

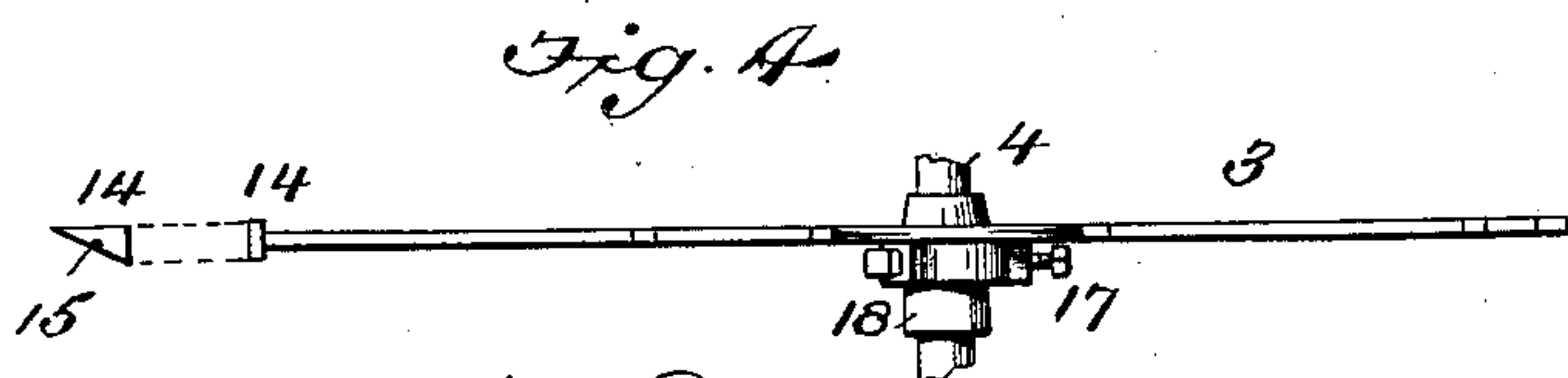
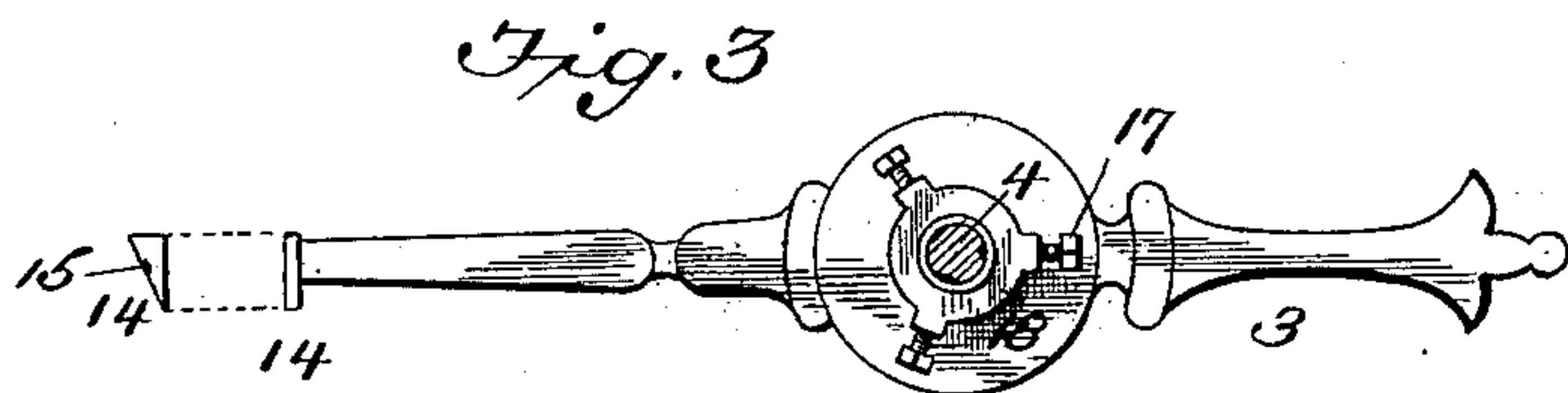
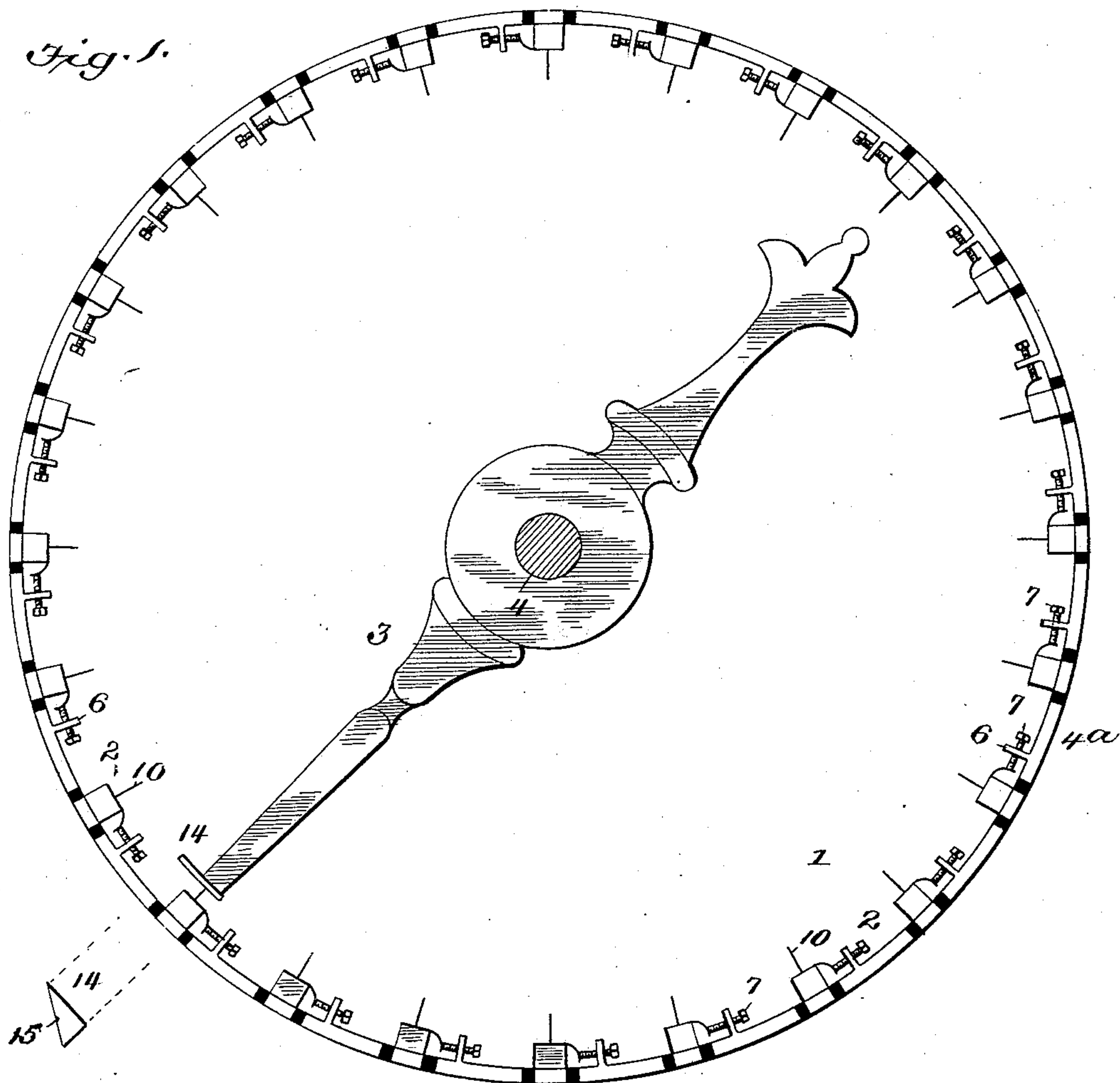
