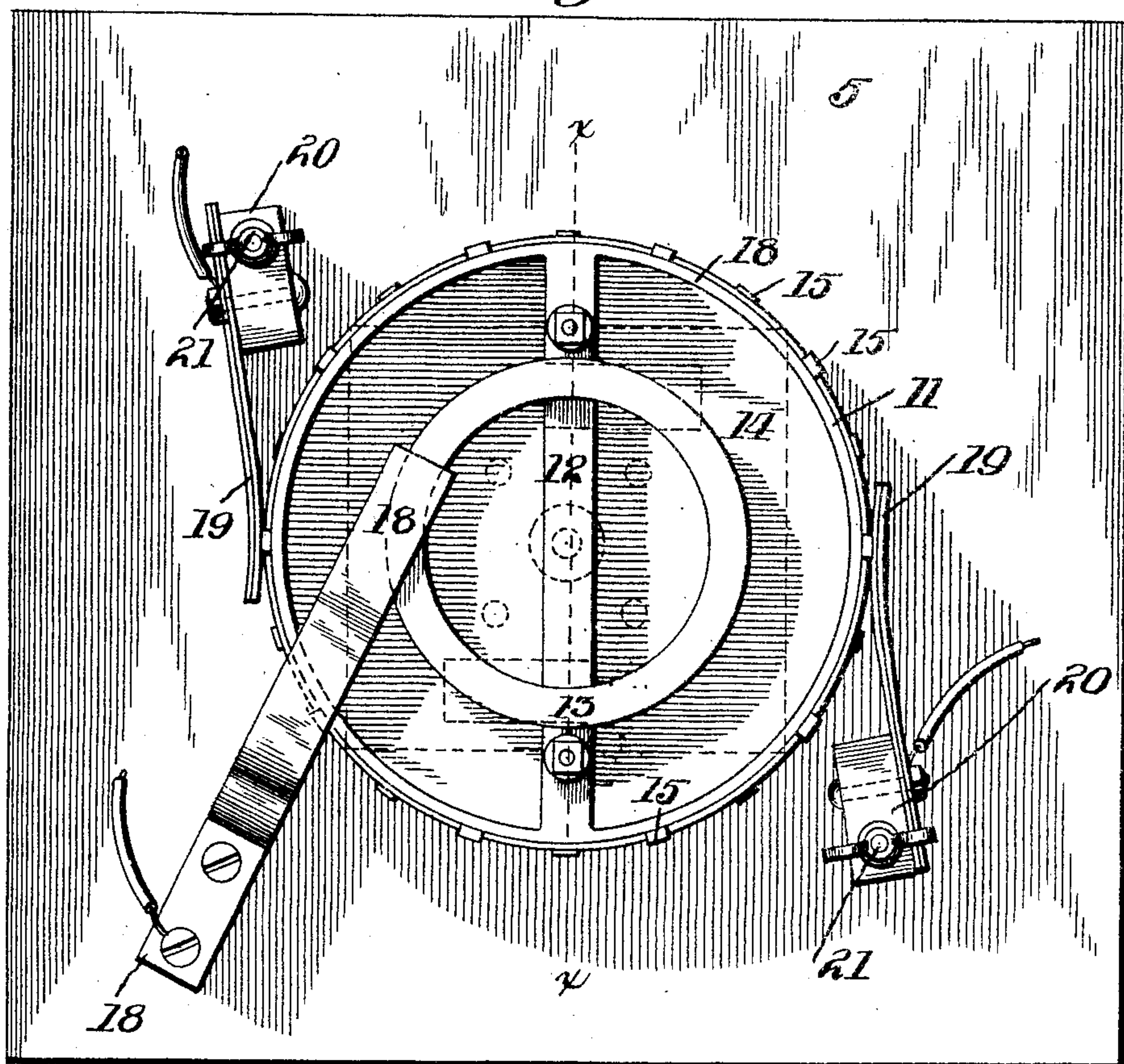
