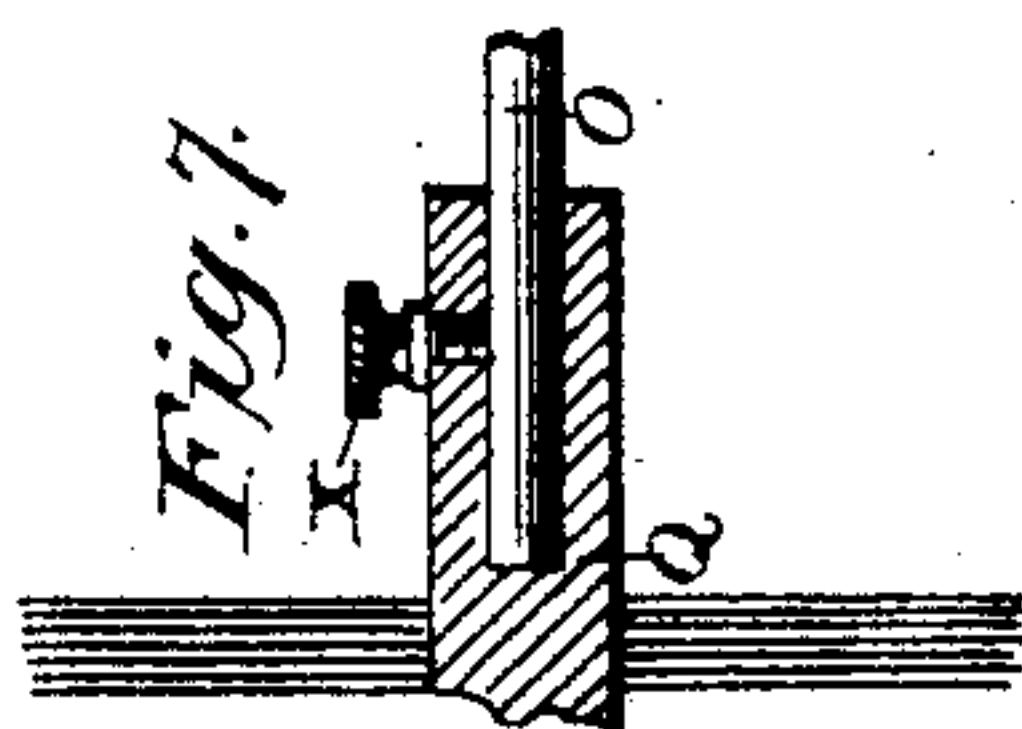
