

No. 673,429.

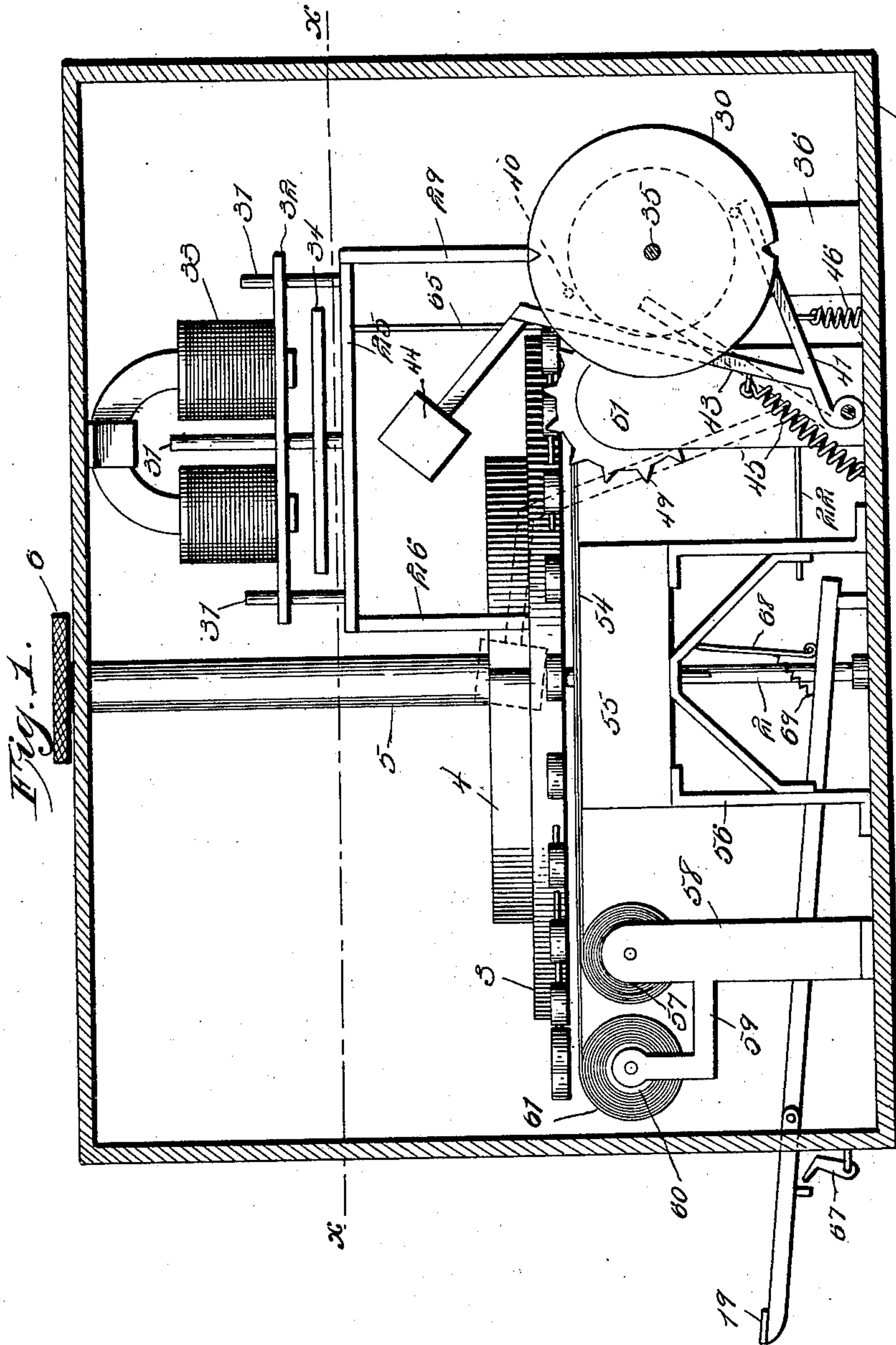
Patented May 7, 1901.

