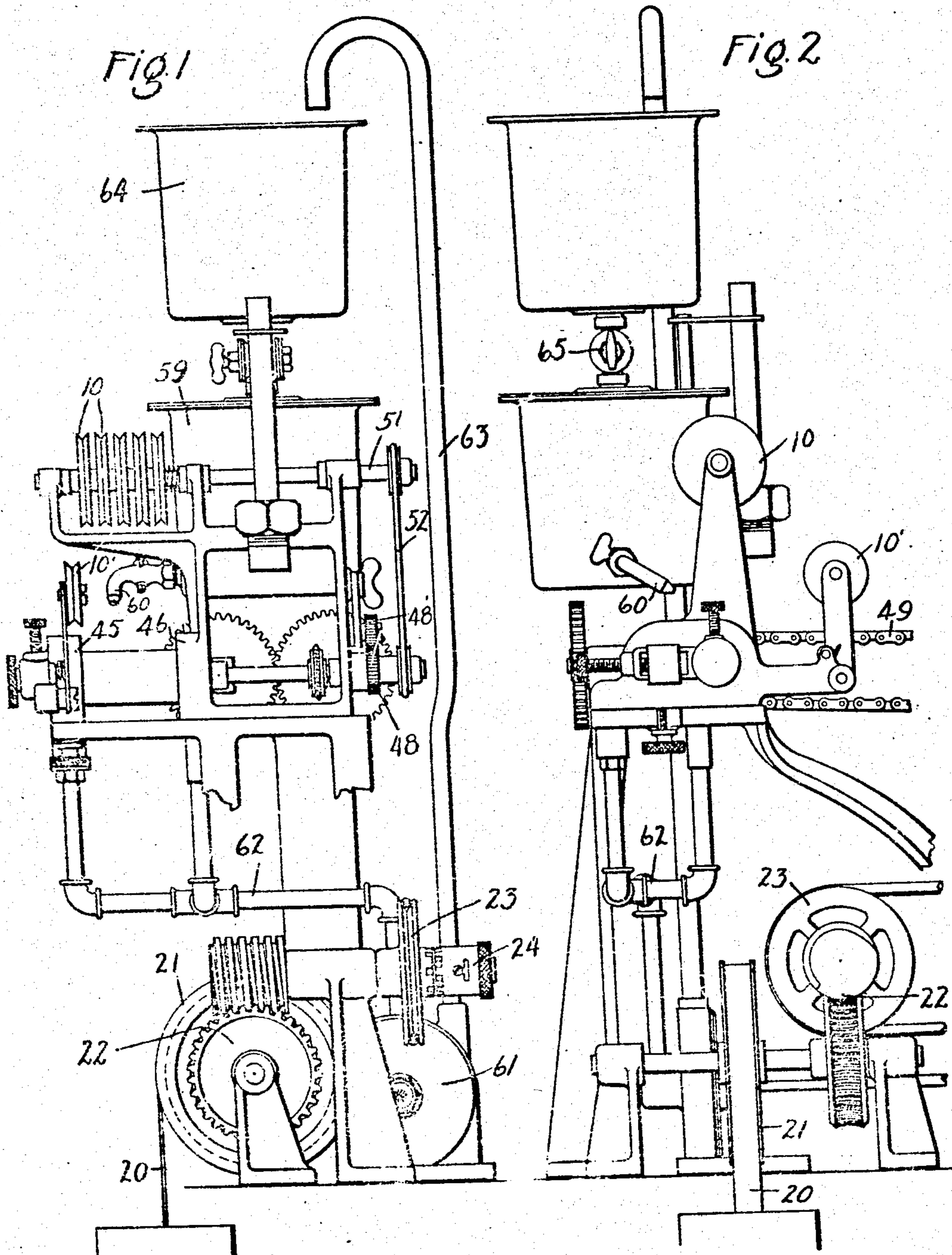


919,470.

G. H. RUPLEY.
WIRE COATING MACHINE.
APPLICATION FILED MAR. 25, 1907.

Patented Apr. 27, 1909.
3 SHEETS—SHEET 1.



