

No. 663,538.

Patented Dec. 11, 1900.

E. H. GATES.
MECHANICAL ERASER.

(Application filed Mar. 8, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

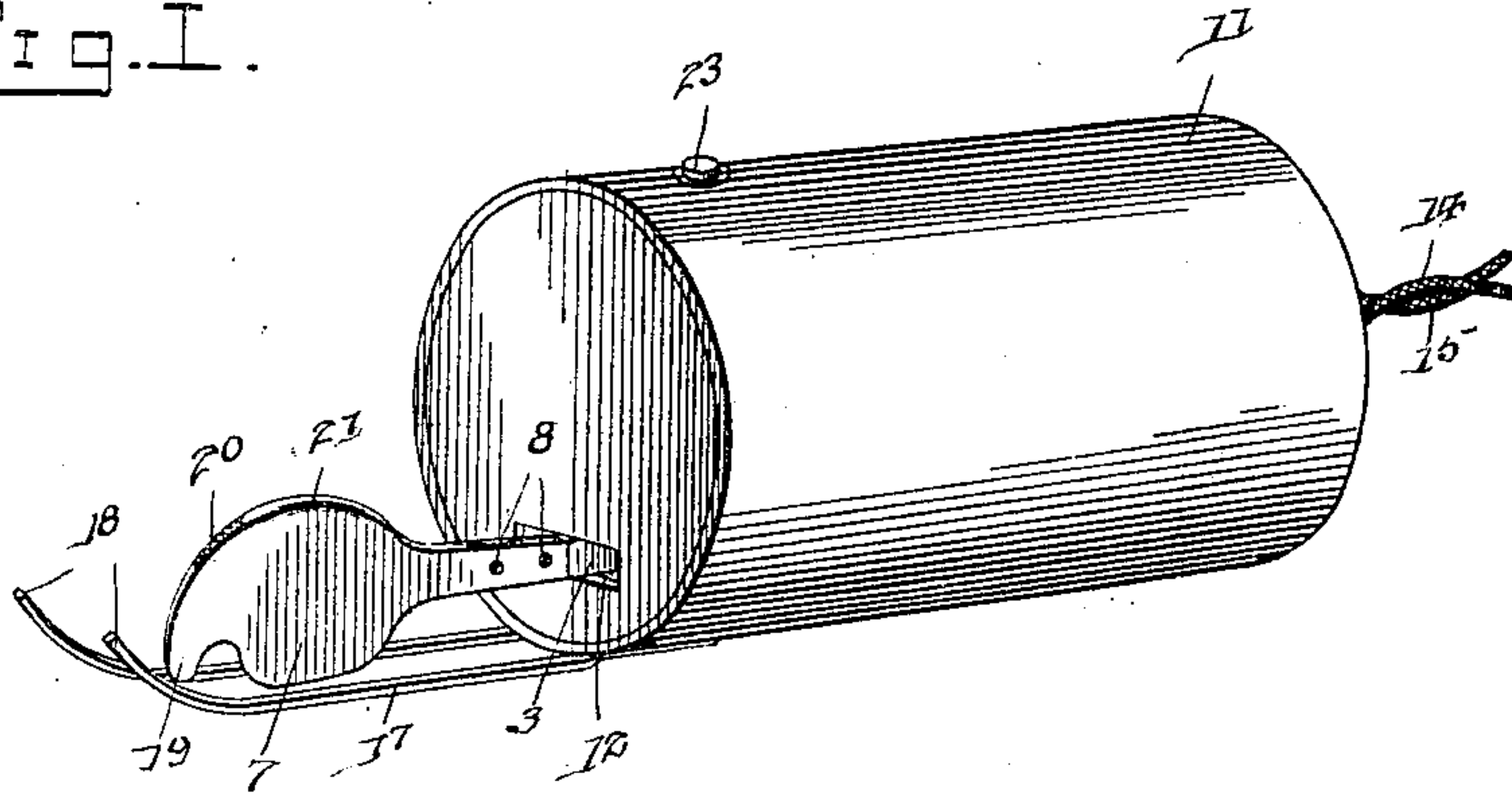


Fig. 2.