A. J. FARMER.
LONG DISTANCE TYPE WRITER.

(Application filed June 4, 1900.)

(No Model.)

7 Sheets—Sheet 1.



Witnesses

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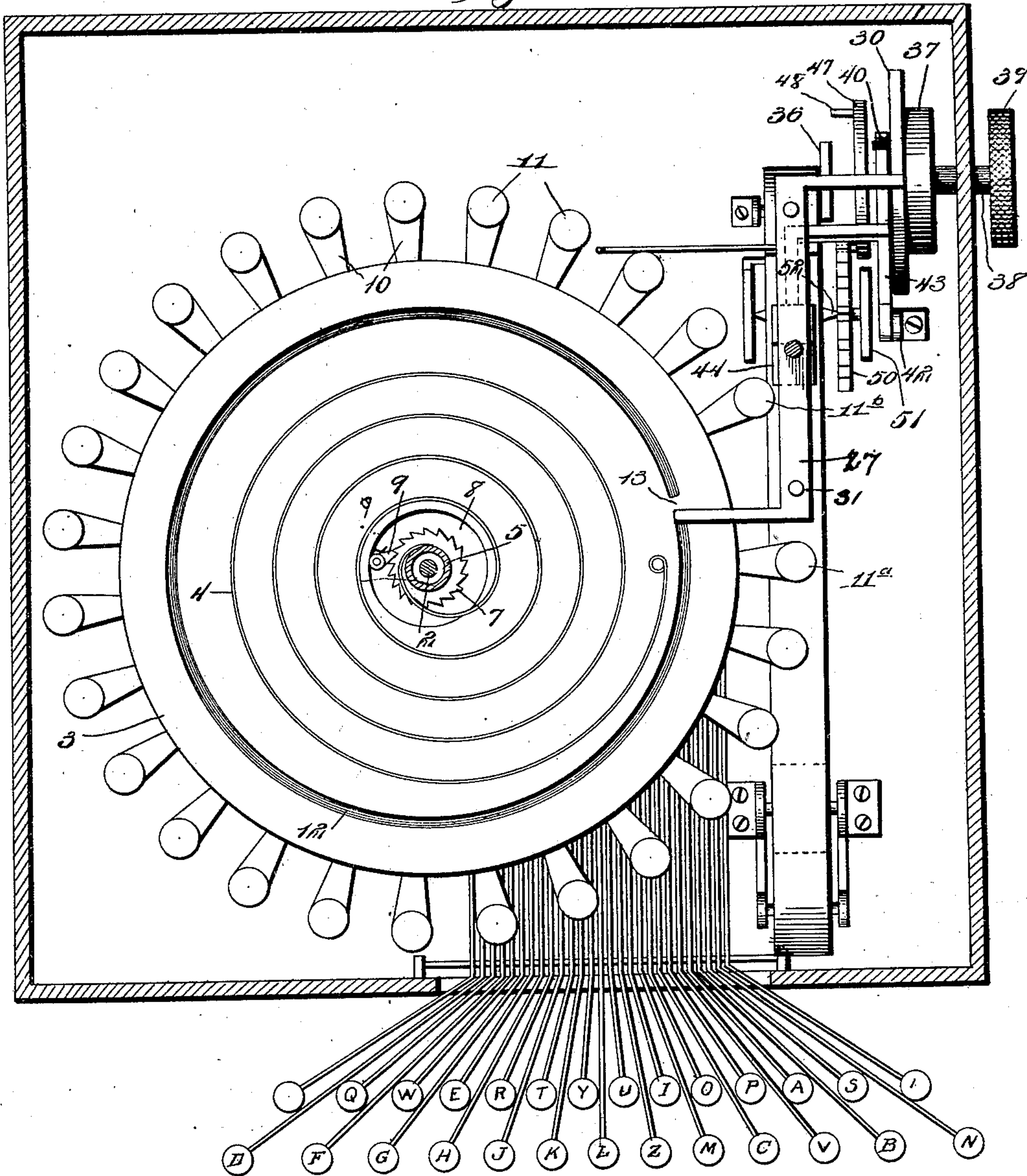
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7 Sheets—Sheet 2.