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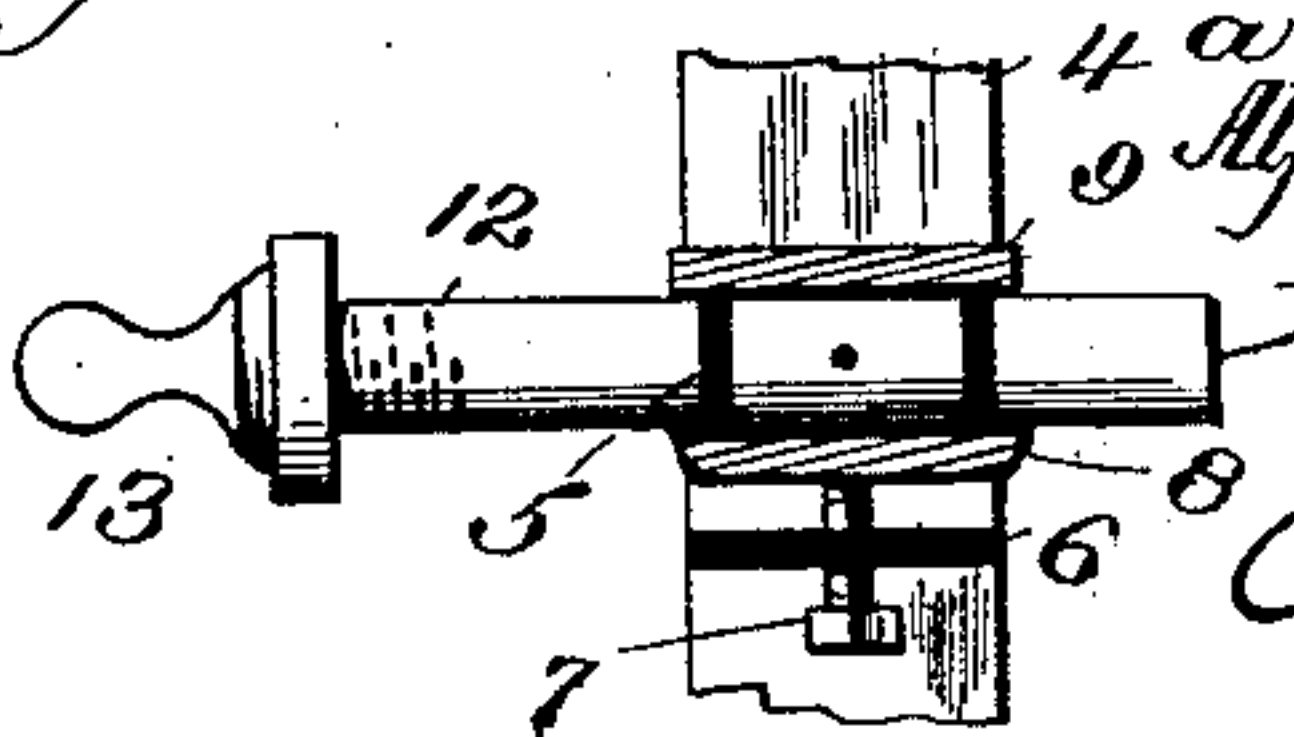
A. A. CARDOSO E BASTOS.  
ELECTRIC PROGRAM CLOCK.