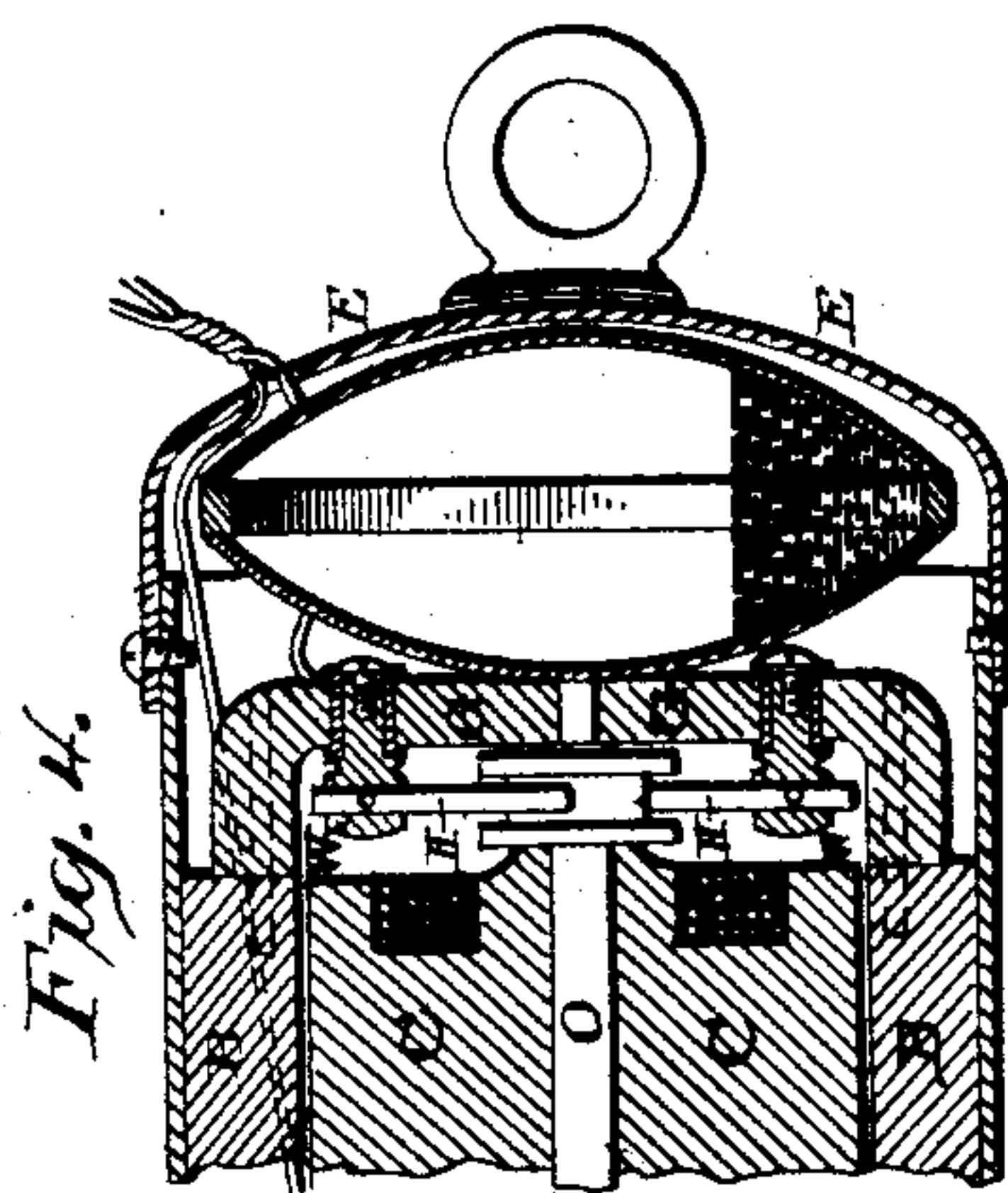
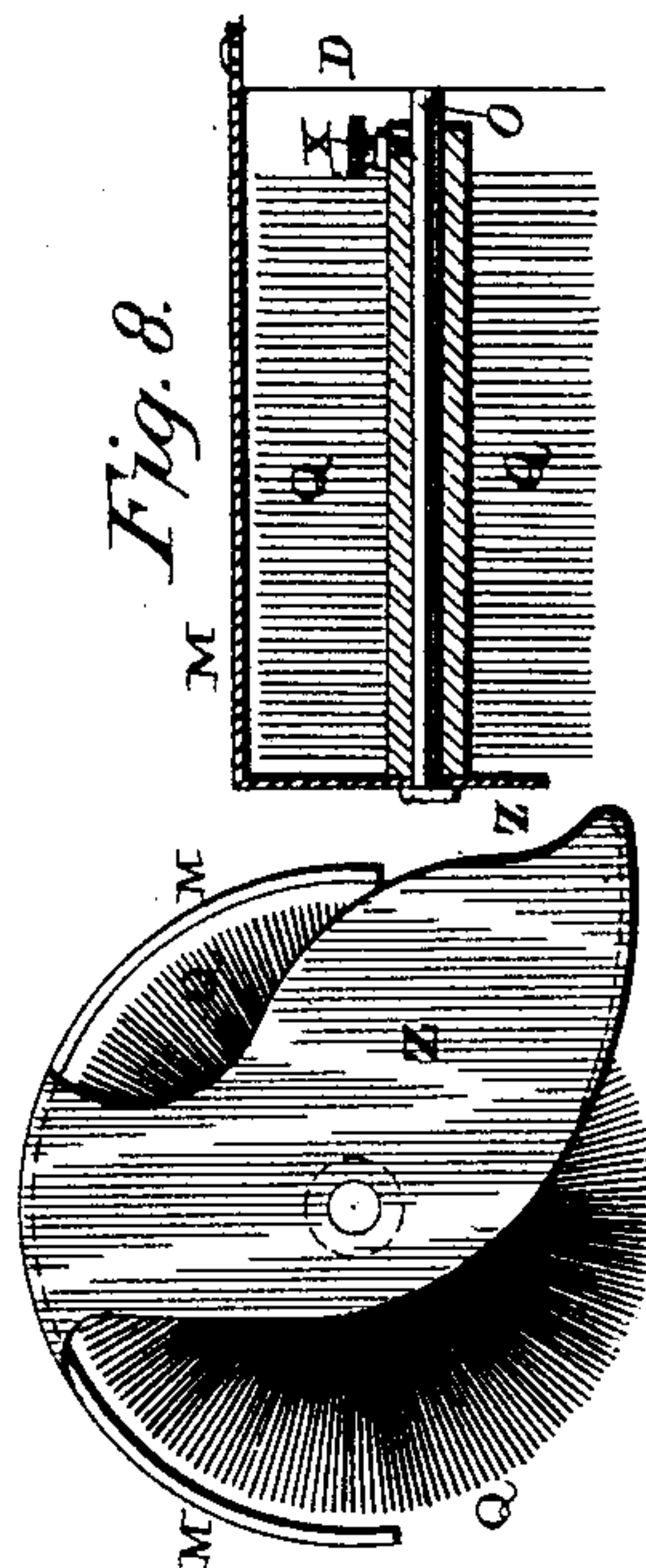