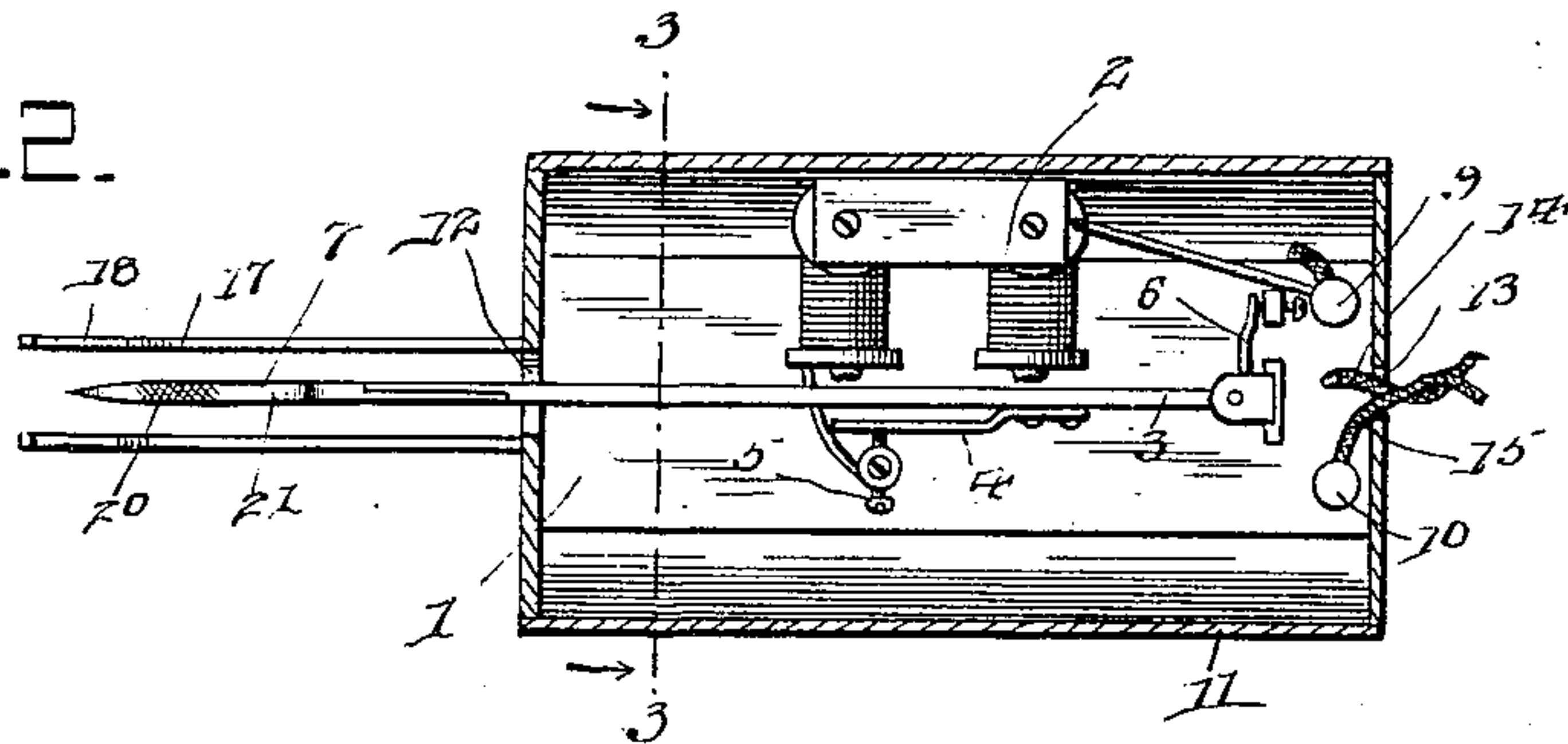


Fig. 4.