No. 560,076.

Patented May 12, 1896.



*Fig. 2*



Witnesses

*John L. ...*  
*Alfred ...*

Inventor

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By *James L. Norris.*

Attorney

(No Model.)

3 Sheets—Sheet 2.

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Fig. 5.

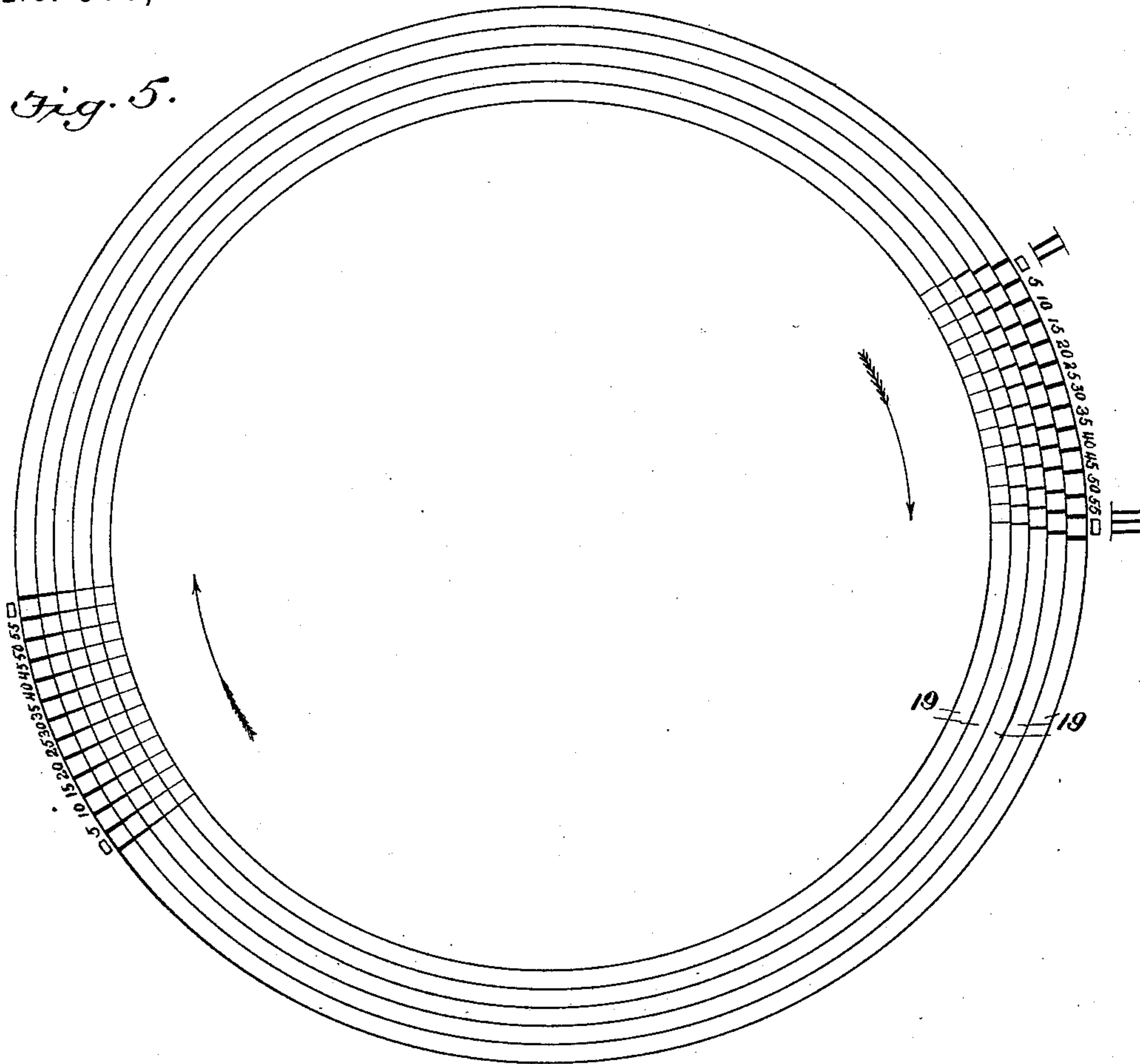


Fig. 6.

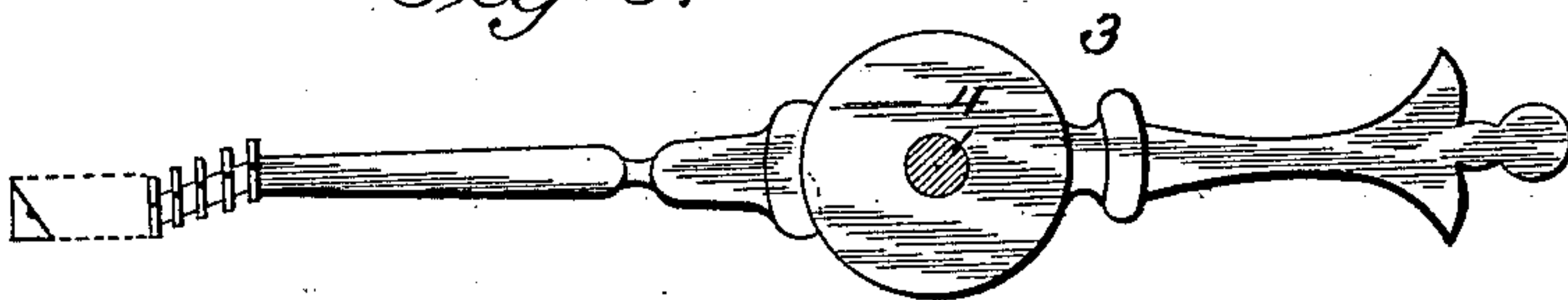


Fig. 7.

