Nov. 18, 1924. 1,515,696

L. PIGNANI ET AL

POWER CONTROLLER

Filed Sept. 10, 1923 3 Sheets-Sheet 1

Fig. 1.

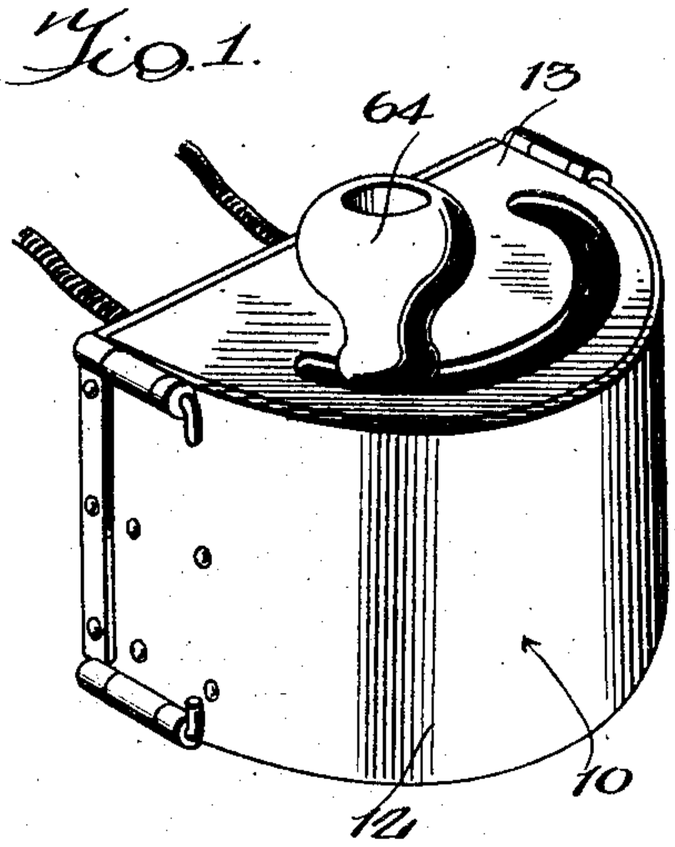
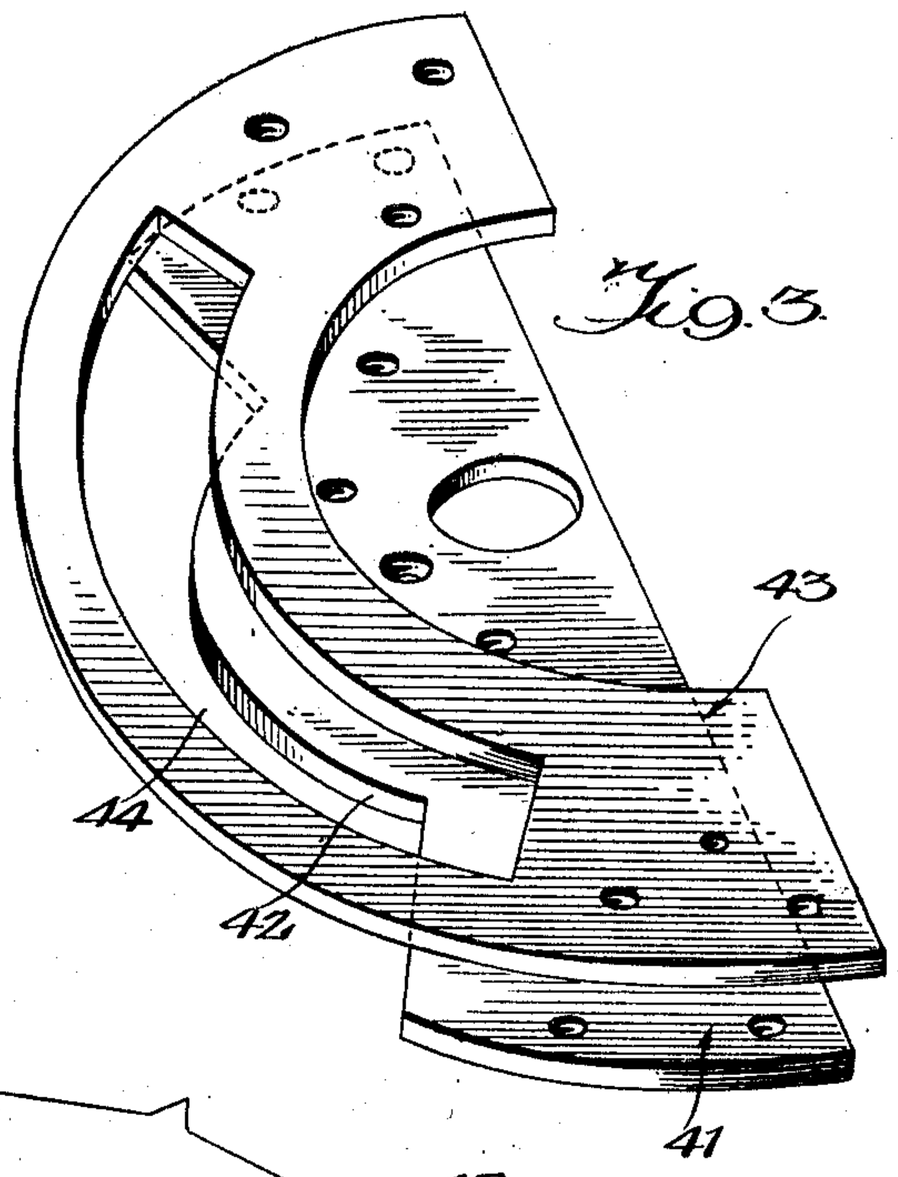