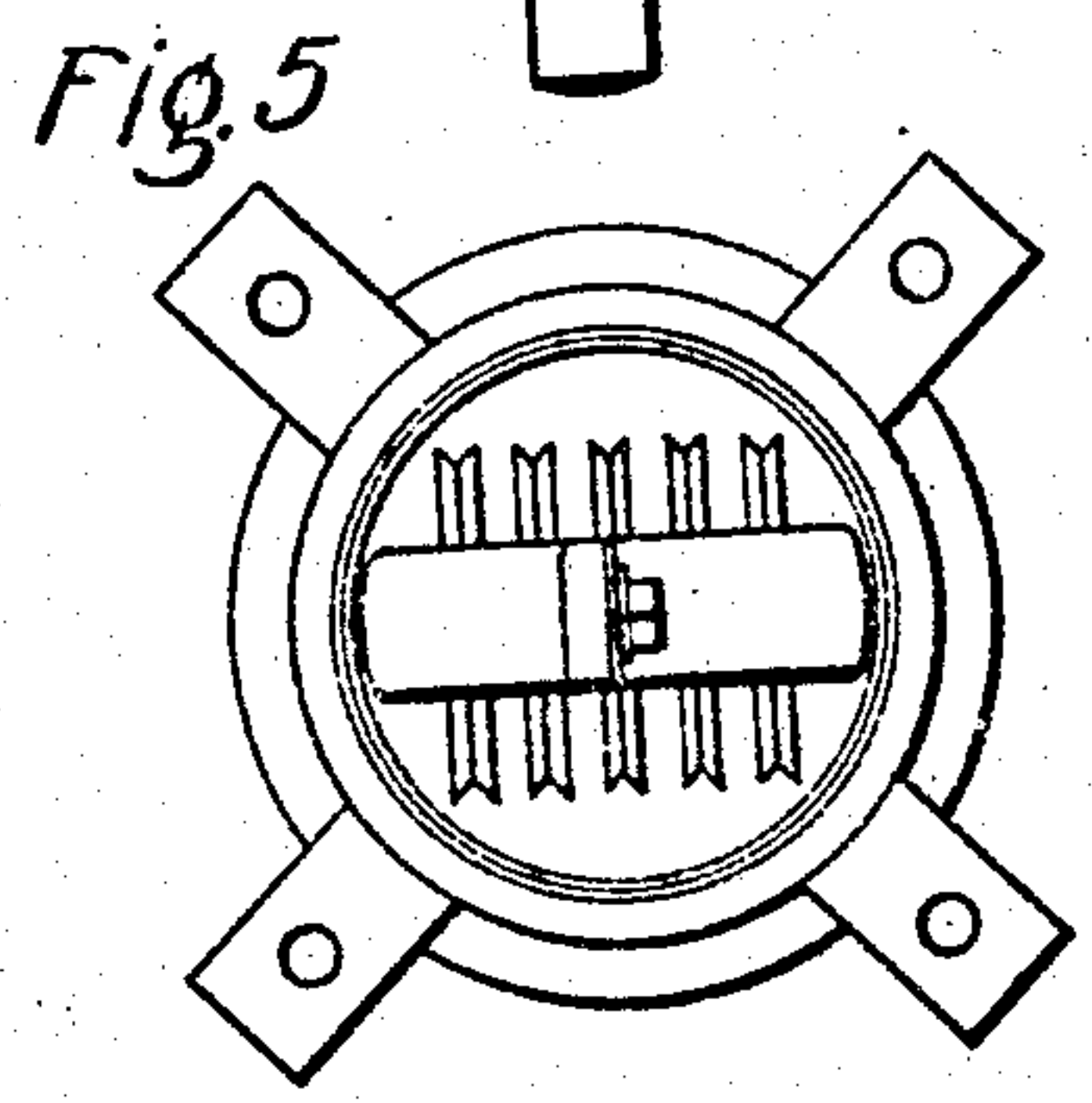
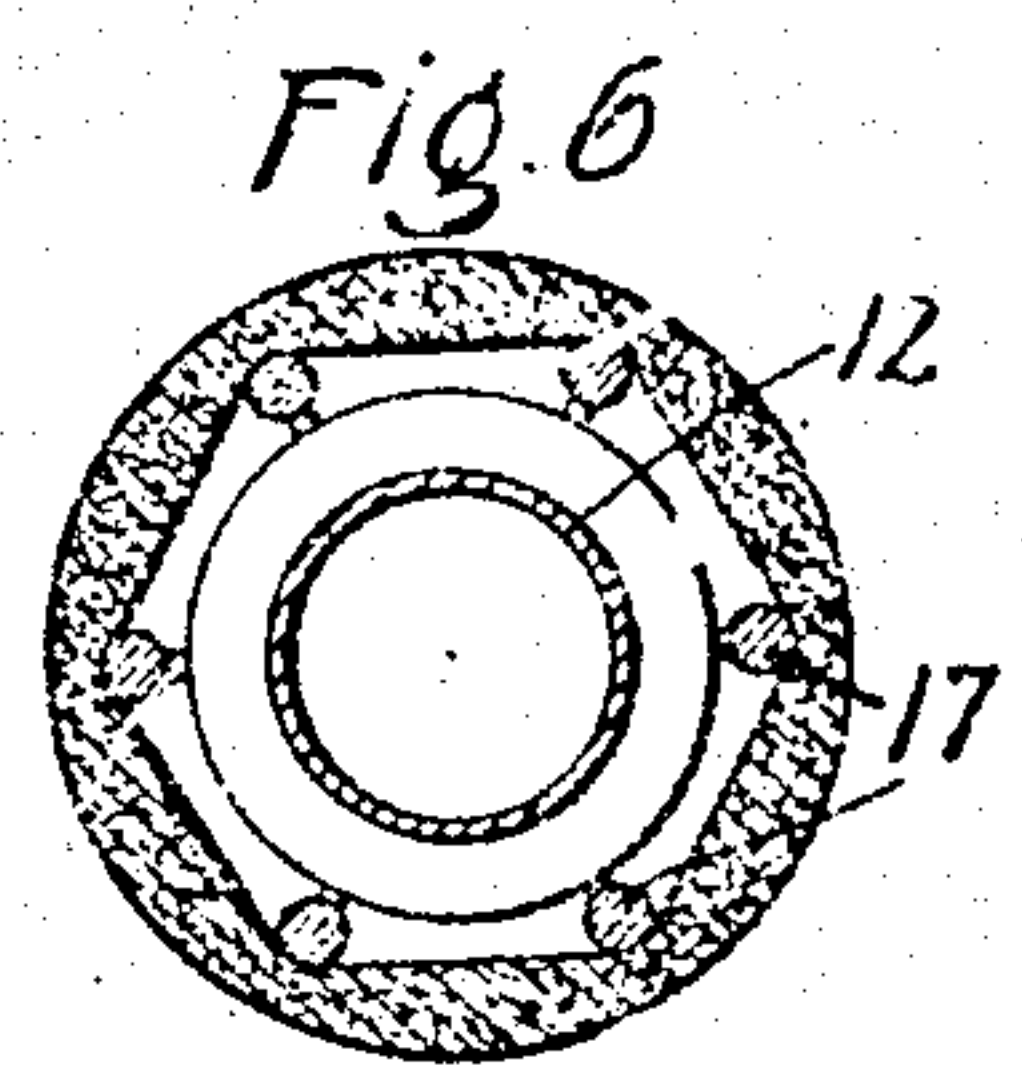
