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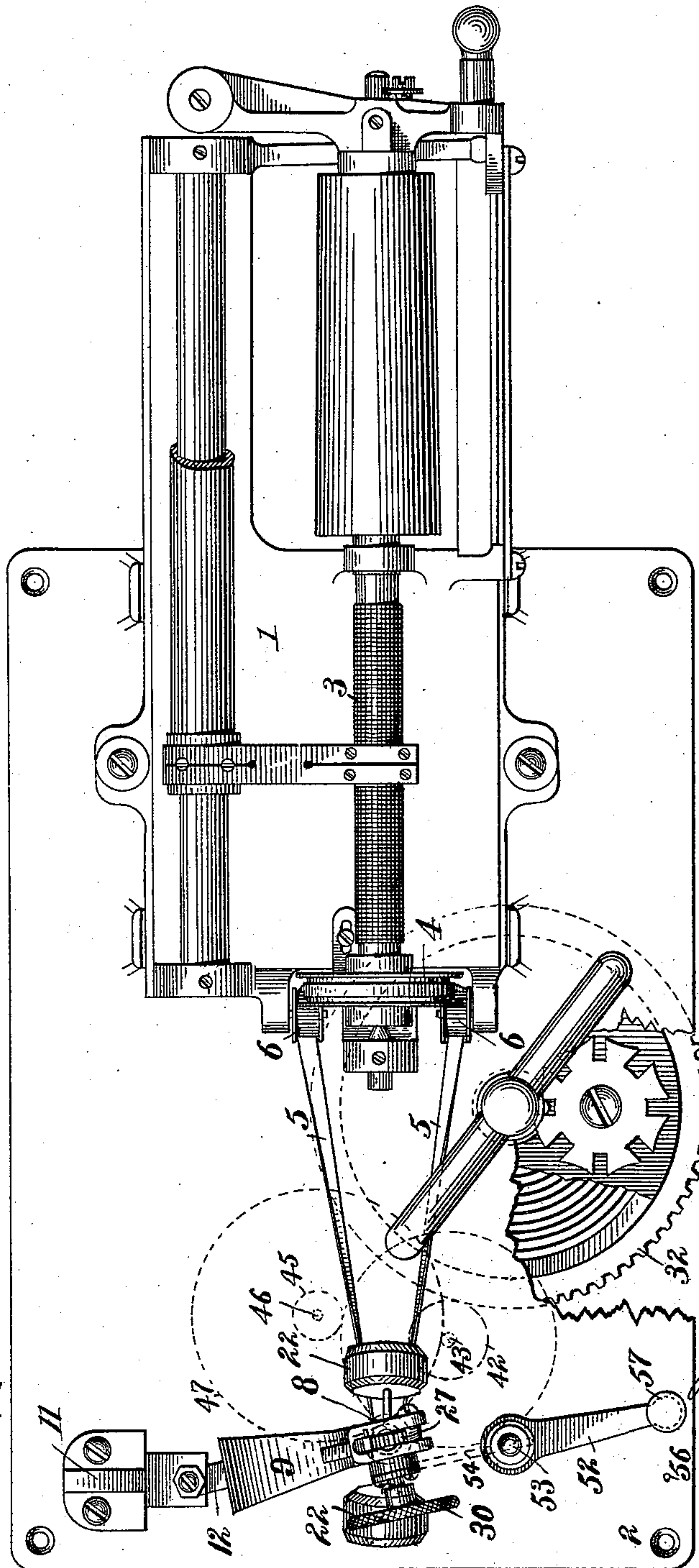
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J. BROICH.  
PHONOGRAPH.

No. 532,718.

Patented Jan. 15, 1895.