Fig. 3.



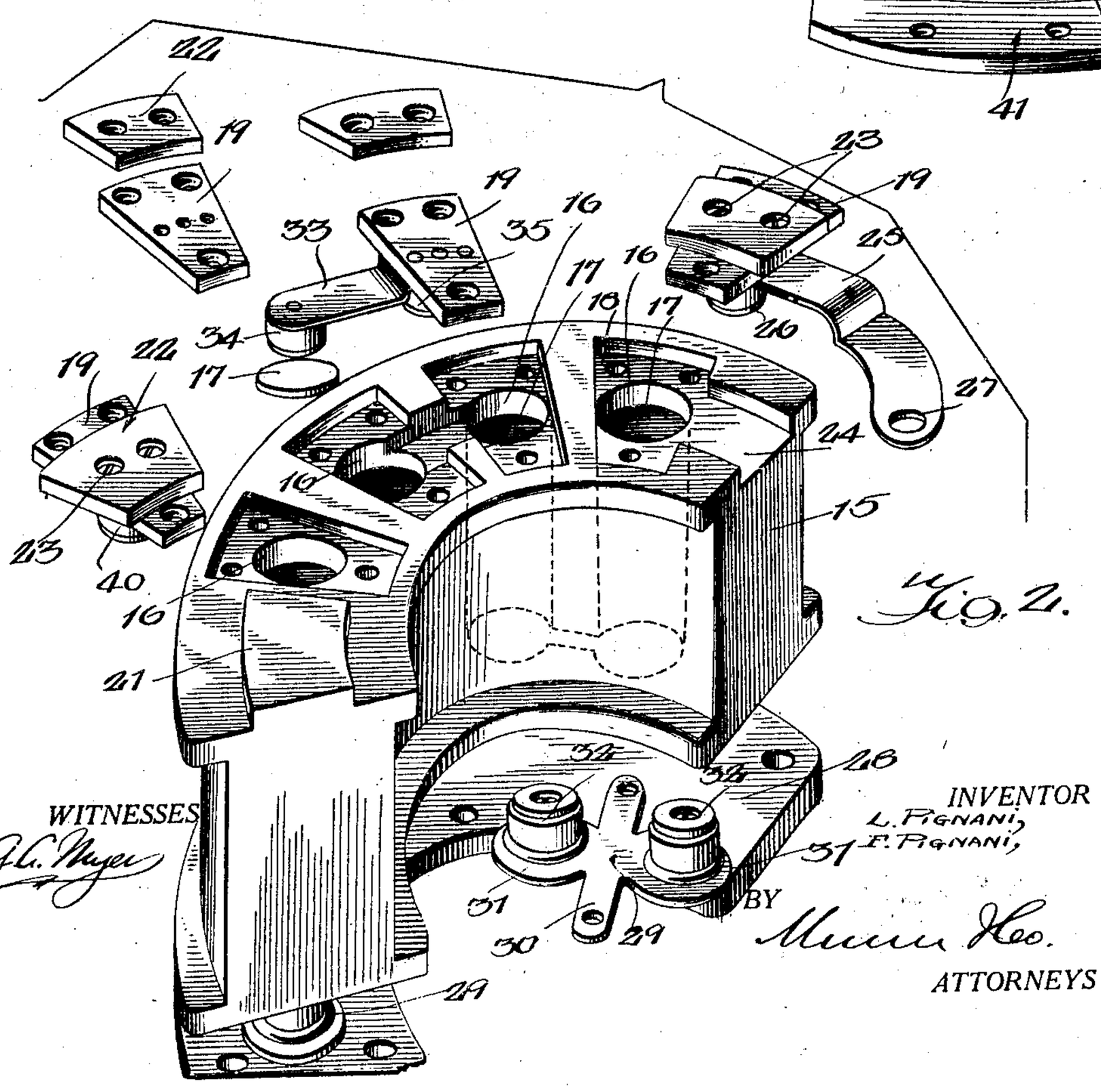


Fig. 2.