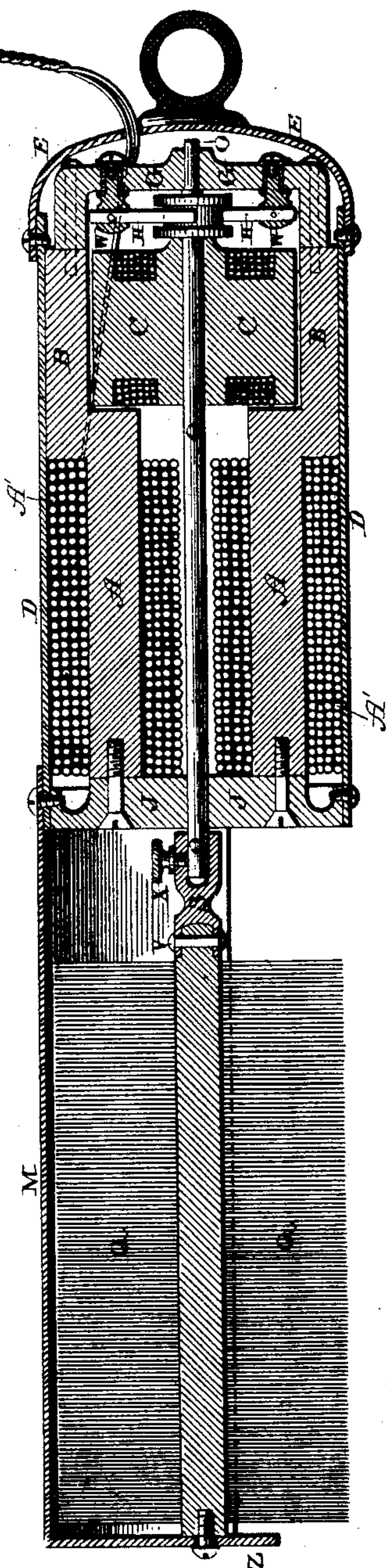