Fig. 1



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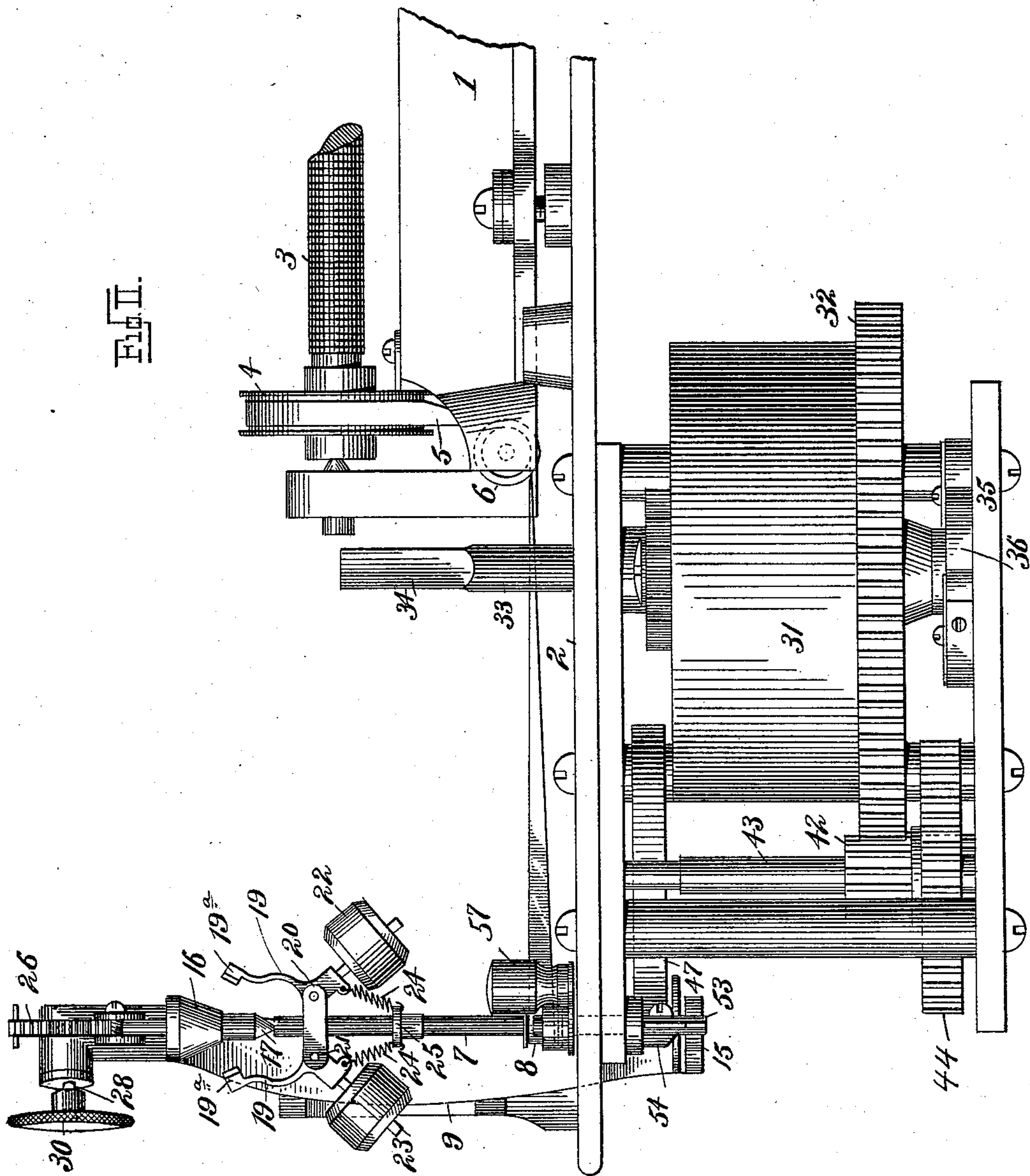
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**J. BROICH.  