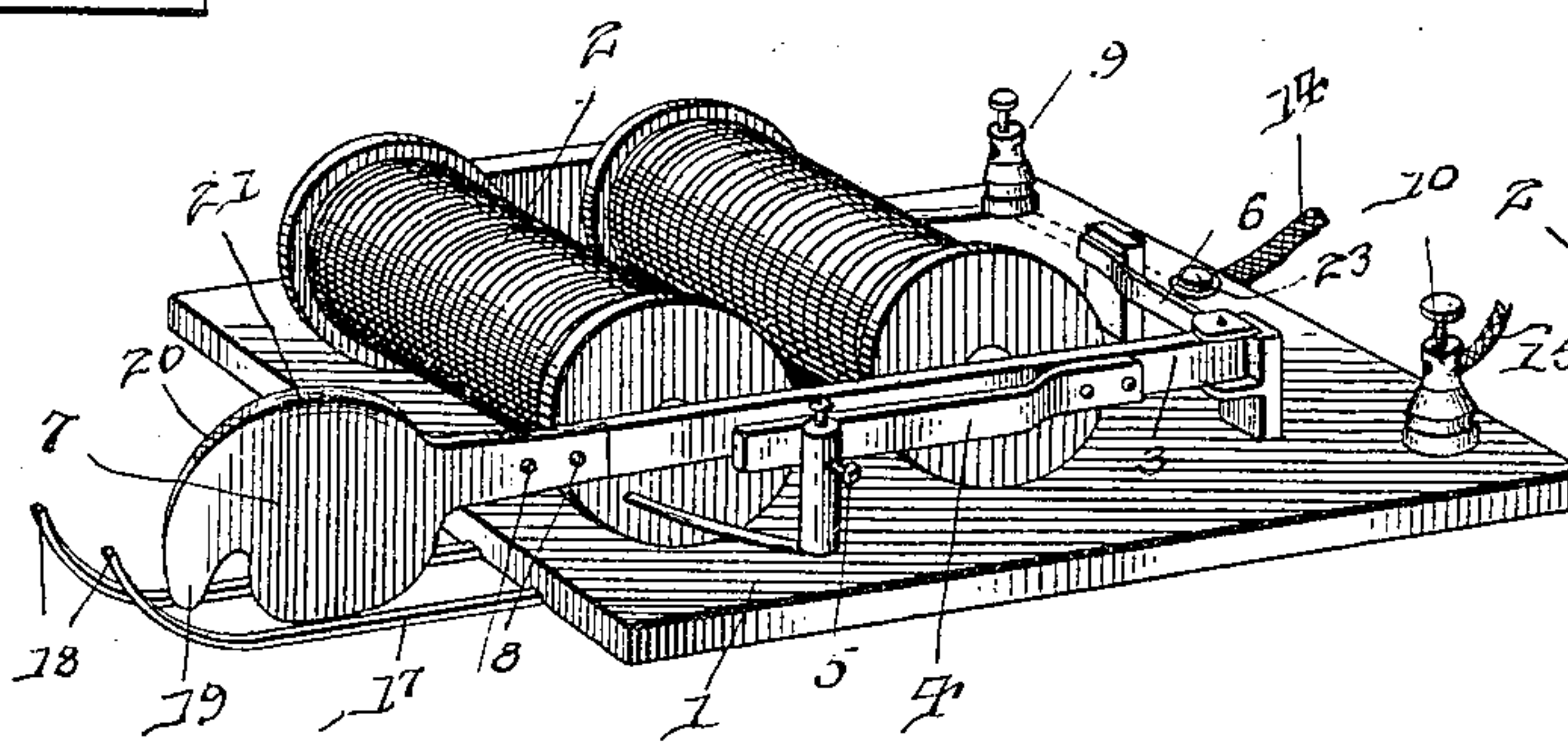