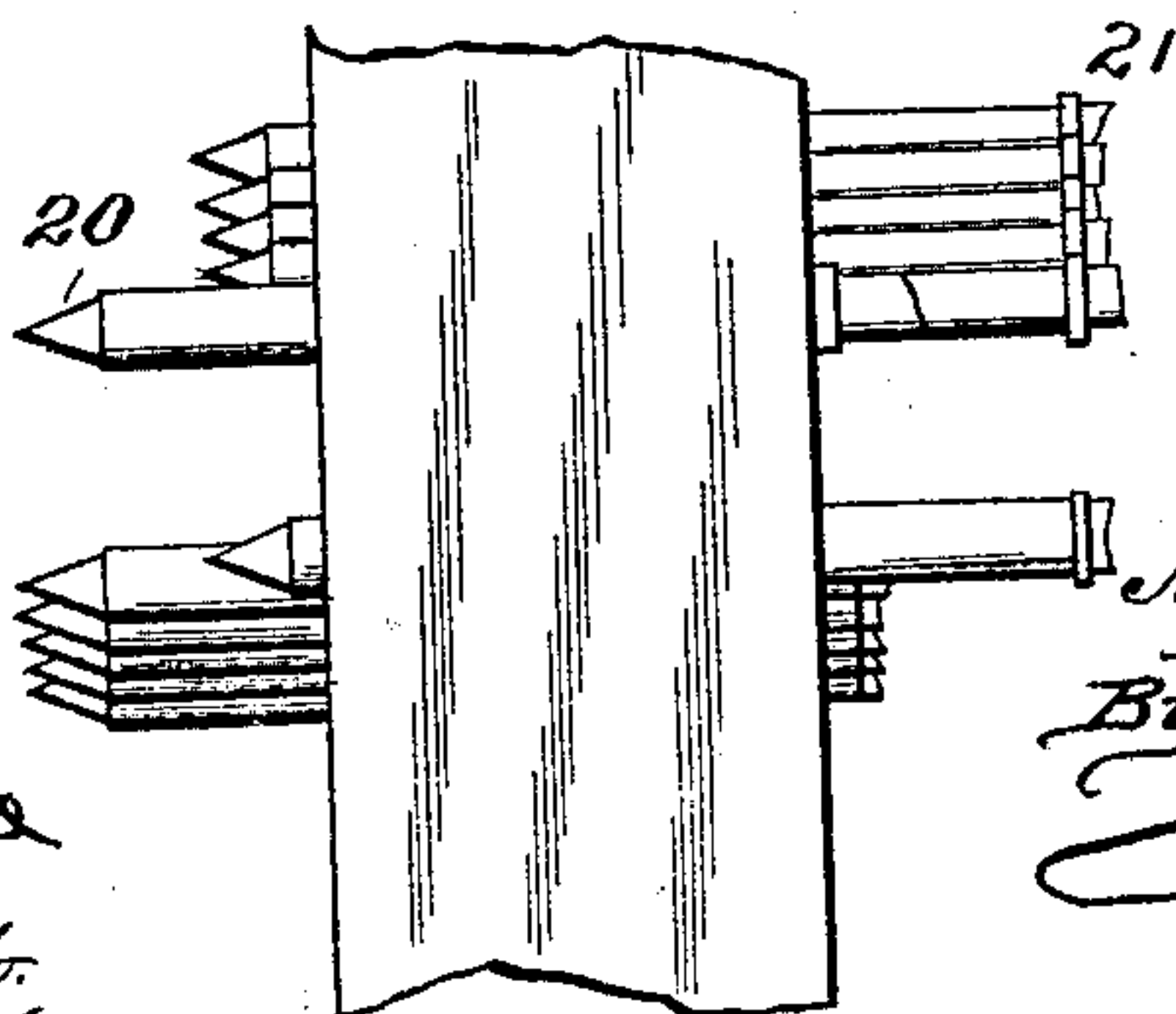
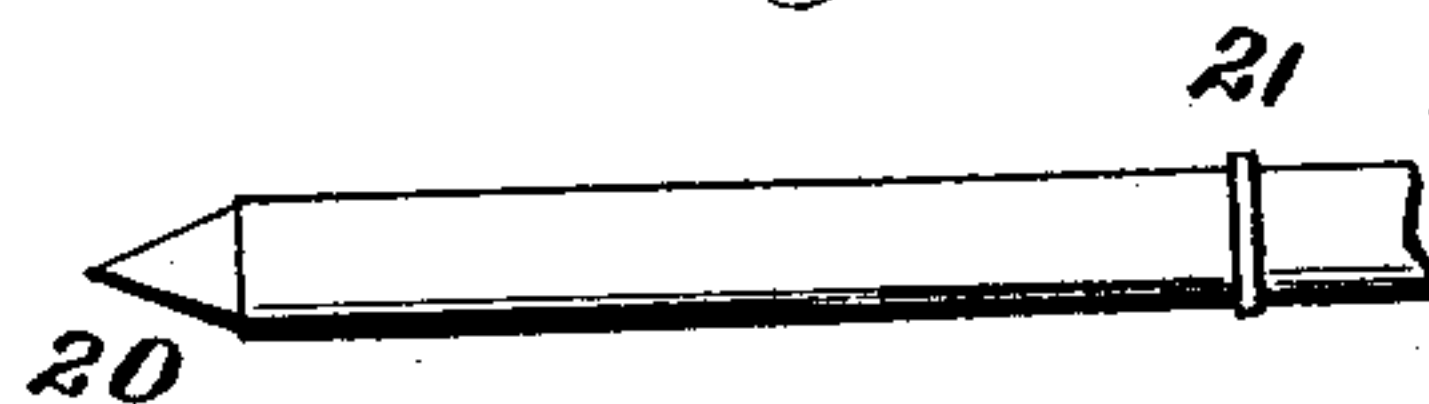


Fig. 8.