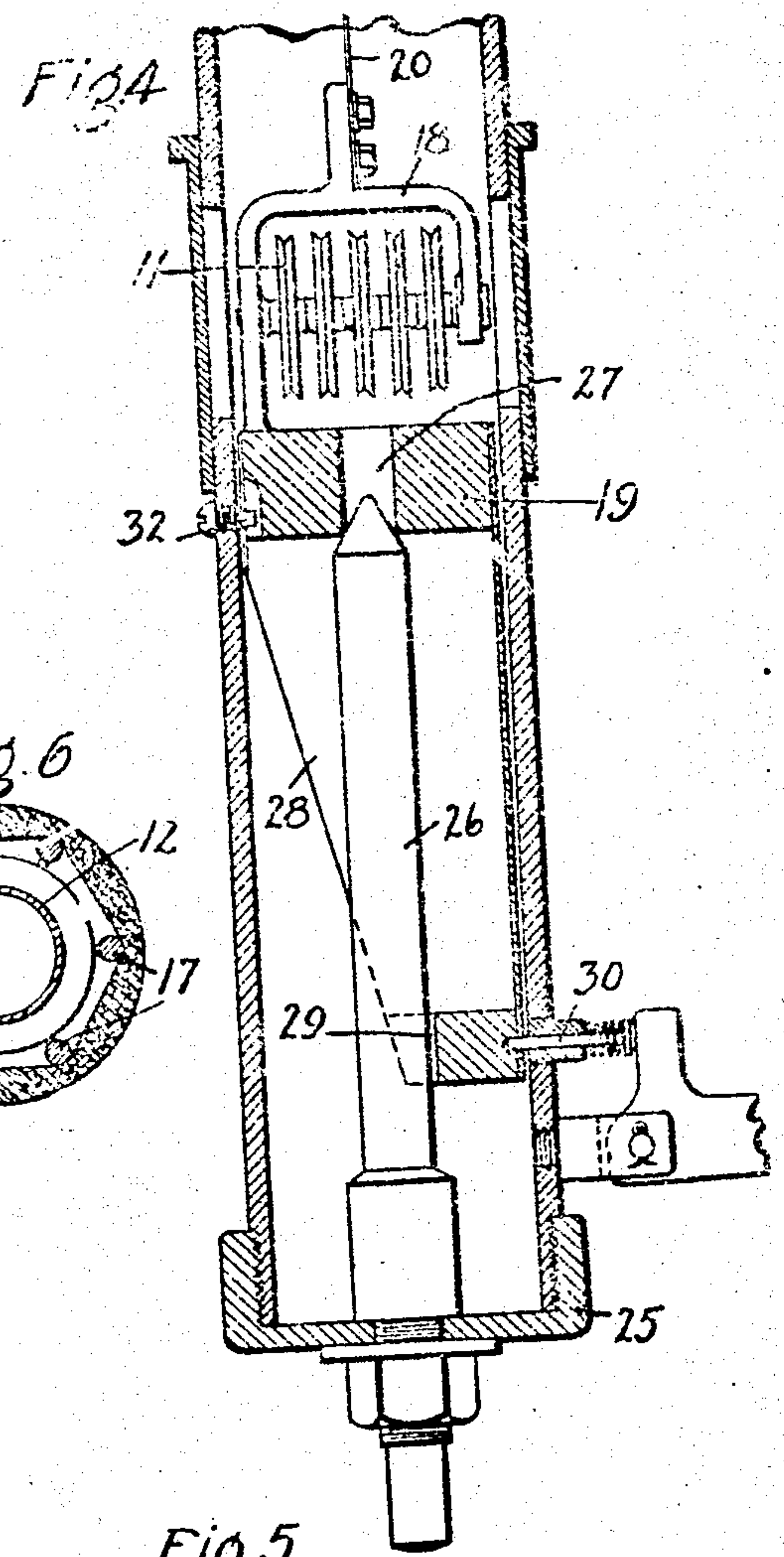
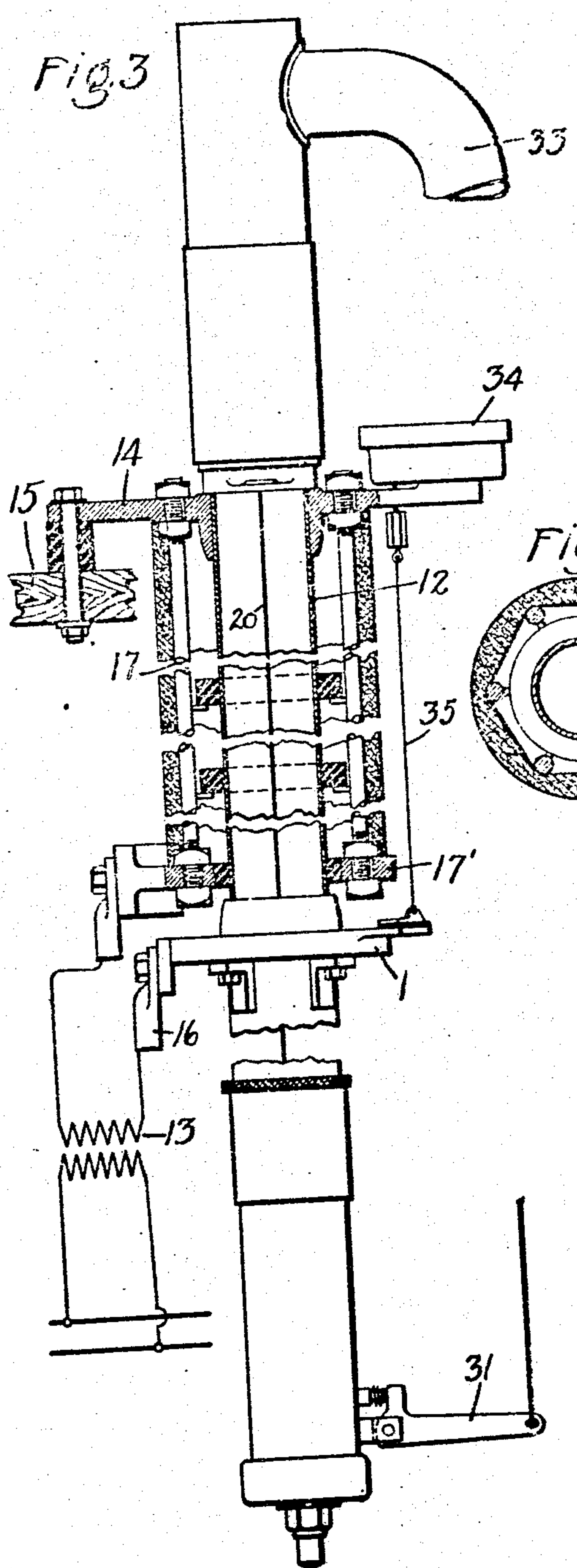
Witnesses:
Lloyd C. Bush
J. W. Allen

