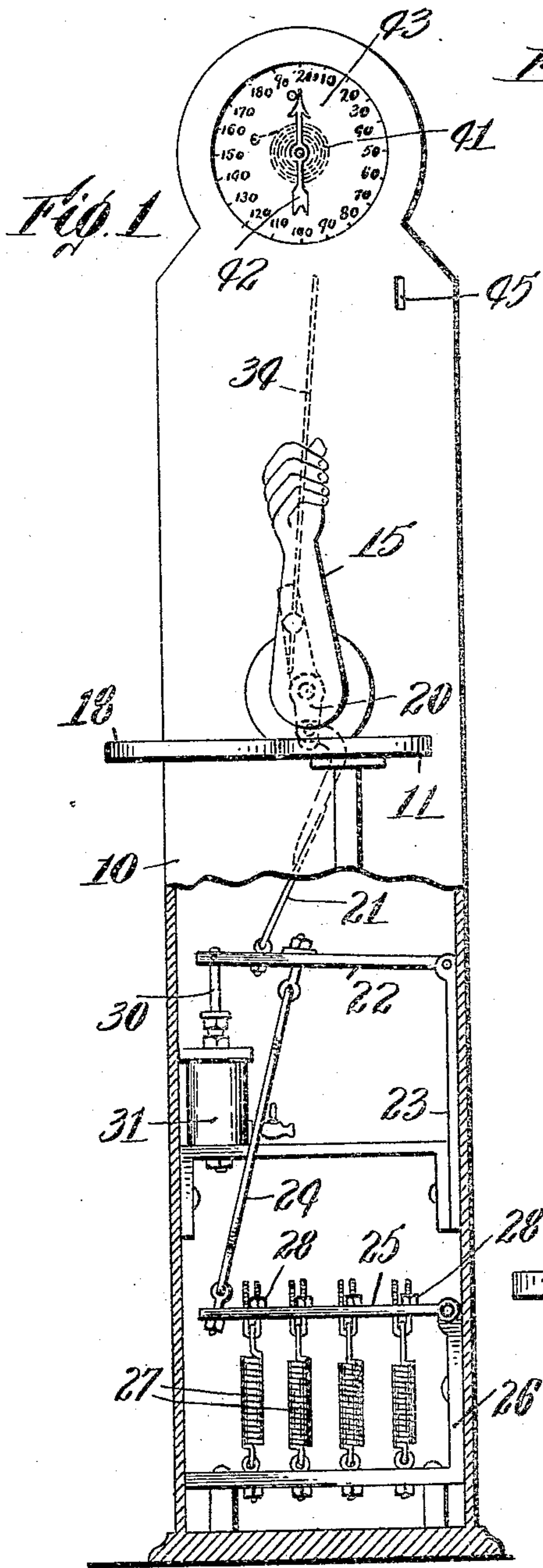


A. A. BRODEUR.
MUSCLE TESTING MACHINE.
APPLICATION FILED DEC. 26, 1907.

929,281.

Patented July 27, 1909.



Witnesses

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UNITED STATES PATENT OFFICE

ALCIBIADE A. BRODEUR, OF WORCESTER, MASSACHUSETTS.

MUSCLE-TESTING MACHINE.

No. 929,281.

Specification of Letters Patent.

Patented July 27, 1909.

Application filed December 26, 1907. Serial No. 408,176.

To all whom it may concern:

Be it known that I, ALCIBIADE A. BRODEUR, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Muscle-Testing Machine, of which the following is a specification.

This invention relates to a machine for testing the muscles of the arm.

It is designed to operate in such a manner as to test the strength of a person's arm when exerted to attempt to force the arm of another person down on a table or the like on which the elbows of both arms rest. In order to accomplish this result the device is constructed with a shelf near which a shaft projects through from the inside of the machine on which is mounted an operating device preferably constructed to represent a forearm and hand extending outwardly at an angle and in proper position for a test of the above mentioned character. The machine is provided with means whereby the application of force to turn the arm downwardly about the pivot about the center of the shaft as an axis will be resisted and the extent of motion will be indicated.

Further objects of the invention are to provide efficient means for resisting this motion; and means for checking the reverse motion so that when the arm is released it will not fly back suddenly. Several features of the invention may be used independently of this particular kind of test mentioned above.

Further objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings in which,

Figure 1 is a front elevation of a machine constructed in accordance with this invention, the lower part being broken away to show interior construction. Fig. 2 is a rear view of the upper part thereof showing the indicating device, and Fig. 3 is a vertical central sectional view through the sheet on which the arm is mounted.

