

No. 620,473.

Patented Feb. 28, 1899.

G. F. MARTIN.  
ELECTRICAL MACHINE.

(Application filed July 18, 1898.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

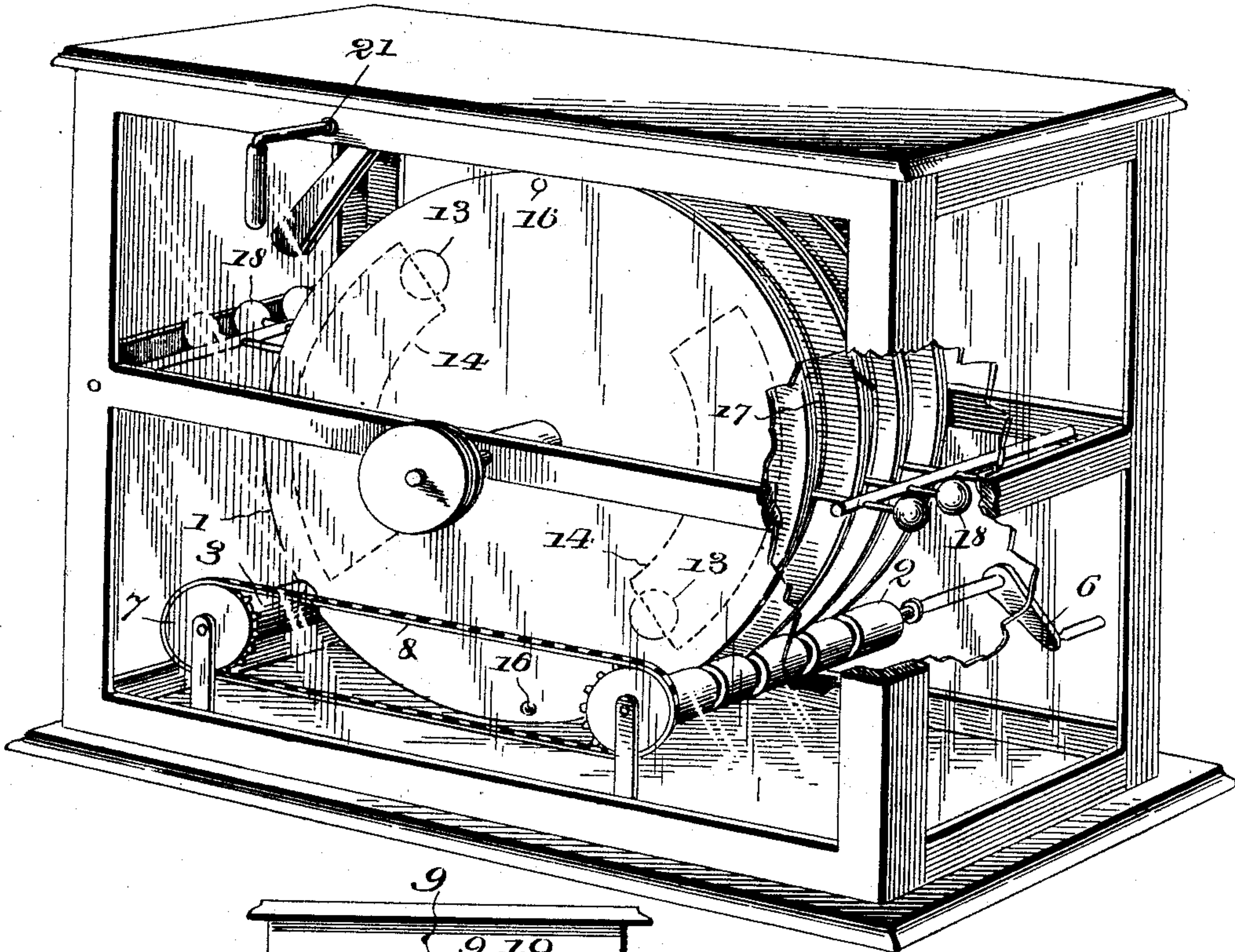
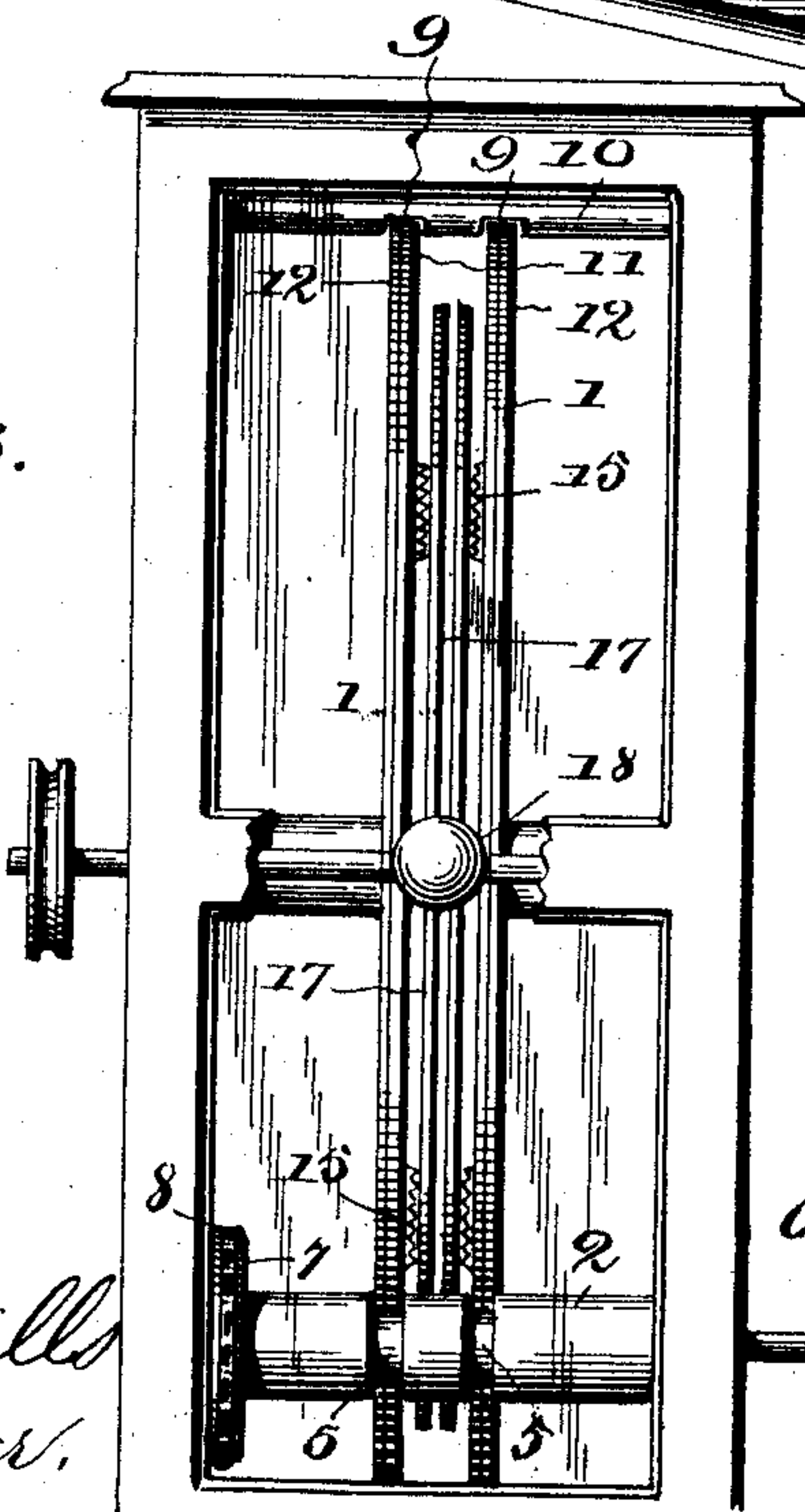


Fig. 3.