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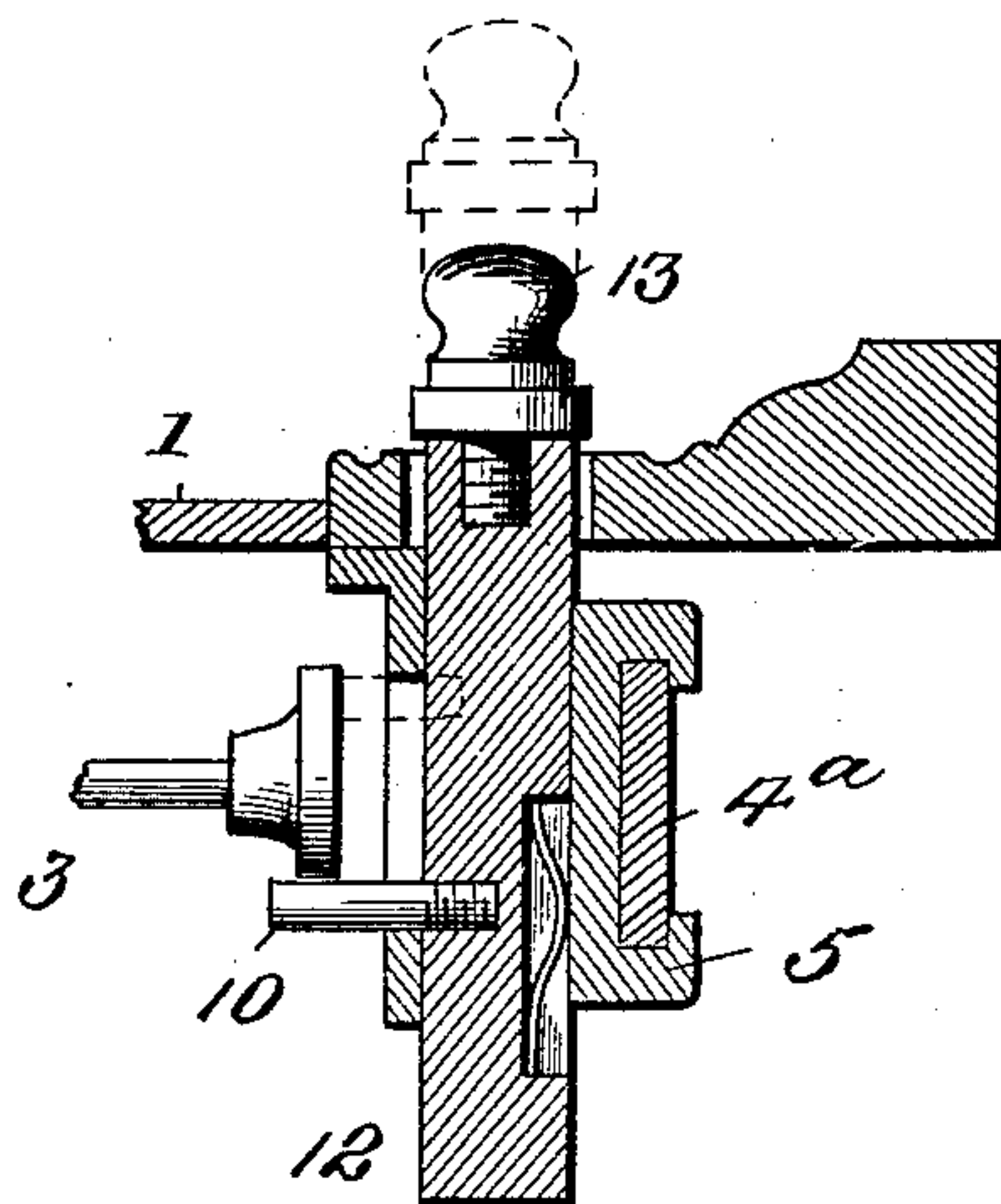
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A. A. CARDOSO E BASTOS.  