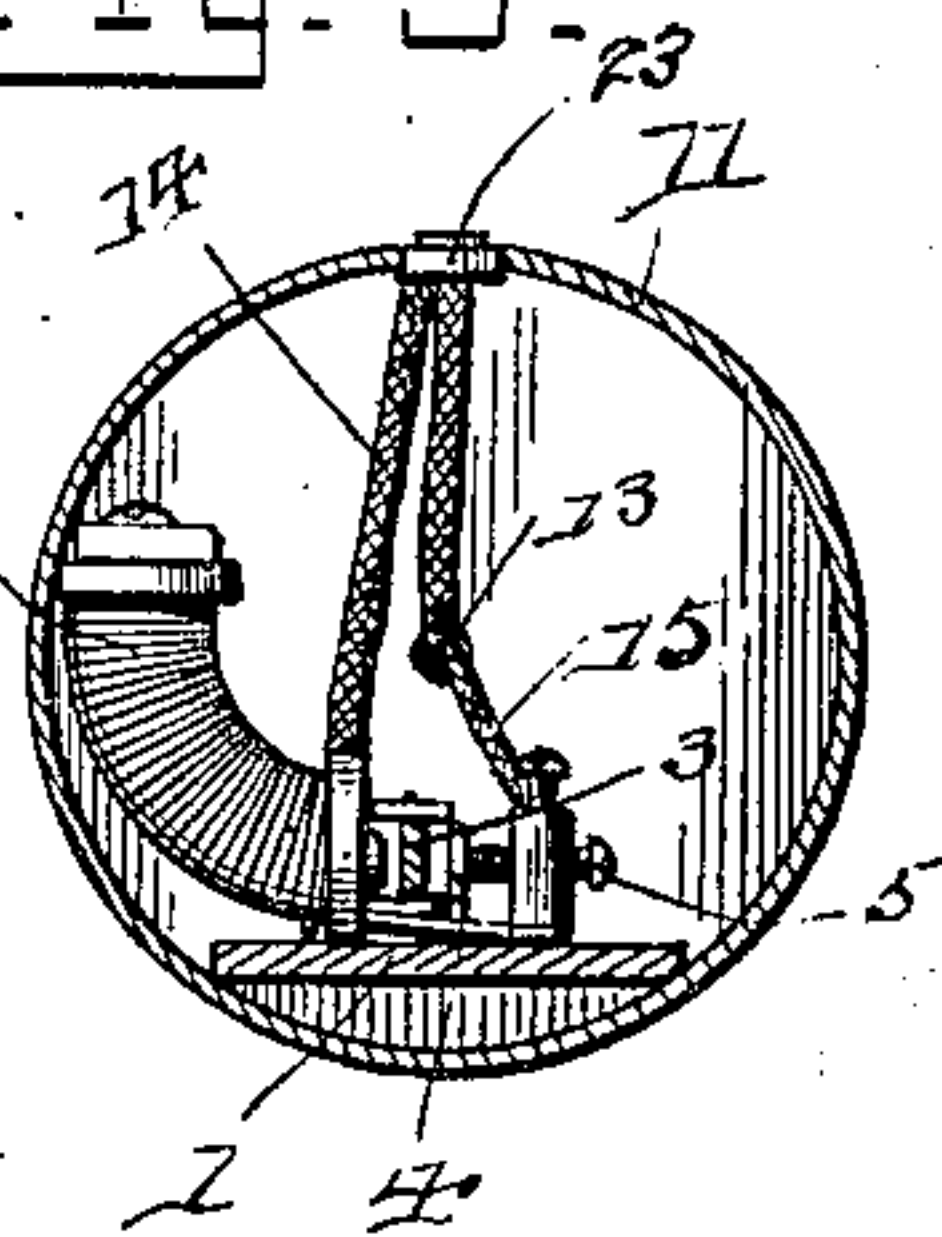