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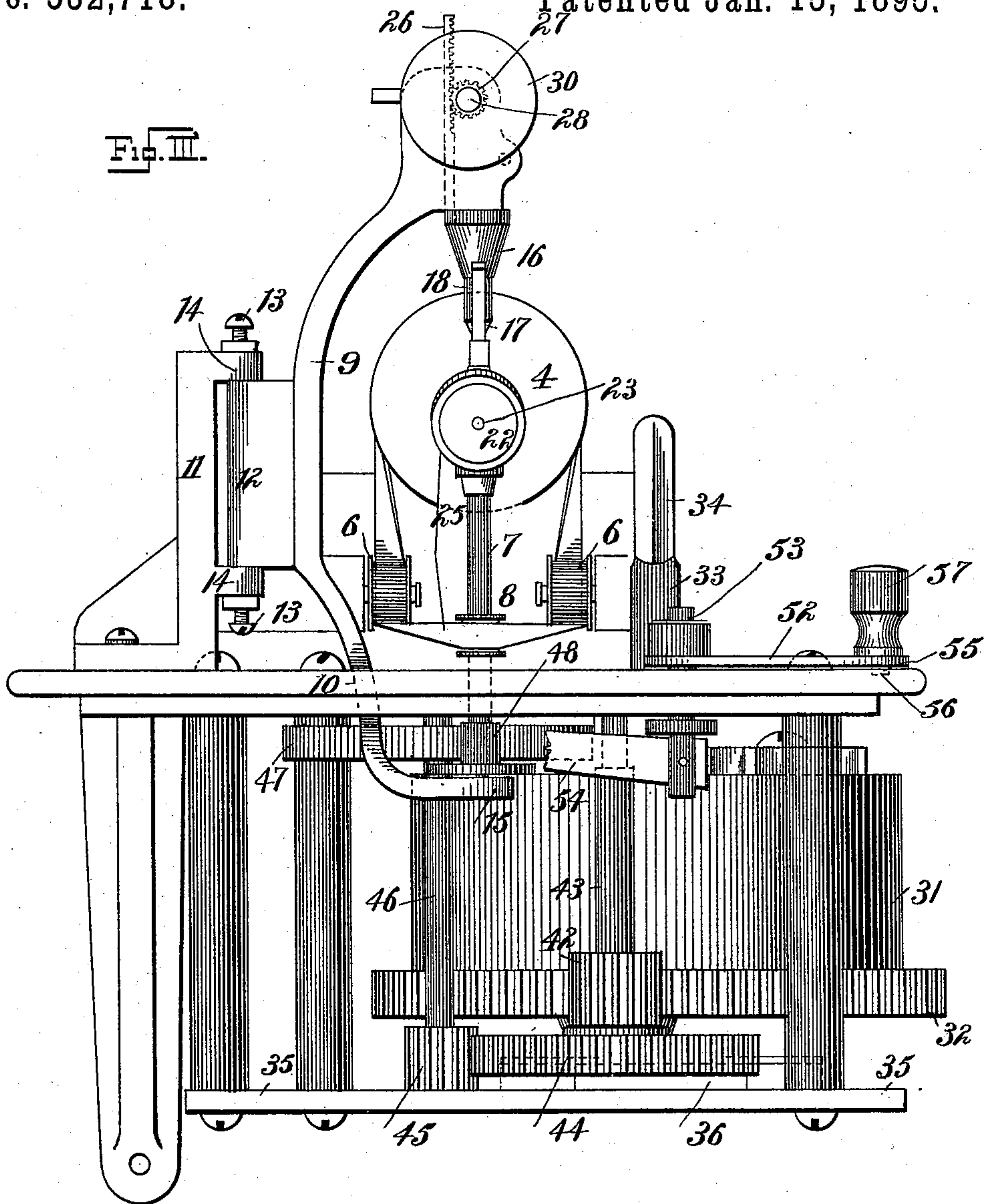
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