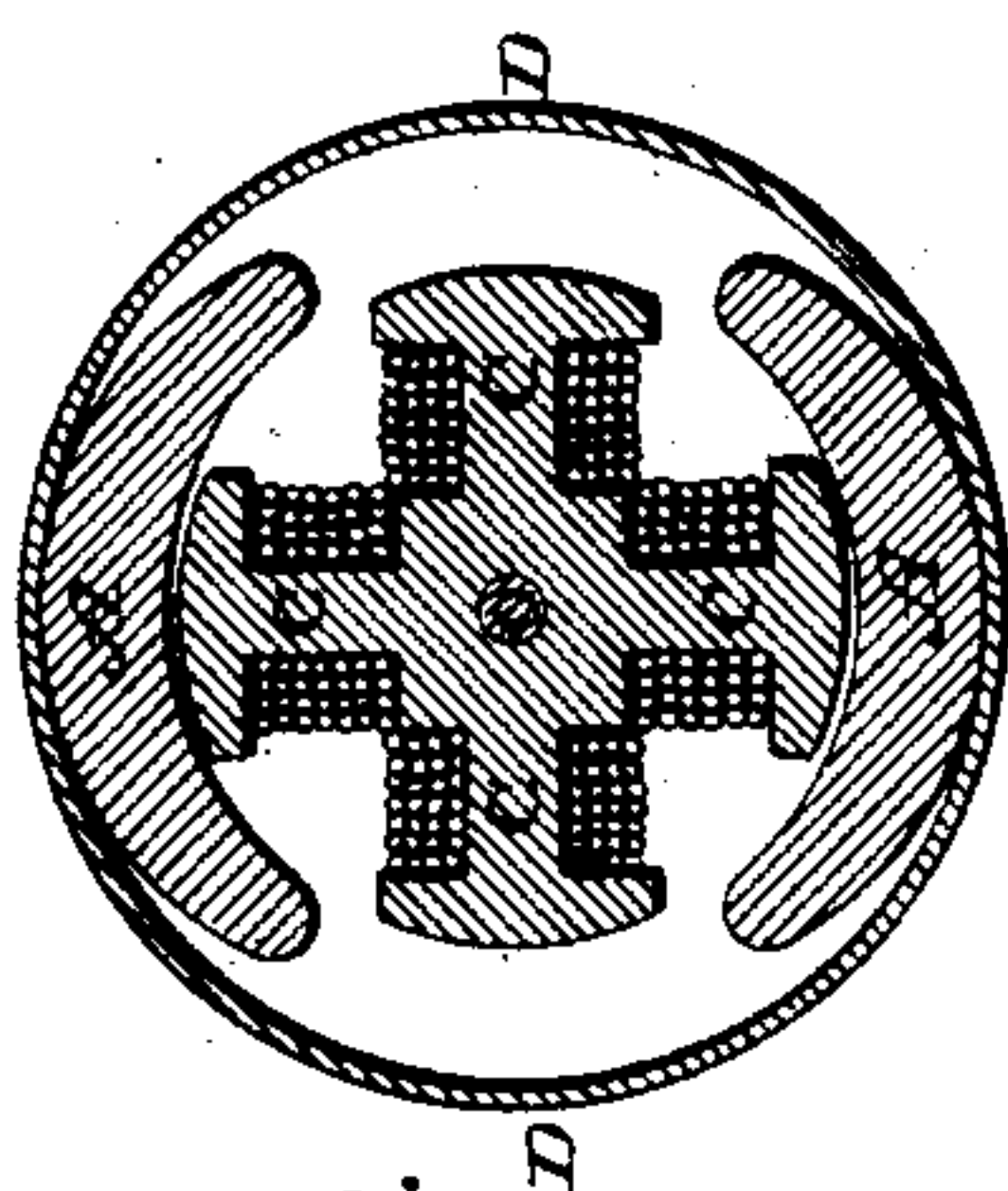
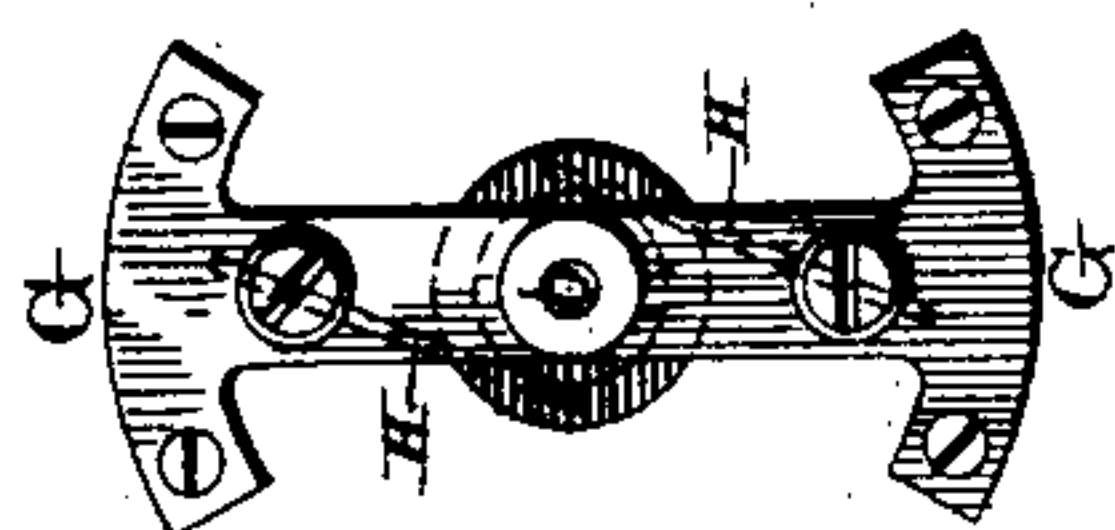