Witnesses  
L. C. Hills  
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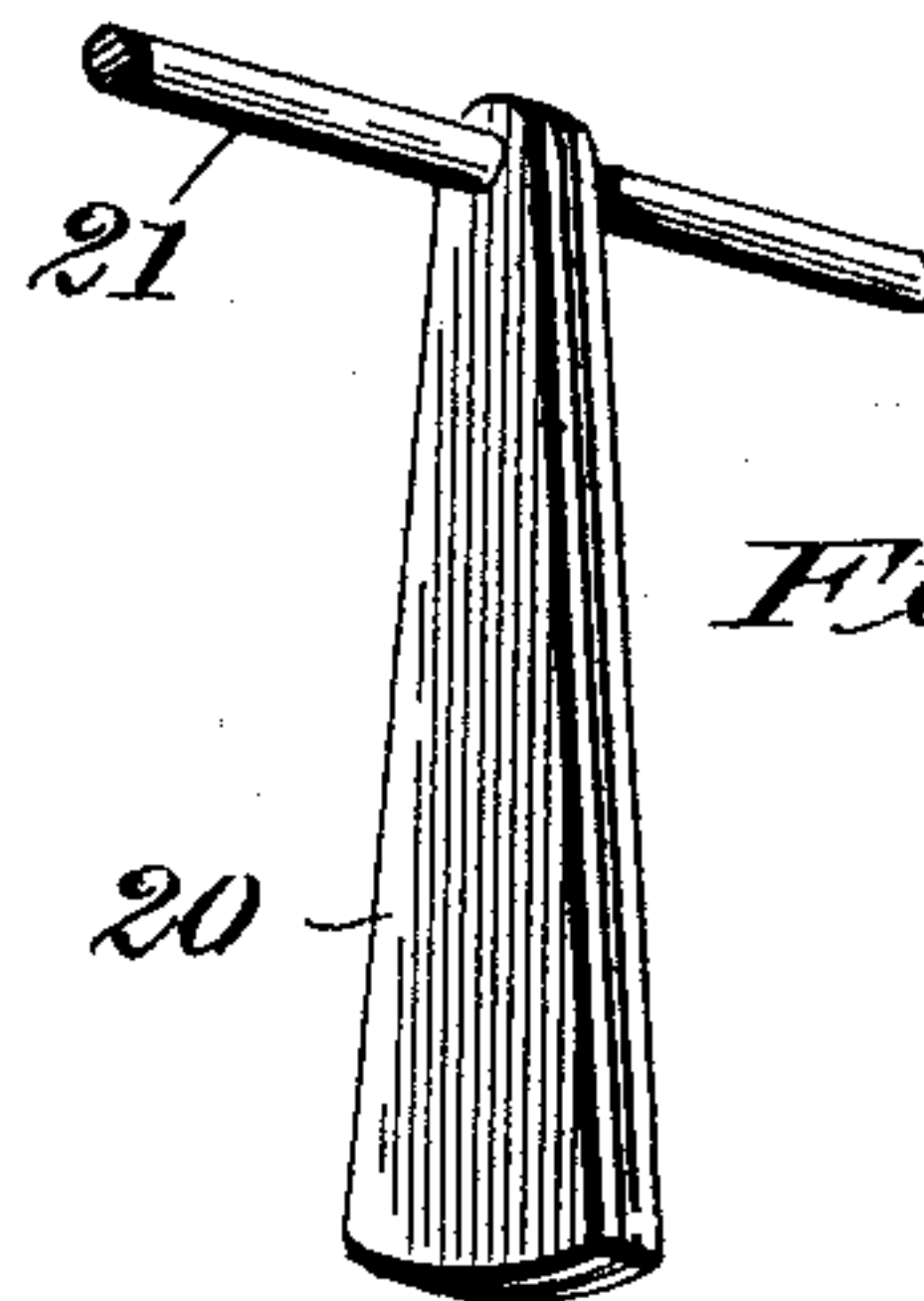


Fig. 6.