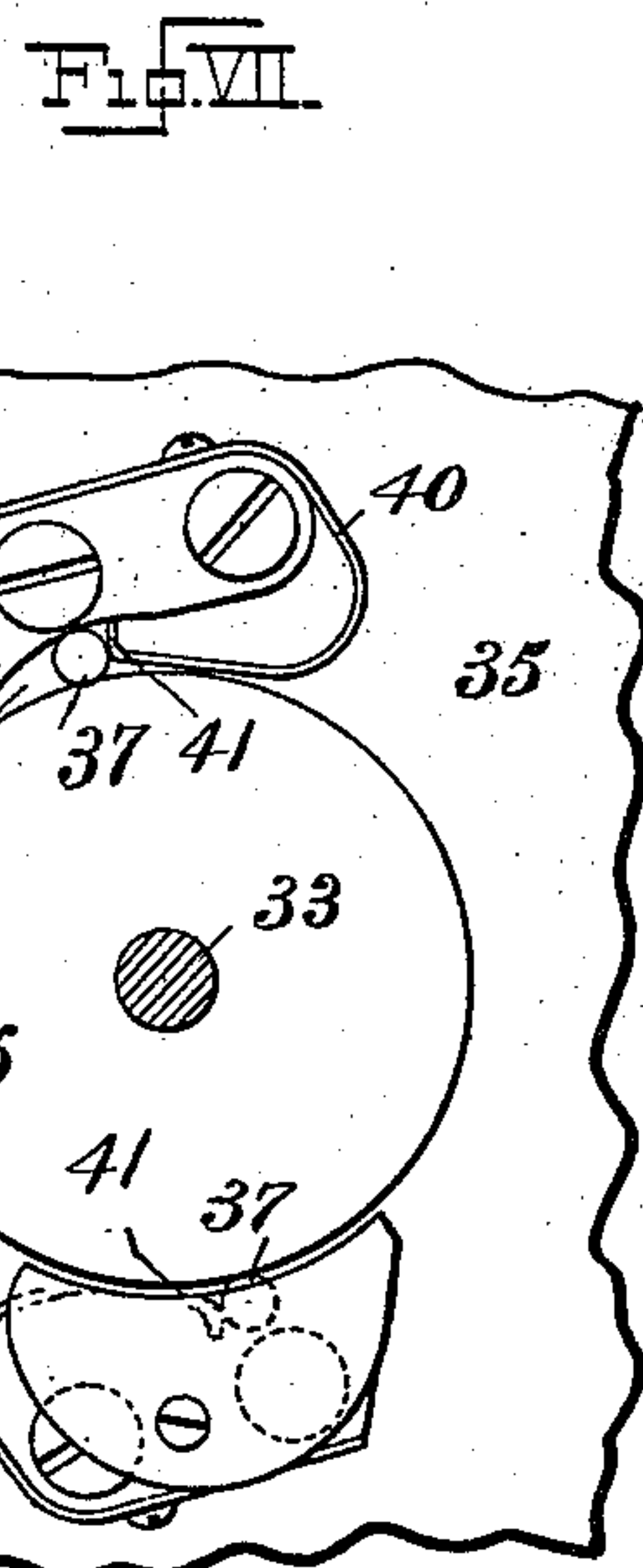
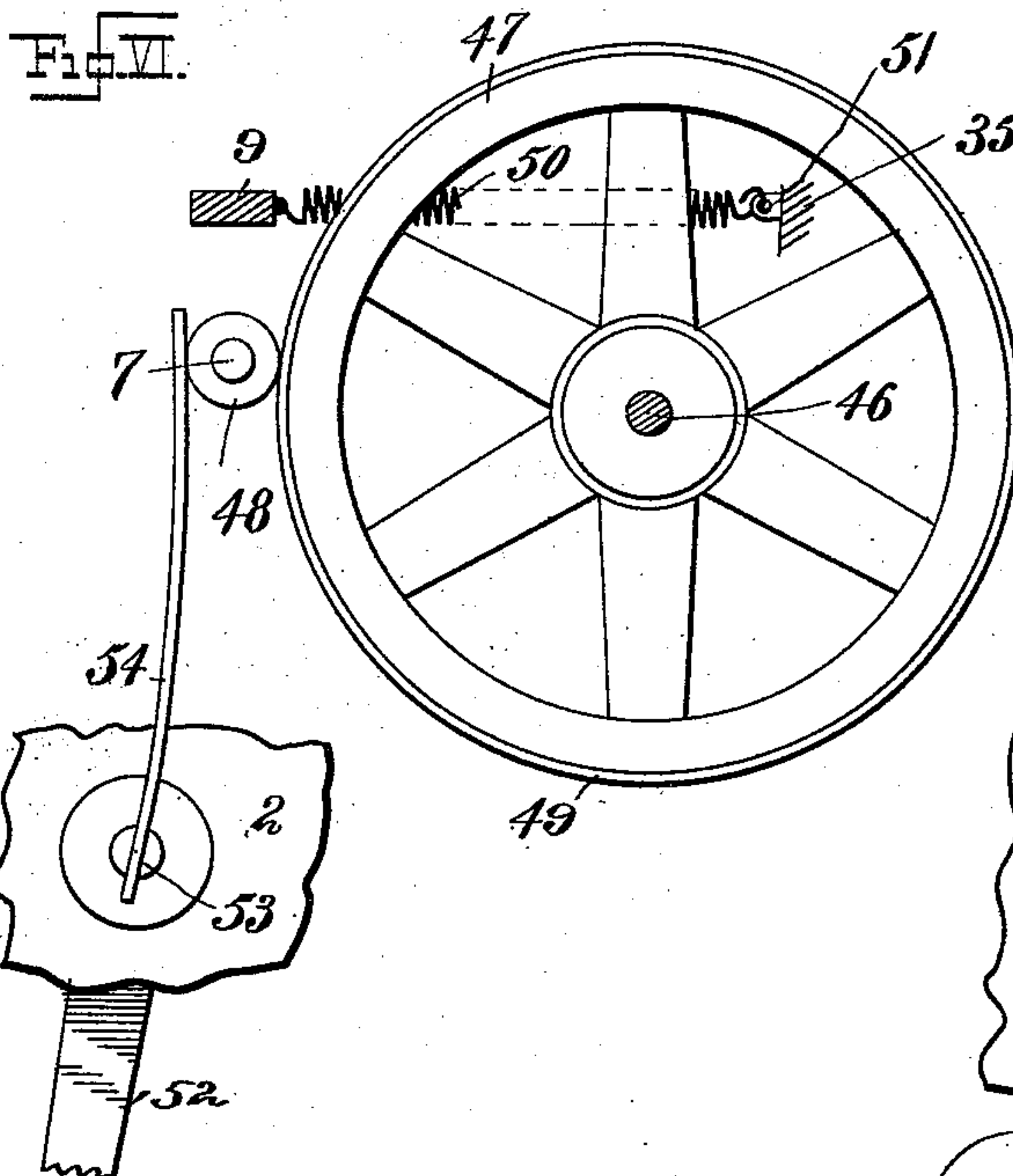
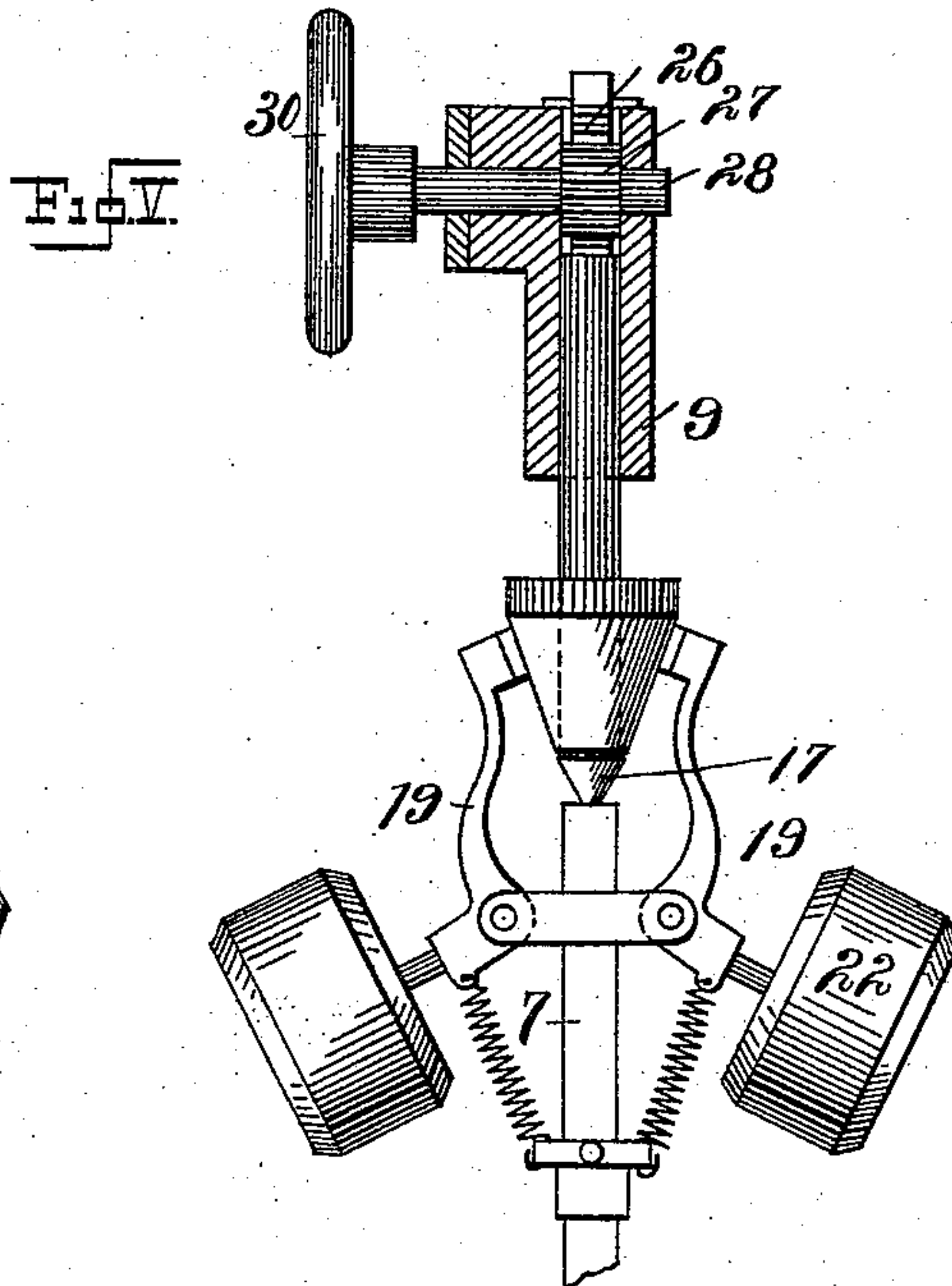
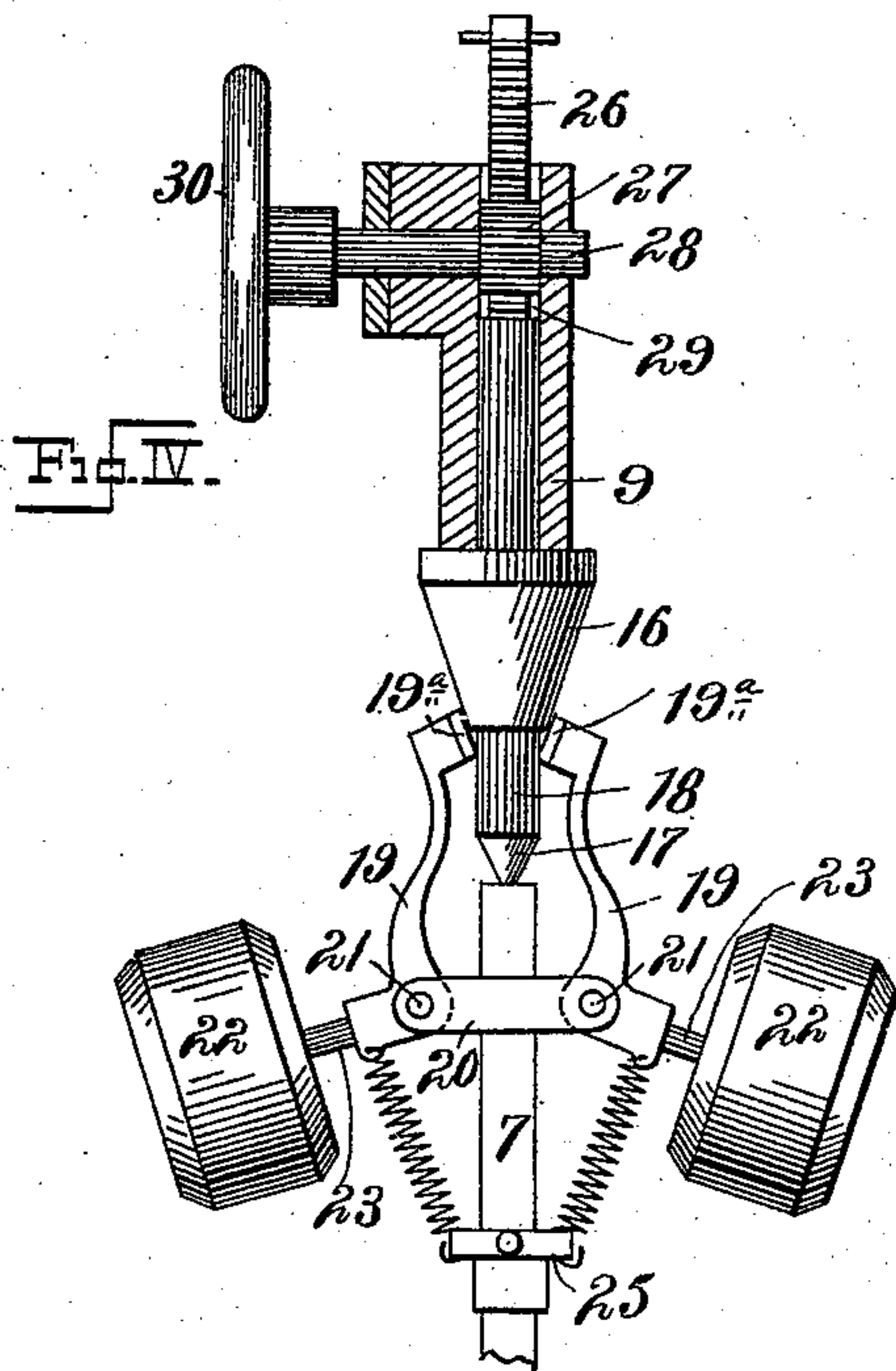
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J. BROICH.  
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# UNITED STATES PATENT OFFICE.