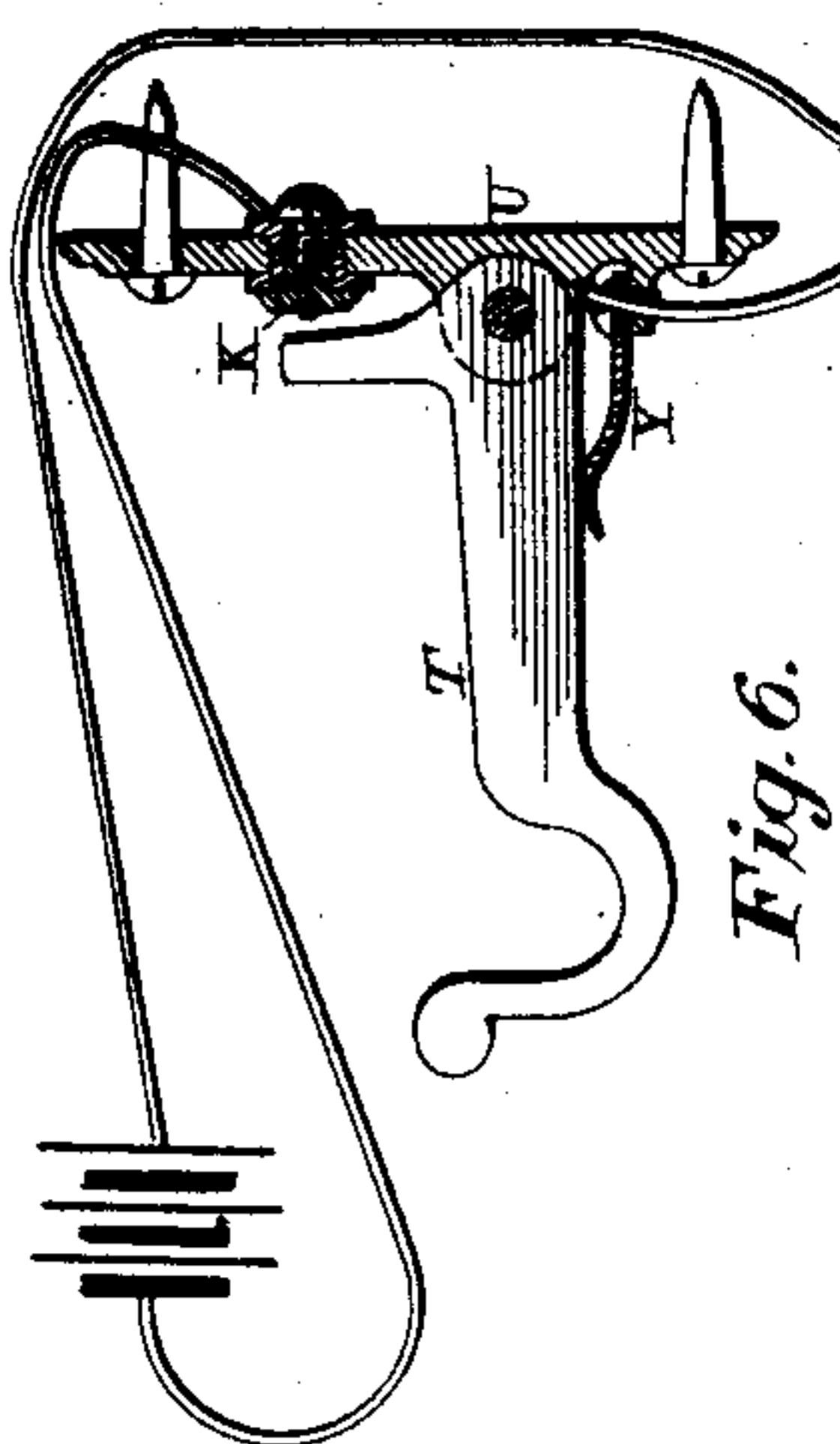