Inventor:  
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2 Sheets—Sheet 2.

Fig. 2

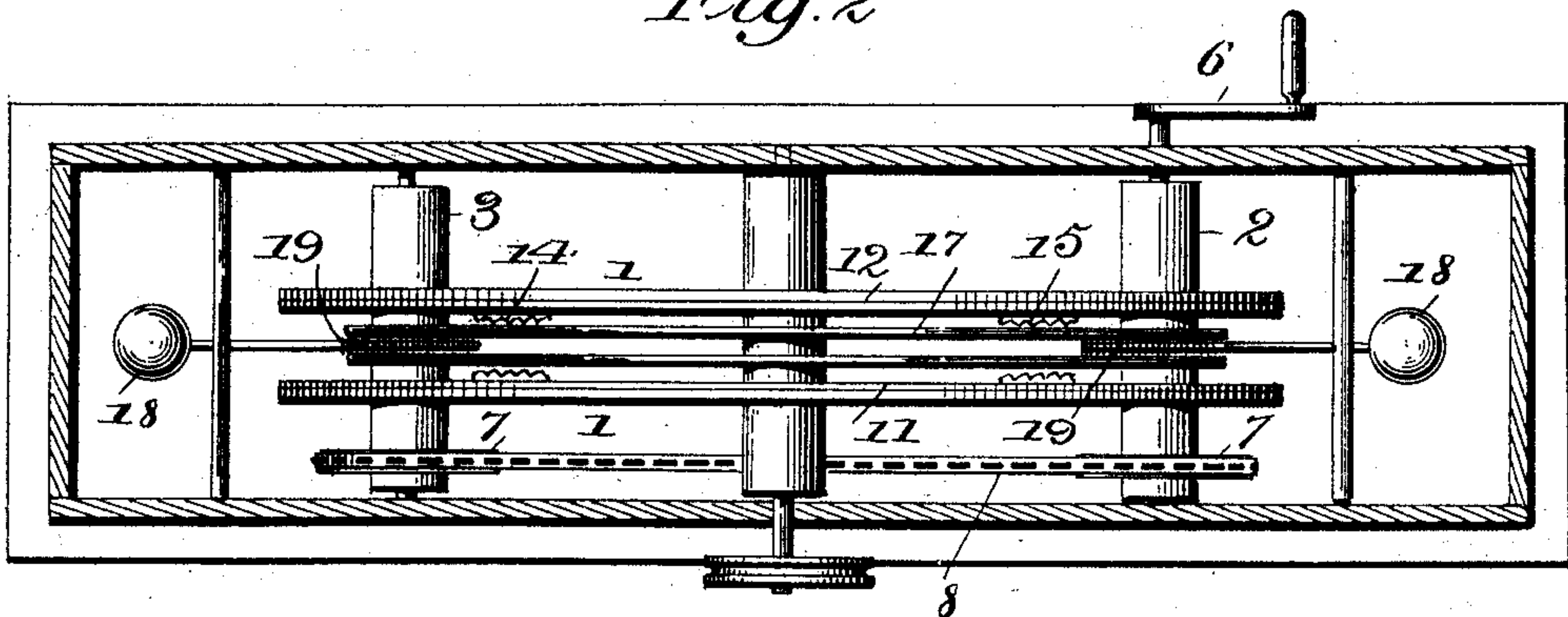


Fig. 5.