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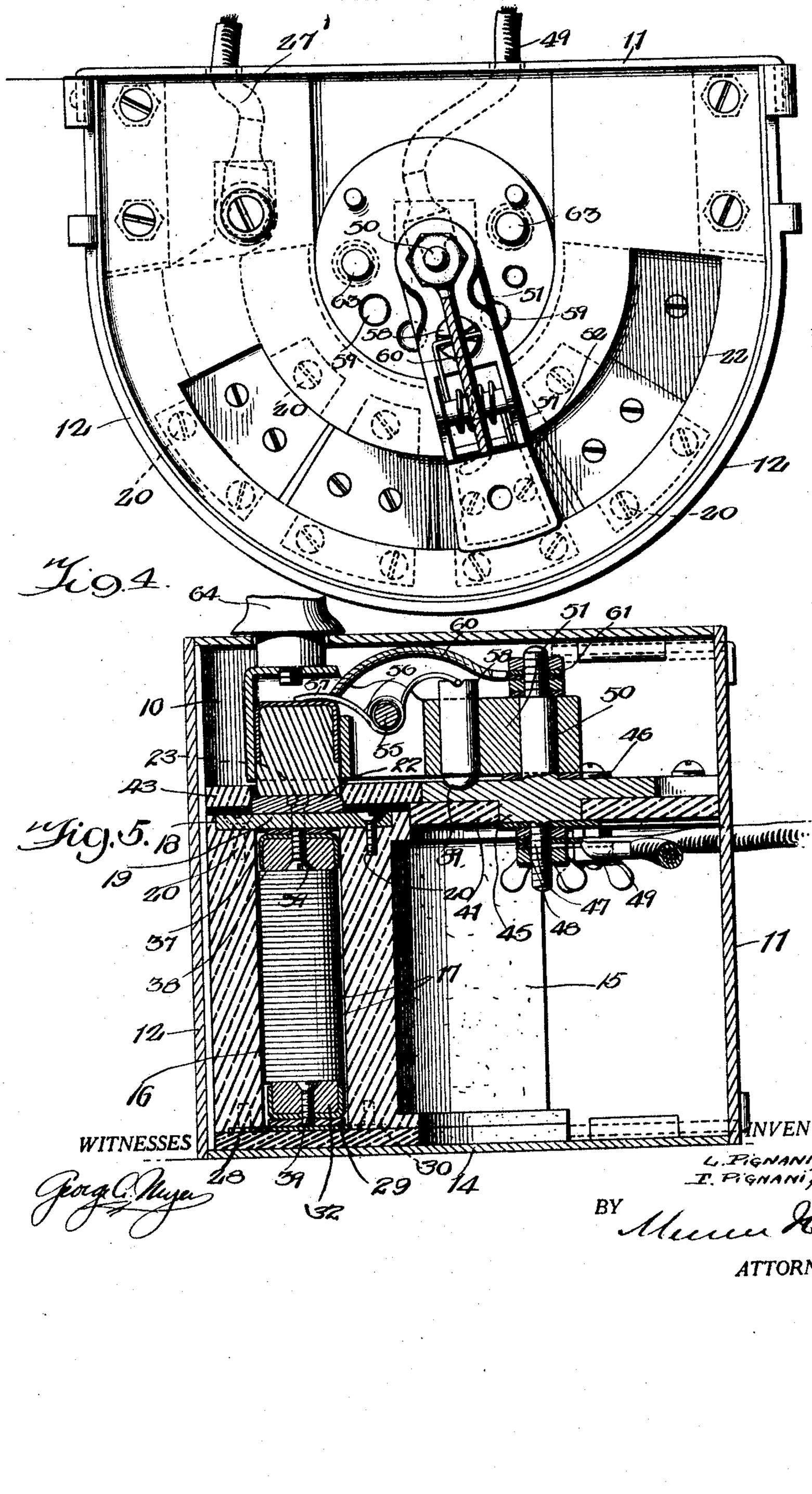