ELECTRIC PROGRAM CLOCK.

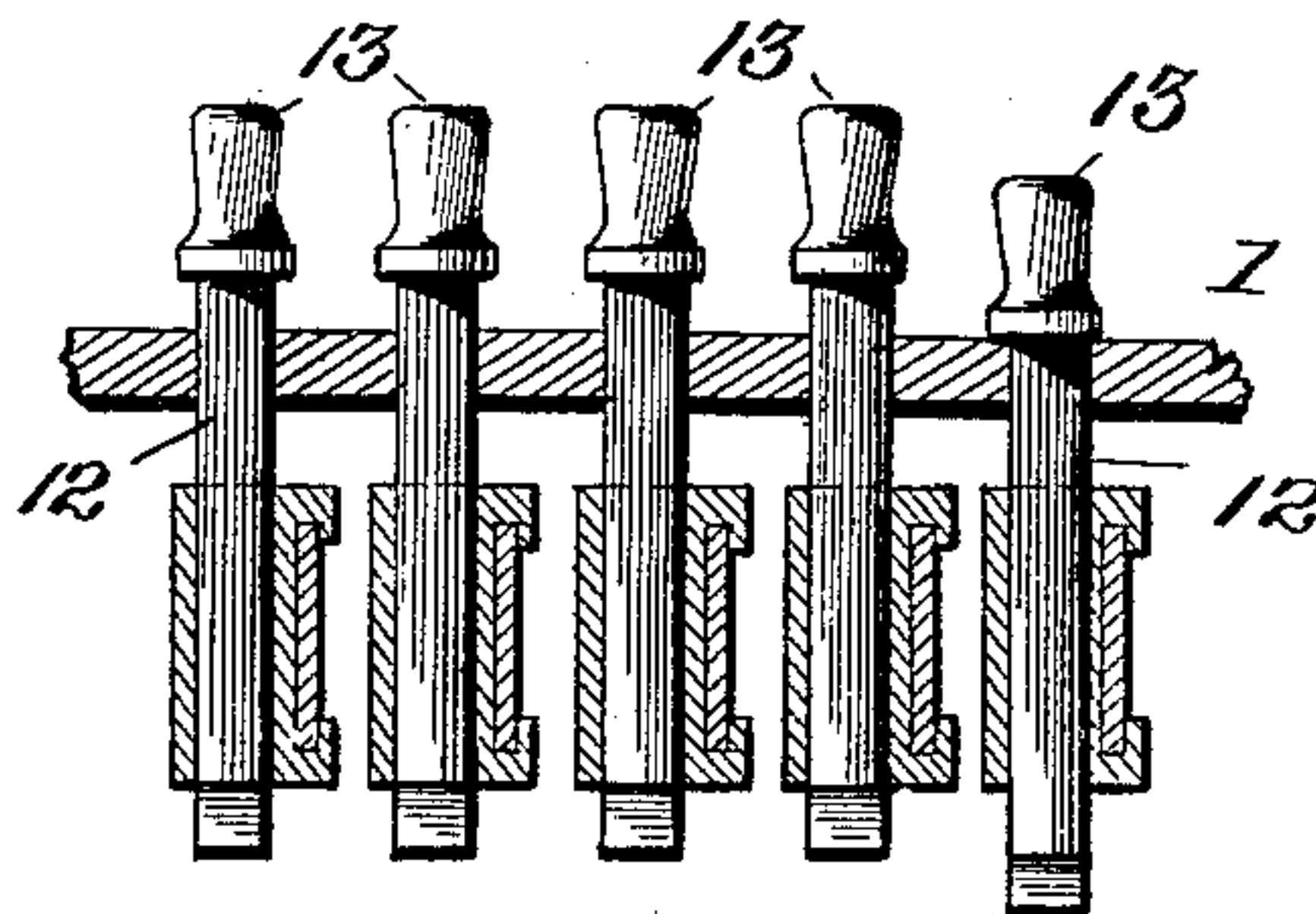
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*Fig. 9.*