Fig. 3.



Witnesses
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2 Sheets—Sheet 2.

Fig. 5.

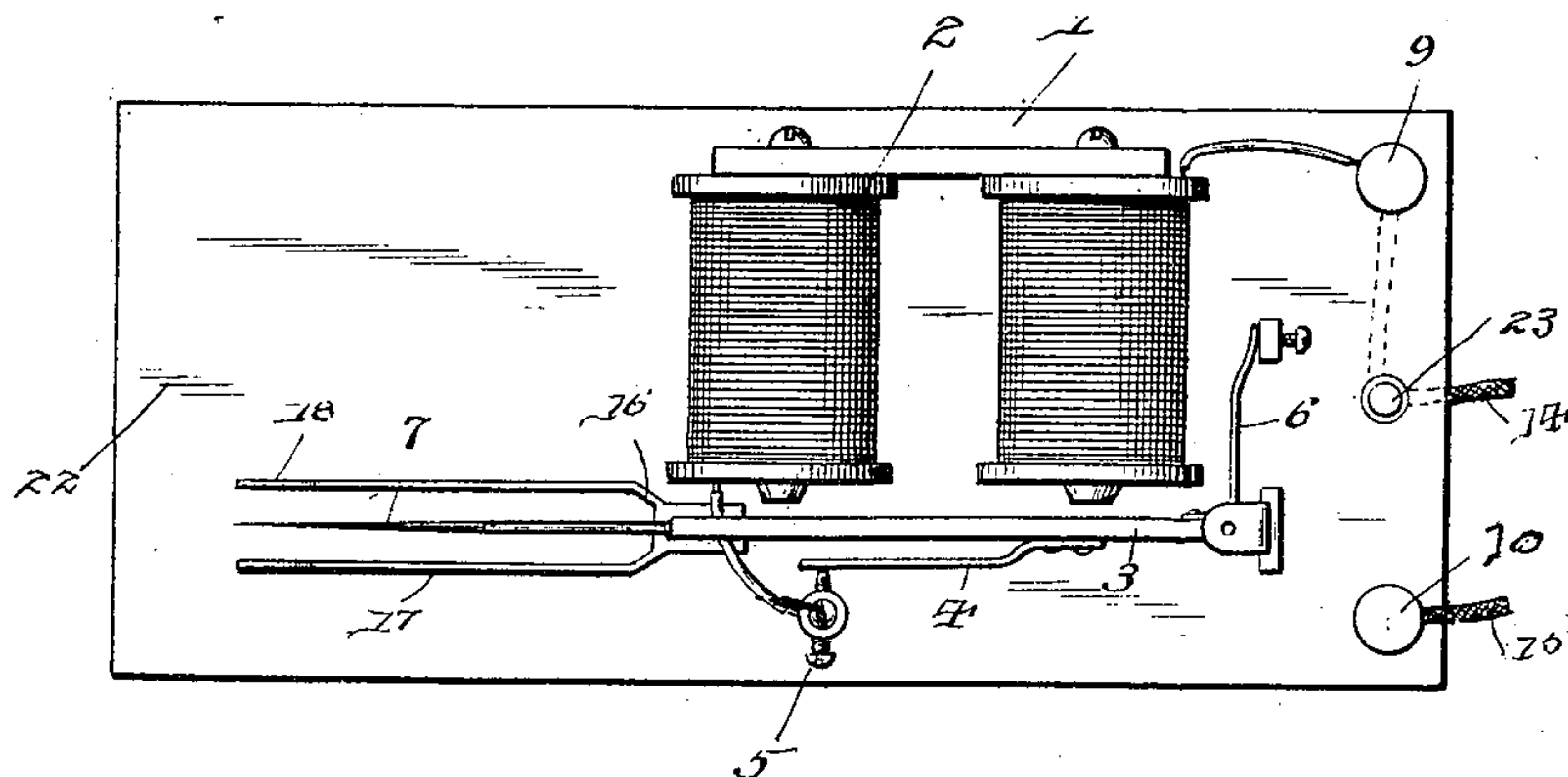
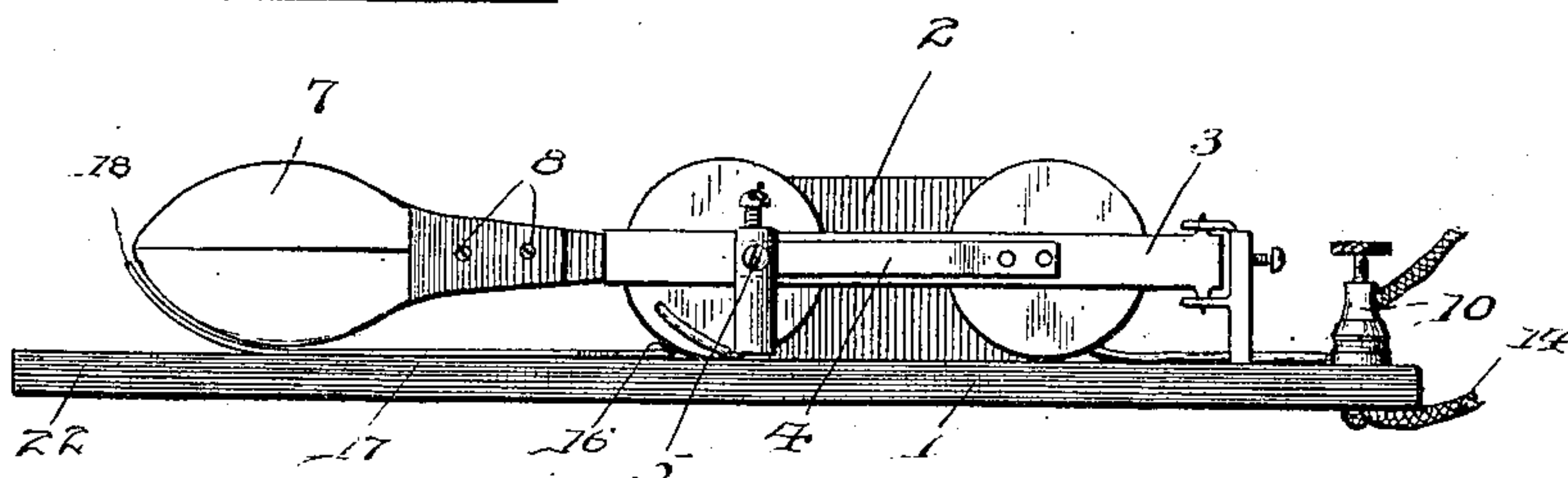