JOSEPH BROICH, OF BROOKLYN, ASSIGNOR TO FREDERICK PEARCE, OF  
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## PHONOGRAPH.

SPECIFICATION forming part of Letters Patent No. 532,718, dated January 15, 1895.

Application filed December 13, 1893. Serial No. 493,517. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH BROICH, a citizen of the United States, residing in Brooklyn, county of Kings, and State of New York, have invented a new and useful Improvement in Phonographs, of which the following is a specification.

My invention relates more particularly to a novel method and apparatus for propelling the cylinder of a phonograph and automatically and manually regulating its speed, combining therewith an attachment for stopping its movement at any point, as will be explained.

My invention consists in details of construction hereinafter specifically referred to and pointed out in the claims.

Referring to the accompanying drawings which form a part of this specification, Figure I represents a plan view showing the phonograph approximately complete together with the operating mechanism. Fig. II is a side elevation of the operating mechanism. Fig. III is an end view of the device. Figs. IV and V show the governor in its two extreme positions. Fig. VI is a detail view of a brake mechanism. Fig. VII is a detail view of a clutch mechanism.

In the accompanying drawings, in which similar numerals of reference indicate corresponding parts in the several views, the numeral 1 indicates the mechanism of a phonograph which is of the well known construction, and 2 is the table or plate upon which the phonograph is usually carried.

3 is the main cylinder-driving shaft and combined feed-screw of the phonograph, and 4 is a grooved pulley carried by said shaft.

5 is the belt that passes over said pulley, and is guided by rollers 6, suitably journaled in the mechanism in the frame of the phonograph over which the belt 5, passes to the pulley 4 in the manner shown.

7 is the governor shaft having a pulley 8 over which the belt 5 passes, whereby as said shaft is rotated, the cylinder-driving shaft and combined feed-screw 3, will be correspondingly turned. The shaft 7, is shown vertically supported, and for the purpose of providing continuous frictional contact between said shaft and its driving wheel disk

or element, said shaft is so carried that it may have lateral movement. For this purpose I have shown a suitable bracket or frame 9, vertically arranged, the lower portion of which passes through a suitable slot or opening 10, in the plate or table 2. The bracket or frame 9, is pivotally carried by a vertical standard 11, secured to the plate 2, said bracket having a side projection or offset 12, that is pivoted to said bracket 11, as for instance, by screws 13 carried by lugs 14 on the standard 11, said screws being suitably arranged to enter sockets in projection 12, as shown in Fig. III. By this means the bracket or frame 9, and the governor shaft 7, which is carried thereby can be swung laterally, as hereinafter more fully explained. The lower portion of bracket or frame 9 has a bearing 15, in which the lower end of the governor shaft 7, is stepped, as shown in Fig. III. For the purpose of reducing friction on said shaft 7 as much as possible, and to provide for the action of the governor-cone 16, the upper end of said shaft is shown receiving the pointed or cone-like end 17 of a rod 18, that is carried by and depends from the upper portion of the bracket 9. By this means the shaft 7, is vertically sustained in the bracket 9, and ease of rotation is insured.

19 are governor arms, that are pivotally carried by the shaft 7, and are shown sustained on said shaft by lugs 20, carried by said shaft to which the arms 19 are pivoted by pins 21. The arms 19 extend parallel to the shaft 7 and carry weights 22 on oppositely extending rods 23, as shown. For convenience of manufacture the arms 19, are shown in substantially bell-crank form, the lower members of which arms are shown connected by springs 24, with the shaft 7, said shaft being shown provided with a collar 25, to which said springs are connected. The action of the governor arms constructed as above specified is such, that when the shaft 7 rotates, the weights 22, will be caused to move outwardly in proportion to the speed of rotation of said shaft, whereby the upper ends 19<sup>a</sup> will be caused to move toward said shaft in a corresponding degree, the springs 24, when used, acting to retard the outward movement of said arms. The upper ends 19<sup>a</sup>, of the arms