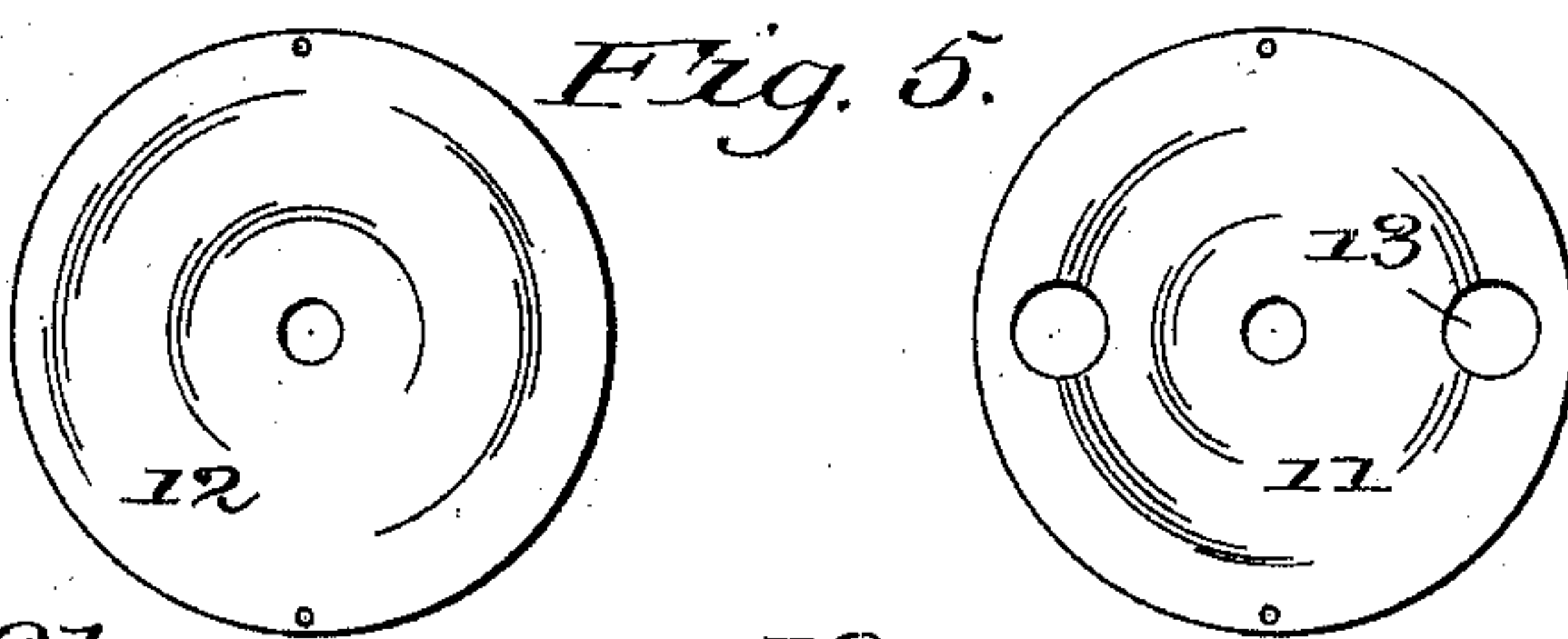
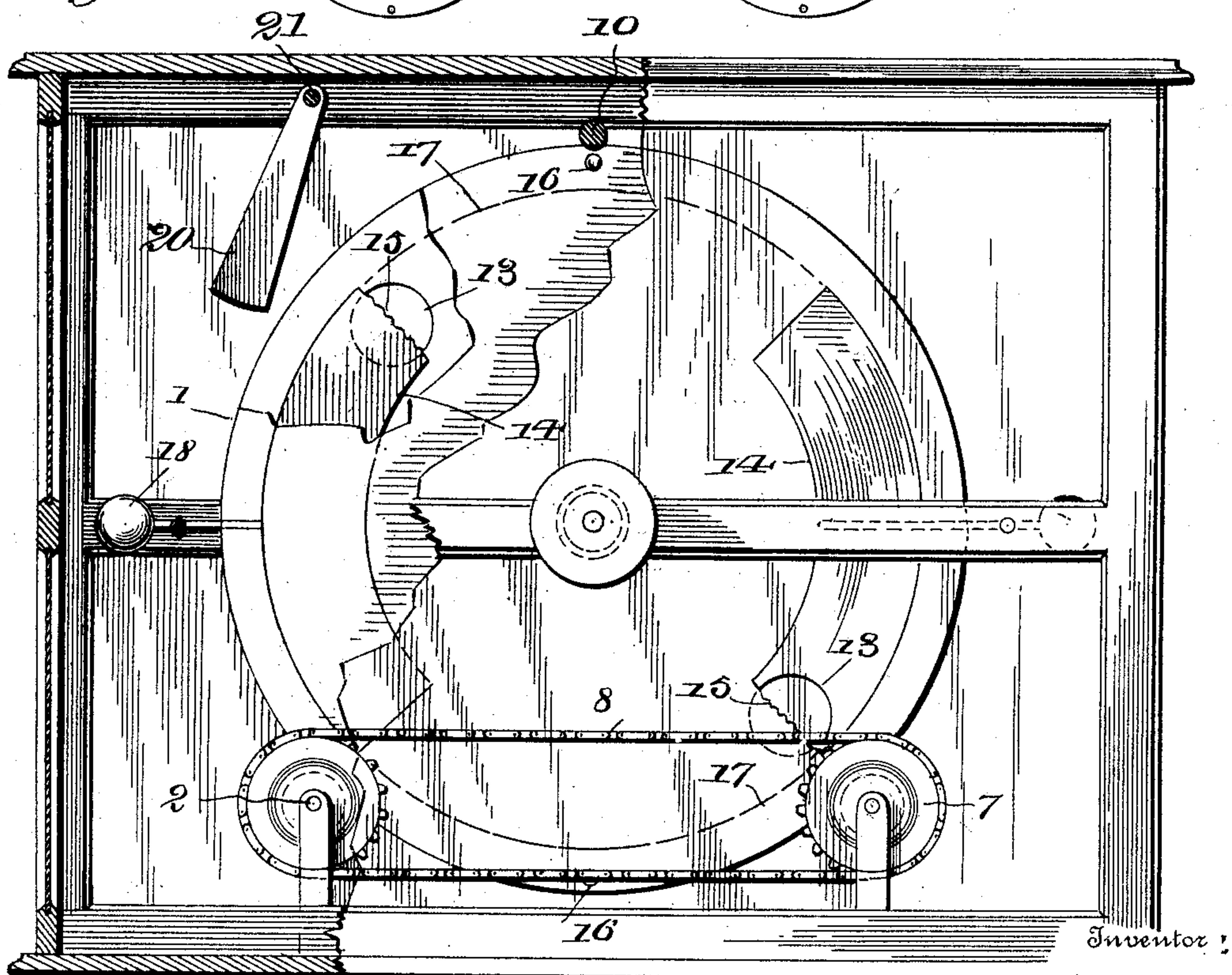