Inventor:
George H. Rupley
By *Alfred S. Rogers*
Att'y.

G. H. RUPLEY.
WIRE COATING MACHINE.
APPLICATION FILED MAR 25, 1907.

Patented Apr. 27, 1909.
SHEET 2.

919,470.



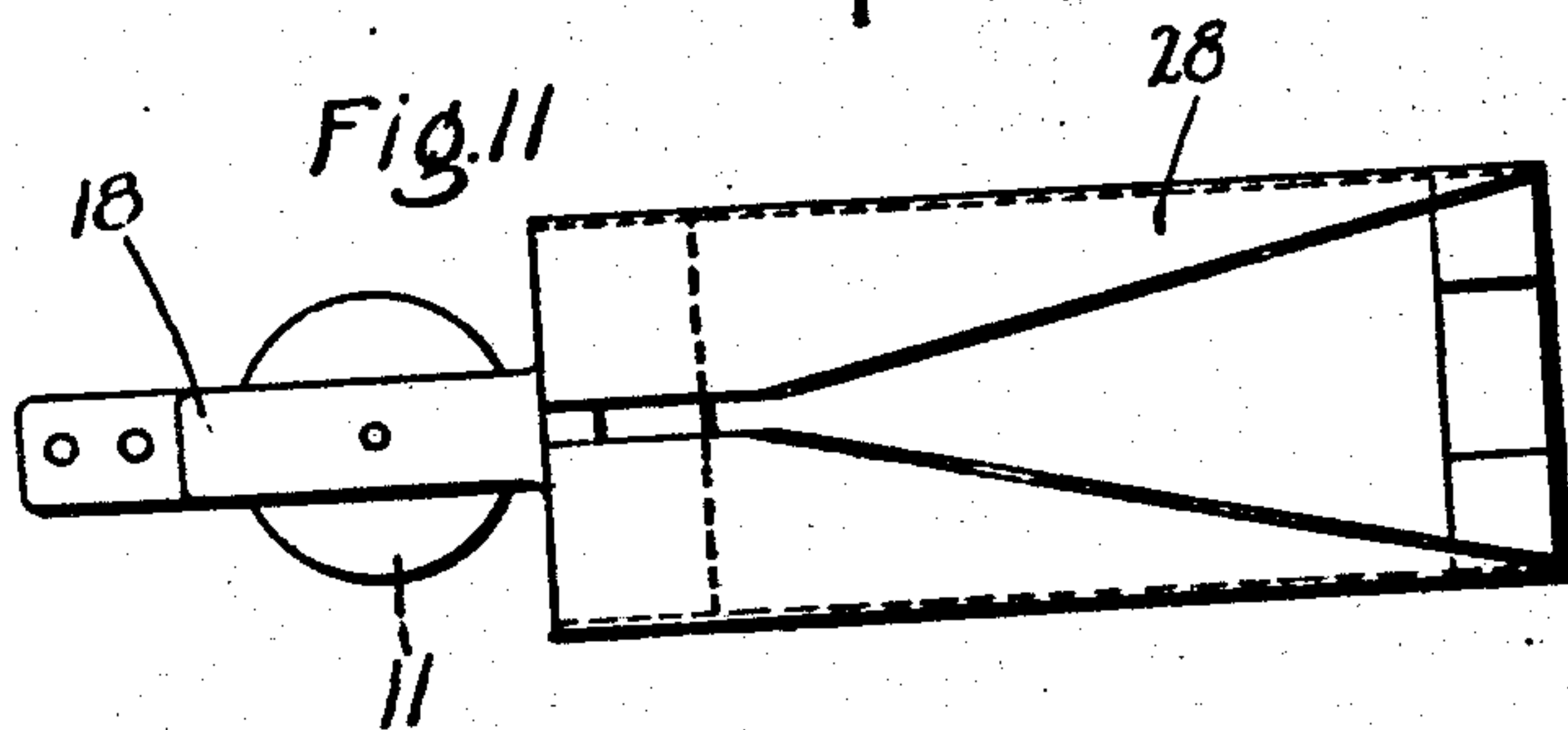
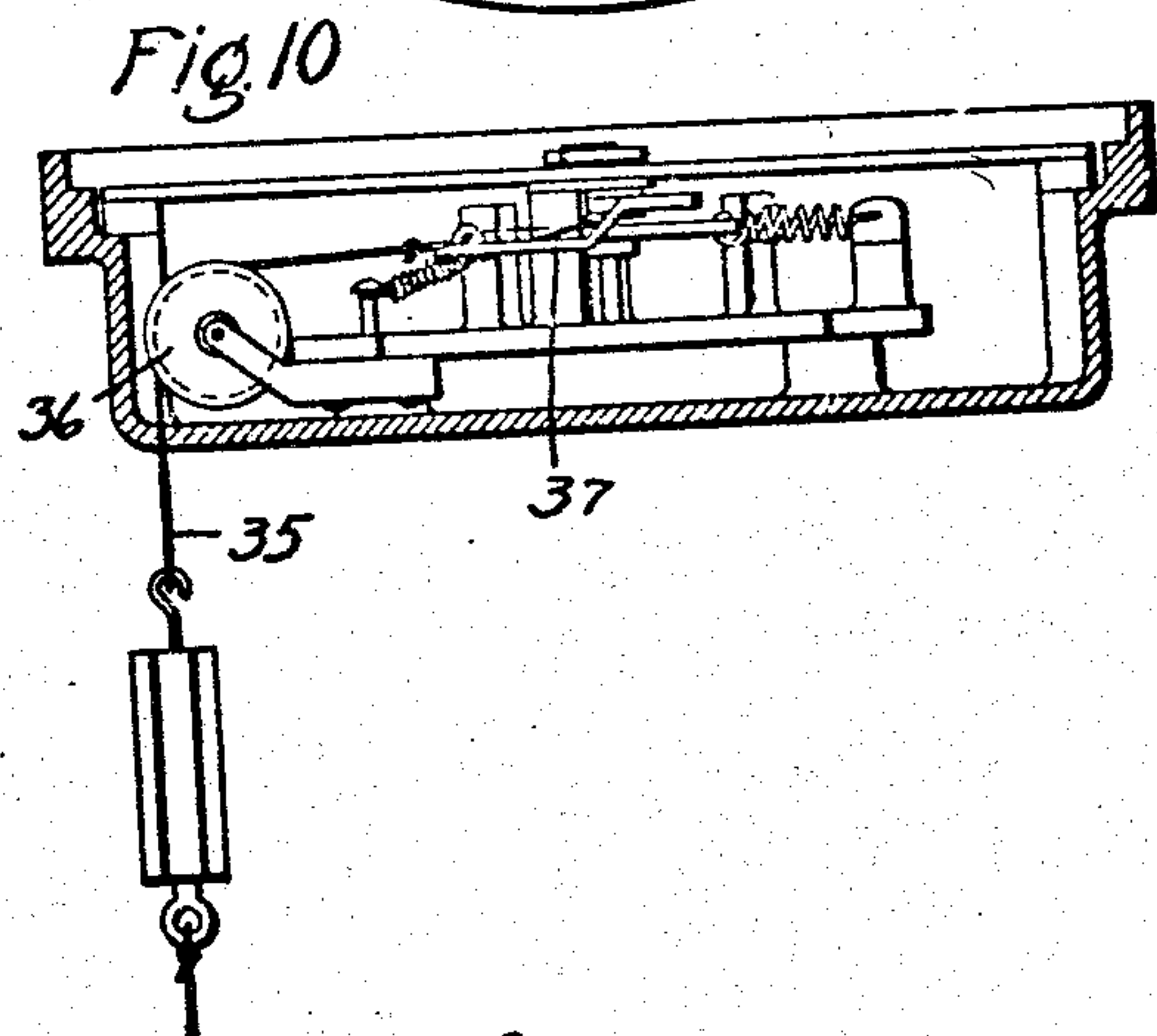
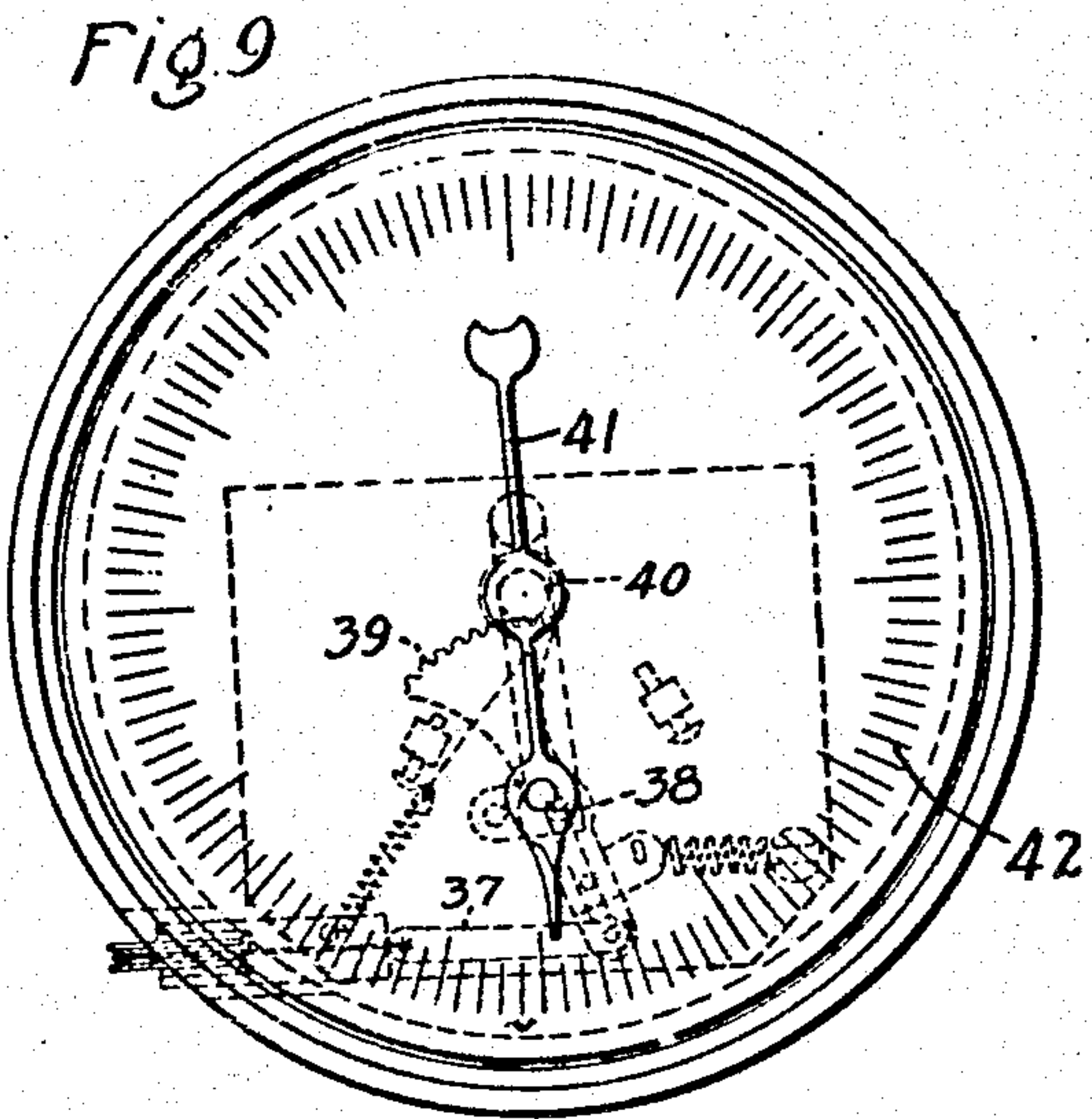