F. A. LEHMANN.
ELECTRICALLY OPERATED BRUSH.

Patented Sept. 8, 1891.



Witnesses:

E. J. Ellis,
19. Bowdoin

Inventor:

F. A. Lehmann
Lehmann & Pattison
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UNITED STATES PATENT OFFICE.

FREDERICK A. LEHMANN, OF WASHINGTON, DISTRICT OF COLUMBIA.

ELECTRICALLY-OPERATED BRUSH.

SPECIFICATION forming part of Letters Patent No. 459,222, dated September 8, 1891.

Application filed October 25, 1890. Serial No. 369,354. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK A. LEHMANN, of Washington, in the District of Columbia, have invented certain new and useful
5 Improvements in Electrically-Operated Revolving Brushes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable
10 others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to an improvement in revolving electrically-operated brushes; and
15 it consists in the combination of a handle which is formed by the field-magnets and a shaft which extends longitudinally through the handle and has a revolving armature secured to one end and a revolving brush to
20 the other, the brush being made to extend in a line with the handle, as will be more fully described hereinafter.

The object of my invention is to locate the motor directly in the handle, so as to relieve
25 the wrist of all strain in sweeping the brush over the object to be cleaned, and to have the brush extend in a straight line with the handle, so that long sweeps of the brush can be made over the objects being cleaned, and thus
30 enable better and more rapid work to be done. This brush is especially designed for cleaning animals of all kinds, for the bristles of the brush, revolving at a high rate of speed, penetrate the hair and sweep away the dust
35 and dirt more rapidly and thoroughly than can be done in any other manner.

Figure 1 represents a longitudinal vertical section of a brush which embodies my invention. Fig. 2 is a vertical cross-section taken
40 through the armature. Fig. 3 is a detached view of the yoke. Fig. 4 shows another form of switch that may be used and which is to be located directly inside of the handle. Fig. 5 is an end view of the brush, showing the
45 guard. Fig. 6 shows a slight modification in construction. Figs. 7 and 8 show slightly different means of attaching the brush to the shaft.

A represents the two field-magnets, of any
50 desired length and shape, and which are secured rigidly together at one end by the

plate J and at the other by the yoke G. As here shown, the two outer ends of the magnets are turned outward, so as to enable a larger armature C to be used than could be
55 done if the magnets were made perfectly straight, and the wire A' is wrapped around the magnets until it is just flush with the outer edges of the turned-out ends B; but I do not limit myself to this particular form of
60 construction. These field-magnets form the handle of the brush, and will be made of a length and thickness proportionate to the amount of power required for driving the revolving brush Q. The operating-shaft O ex-
65 tends longitudinally through the handle and has its bearings in the plate J and the yoke G, and has the armature C rigidly secured to it, so as to revolve between the two outwardly-
70 turned ends B of the field-magnets A. This armature is preferably given four arms, so as to prevent any dead-center; but I do not limit myself to any details of construction in this respect, for this may be varied at will without departing from the spirit of my in-
75 vention.

Secured to the yoke G are the two supports
80 w, to which the brushes H are secured, and which operate upon the commutator in the usual manner.

In order to prevent all of the operating parts from being injured and to make the handle in a convenient form, a cover D is applied to the outer sides of the field-magnets, and this covering is secured to the plate J at one end by
85 means of screws or any other suitable fastenings. To the outer end of this cover D is secured the cap or cover E, which is provided with a ring, so as to enable the brush to be hung up upon the switch or any other sup-
90 port provided for it. As will be seen, all of the operating parts of the brush are entirely closed, so as to protect them from dust and dirt and from being injured in any way.

Attached to the outer end of the shaft O by
95 any suitable form of coupling that may be preferred is the revolving brush Q, which may also be of any construction preferred. Instead of the coupling S, which is secured by a rivet V at one end to the brush and by a
100 set-screw X at its other end to the shaft O, the shaft may be made to project into or

through the center of the brush and the brush be fastened thereto in any manner desired. If so preferred, the end of the shaft may extend directly into the center of the brush and be fastened thereto by means of a set-screw without the intervention of a coupling of any kind.

In order to prevent the brush from catching in the hair of the manes and tails of the animals being cleaned, a shield or cover is used, which will extend outward over the top of the brush to or beyond its outer end, as shown. The guard Z at the end of this cover serves to catch under the hairs of the mane or tail as the brush is being used and moves them out beyond the reach of the brush, so that it will not catch them and wind them around the brush and thus cause either the hairs to be pulled out or the brush to be stopped by having the hairs wind around it. It is immaterial how this cover is attached to the handle or whether it is used to support and steady the outer end of the brush or not. Should the shaft O be made to extend through the brush, it may form a third bearing for it, if so desired. If the cover projects below the center of the brush and is used as a support for it, a screw or rivet may be passed loosely through the cover, as shown, into the end of the brush. This cover is not absolutely necessary, but its use enables the operator to use the brush more rapidly and safely in cleaning animals where the hairs of the mane or tail are likely to be caught by the brush and saves the necessity of having to bag the mane and tail, as is done as a matter of safety where revolving brushes are used in cleaning animals.