Fig. 6.



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UNITED STATES PATENT OFFICE.

ERNEST H. GATES, OF TROY, NEW HAMPSHIRE.

MECHANICAL ERASER.

SPECIFICATION forming part of Letters Patent No. 663,538, dated December 11, 1900.

Application filed March 8, 1900. Serial No. 7,891. (No model.)

To all whom it may concern:

Be it known that I, ERNEST H. GATES, a citizen of the United States, residing at Troy, in the county of Cheshire and State of New Hampshire, have invented a new and useful Mechanical Eraser, of which the following is a specification.

This invention relates to erasers for removing ink and pencil marks from paper, and has for one object to provide means for mechanically vibrating such an eraser, so as to quickly and effectually perform the erasing operation and without danger of forming a hole in the paper. It is also designed to provide a portable device which may be conveniently applied to the work and also moved upon the desk or table, so as to be placed out of the way when not required for use.

A further object of the invention is to provide means for firmly holding the paper against being rucked up or wrinkled during the operation of the erasing-blade, and finally to provide an improved form of erasing-blade which is designed to erase both large and small marks and also to form a burnisher.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a perspective view of the improved eraser inclosed within a cylindrical casing, so as to facilitate the handling thereof. Fig. 2 is a plan section thereof. Fig. 3 is a transverse sectional view taken on the line 3 3 of Fig. 2. Fig. 4 is a detail perspective view of a modified form of the device with the casing omitted. Fig. 5 is a plan view of another modification of the eraser. Fig. 6 is a side elevation thereof.