Fig. 2.



Witnesses

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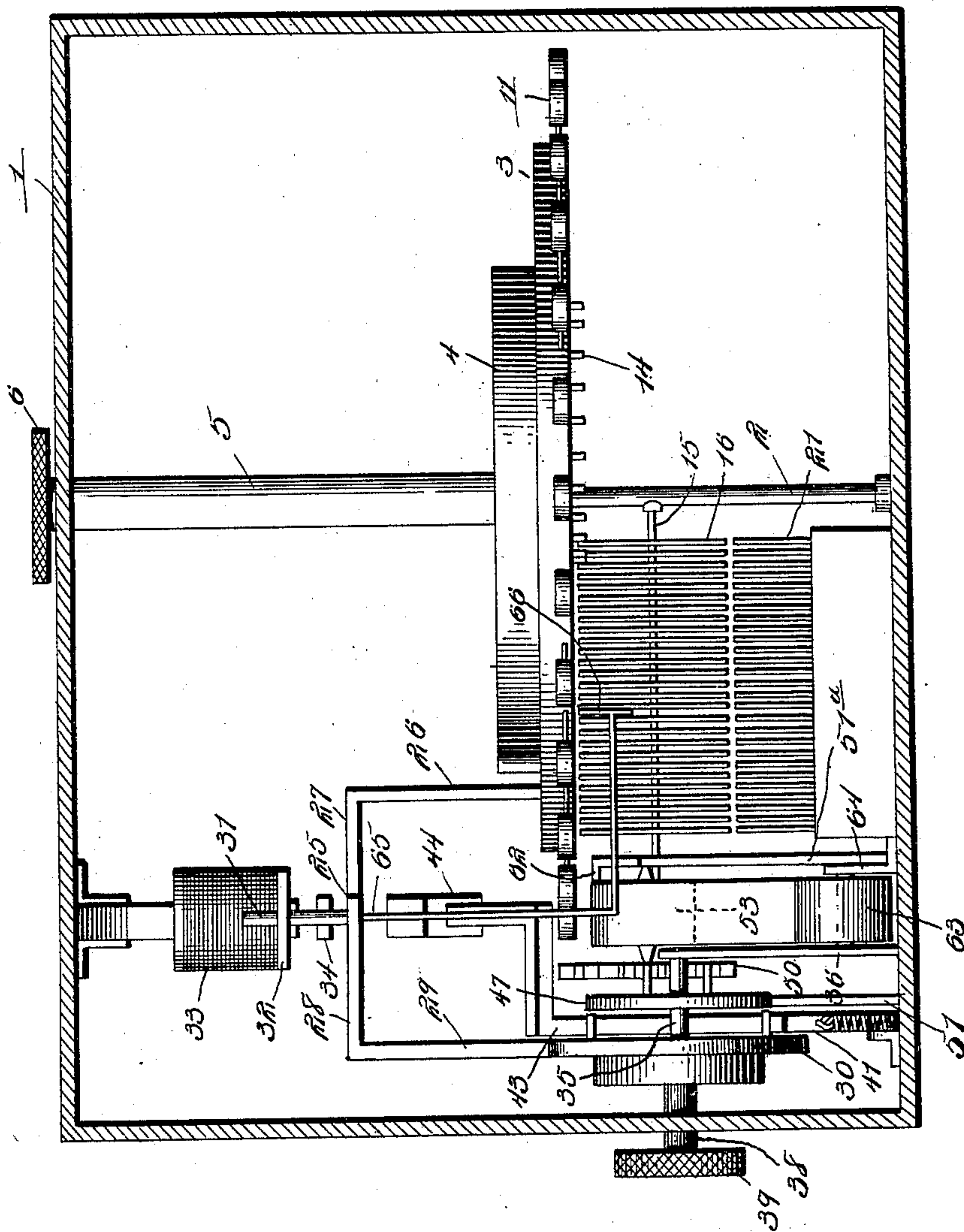
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Fig. 3.