*Fig. 10.*



Witnesses

*John J. Smith*  
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Attorney



# UNITED STATES PATENT OFFICE.

ALFREDO ANTONIO CARDOSO E BASTOS, OF SÃO PAULO, BRAZIL.

## ELECTRIC PROGRAM-CLOCK.

SPECIFICATION forming part of Letters Patent No. 560,076, dated May 12, 1896.

Application filed March 20, 1894. Serial No. 504,428. (No model.) Patented in Brazil November 25, 1893, No. 1,664.

*To all whom it may concern:*

Be it known that I, ALFREDO ANTONIO CARDOSO E BASTOS, bookkeeper, a subject of the King of Portugal, and a resident of São Paulo, in the State of São Paulo, Republic of Brazil, have invented certain new and useful Improvements in Electric Program-Clocks, (for which I have obtained Letters Patent in Brazil, dated November 25, 1893, No. 1,664,) of which the following is a specification.

My invention relates to apparatus for electrically and automatically controlling the mechanism of a clock, and the purpose thereof is to provide an apparatus capable of use either as a part of an individual clock or as a separate controlling mechanism capable of acting upon one or more clocks at various distances, the specific function of the controlling apparatus being to enable the clock, or any one or more of the clocks included in the system, to sound an alarm or to be otherwise governed in a manner predetermined by the adjustment of the controlling apparatus.

My invention consists, therefore, in the novel construction of parts, in the several combinations thereof, and in the various features of invention hereinafter fully explained, and then particularly pointed out and defined in the claim which concludes this specification.

To enable others skilled in the art to which my said invention pertains to make, construct, and use the same with a clear understanding thereof, I will now describe said invention in detail, reference being had for this purpose to the accompanying drawings, in which—

Figure 1 is a face view of the controlling-dial and its adjuncts. Fig. 2 is a detail view showing part of the flange of the dial and one of the insulated contacts. Fig. 3 is a view of the hand removed from the dial and inverted. Fig. 4 is a side elevation of the hand and part of its supporting-shaft. Fig. 5 is a plan or face view of a modified form of dial for a multiple-signal-controlling mechanism. Fig. 6 is a detail view of the hand used with the dial shown in Fig. 5. Fig. 7 is a view showing a group of the adjustable contacts carried by the dial shown in Fig. 5. Fig. 8 is a detail view of one of the contacts shown in Fig. 7. Fig. 9 is a detail sectional view of one of the contacts, illustrating the triangular contact

carried by the hand in contact therewith; and Fig. 10 is a sectional view taken through one edge of the dial shown in Fig. 5.

Referring more particularly to Fig. 1 of the accompanying drawings, which represents an individual controlling mechanism adapted to a single clock, but capable of being extended to a series, the reference-numeral 1 in said figure indicates a setting-dial, which in many respects resembles the hour-dial of an ordinary timepiece. It is divided into twenty-four equal parts or divisions, each denoted by the reference-numeral 2, and is provided with a single hand 3, which is mounted upon a central arbor 4, forming part of the hour-wheel, which turns upon the shaft of the minute-wheel of an ordinary clock-movement.