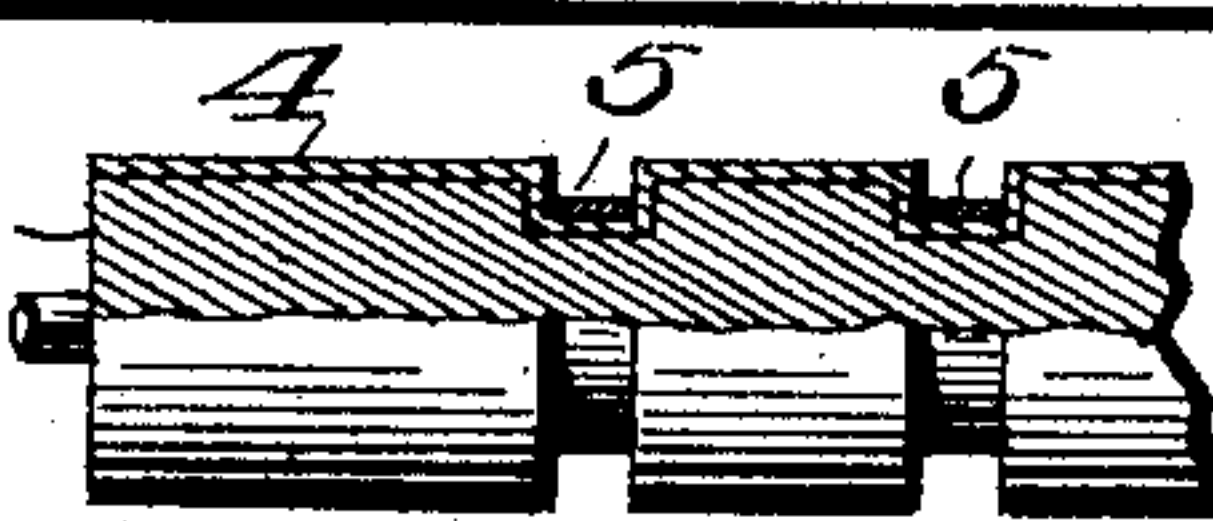
Fig. 4.