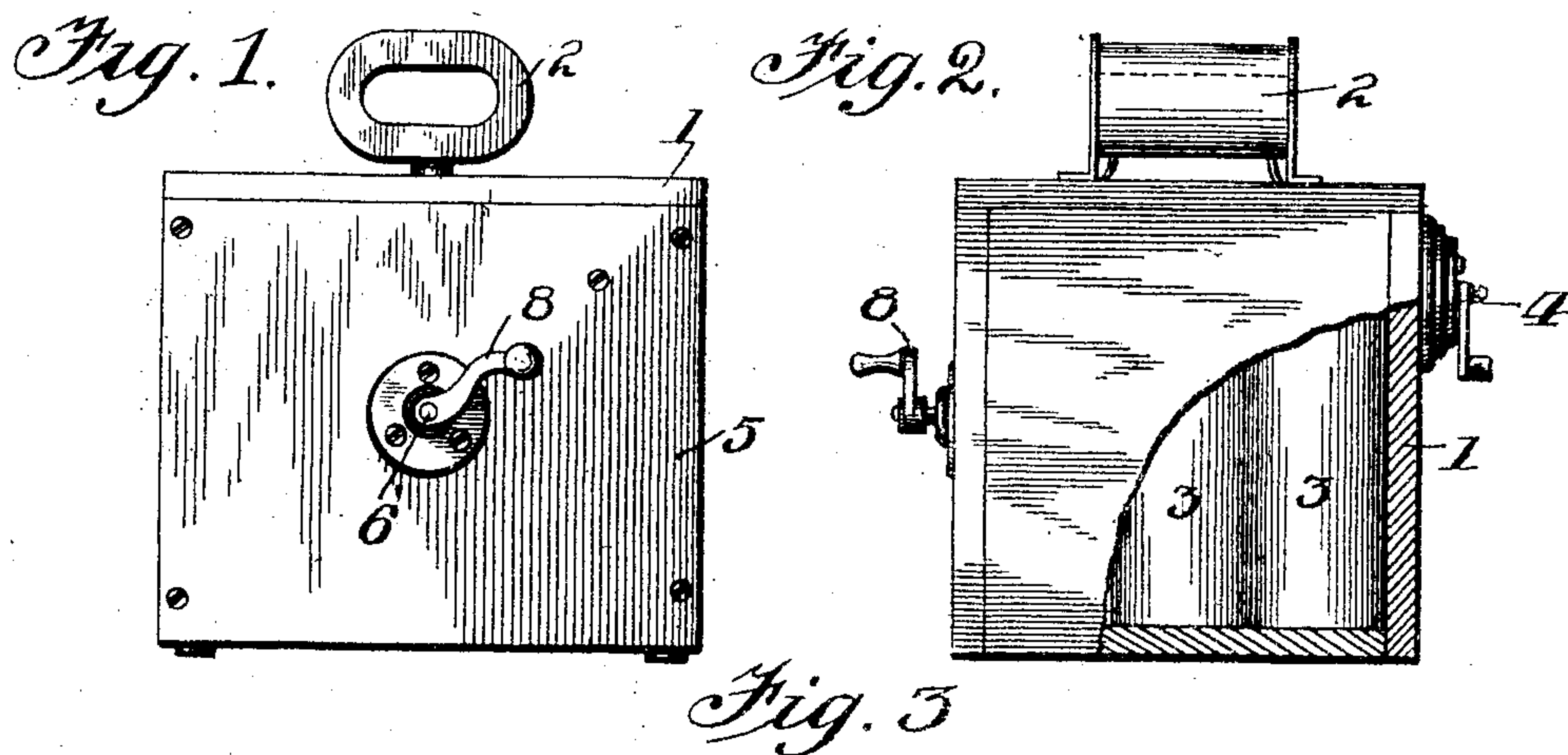