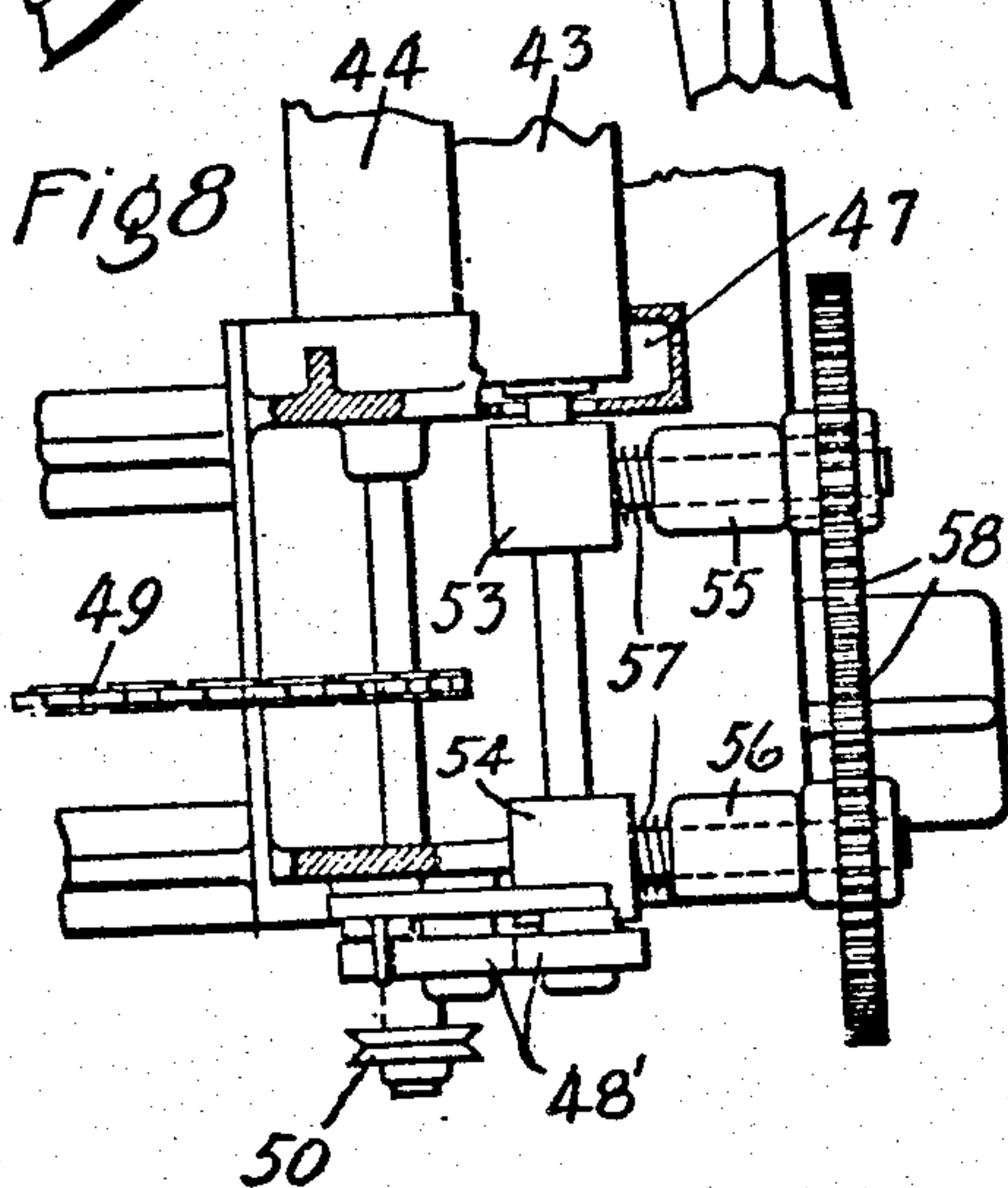
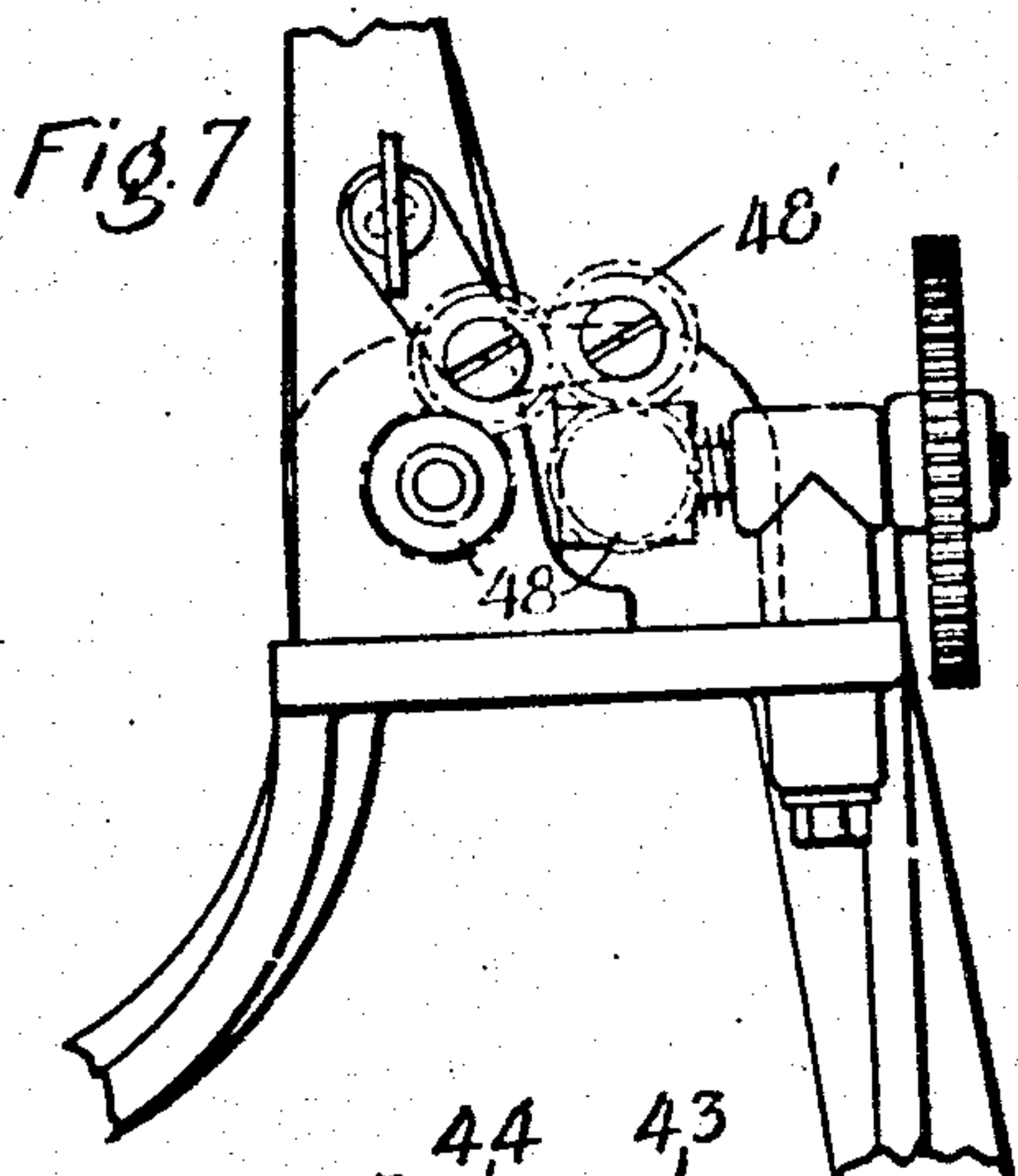
Witnesses:
Lloyd C. Bush
J. Ellis Allen