Fig. 4.

Fig. 5.

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POWER CONTROLLER

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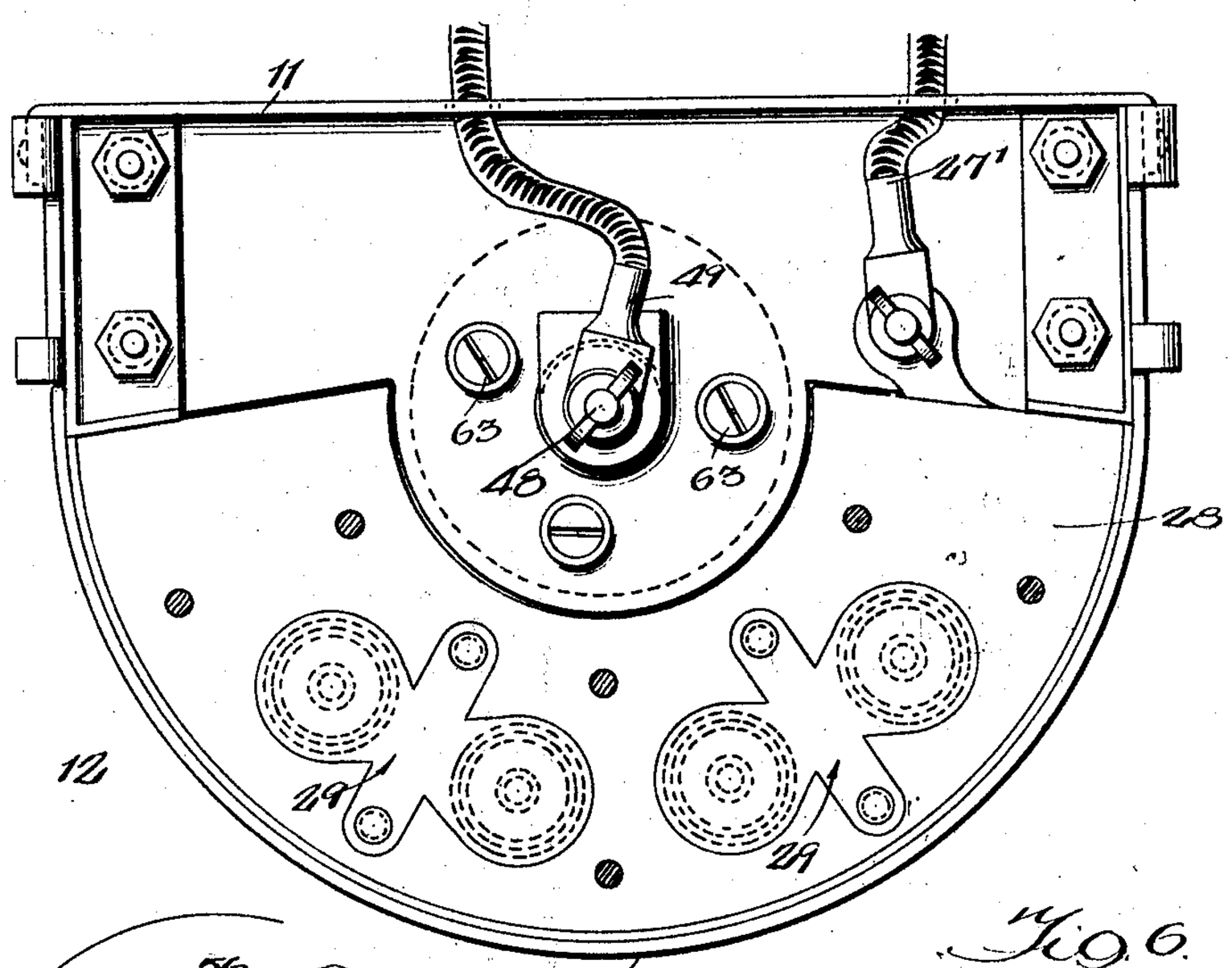

Fig. 6.