P. KERNS.
WATCH DEMAGNETIZER.
APPLICATION FILED MAR. 9, 1903.

2 SHEETS—SHEET 1.

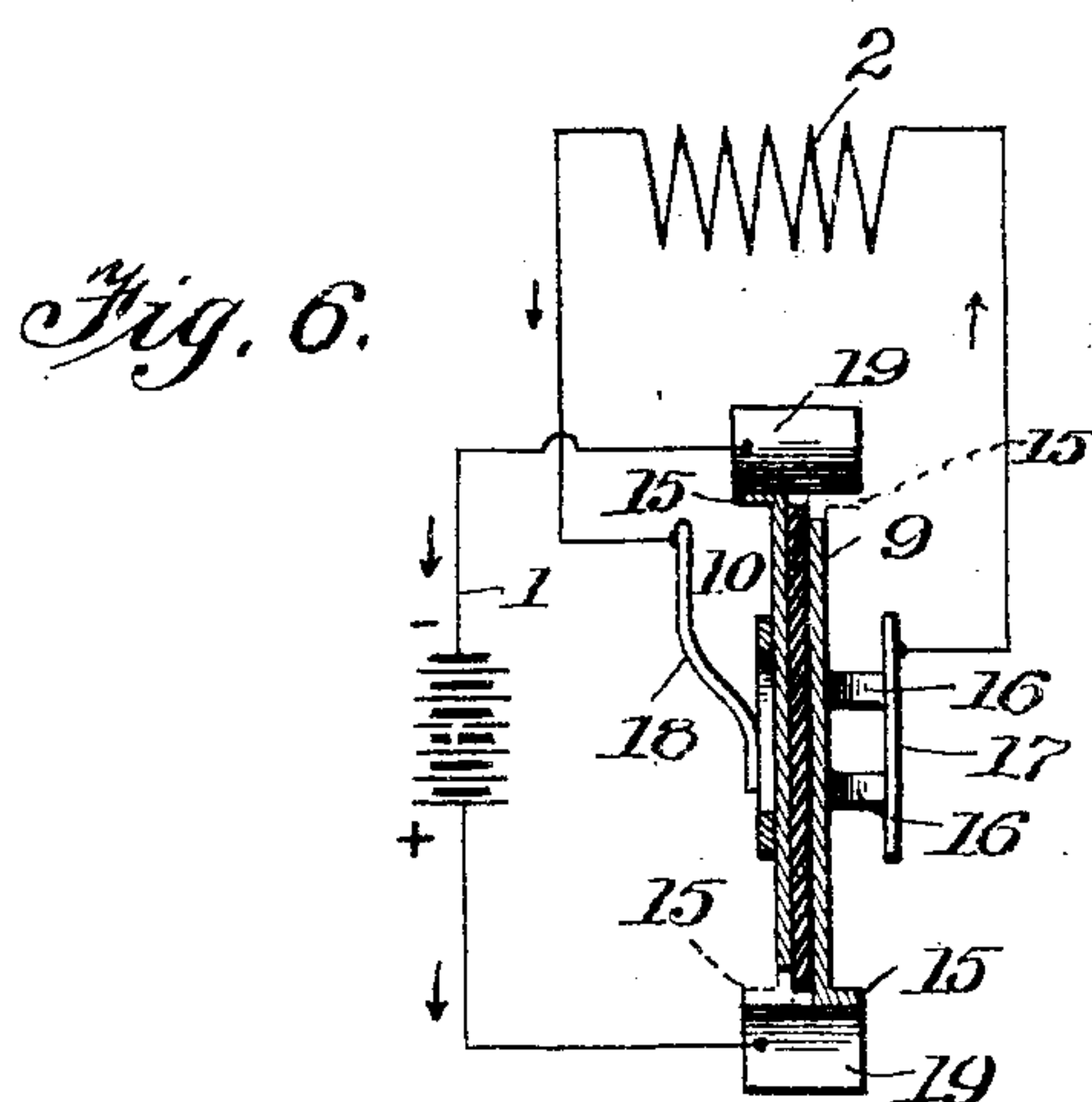