19, have friction faces of suitable construction that are adapted to bear against the cone 16 as in Fig. V. For the purpose of causing the arms 19 to bear with more or less force upon the cone 16 in proportion to the speed of rotation of the shaft 7, so as to more or less retard the rotation of said shaft, as and when desired, said cone is made vertically adjustable on the rod 18, and for this purpose said cone is shown provided with a vertically extending toothed rack 26, that meshes with a pinion 27 carried on a shaft 28 journaled in the upper part of the bracket 9, and shown extending transversely of and above the rod 18, said pinion lying in a socket 29, in said bracket 9. The shaft 28 is shown provided with a thumb-wheel 30, whereby the shaft can be turned. With this arrangement the cone 16 can be moved vertically as much as desired to cause the arms 19, to bear upon it sooner or later in accordance with the speed of the governor shaft 7. The arms 19, and the cone 16 thereby become a brake to retard the rotation of the shaft 7, which brake can be readily adjusted by hand to cause the shaft 7, to continuously rotate at the desired speed, for, by presenting a greater or less (or in other words, a wider or narrower) surface to the friction faces 19<sup>a</sup> of the governor arms 19, the outward swinging of the weights 22 can be limited, and thus the force generated by their rotation will be applied through the arms 19, to the cone 16. By this means a very fine adjustment of the brake mechanism for the governor shaft can be effected, which will be found of special utility in a phonograph driven by a motor or mechanism of a gradually decreasing power, such as a spring actuated mechanism, as hereinafter described, although it is evident that this improved governing device may be used with a motor of a constant power, such as an electric motor as ordinarily applied for operating a phonograph.

My improved operating or driving mechanism is constructed and operated as follows:

31 is a going-barrel having a suitable spring within it and provided with a circular rack 32, which going-barrel may be of the ordinary or well known construction such as usually found in a musical box, so far as its general arrangement is concerned.

33 is the winding stem of the going-barrel, and 34 is a suitable key for winding the spring within said barrel.

The barrel 31 is shown located beneath the plate or table 2 and sustained by a bracket 35 carried thereby. To prevent reverse motion of said going-barrel, while at the same time preventing the noise that usually arises by the use of a ratchet and pawl, I have connected with said barrel 31, a friction disk 36, that is adapted to bear against rollers or balls 37 that are confined between said disk and an abutment 38. This abutment 38 is secured to the bracket 35 (see Fig. VII) and its side that faces said disk is cam like and gradually

approaches said disk forming a gradually decreasing or substantially V-shaped opening 39, in which the roller 37 may be jammed.

40 is a spring having one end 41 bent inwardly and lying in the path of the ball 37, so as to close the recess 39 and confine said ball in said recess while at the same time permitting said roller to have free movement in the direction of normal rotation of the disk 36 as shown by the arrow in Fig. VII.

With the above arrangement the disk 36 and the going-barrel 31 can have noiseless rotation in the driving direction, but if said disk tends to turn in the reverse direction the ball 37 will be jammed in the recess 39 between the disk 36 and abutment 38.

In Fig. VIII I have shown two abutments 38; springs 40 and rollers 37, whereby the pressure on said disk 36 will be equalized.

The governor shaft 7 is to be driven from the going-barrel 31, and for this purpose I have provided a system of speed-gearing between said barrel and said shaft. The rack 32 is shown in mesh with a pinion 42 on an arbor 43, suitably journaled in the bracket 35. The arbor 43 carries the gear wheel 44, that meshes with a pinion 45 on an arbor 46, suitably journaled in the bracket 35, the arbor 46 at its upper end carrying a friction disk or wheel 47, that is arranged to bear on a friction pulley 48, carried by the governor shaft 7. The friction disk 47 preferably carries on its periphery a rubber or other friction band 49, and the pulley 48 may also be made of rubber to produce great frictional contact with a minimum of noise. By the system of gearing above specified in conjunction with the power of the spring in the going-barrel the desired speed of the governor shaft 7 can be produced.

As above specified the governor shaft 7, has lateral motion which is for the purpose of permitting the pulley 48 to be pressed with more or less force against the friction disk 47. I preferably press the parts 47 and 48 together by spring action and for this purpose I connect to the bracket 9 a suitable spring 50, which at its other end may be detachably connected to an eye 51, on the bracket 35 or elsewhere. The action of this spring 50 is to continuously press the parts 47 and 48 together, and on account of the shaft 7 being pivotally supported any wear between said parts 47 and 48, will be automatically taken up.

To arrest the rotation of the governor shaft 7, when desired I have provided a brake which is arranged as follows:

52 is a handle or lever located above the plate 2 and carried by a shaft 53 suitably journaled in said plate and projecting below the same. At the lower part of said shaft is secured a spring finger 54, that is arranged to bear upon the pulley or roller 48, (see Fig. VI,) whereby the pressure of said finger upon said roller or pulley will stop the rotation of the governor shaft. To hold the lever 52 in the desired position it is provided on its



under side with a pin 55, arranged to enter apertures 56 in the plate 2, which apertures are so located as to hold the lever 52 in such position that the spring finger 54, will bear upon the roller or pulley 48 or release the same as the case may be.

57 is a knob on the lever 52 to permit its manipulation.