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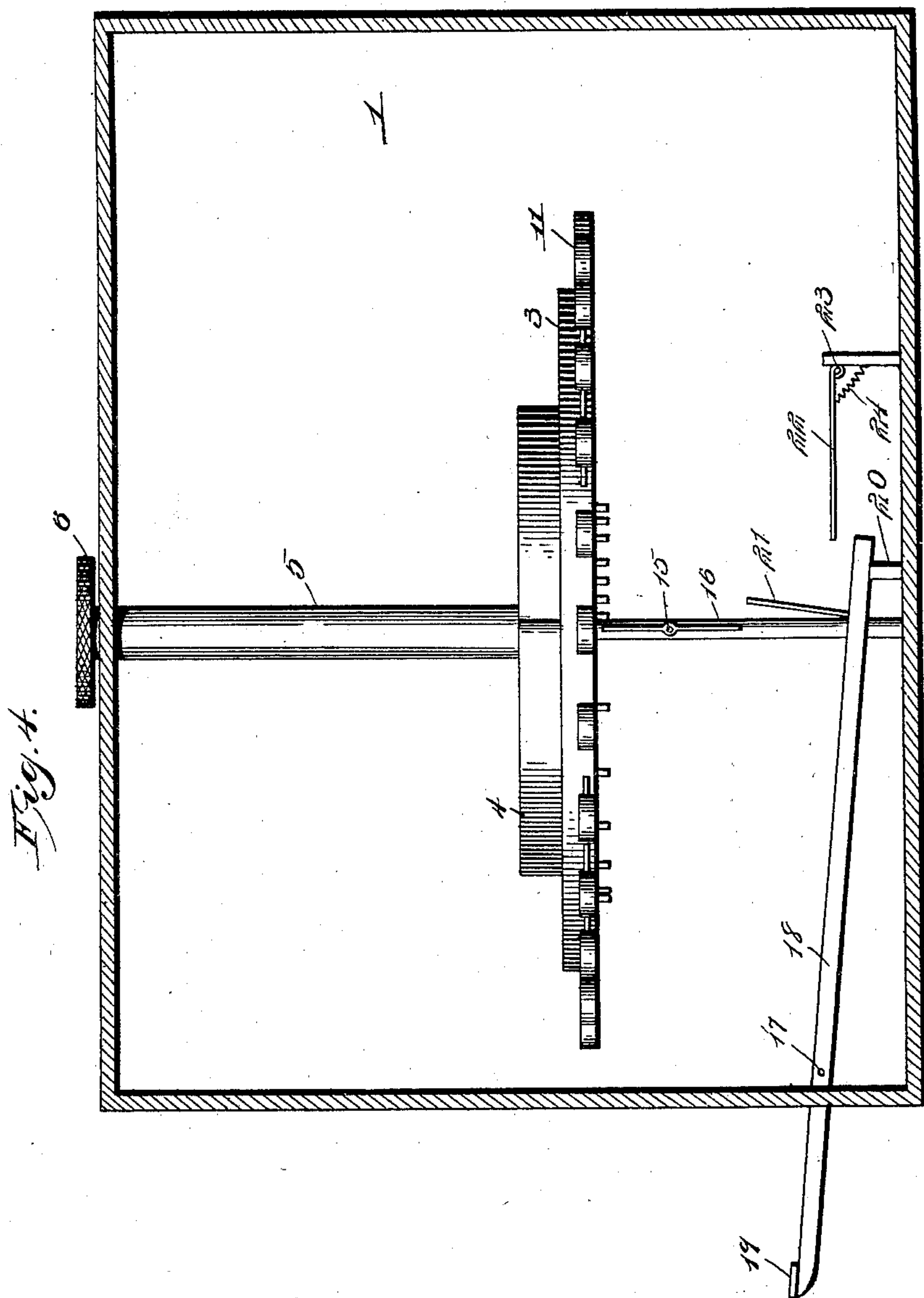
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7 Sheets—Sheet 4.