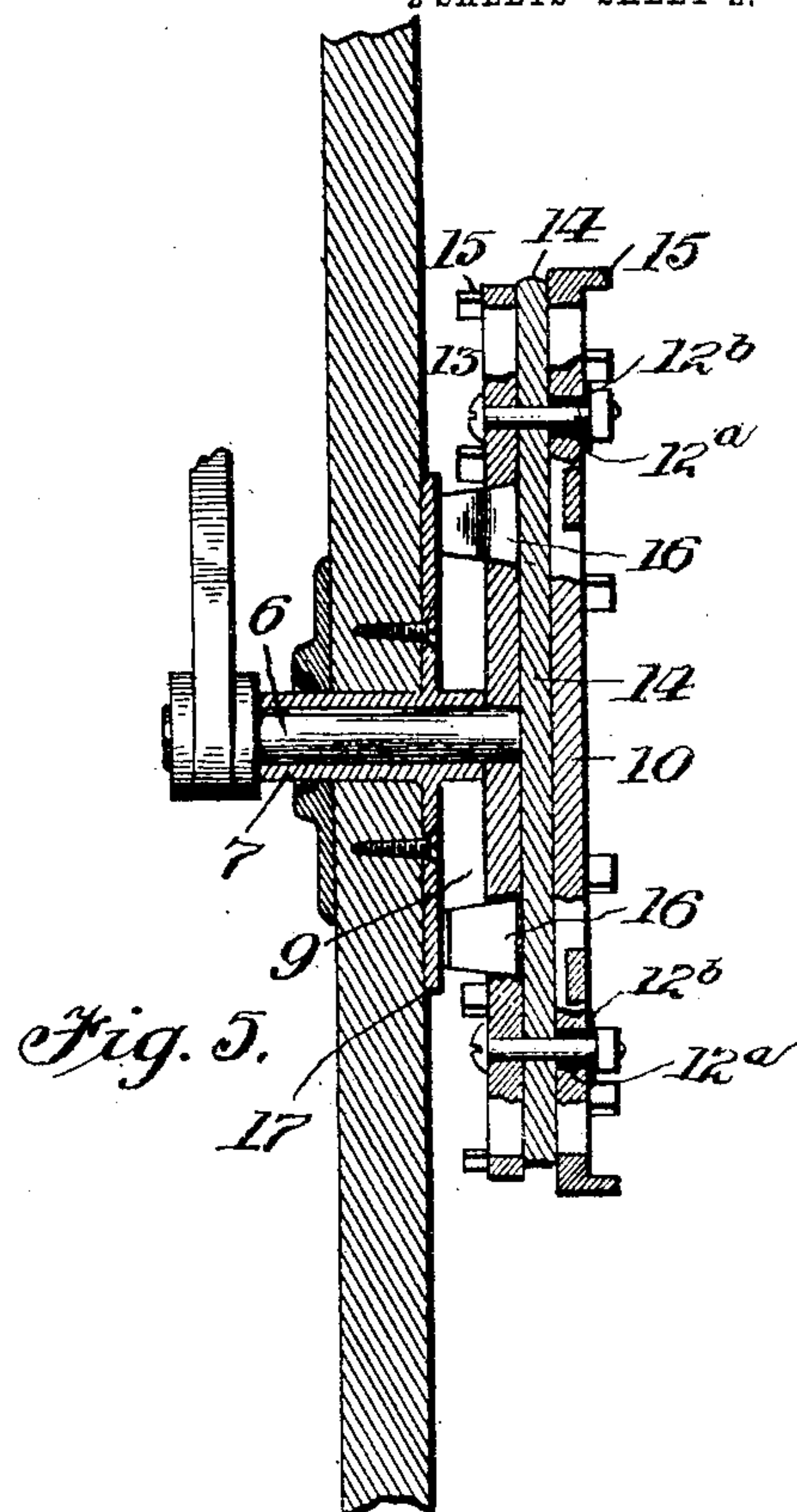
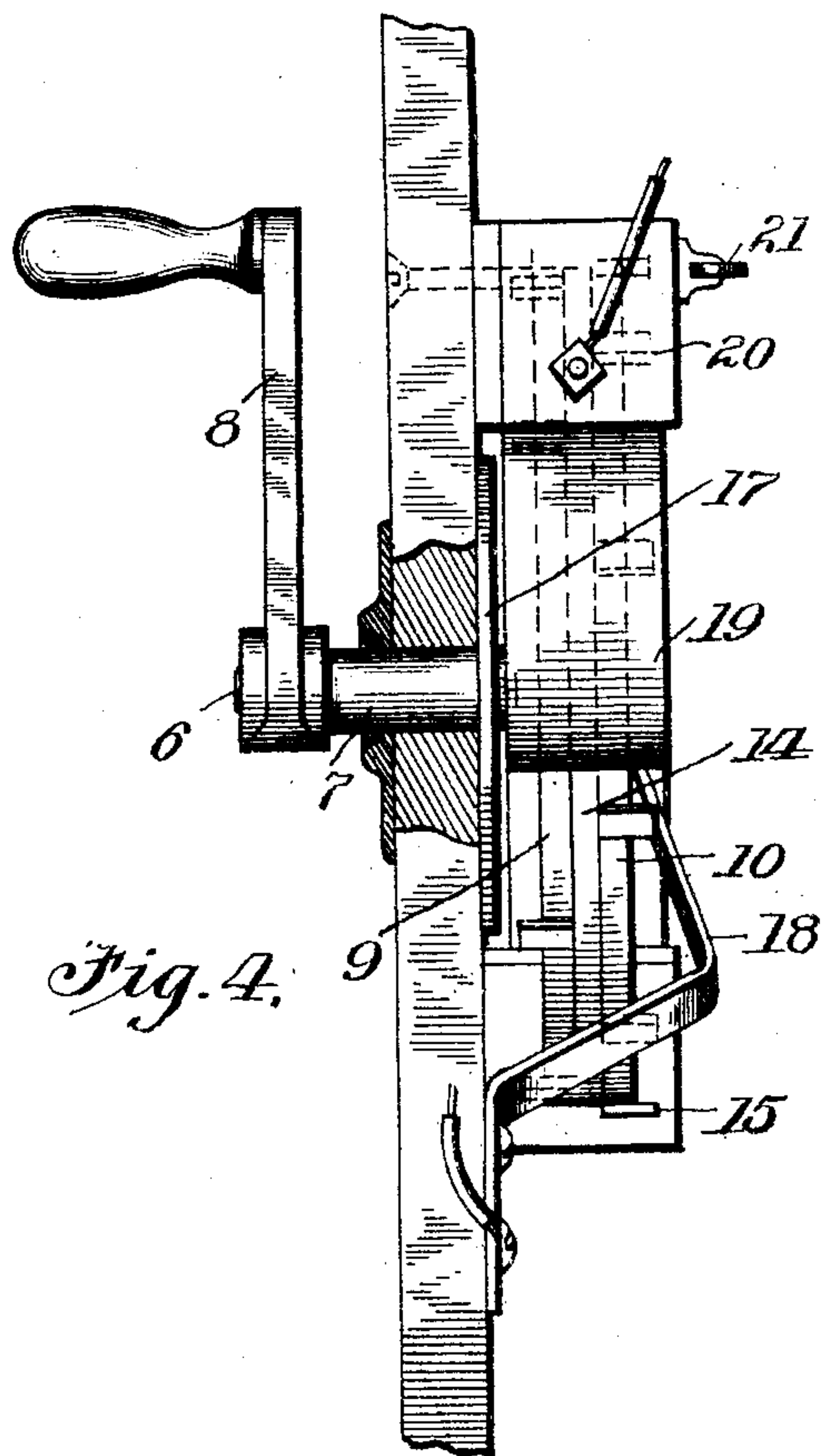