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Fig. 7.



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# UNITED STATES PATENT OFFICE.

GEORGE F. MARTIN, OF CORYDON, INDIANA.

## ELECTRICAL MACHINE.

SPECIFICATION forming part of Letters Patent No. 620,473, dated February 28, 1899.

Application filed July 18, 1898. Serial No. 686,283. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE F. MARTIN, a citizen of the United States, residing at Corydon, in the county of Harrison and State of Indiana, have invented certain new and useful Improvements in Static Electric Generators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to electrical machines, the same being designed as an improvement upon the well-known Holtz machine, the object of the invention being to simplify the construction of the present Holtz machine, to provide means whereby the pressure within the machine may be controlled, and means whereby the initial charge may be readily and conveniently applied.

The invention consists in mounting the stationary armature-plates upon two parallel intergeared shafts having sleeves of rubber or other insulating material thereon formed with grooves in which said plates fit, an insulated guide adjacent to the upper edges of said plates provided with grooves in which the plates fit, and means for turning said shafts simultaneously.

The invention also consists of a polarizer constructed of two thin strips of wood or other like material suitably secured together with an interposed strip of tin-foil and coated upon their outer surfaces with shellac, the same being pivotally mounted upon a metallic rod or shaft in electrical connection with a small machine or generator and adapted to be moved upon its pivotal connection with said shaft between the two movable plates for the purpose of initially charging the machine.

The invention also consists in other details of construction and combinations of parts, which will be hereinafter more fully described and claimed.

In the drawings forming a part of this specification, Figure 1 represents a perspective view of an electrical machine embodying my improvements. Fig. 2 is a top plan view of one of the same. Fig. 3 is an end view. Fig. 4 is a side elevation. Fig. 5 is a view of the two disks from which the armature-plate is

made, and Fig. 6 is a detail view of the polarizer.

Like reference-numerals indicate like parts in the different views.

The operative parts of my machine are preferably located within a suitable air-tight frame or casing, substantially as shown and described in the patent to Waite, No. 497,226, dated May 9, 1893, but forming no part of the present invention the same will not be specifically described. The stationary armature-plates 1 are arranged in pairs parallel to each other, being supported at their lower edges upon parallel shafts 2 3, each being provided with a sleeve or covering 4 of hard rubber or other suitable non-conducting material having grooves 5 5 therein, in which the edges of said plates fit. The said grooves have bands of soft rubber in them to prevent the plates cutting the sleeve. One of the shafts 2 is provided with a crank 6, and each has a sprocket-wheel 7 upon its outer end, around which passes a sprocket-chain 8. The upper end of each of the plates 1 fits and is adapted to move within a groove 9 in a guide rod or bar 10, preferably constructed of rubber or other like insulating material. Each of the armature-plates 1 is made up of two glass disks 11 and 12, the former provided with windows 13, located at diametrically opposite points and the latter carrying the paper armatures 14 14, one of the ends of each of which terminates in a series of teeth or tongues 15 15, which project through the windows 13 13 in the disk 11 and constitute the armature-collectors. The said disks are united by two small bolts or pins 16 16, extending through corresponding openings in each disk adjacent to its outer edge. The said openings lie at an angle of forty-five degrees to the end of the adjacent armatures or windows. The armatures and the contiguous faces of said disks are coated with shellac before assembling. Between the plates 1 1 are located the rotatably-mounted motor plates or disks 17 17, of the usual form of construction and operated in the usual manner. The pole-collectors 18 are located between the plates 17 17, being designed for the purpose of collecting the electricity generated. The said collectors are preferably located in a horizontal plane, the same entering the machine at diametrically opposite points. These



collectors are adjustably mounted in any suitable manner and carry the electrodes 19 19, both being of any well-known construction.