Corresponding parts in the several figures of the drawings are designated by like characters of reference.

In carrying out the present invention and as embodied in all of the forms of the device shown in the accompanying drawings I em-

ploy a suitable base 1, which is preferably flat and of substantially rectangular shape. Mounted upon the upper side of this base and adjacent to one longitudinal edge and also to one end thereof is a pair of electromagnets 2, having an ordinary vibrating armature 3, which extends longitudinally of the base. Secured to the outer side of the armature is the usual longitudinally-disposed spring-contact 4 for engagement with a suitable contact-point 5, which is fixed to the base and in electrical connection with the adjacent coil of the magnet, said contact-spring being normally held in engagement with the contact-point 5 by means of the usual spring 6, carried by the base and bearing against the armature. The free end of the armature is provided with a longitudinally-disposed eraser-blade 7, which is removably connected to the armature by means of suitable fastenings 8, so that the eraser may be replaced when worn or broken or a different-shaped eraser may be substituted. At the opposite end of the base there are provided the opposite binding-posts 9 and 10 for connection with the respective poles of a battery or other source of electrical energy.

In the operation of the device the work to be operated upon is placed beneath the eraser-blade 7, after which the electrical circuit is closed by any suitable means, so that the armature will be vibrated in the usual manner, thus vibrating the eraser-blade across the upper surface of the work, and thereby the erasing operation is effectually performed.

To facilitate the handling of a comparatively small eraser, it is designed to house the actuating parts of the device, including the base, within a substantially cylindrical casing or housing 11, which forms a convenient handle to be held in one hand, so that the eraser-blade may be applied to any particular part of the work. The forward end of the casing is provided with a lateral slot or opening 12, which is located adjacent to the upper side of the base, so as to receive the outer projecting end of the armature, and said slot or opening is elongated transversely of the base, so as to permit of the vibrating motion of the armature. At the opposite end of the casing there is provided a central opening 13, through which project the wires 14

and 15, that are connected to the respective binding-posts 9 and 10. In order that the casing may be as small as possible to be conveniently held in one hand, the magnet is located almost entirely at one side of the base, as shown in Fig. 3, and bowed longitudinally, so as to fit against and conform to the interior walls of the casing, which arrangement is the only difference in the actuating parts between the present form and that shown in the other figures of the drawings.

To prevent the paper or work from rucking up or becoming wrinkled during the operation of the device, there is provided for each form of the device a spring clamping-foot 16, which is removably connected to the blade end of the base or the casing, as the case may be, and also has a two-tined fork 17, the members of which extend longitudinally at opposite sides of the eraser-blade, so as to permit of the lateral vibration thereof, and the outer extremities of the tines are bowed upwardly, as at 18, to facilitate the introduction of the paper beneath said forked clamping-foot. By means of this clamping-foot the paper is held firmly against the desk or table, so as to prevent the paper from being rucked or creased by the rapid movement of the eraser-blade, and it also forms a guide to insure the proper engagement of the blade with the paper, and thus effectually precludes the possibility of making a hole in the paper.

In some instances it may be desirable to provide the blade with a pointed finger 19 at the outer end thereof, so that the entire device may be tipped or inclined to bring this finger into contact with the paper to erase a small mark. Thus in this application of the device the upwardly-bowed extremities of the tines of the clamping-fork rock upon the paper and preserve the proper relation between the finger and the paper, so as to prevent the formation of a hole in the latter, as will be readily understood. Also it is designed that the upper edge of the blade be made comparatively broad and provided with a file or serrated portion 20 and a smooth burnishing portion 21, which portions of the blade may be brought into use by inverting the entire device.