Witnesses,
J. D. Perry
J. B. Weir

Inventor,
Patrick Kerns
By Jones & Bradington

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2 SHEETS—SHEET 2.



Witnesses:
C. D. Perry
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Inventor,
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UNITED STATES PATENT OFFICE.

PATRICK KERNS, OF CHICAGO, ILLINOIS.

WATCH-DEMAGNETIZER.

No. 797,811.

Specification of Letters Patent.

Patented Aug. 22, 1905.

Application filed March 9, 1903. Serial No. 146,974.

To all whom it may concern:

Be it known that I, PATRICK KERNS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Watch-Demagnetizers, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to improvements in devices for alternating electric currents, particularly designed for use in connection with apparatus for demagnetizing objects which have become permanently magnetized, such as watches, &c.

In the drawings forming a part of this application, Figure 1 is an elevation of an apparatus particularly adapted for demagnetizing watches and employing my improved device for alternating the current. Fig. 2 is a side view thereof. Fig. 3 is an enlarged view of my improved device to alternate the current. Fig. 4 is a side view thereof. Fig. 5 is a vertical section on the line $x x$, Fig. 3; and Fig. 6 is a diagrammatical view showing the circuits for the current.

The drawings illustrate one way of embodying my invention in a practical device. Therein is shown a box or casing 1, on which is mounted a solenoid 2, which has its helices particularly formed to receive watches or other articles to be demagnetized. Within the box are inclosed batteries 3 for supplying current to said solenoid, and a switch 4 is arranged in the circuit for said current.

Through the front board 5 of the box extends a shaft 6, which is journaled in a suitable bearing 7. On the outer end of said shaft is a crank 8 for turning the same, and on the inner end thereof and rotating therewith is fixed a wheel 9, and to said wheel is concentrically secured a second wheel 10. Each of these wheels preferably consists of a circular band or hoop 11, within which is diametrically arranged a bar 12, which has its ends secured to said hoop. The two wheels are secured together preferably by bolts 13, which pass through holes provided in the bars 12 of said wheels. The bolts are insulated from electrically connecting said wheels preferably by sleeves 12^a, of insulating material, surrounding the same and arranged in the holes for the bolts in the bar of the wheel 10, and washers 12^b, of insulating material, interposed between the nuts of said

bolts and the bar in which are arranged the sleeves. The wheels are insulated directly from each other by an annular disk 14, of fiber or other insulating material, interposed between the same. The insulating-disk is of slightly greater diameter than the hoops or circular bands, and therefore the edges of the former protrude a little beyond the periphery of the latter.