From the foregoing description it will be observed that I have provided a vertically arranged governor shaft that has lateral movement to permit frictional contact with its driving mechanism, and that said shaft is connected on one side to the operating mechanism, and on the other side to the cylinder of the phonograph, whereby said governor shaft is directly utilized for transmitting power to the phonograph cylinder. By this means I utilize the governor shaft as a means of connection in the line of transmission of power from the operating mechanism to the phonograph cylinder.

My improved governor will be found of great advantage in its capability of being adjusted to a nicety, so as to provide for uniformity of speed under all tensions of the operating spring or speed of the motor, and the consequent perfect delivery of the sounds from the phonograph cylinders.

A further improvement resides in the elimination of sounds from the driving mechanism by reason of the frictional transmission of power to the phonograph cylinders.

The device is simple in construction, readily manipulated and not liable to get out of order, as the parts co-act in such manner as to give the best results under all conditions.

Having now described my invention, what I claim is—

1. In a phonograph, a cylinder carrying shaft having a pulley, combined with an independent governor shaft having a pulley, guide pulleys and a belt passing from the governor shaft pulley over the guide pulleys and over the pulley on the cylinder shaft, substantially as described.

2. In a phonograph, a cylinder-carrying shaft, and a pulley thereon, combined with an independent governor shaft, a belt running therefrom over guide pulleys direct to said pulley, and means for rotating said governor shaft to transmit motion direct to said cylinder shaft, substantially as described.

3. In a phonograph, a cylinder-carrying shaft having a pulley combined with a governor-shaft, also having a pulley, a direct belt passing from said governor-shaft pulley to said cylinder-carrying shaft pulley, over guide pulleys, and driving mechanism connected with said governor shaft by frictional devices, substantially as described.

4. In a phonograph, a cylinder-carrying shaft, combined with a governor-shaft, and direct connections between said shafts, a spring-actuated mechanism for rotating said governor shaft, and frictional devices be-

tween said spring-mechanism and said governor shaft, substantially as described.

5. In a phonograph, a cylinder-carrying shaft, combined with a governor shaft connected therewith, said governor-shaft having lateral motion, and with driving mechanism having frictional devices for connection with said governor shaft, and means for holding said shaft against said devices, as and for the purposes specified.

6. A governor shaft, and weighted arms carried thereby and having friction faces, combined with a vertically adjustable brake device in line with said shaft, but independent thereof, and means for adjusting said brake-device toward and from said arms, to permit said friction faces to bear thereon with more or less force, substantially as described.

7. A governor shaft, and weighted arms carried thereby, said arms having friction faces, combined with a cone in line with said shaft, and means for adjusting said cone toward and from said arms as and for the purposes specified.

8. A governor and bell crank arms pivotally carried thereby, and weights connected with one member of said arms, the opposite members of said arms having friction faces, combined with a cone in line with said shaft, and means for adjusting said cone toward and from said arms, substantially as described.

9. A governor shaft, weighted arms pivotally carried thereby, and springs connecting said arms with said shaft, combined with a cone in line with said shaft and means for adjusting said cone toward and from said shaft, substantially as described.

10. A governor shaft, and weighted arms carried thereby, combined with a cone in line with said arms, a rack connected with said cone, a pinion in mesh with said rack, and means for turning said pinion to operate said cone, substantially as described.

11. The combination of a bracket or frame, a governor shaft pivotally carried thereby, a rod carried by said bracket or frame against which one end of said shaft bears, weighted arms pivoted on said shaft, a cone sliding on said rod and means for adjusting said cone toward and from said arms as and for the purposes specified.

12. The combination of a bracket and means for pivotally supporting it with a governor shaft carried thereby, governing devices connected with said shaft, a friction disk for turning said shaft and means for holding said shaft against said disk, substantially as described.

13. The combination of a plate or table and a standard carried thereby, with a vertical bracket or frame pivotally carried by said standard, a governor shaft journaled in said bracket or frame, governing devices connected with said shaft, a frictional driving disk to turn said shaft, and means for holding said shaft in engagement with said disk, substantially as described.



14. The combination of a vertical governor shaft, and means for permitting it to have lateral motion, governing devices connected with said shaft and a friction disk or roller on said shaft, with a friction disk and means for turning it, and with a spring arranged to press said disk and roller together, as and for the purpose specified.

15. The combination of a governor shaft, and governing devices connected therewith, with frictional devices for turning said shaft, and a brake to act on said shaft to arrest its rotation, substantially as described.

16. The combination of a governor shaft, governing devices connected therewith, frictional devices for turning said shaft, a brake finger to arrest the rotation of said shaft and a lever or handle carrying said brake finger, substantially as described.

17. The combination of a governor shaft, a friction disk or roller carried thereby, a friction disk in engagement therewith, a spring and intermediate devices between said spring and said friction disk for turning the latter by the former, as and for the purposes specified.

18. The combination of a laterally movable governor shaft, a friction disk arranged to turn said shaft, a going-barrel, a spring for turning said barrel, a rack carried by said barrel, and gearing between said rack and said friction disk, as and for the purposes specified.

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