By reference to Figs. 5 and 6 of the drawings it will be observed that the forward end of the base is extended outwardly beyond the outer extremity of the eraser-blade, so as to form a support 22 for the paper, and the clamping-foot extends across the support, so as to firmly clamp the paper thereto. In this form of the device it is preferable to employ an ordinary shape of eraser-blade, as shown, for an inclination of the entire device would not alter the relation of the blade and the support. However, the tines of the fork are bowed upwardly, as in the other forms of the eraser, so as to facilitate the introduction of the paper between the support and the clamping-foot.

From the foregoing description it will be

apparent that the present device may be fixed to a table or other support in the form shown in Fig. 4, and it may also be arranged to provide a portable device, so that it may be moved from place to place to facilitate the operation thereof, and thus render the device particularly useful for draftsmen.

To control the electric circuit so as to start and stop the operation of the eraser-blade, there is provided a suitable switch or push-button 23, which is arranged in convenient position to be readily operated. In the form of the device having the casing the push-button is located in the upper side of the casing, adjacent to the forward end thereof, so as to be in position for convenient operation by the forefinger of the operator. To accommodate this push-button, the conductor 15 connects directly to the binding-post 10, while the other conductor 14 is connected to the push-button and then passes to the opposite binding-post 9, so that the means for controlling the circuit may lie between the two connections of the device with the electric conductors. In the forms of the device which do not have a cylindrical casing the push-button is mounted upon the base, at the rear end thereof, and intermediate of the two binding-posts, so as to preserve the same general relation of parts.

What I claim is—

1. A device of the class described, comprising a base, an electromagnet mounted thereon, a vibrating armature for the magnet, electric conductors for connection with a source of electrical energy, and an erasing device carried by and movable with the armature.

2. A device of the class described, comprising a base, an erasing device mounted thereon, means for mechanically operating the latter, and a work-holder also carried by the base and arranged to cooperate with the erasing device.

3. A device of the class described, comprising a base, an erasing device mounted thereon, means for mechanically operating the latter, and a forked work-holder carried by the base, having the outer ends of its tines bowed upwardly and also arranged to cooperate with the erasing device.

4. A device of the class described, comprising an erasing-blade, means for mechanically operating the same, and a forked work-holder, the tines of which are located at opposite sides of the erasing-blade.

5. A device of the class described, comprising a vibrating erasing-blade, means for vibrating the blade, and a forked spring work-holder, the tines of which are located at opposite sides of the blade to permit of the movement thereof, and the free ends of the tines being bowed upwardly.

6. A device of the class described, comprising a base, a vibrating eraser mounted thereon, means for operating the eraser, and a work-holder projecting in advance of the base.

7. A device of the class described, comprising a base, an eraser mounted thereon and pro-

jecting in advance thereof, means for operating the eraser, and a work-holder projecting in advance of the base and located beneath the eraser.

5 8. A device of the class described, comprising a base, a vibrating eraser mounted thereon, means for operating the eraser, and a forked work-holder located beneath the eraser, both the latter and the work-holder projecting in
10 the same direction beyond the base, and the outer extremities of the tines of the fork being bowed upwardly.

9. A device of the class described, comprising a hollow handle, having a slot at one
15 end thereof, an eraser projecting outwardly through the slot, and means housed within the handle for causing the eraser to vibrate in the slot.

20 10. A device of the class described, comprising a hollow handle, having a transverse slot at one end, and an opening at the opposite end thereof, an electromagnet housed within the handle, a vibrating armature also housed within the handle and projecting outwardly

through the slot, an erasing-blade carried at 25 the outer end of the armature, and a pair of electrical conductors passing outwardly through the opening in the opposite end of the handle.

11. An eraser-blade, having a sharp con- 30 vexed longitudinal edge, and a laterally-disposed pointed erasing-tongue adjacent to the outer end of the blade.

12. A device of the class described, comprising a mechanically-operated eraser-blade, hav- 35 ing a pointed erasing and laterally-disposed tongue, and a forked work-holder, having its tines located at opposite sides of the eraser-blade, and the outer extremities of the tines being bowed upwardly. 40

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ERNEST H. GATES.

Witnesses:

CORA M. STONE,
CHARLES G. BEMIS.