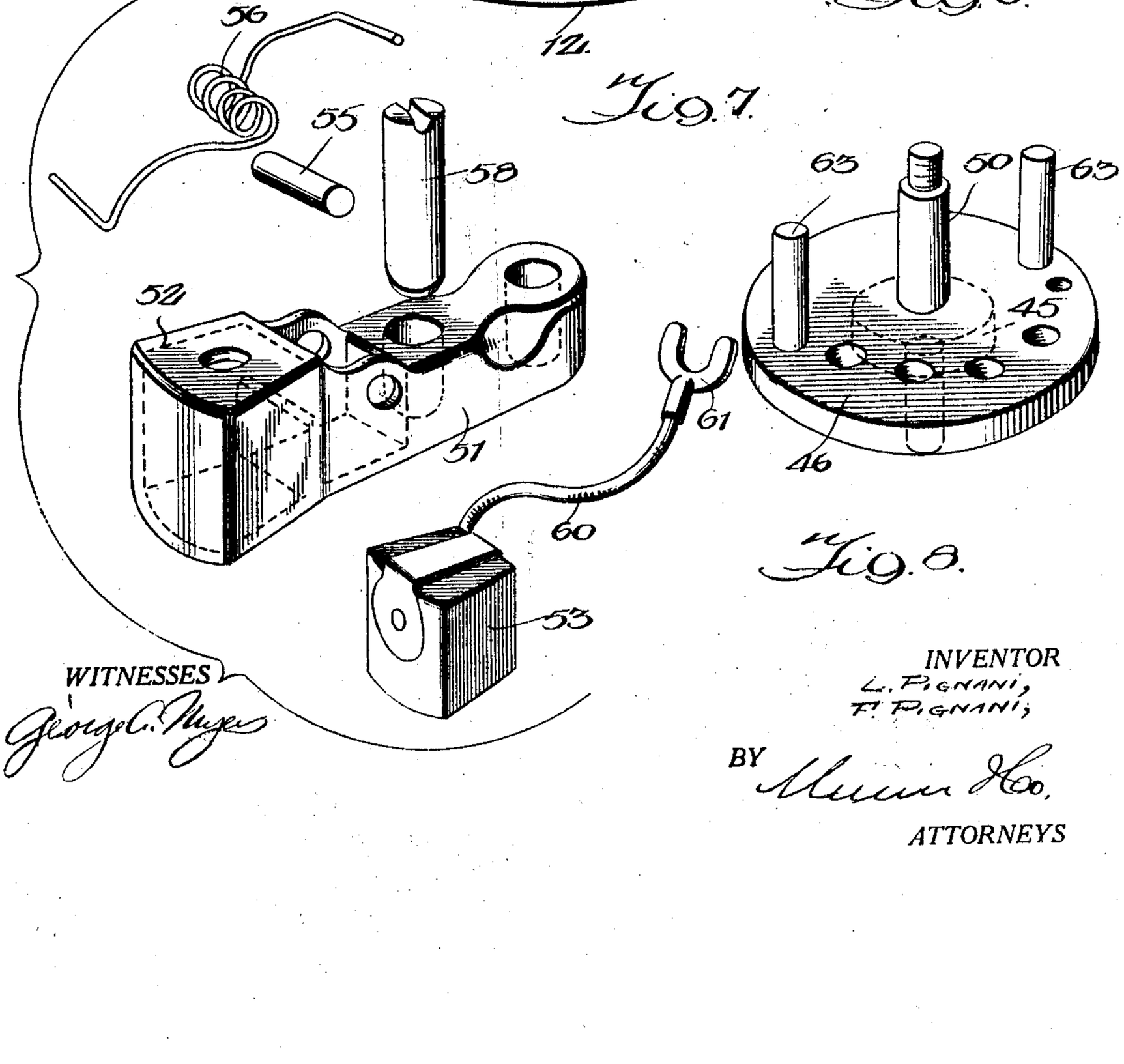

Fig. 7.