Inventor:
George H. Rupley.
By *Alfred H. Davis* Att'y.

G. H. RUPLEY.
WIRE COATING MACHINE.
APPLICATION FILED MAR. 25, 1907.

Patented Apr. 27, 1909.
3 SHEETS—SHEET 3.

919,470.



Witnesses:
Lloyd C. Bush
J. Ellis Glen.

Inventor:
George H. Rupley.
By *Alfred H. Davis* Att'y

UNITED STATES PATENT OFFICE.

GEORGE H. RUPLEY, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

WIRE-COATING MACHINE.

No. 919,470.

Specification of Letters Patent.

Patented April 27, 1909.

Application filed March 25, 1907. Serial No. 364,318.

To all whom it may concern:

Be it known that I, GEORGE H. RUPLEY, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Wire-Coating Machines, of which the following is a specification.

This invention relates to devices for insulating electrical conductors and has for its object the provision of a machine whereby a continuous length of conductor may be coated with an insulating material in a rapid and at the same time thoroughly efficient manner. In my previous patents Nos. 806,574 and 806,575, I have shown and described a machine for coating electrical conductors. In these patents the oven in which the insulation is hardened is intended to be very long and open at both ends so that the conductors simply pass through the oven and return. In this case the oven is heated by means of hot gases which pass through the interior of the oven. I have found, however, that certain sizes of wire can be rapidly and efficiently coated by having the oven closed at one end thereby saving a large portion of the heat by preventing the circulation of cold air through the oven. I have found it to advantage also to heat the walls of the oven, as for instance by means of an electric current thereby producing a very uniform temperature throughout the oven. The oven may be very much shorter than in the previous patents and the temperature higher. I can thus maintain a high speed of insulation at a low expense with a great saving of space for installation.

My invention therefore consists in the features of construction and in the arrangement and combination of elements hereinafter set forth, and particularly pointed out in the claims annexed hereto.

Referring to the drawings in which I have shown one embodiment of my invention, Figure 1 is a front elevation of the upper portion of the coating machine, the oven itself not being shown; Fig. 2 is a side elevation of the same; Fig. 3 is an elevation partly in section of the oven itself; Fig. 4 is a sectional

elevation of the lower portion of the oven showing means for guiding and locking in place the lower set of sheaves; Fig. 5 is a plan view of the lower portion of the oven; Fig. 6 is a section of the oven taken through the central portion thereof; Figs. 7 and 8 are details of the mechanism for operating the coating rolls; and Figs. 9 and 10 are plan and sectional views respectively of the thermostatic indicator. Fig. 11 is a detail view of the lower sheave carrier.

In my co-pending application Serial No. 364,317 I have described and claimed a spooling device which is adapted for use in connection with the present coating device. The wire will be fed from the spooling device to the first of the sheaves 10 over the tension sheave 10', thence over the first of the sheaves 11 located in the oven as hereinafter described. The wire runs back and forth over the sheaves 10 and 11 thence back to the spooling device, in the meantime receiving its coating of insulation. The machine comprises an electrically heated oven composed of a metallic tube or pipe 12 of suitable size in circuit with a transformer 13. Secured to and in electrical contact with the pipe is a bracket 14 supported and insulated from platform 15. At the lower end of the pipe is a conducting terminal 16 in electrical contact with the pipe. A series of conducting rods 17 are arranged longitudinally of the pipe and pass through bracket 14 at the top and bracket 17', provided with a terminal, at the bottom. The rods are in electrical contact with bracket 14 but insulated from bracket 17'.

Current from the transformer will pass from bracket 17' through rods 17 thence back to the pipe to terminal 16 thereby heating the pipe which is completely surrounded by a lagging of asbestos, mineral wool or the like to prevent radiation. The sheaves which are inside of the oven are rotatably mounted upon a bracket 18, the base 19 of which is the shape of the oven, i. e., circular, and substantially the same size so that it will move freely up and down within the pipe. The bracket is supported by a flexible strap or band 20 which passes upward to the top

of the oven and thence over a band wheel or pulley 21 which is driven by a worm and wheel 22 from any desired source through the sheave 23. The pulley is thrown in operation by the clutch 24 to raise and lower the bracket 19. One of the objects of having the lower sheaves movable is to facilitate the stringing up of the machine when a new spool is started or when the wire breaks. The bracket 19 supporting the sheaves is simply brought to the top of the oven and the wire is passed back and forth through the sheaves. The pipe or oven is tightly closed at the bottom by means of a screw cap 25, so that in order to accurately position the bracket as it descends by gravity to the bottom of the oven and at the same time locking it into position, I provide means for automatically bringing about this result. Extending upward through the cap 25 is a pin 26 arranged centrally to the oven. The upper end of the pin is pointed and adapted to engage a hole 27 in the center of the base 19. The bracket 19 is provided with a hood shaped portion 28 extending downward over the pin 26. The hood is parallel with the pipe on one side, tapered on the other and is provided with a slot 29 having converging sides into which the pin 26 projects as the hood descends. The pin passing through the slot will turn the bracket to the desired position in which it will be locked by means of a spring-pressed pin 30, controlled by a bell-crank lever 31 from some remote point, as for instance, the top of the oven where the operator is located. When it is desired to restring the device the lever 31 is released and the bracket 19 may be drawn upward as above described. A guide pin 32 is provided for accurately adjusting the position of the bracket. The hot gases which come from the oven are carried off through the exhaust port 33.

As a means for determining the temperature within the oven, I provide a suitable indicator 34 which is connected with the lower end of the oven by means of a wire or other suitable connection 35. Any well-known type of indicator or gage may be used, but I have shown a simple form in which the flexible connection from the bottom of the oven passes over a pulley 36, and, by means of a link 37, rotates a lever pivoted at 38, having at its free end teeth 39 engaging a pinion 40. The pinion 40 rotates a pointer 41 over a scale 42 which may be calibrated to degrees or in any desired manner. It will be seen that the changes in temperature affecting the length of the pipe 12 will be transmitted to the indicator in a very simple and reliable manner.