Upon the circumference of the dial 1 and insulated therefrom in any suitable manner is a flange 4<sup>a</sup>, and upon this flange upon the side adjacent to the center of the dial are mounted a number of rectangular pieces 5, corresponding to the number of divisions upon the face of the dial. These superposed pieces are hollowed out interiorly to form each a species of tube and are attached to or mounted upon the dial. Upon one side of each of the said tubular attachments 5 is a rigid block 6, through which is tapped a screw 7, by which the tubular piece 5 is held between two shoulders 8 and 9, as shown in Fig. 2, and a limited adjustment permitted toward and from the block 6. The tubular piece is provided upon the side adjacent to the center of the dial with a small opening, through which projects a wire 10, forming part of a contact 12, which is introduced within the tubular piece 5, the series of wires 10 converging toward the center of the dial. The several contacts 12 are each provided with a binding-screw 13, tapped into the end and capable of securing the several individual wires leading to one pole of an electric battery of any preferred type, which may be concealed in the clock-casing or arranged at any exterior point preferred. The wire forming the electric connection with the opposite pole of the battery is usually connected to the shaft of the hand revolving over the face of the dial, though it may be connected to other parts of the clock-movement.

The hand 3 is of any suitable conducting



material and is provided upon the extremity of its longer end with a triangular contact-piece 14, the two legs of the triangle being the longer parallel with and the shorter perpendicular to the face of the dial. The hypotenuse of said triangle is turned downward, and as said hand revolves it is swept slowly over the series of short projecting wires 10. Being inclined relatively to the face of the disk it will engage the wires as soon as its acute angle has passed slightly beyond the same and will bear more closely upon each as its movement continues. In order that the alarm may be accurately sounded, the engaging face of the hypotenuse is insulated in any suitable manner save at the central point 15, which lies in the radius coinciding with the central line of the hand 3, and when this point is touched by anyone of the wires 10 the circuit of the battery is closed and an alarm is sounded upon a gong of any preferred type. This gong may be arranged within the clock or at any one or more points remote from the clock. The screws 7 serve also as regulators, and by their adjustments the sounding of the alarm may be rendered exact to the moment and second indicated by the clock-movement. The hand 3 is fastened upon the arbor of the hour-wheel by means of screws 17, tapped through its hub 18, as shown in the detail view, Figs. 3 and 4, so that it can be readily set to make the alarm connection at any desired time.

As it may in some cases be desirable to provide means whereby an alarm or signal may be given at each consecutive minute of the twelve hours denoted by the clock-dial, or at any one of the seven hundred and twenty minutes comprised in the twelve hours, I provide the modified form of apparatus shown in Fig. 5. This consists of a dial which resembles that shown in Fig. 1, save that it is provided with five concentric circles 19, arranged as near its margin as may conveniently be, each being provided with one hundred and forty-four tubular pieces 5, similar to those shown in Fig. 1, either with or without the regulating-screws 7. In order to prevent any accidental concurrence between the signals operated by the contacts 12, which are arranged within these tubular pieces, the latter are arranged in stepped lines drawn from the margin inward, but concentric to the center of the dial 1, and the contact-pieces 14 on the hand 2 are correspondingly arranged, as seen in Fig. 6. I prefer also in this case to provide the contact-pieces 12 with cuneiform terminals 20, which stand upon the outer extremities in position to engage the traveling contacts on the hand 2, by which they will be pushed inward as the contacts pass over them,

as seen in Fig. 7, thereby giving the alarm by the engagement of the conducting-contacts 15 of the triangular contacts with cuneiform terminals, and at the same time pushing the contacts out of place, so that they cannot be a second time engaged without a new adjustment. This adjustment of the contacts will be limited and confined to the proper point of projection by means of projections or ribs 21, formed upon the bodies of the said contacts, as shown in Fig. 8, whereby their outward projection will be arrested. If desired, these contacts may be thrown outward into position to engage the traveling contacts 14 by means of light springs, which will yield to the pressure exerted by the triangular contacts on the hand 2.

It is evident that by the means described I may operate any number of individual alarms or signals, or alarms from a single clock-movement, without regard to the position of said signals, and I may in the same manner control the action of a series of clocks placed at different points by a single central controlling mechanism without material change.

What I claim is—

In an electric-signal-clock movement, the combination of a dial having equal divisions, a series of adjustable contacts projecting through the outer edge of said dial and arranged to correspond with said divisions, each of said contacts consisting of a push-pin projecting through an aperture in said dial and fitted and longitudinally movable in a support adjustably arranged upon a flange supported beneath and insulated from the dial, a wire projecting inwardly from said push-pin through an elongated slot in said flange, a spring carried by said push-pin and bearing against said support for holding said pin in its adjusted position, a hand adjustably mounted on the arbor of the hour-hand of the clock-movement, and a triangular contact carried by the outer end of said hand, the inclined face of which operates to successively engage the projecting contacts that have been projected into the path of the hand and complete the circuit, and after having completed the circuit force the push-pins inward to throw the projecting contacts out of the path of the hand, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 20th day of December, 1893.

ALFREDO ANTONIO CARDOSO E BASTOS.

Witnesses:

JULES GERAUD,  
CARLOS JORGE BAILLY.