Fig. 8.

WITNESSES

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Patented Nov. 18, 1924. 1,515,696

UNITED STATES PATENT OFFICE.

LAWRENCE PIGNANI AND FRANK PIGNANI, OF BLAIRSVILLE, PENNSYLVANIA.

POWER CONTROLLER.

Application filed September 10, 1923. Serial No. 661,976.

To all whom it may concern:

Be it known that we, LAWRENCE PIGNANI and FRANK PIGNANI, citizens of the United States, and residents of Blairsville, in the county of Indiana and State of Pennsylvania, have invented certain new and useful Improvements in Power Controllers, of which the following is a specification.

This invention relates to improvements in controllers for electric motors or the like.

The object of the invention is to provide an improved supporting means for the contact lugs and resistances employed in connection with the construction of controllers.

It is also an object of the invention that the supporting means for the resistances together with the contact lugs therefor can easily be disassembled with the view of substituting new parts when required.

It is also within the scope of the objects of the invention that the device be exceedingly simple in construction and durable.

Other objects and objects relating to details of construction, combination and arrangement of parts will hereinafter appear in the detailed description to follow.

The invention is illustrated by way of example in the accompanying drawings, in which,

Figure 1 is perspective view of the controller constructed in accordance with the present invention.

Figure 2 is a group view illustrating the form of contact lugs employed together with the supporting means therefor and the resistances carried by said supporting means.

Figure 3 is a group view showing a pair of insulator plates employed in connection with the construction of the present controller.

Figure 4 is a top plan view of the controller when fully assembled and with the top or cover of the controller casing removed.

Figure 5 is a vertical transverse sectional view through the controller.

Figure 6 is a bottom plan view of the controller when fully assembled.

Figure 7 is a group view illustrating the different elements employed in connection with the contact making arm of the contoller.

Figure 8 is a perspective view showing in detail the pivot plate or member for the contact making arm of the controller.

Referring to the drawings more particularly there may be provided for the device a housing or casing generally designated by the reference character 10, said housing or casing being preferably semi-cylindrical in shape and including a rear wall 11, an arcuate shaped wall 12 having its ends integrally connected to the ends of the rear wall 11, a removable top or cover 13 and a removable bottom 14.

Within the housing 10 there is positioned a block generally designated by the reference numeral 15, said block being made of insulating material preferably asbestos. This block is arcuate in shape and adapted to be fitted within the casing 10. The block is provided with a plurality of transversely extending openings 16, said openings being shown as four in number and within each opening there is positioned a multiplicity of super-imposed carbon discs 17. The upper end of each opening 16 is in register with a depression 18, said depression being of the shape shown and adapted to receive a contact lug 19. These contact lugs are held in position by the means of screws threaded therethrough and extending into the block 15 as at 20 (Figure 5).

Adjacent one end of the block upon its top surface there is formed a protrusion 21 which is similar in shape to an ordinary contact plate. Also upon each of the lugs 19 there is secured a contact plate 22, said plate 22 in each instance being secured in position by means of screws or the like 23 and said screws being countersunk for a purpose which will later become apparent.

The depression 18 occurring at one end of the block 15 communicates with a groove 24, said groove being adapted to receive a conductor strip 25, said strip having its one end electrically connected to the associated contact lug 19 and carrying a contact button 26 which is adapted to extend into the opening or bore 16 occuring beneath the associated contact lug 19. The strip 25 is formed at its free end with an opening 27 through which a bolt may be extended for clamping this strip to a suitable conductor cable or wire 27′ (Figures 4 and 6).