As a means for coating the wire, I provide coating rolls 43 and 44, which may be what are commonly known as printer's rolls, or

any desired composition which is suited to the materials to be applied. It is understood, of course, that this form of a coating device can only be used with fine wire, and I do not limit my invention to this particular means of applying the coating. The rolls have bearings in the housings 45 and 46, which are hollow as shown at 47 so as to partially inclose the rolls and catch the coating material as it leaves the latter. The shafts of the rollers are extended backward and at their rear end are geared together by gears 48, intermediate gears, 48', being provided so as to permit the separating of the rolls. A sprocket chain 49 driven from any suitable source operates the rolls, and a sheave 50 on the shaft of roll 44 drives shaft 51 by means of a belt 52 on which are mounted the sheaves 10. In order to maintain parallelism of the rolls 43 and 44, the former roll is rotatably mounted in boxes 53 and 54, which, in turn, are journaled in the bearings 55 and 56, respectively, and are free to move longitudinally, the rolls being pressed together by springs 57. Screw threaded by right and left hand threads to the outer ends of the boxes are gears 58 which are in mesh and will cause boxes 53 and 54 to move an equal amount and thereby maintain parallelism of the rolls. The coating material is fed to the rolls from the receptacle 59, provided with a spigot 60, arranged over the rolls so as to feed the material between them. The material will flow to the ends of the rolls and through the housings 45 and 46 as before described. The material then runs to the pump 61 through the pipe connections 62. This pump is driven in any suitable manner and delivers the material through the pipe 63 to receptacle 64, from whence it runs through the valve 65 to the receptacle 59. The particular insulating material used in connection with my machine forms no part of my invention, but I prefer to employ linseed oil prepared and treated in accordance with my previous patents above referred to. This, however, may be modified without departing from the spirit of my invention.

In the use of my invention, the oven is first heated up to a temperature of between 600 and 900° F., by means of the electric current passing through the coils 13 as primary, acting upon the pipe 12 as a short-circuited secondary, the temperature being shown upon the indicator 24. The bracket 18 supporting the sheaves 11 is brought up to the top of the oven by means of the pulley 22, and the operator strings the wire back and forth through the sheaves 10 and 11. The bracket is then allowed to descend and is locked in place as described. The insulating material enters the receptacle 64 thence to the receptacle 59 and to the coating rolls 43 and 44. The conductor passes from one of the sheaves 10 through the rolls where it receives a coating,

thence into the oven, which being at a temperature of from 600 to 900° F., hardens the material before it reaches the lower sheave 11, whence it comes up over the second sheave 10, thence down again through the rolls to receive another coating which is, in turn, hardened. Any desired number of coatings may thus be applied to the wire. It will be seen that by having the oven closed at the lower end and the coating device at the upper end, a great saving in heat is effected and the air, which is not essential to my process as described in my previous patents, is excluded. The temperature being high, I am able to use a short oven and a high speed, which latter varies with the size of wire employed. By the use of my machine, in connection with the spooling machine disclosed in my co-pending application above referred to, I am able to coat the smaller sizes of wire at from 500 to 600 feet per minute.

It will be understood, of course, that many modifications of the arrangement and construction herein shown may be made without departing from the spirit of my invention, the scope of which is set forth in the annexed claims.

What I claim as new, and desire to secure by Letters Patent of the United States, is,—

1. A machine for coating electrical conductors comprising an externally heated closed oven open at one end only, a coating device at the opposite end and means for passing the conductor continuously through said oven.

2. A machine for coating electrical conductors comprising a vertical oven closed at the lower end, a coating device at the upper end, and means for passing the conductor continuously from the coating device through the oven along a rectilinear path.

3. A machine for coating electrical conductors comprising an externally heated vertical oven closed at the lower end, a coating device at the upper end, and means for passing the conductor through the coating device to the bottom of the oven and back through the top thereof along a rectilinear path.

4. A machine for coating electrical conductors comprising a vertical oven closed at the lower end, coating rolls mounted at the upper end, means for passing the conductor between the rolls to the bottom of the oven and back through the top thereof along a rectilinear path.

5. A machine for coating electrical conductors comprising an electrically heated oven closed at the lower end, a coating device at the upper end, and means for passing the conductor through the coating device to the bottom of the oven and back through the top thereof along a rectilinear path.

6. A machine for coating electrical conductors comprising a metallic casing closed

at one end and forming a resistance path for a heating current, a coating device at the open end of said casing, and means for passing the conductor through the coating device to the closed end of the casing and back to the open end along a rectilinear path.

7. A machine for coating electrical conductors comprising a vertical metallic casing closed at the lower end and forming a resistance path for a heating current, a coating device at the upper end of the casing, and means for passing the conductor through the coating device to the lower end of the casing and back through the upper end.

8. A machine for coating electrical conductors comprising a vertical oven closed at the lower end, a coating device at the upper end, a sheave for supporting the conductor movable longitudinally throughout the length of the oven, and means for securing said sheave at the bottom of the oven.

9. A machine for coating electrical conductors comprising a vertical oven closed at the lower end, a coating device at the upper end, a sheave for the conductor and a support therefor arranged to descend by gravity from the top to the bottom of the oven, means for guiding said support to a predetermined position within the oven, and means for securing the support in said position.

10. A machine for coating electrical conductors comprising a vertical metallic casing closed at the lower end and forming a resistance path for a heating current, a coating device at the upper end of the casing, a sheave for the conductor and a support therefor arranged to descend by gravity from the top to the bottom of the casing, and means for securing the support within the casing.

11. A machine for coating electrical conductors comprising a vertical oven closed at the lower end, a coating device at the upper end, sheaves for the conductor and a support therefor arranged to descend by gravity to the bottom of the oven, means for securing the support at the bottom of the oven, and means for raising the support to the top of the oven.

12. A machine for coating electrical conductors comprising a vertical oven closed at the lower end, a coating device, a plurality of sheaves for the conductor supported at the upper end, correspondingly arranged sheaves mounted on a support adapted to descend by gravity from the top to the bottom of the oven, and means for securing the latter within the oven.

13. A machine for coating electrical conductors comprising a metallic casing forming a resistance path for a heating current, a coating device, means for passing a conductor therethrough and into the oven, an indicator and connections between said indicator

4
and one end of the casing whereby changes in the length of the casing due to variations of temperature will be indicated.

5 14. A machine for coating electric conductors comprising a tubular metallic oven lagged outside with heat insulating material, a coating device, means for leading a conductor from the coating device to the oven and

means for passing a heating current of electricity through said oven.

In witness whereof, I have hereunto set my hand this 22nd day of March, 1907.

GEORGE H. RUPLEY.

Witnesses:

BENJAMIN B. HULL,
HELEN ORFORD.