The device preferably is constructed with a casing 10 from which projects a shelf 11 at a convenient height. Supported in this casing in any convenient way as by means of a frame 12 on which it is journaled is a shaft 13. At the front end of this shaft is an opening 14 through the casing through which the end of the shaft projects. Fixed to this end of the shaft is an operating device or arm 15 shown as in the form of a representation of

a human forearm and hand. The hand constitutes means by which the arm may be grasped in order to operate the device. A plate 16 is preferably located over the opening 14 and the arm 15 is shown as provided with a cylindrical projection 17 extending through an opening in the plate. Obviously any attempt to turn the arm 15 down so as to bring the hand thereof in contact with the end 18 of the shelf, which constitutes a limit for the same, will result in turning the shaft 13. In order to provide a proper resistance against this motion, the shaft is provided with an arm 20 pivotally connected by a link 21 with a lever 22 pivoted on a plate 23 fixed to the casing. This lever 22 is connected by a link 24 with a lever 25 which is pivoted to a plate 26 also secured to the casing. A series of springs 27 are employed to resist the motion of the lever 25. These springs preferably are secured to the bottom of the box or to any stationary object and are adjustably secured to the lever 25 as by means of nuts 28 or the like. These springs also are preferably of varying strength from one end to the other, as indicated in the drawings by variations in the lengths of the springs. It will be obvious that any attempt to rotate the arm 15 will result in stretching these springs and will be yieldingly resisted by them. In order to prevent the arm from being forced back rapidly after pressure is released from it, the outer end of the lever 22 is pivotally connected with a piston-rod carrying a piston, (not shown) in a cylinder 31 constituting a dash-pot or check for the return motion of the arm. This cylinder 31 may be filled with oil or other liquid to make its operation more uniform.

In order to register the motion of the arm 15 the shaft 13 is provided with another arm 33 which is adjustably connected with a link 34 by means of a bolt 35 and nuts 36. The link 34 is provided with a rack 350 at its upper end engaging a pinion 360 on a shaft 37 which carries a ratchet-wheel 38. A pivoted pawl 39 is located in such position as to engage the teeth of the ratchet-wheel and may be forced into engagement with these teeth in any desired way. In the form shown, gravity alone is depended upon for this purpose. This pawl is provided with a projecting rod 40 which the upper end of the rack 350 engages on the upward motion thereof to release the pawl from the ratchet-wheel and permit a spring 41 with which the shaft

is provided to turn the shaft and the pointer 42 with which it is provided back to zero on the dial 43 with which the front of the casing is provided and over which the pointer 5 moves to indicate the amount of motion of the shaft 13.

I am aware that the invention may be carried out in many other forms than that shown by any person skilled in the art without departing from the scope of the invention as expressed in the claims.

Having thus described my invention what I claim is:—

1. In a muscle testing machine, the combination of a casing, an arm extending outwardly from the front thereof and adapted to oscillate on an axis from a vertical to a horizontal position, yielding means for resisting the oscillation of the arm in one direction, and a shelf projecting from the casing in a plane at about the height of the axis on which the arm oscillates in position in the path of the end of the arm to limit the motion of the arm.

2. A muscle testing machine having a casing, and operating means in the form of the representation of a human forearm and hand projecting therefrom and adapted to turn about an axis, and a shelf projecting from the front of the casing under said operating means, and in the path of the hand, whereby said shelf serves as a stop for the hand and as a rest for the elbow of the operator.

3. In a muscle testing machine the combination of a casing having a substantially vertical front, an arm extending outwardly from the front thereof, and oscillatable on a horizontal axis, yielding means for resisting

the oscillation of the arm, and a horizontal shelf projecting from the front of the casing below the arm and in position to support the elbow of the operator when turning the arm with his hand. 40

4. In a muscle testing machine, the combination of a shaft, an arm thereon for operating it, a pivotal lever independent of the shaft, means connecting the lever with said shaft whereby the lever will be moved about its pivot when the shaft is turned, means for resisting the said motion of the lever, and means connected with the lever for checking its motion in the opposite direction. 45

5. In a testing machine, the combination of a shaft, means for turning the shaft, a pivoted lever, a link connecting the shaft with said lever, a second pivoted lever, a link connecting the second lever with the first lever, and springs arranged along the second lever at varying distances from the fulcrum for resisting the motion of the second lever. 50

6. In a testing machine, the combination of a shaft, means for turning the shaft, a pivoted lever, a link connecting the shaft with said lever, a second pivoted lever connected therewith, springs for resisting the motion of the second lever, and a cylinder having a piston therein connected with the first lever for checking its motion in one direction. 55

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses. 60

ALCIBIADE A. BRODEUR.

Witnesses:

A. E. FAY,
C. F. WESSON.