By turning the crank 6 the shafts 2 3, which  
5 are geared together, will be moved in unison and turn the armature-plates 1 in one direction or the other, so as to change the angle between the armature-collectors and the pole-collectors. In this way the internal pressure  
10 within the machine is under the complete control of the operator. The usual method of controlling this pressure in machines of this class is by changing the distance between the poles of the machine. By my arrangement  
15 the resistance at the poles may be zero and the machine may be run at full pressure.

In connection with the parts above described I employ a polarizer, (indicated by the numeral 20 and designed for the purpose of  
20 initially charging the armatures of the armature-plates,) the same being constructed of two strips of wood glued together and having an interposed strip of tin-foil between them, with the outer surface of the wooden strips  
25 covered with a coating of varnish or shellac. The said polarizer is pivotally mounted upon a transverse shaft 21, which is in electrical connection with a small machine or generator, (not shown,) the said shaft being so located  
30 that the polarizer may be moved upon its pivotal connection therewith, so as to lie in a position between the movable plates 17 when it is desired to charge the machine and removed therefrom when the initial charge has  
35 been applied.

In the preceding description but one set of armature and motor plates and the parts connected to and coacting therewith has been referred to. These parts constitute one element  
40 only of the machine. Any number of these elements, however, may be employed, and a plurality of them is intended to be employed in the construction of machines for use and sale. The addition of elements after  
45 the first is accomplished by making the shafts 2 3 and the insulating-covering 4 thereon longer, increasing the number of grooves 5 in said covering, and locating the armature-plates in said grooves, with the motor-plates  
50 between them, but one additional armature-plate being required for each additional element and that located with its back toward the outside of the casing. Two additional pole-collectors will be required for each added  
55 element, and but one polarizer will be required for the whole machine.

The construction described herein will be found to be the simplest possible arrangement under which all the known laws of static induction for the generation of high-voltage  
60 electricity may be utilized.

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

1. In an electrical machine of the character  
65 described, a stationary armature-plate and a movable motor-plate, and means for adjusting the armature-plate.

2. In an electrical machine of the character  
70 described, a stationary armature-plate provided with windows, armatures, and armature-collectors projecting through said windows, a movable plate, pole-collectors, and means for adjusting the armature-plate  
75 whereby the angle between the armature-collectors and pole-collectors may be regulated and the pressure within the machine thereby controlled.

3. In an electrical machine of the character  
80 described, the combination with the stationary armature-plate and the movable motor-plate, of supports for the armature-plate consisting of parallel shafts intergeared together, and means for turning said shaft.

4. In an electrical machine of the character  
85 described, the combination with the stationary armature-plates and the movable motor-plates, of supports for the armature-plates whereby the same may be adjusted, consisting of a pair of intergeared shafts, means for  
90 rotating the same in unison, and a sleeve of insulating material upon each of said shafts provided with grooves within which the edges of said armature-plates fit, and a grooved insulating guide-piece for the upper edges of  
95 said armature-plates.

5. In an electrical machine of the character  
described, the combination with the stationary armature-plates and the movable motor-plates, of a pivotally-mounted polarizer constructed of two strips of wood glued together,  
100 with an interposed strip of tin-foil, the outer surfaces of said wooden strips being coated with varnish or shellac, the said polarizer being adapted to be moved into and out of relation with said plates.  
105

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

GEORGE F. MARTIN.

Witnesses:

GEO. C. IRWIN,  
J. E. MCCLUREN.