Upon the bottom face of the block 15 there is bolted or otherwise secured a plate of insulating material 28, said plate being preferably of asbestos in compressed form and corresponding in shape to the lower face of the

block 15. The plate 28 supports a pair of connecting elements or members 29, each member comprising a cross arm 30 with a pair of plate extensions 31 and each plate extension carrying upon its upper face a contact button 32. The contact buttons 32 of each member 29 may be extended into a pair of adjacent openings 16 and preferably the lower face of the block 15 is recessed so that each member 29 may have its lower face flush with the bottom face of the block 15. The two members 29 are best shown in Figure 6. The members 29 may be secured in position by extending suitable screws through the ends of the bar 30 and further extending said screws into the block 15. By the connector members 29 the two contact lugs 19 occurring adjacent each end of the block 15 are electrically connected and in order to electrically connect the two center contact lugs 19 one of these lugs is provided with a lateral extension 33 which carries at its free end a contact button 34 adapted to extend into the opening or bore 16 for the remaining contact lug 19. This contact button 34 will, of course, contact with the carbon disc within the associated opening 16.

The contact lug 19 carrying the extension 33 is also provided with a contact button 35 which may extend into the associated bore or opening 16 and also engage with the carbon disc in said opening. The contact buttons 26, 32, 34 and 35 are of the same construction and each comprises a cup-shaped member 37 in which there is carried a carbon plug 38 and through this carbon plug and the bottom of the cup member 37 there is extended a screw 39 which is threaded into the bottom of the associated contact lug 19. Also the contact lug 19 occurring adjacent the insulating contact member 21 carries a contact button 40 and this in turn is adapted to establish electrical connection with the stack of carbon discs therebeneath and occurring in the associated opening or bore 16.

An arcuate shaped plate 41 is provided, as best shown in Figure 3, and which is formed with a recess 42. This plate is adapted to be positioned within the portion of casing 10 not occupied by the block 15. The recess 42 of the member 41 is adapted to fit upon the inner side of the block 15. Any suitable supporting means may be provided for the member 41.

Upon the member 41 there is fitted or positioned a second plate 43 which is likewise of insulating material, preferably of asbestos, and this plate is provided with an elongated slot 44. The plate 43 rests upon the top surface of the block 15 and also upon the contact lugs 19 as best shown in Figure 5 of the drawing. The slot 44 of plate 43 is in registering relation with the contact plate members 22 carried by the contact lugs 19.

The plate member 41 is provided with a suitable opening adapted to receive a boss or enlargement 45 formed on the lower side or face of a circular plate member 46. This circular plate member is specifically shown in Figure 6 and has extending downwardly from its boss 45 a stud 47 which carries suitable nuts 48 whereby a terminal lug 49 may be connected with the stud 47.

The plate 46 has extending from its upper end a stud 50 upon which the one end of an arm 51 is pivotally connected. This arm carries at its outer end a socket member 52 which is adapted to receive a carbon brush 53, said carbon brush being in register and adapted to engage upon the contact plates 22. The arm 51 also supports the bolt 55 which has coiled thereabout the intermediate portion of a compression spring 56, said spring having one of its ends engaging the carbon brush 53, as at 57, and its other end engaging upon a plug 58 slidable vertically through the arm 51.

The lower end of the plug 58 is bevelled as shown and adapted to be brought to seat in different depressions 59 formed in the circular plate 46 and thereby to yieldably hold the arm 51 against swinging movement. The brush 53 may have the conductor cord 60 connected therewith and this cord may carry at its one end a suitable washer 61 which may be connected through means of lock nuts as shown with the free end of the stud 50. The plate 46 also carries a pair of diametrically disposed plugs 63 whereby to limit the swinging movement of the arm 51. Also the socket 52 carries a handle or knob 64 whereby the arm 51 may be manually moved so that this brush 53 may be brought to engage either of the contact plates 22.

In the use of the present device, the same may be electrically connected with the motor to be controlled and connected in series with the current supply for said motor. The connections should be made with the terminal lug 49 and cable or cord 27′ in such a way that when the arm 51 is moved so that its brush 53 engages upon the protrusion 21 of the block 15 the current will be discontinued through the motor. Upon bringing the arm 51 so that its brush 53 will engage with the contact plate 22 adjacent the protrusion 21 current must pass through all of the different resistances comprising the carbon discs 17 before the same enters the motor. As the motor is brought up to speed the resistances can be cut out and the controller used in the many different ways for regulating the current passing through the door. It is particularly to be pointed out that with a construction of this character the block 15 serves the principal supporting means and insulating means of both the contact plates and the resistances carried thereby and it is further important to note that with this block assembled as shown the same can

be quickly and easily removed when it is desired to substitute another block therefor, that is, in case the block 15 becomes damaged and unfit for further use.