Upon the periphery of each wheel are arranged contact-lugs 15, which project above the rim of the insulating-disk and preferably extend out beyond one side of the wheel to which they are attached in order to provide additional contact-surface.

The wheel 9 has connected therewith brushes 16, which are held in position by parts thereof, which are clamped between one of the bars 12 and the insulating-disk between the wheels. These brushes engage a contact-plate 17 on the front board of the casing, which is suitably connected with one side of the solenoid. The other side of the solenoid is preferably connected with a brush 18, secured upon the front board and engaging a contact-plate connected with the wheel 10.

The contact-lugs on the wheels are adapted to be engaged by brushes 19, which are preferably arranged tangentially to the peripheries of the wheels. These brushes have their outer ends supported on blocks 20, which are adjustably secured to the front board by bolts 21. The inner ends of the brushes are adapted to spring, and by adjusting the supports for said brush the surface of the brushes with which the lugs on the wheels engage may be varied, and thereby the interval of time the lugs remain in contact with the brushes in rotation of the wheel may be lengthened or shortened.

The brushes 19 are wide enough to engage the lugs on either wheel, and the lugs on said wheels are so arranged that said brushes contact first with a lug on one wheel and then with a lug on the other wheel throughout the rotation of said wheels. Between the lugs the connection of the brushes with the wheels is broken, and by varying the time which the brushes contact with the lugs in rotation of the wheel the time which the connection between the lugs and the brushes is broken is likewise varied. The brushes are held from contact with the wheels between the lugs by the disk, which insulates the wheels from each other. The brushes 19 are preferably

each connected with a different side of a source of electrical supply, which is here shown as batteries 3.

By reference to Fig. 6 the circuit for the current will be readily understood. When each brush 19 is in contact with a lug on one of the wheels, as shown, the current will flow through the solenoid in the direction indicated by the arrow. Then suppose that the wheels are moved to break the contact between the lugs shown in full lines and to make connection between the lugs indicated in dotted lines. In this instance the current will flow through the solenoid in the opposite direction from that indicated by the arrow. In the rotation of the wheels the brushes contact alternately with lugs on opposite wheels, and therefore the current is continuously alternated through the solenoid and each reversal of the current excites a magnetic field which has opposite poles to the previously-excited field.

In using my device the object to be demagnetized is placed within the solenoid and then magnetic fields which alternately have opposite poles are excited by successively reversing the current through the solenoid. At the beginning of the operation the crank is turned slowly, so as to permit contact between the lugs and brushes a sufficient period of time for the current to overcome the self-induction of the coil and arise to its maximum value, whereby the strength of resulting magnetic field is raised to its full extent. The speed of the crank is then gradually increased, which reduces the period of time the brushes and lugs remain in contact. As less time is given for the current to overcome the self-induction of the coil, consequently the current does not rise to its maximum efficiency in the solenoid, and consequently the intensity of the resulting magnetic field is reduced, and therefore the successive magnetic polarity of the object to be demagnetized is decreased. The object is slowly drawn away from the solenoid during the rapid alternation of the current, and the switch is manipulated to cut off the current when the object has been sufficiently removed from the coil.

I have made the brushes which contact

with the lugs adjustable, so that the surface thereof with which the lugs contact in passing may be increased or decreased. This enables the device to be readily adjusted to different currents without changing or modifying the method of operating the device heretofore set out or decreasing the speed of turning the crank at a given time, for by decreasing the surface of the brushes with which the lugs contact the period of time of each contact at a given speed of operation may be decreased, and vice versa.

Various changes may be made in the details of construction herein shown and described without in any way departing from the spirit of my invention and the same yet remain intact and be protected.

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

1. In a device of the character described, the combination with a solenoid, of a pole-changer, comprising two wheels each connected with a different side of the same circuit and having a plurality of contact-points, a disk of greater diameter than said wheels insulating said wheels from each other, and brushes adapted to alternately engage the contact-points of a different wheel but be held out of contact with said wheels by said disk.

2. In a device of the character described, the combination with a solenoid, of a pole-changer comprising two wheels each connected with a different side of the same circuit and having a plurality of contact-points, a disk of greater diameter than said wheels for insulating the same from each other, and brushes adapted to alternately engage the contact-points of a different wheel but held out of contact with said wheels by said disk, said brushes being adjustable in order to vary the length of time they contact with said points.

In witness whereof I have hereunto subscribed my name in the presence of two witnesses.

PATRICK KERNS.

Witnesses:

M. R. ROCHFORD,
EDWIN B. H. TOWER, Jr.