Any form of switch desired may be used in connection with the brush. If desired, an automatic switch such as is shown in Fig. 4 may be placed inside of the covering of the handle, and thus automatically stop the brush as soon as it is hung up or whenever it is turned into a vertical position. This switch consists of two concavo-convex conducting-plates, which are separated from each other at their edges by a ring of suitable non-conducting material, and in the chamber formed by the plates and non-conducting material is placed a suitable quantity of mercury. When the brush is hung up or turned into a vertical position, all of the mercury flows upon the inner plate, and hence the current is broken and the brush ceases to revolve. When the brush is in a horizontal or nearly horizontal position, the mercury is in contact with both of the plates, and then the current passes directly through the switch. A hooked lever T may be used, and upon which the implement is to be hung whenever it is desired to stop the brush. This lever T is pivoted upon the plate U, which is secured to a wall or any other suitable support, and to which plate is connected one of the wires which extends to the motor. Secured to this plate U is a spring Y, which when the implement is removed from the lever forces it upward, so as to cause

the prong upon its inner end to make connection with the button K, which is connected to one of the wires of the battery or other source of electricity. This button is insulated from the plate, and when the lever makes contact therewith the current passes through the button, the lever, and the wire to the motor. The other wire extends from the pole of the battery directly to the motor. The moment the implement is removed from the outer end of the lever T the spring Y forces the lever to close the circuit, and then the brush is started into operation.

While this brush is especially intended for cleaning animals, it is evident that it may be applied to many other uses. By having the brush extend in a line with the handle the operator has only to sweep the brush lightly over the animal, when the bristles will penetrate the hair and not only brush out the dust and dirt, but clean the hide as can be done in no other way.

By means of a revolving brush constructed as here shown an animal can be cleaned more thoroughly in five minutes than can be done with the ordinary brush and curry-comb in one hour, and hence will enable a boy to do the work of a number of men, and thus effect a great saving in livery-stables, stock-farms, and other places where a number of animals are kept and a number of men are employed to keep them. As the bristles of the brush penetrate to the skin of the animal and cleans it thoroughly, the health of the animal is greatly benefited, and it will keep in good condition upon a smaller amount of feed than where the skin is left dirty.

If the operating mechanism is placed inside of the brush, either the motor must be made so small as to be of but little service or the brush must be made so large as to be very unwieldy and very hard upon the wrist to operate. If the brush does not extend in a line with the handle, a long sweeping motion cannot be given to the brush, and hence rapid and effective work cannot be done. If the motor is placed in the handle, as here shown, the main weight is held in the hand and the brush does not act as a heavy weight to tire the wrist, as is the case where the motor, weighing several pounds, is placed in the brush.

No claim is here made to a brush carrying a motor inside of it, or to a brush revolving at right angles to the handle, or to a brush where the motor is not placed inside of the handle and the brush does not extend in a line with the handle.

Having thus described my invention, I claim—

1. In a revolving electrically-operated brush, the combination of a handle which is formed by the field-magnets, a shaft which extends longitudinally between or through the field-magnets or handle, the armature secured to one end of the shaft, and the revolving brush secured to the other, the brush being made to

extend in a straight line with the handle, substantially as shown.

2. The combination of the field-magnets which form a handle, a shaft which extends longitudinally through the handle, the armature secured to one end of the shaft and a revolving brush secured to the other, with the forward support for the shaft, the yoke G, and the commutator, the brush being made to extend in a straight line with the handle, substantially as described.

3. The combination of the field-magnets, the shaft which extends longitudinally through the handle formed by the magnets, the revolving brush secured to the outer end of the shaft, the armature secured to the opposite end of the shaft, the commutators, conducting-wires, and an automatic switch, substantially as set forth.

4. In a revolving brush, the combination of the handle, the brush which extends in a line with the handle, and the operating mechanism placed wholly inside of the handle, with a battery or other source of supply of electricity, and the conductors, substantially as specified.

5. The combination of the handle, a revolving brush which extends in a line with the handle, a cover applied to the brush, and a guard or projection located at the end of the cover and projecting forward in advance of it, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

F. A. LEHMANN.

Witnesses:

E. P. ELLIS,
PHILIP MAURO.