While we have shown and described the preferred form of our invention, we wish it to be understood that we are aware of the fact that the general arrangement, combination and construction of parts might be changed by those skilled in the art without departing from the spirit of the invention as indicated by the appended claims.

We claim:

1. In a controller of the character described, a block of insulating material, a casing in which said block may be disposed, means whereby the block may be removably supported within the casing, and electrical contact elements carried by the block upon one face thereof, said elements being insulated from each other and arranged in circular formation, for the purpose described.

2. In an electrical control apparatus of the character described, an arcuate shaped block made of insulating material, and electrical contact elements arranged upon one face of the block, for the purpose described.

3. In an electrical control apparatus of the character described, an arcuate-shaped block of insulating material having its one face formed with a plurality of depressions, and a contact member seated in each of said depressions, for the purpose described.

4. In an electrical control apparatus of the character described, an arcuate-shaped block of insulating material having a plurality of depressions upon one face thereof, and a transverse bore registering with each of said depressions, a resistance disposed within each bore, and a contact plate disposed in each depression and adapted to engage with the associated resistance, and means for connecting said contact plates and resistance in series with each other.

5. In an electrical control apparatus of the character described, a block made of insulating material and of arcuate formation and having its one face formed with a plurality of depressions, a contact plate in each of said depressions and a protrusion at one end of the block adapted to serve as an insulated contact plate.

6. In a device of the character described, a block made of insulating material and of arcuate formation, said block having a plurality of depressions in one face thereof, a transverse bore registering with each depression, a plurality of carbon discs disposed in each bore, a contact plate disposed in each depression, and connecting means whereby said contact plates and carbon discs may be connected in series with each other.

7. In a device of the character described, a block made of insulating material and of arcuate formation, said block having a plurality of depressions at one face thereof, a transverse bore registering with each depression, a plurality of carbon discs disposed in each bore, a contact plate disposed in each depression and connecting means whereby said contact plates and carbon discs may be connected in series with each other, and a protrusion upon the last-named face of the block member at one end thereof adapted to form an insulated contact plate.

8. In an electrical control apparatus of the character described, a block of insulating material and of arcuate formation, said block having its one face formed with a plurality of depressions and each depression registering with a transverse bore through said block, a contact plate disposed in each depression, a bottom carried by each contact plate adapted to engage a carbon disc disposed in each of said transverse bores, and connecting elements whereby said contact plates and carbon discs may be connected in series with each other.

9. A device of the character described, a block of insulating material of arcuate formation, a casing adapted to enclose said block, a plurality of contact plates carried by one face of the block, said plates being arranged in circular formation, a plate having an elongated recess adapted to fit upon the last-named face of the block, and said recess being in register with said contact plates of the block, a pivoted handle supported within the casing, and a brush carried by said handle adapted to wipe over said contact plates carried by the block.

10. In a device of the character described, a contact device comprising a cup-shaped member, a carbon button adapted to be disposed in said cup-shaped member, and a fastening element extending through said carbon button and the bottom of said cup.

11. In a device of the character described, a contact-making arm comprising an elongated metallic member terminating at one end in a socket, a carbon brush supported by said socket, a coil spring having its one end adapted to rest upon said brush and yieldably resist movement in one direction of said brush, a pin slidable through the pivoted member adapted to be depressed by the other end of said coil spring, and a plate beneath said pin having depressions into which said pin may move and thereby yieldably hold the arm against movement.

12. In a controller of the character described, a block of insulating material, and contact elements arranged upon one face of the block.

13. In a device of the character described, a contact device comprising a cup-shaped member and a carbon button in said cup-shaped member.

14. In a device of the character described, a contact device comprising a cup-shaped

member and a carbon button in said cup-shaped member, and a fastening device secured to the carbon button and extending through the bottom of the cup.

15. In a device of the character described, a pivoted control arm, carrying a depressible brush and a depressible stop pin, and a spring arranged to depress both pin and brush.

16. In a device of the character described, a pivoted control arm, a pin slidably supported by the arm and its one end adapted to engage a surface beneath the arm, said surface having depressions to receive the associated end of the pin, and means for depressing the pin.

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