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Fig. 5.

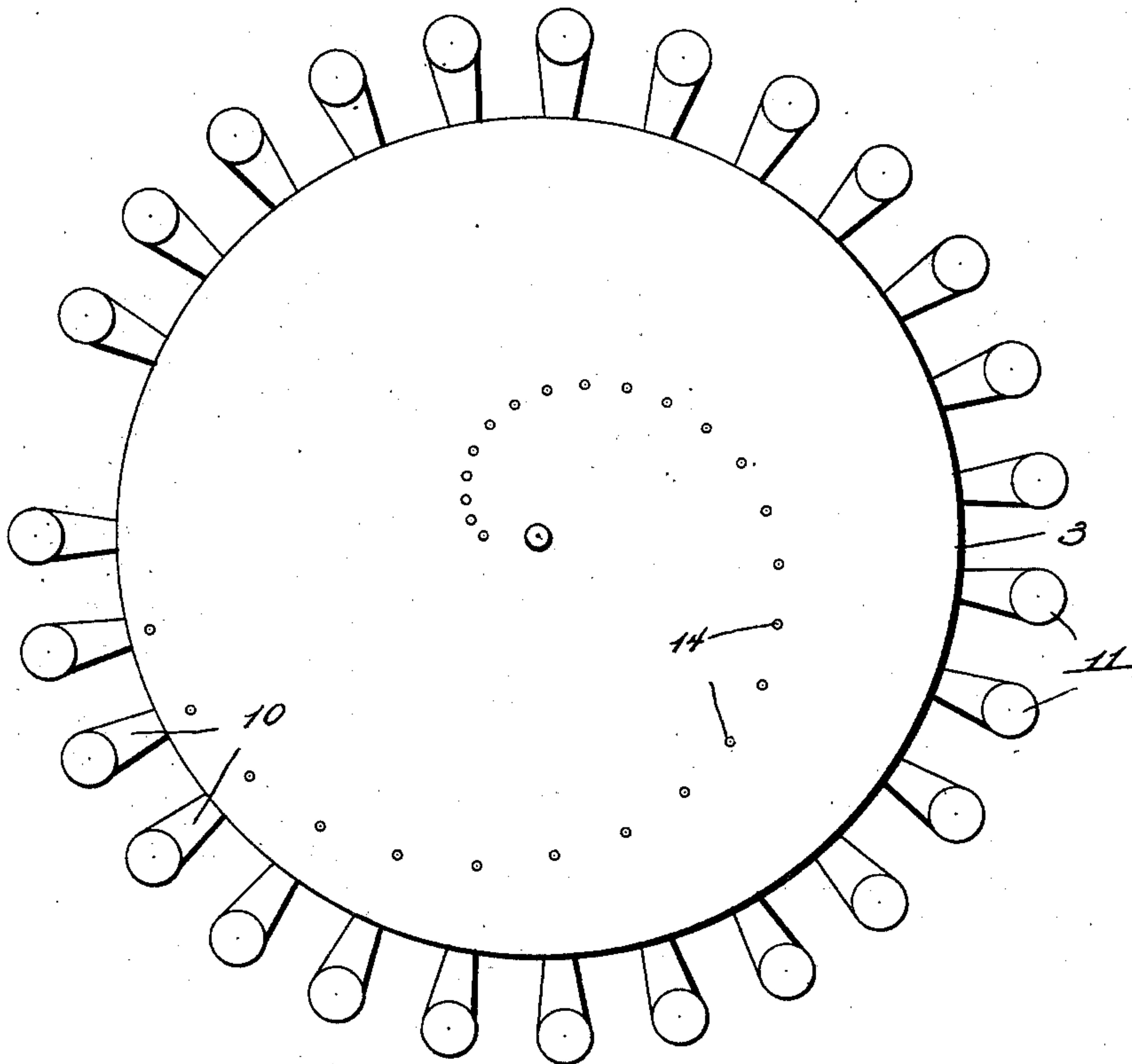
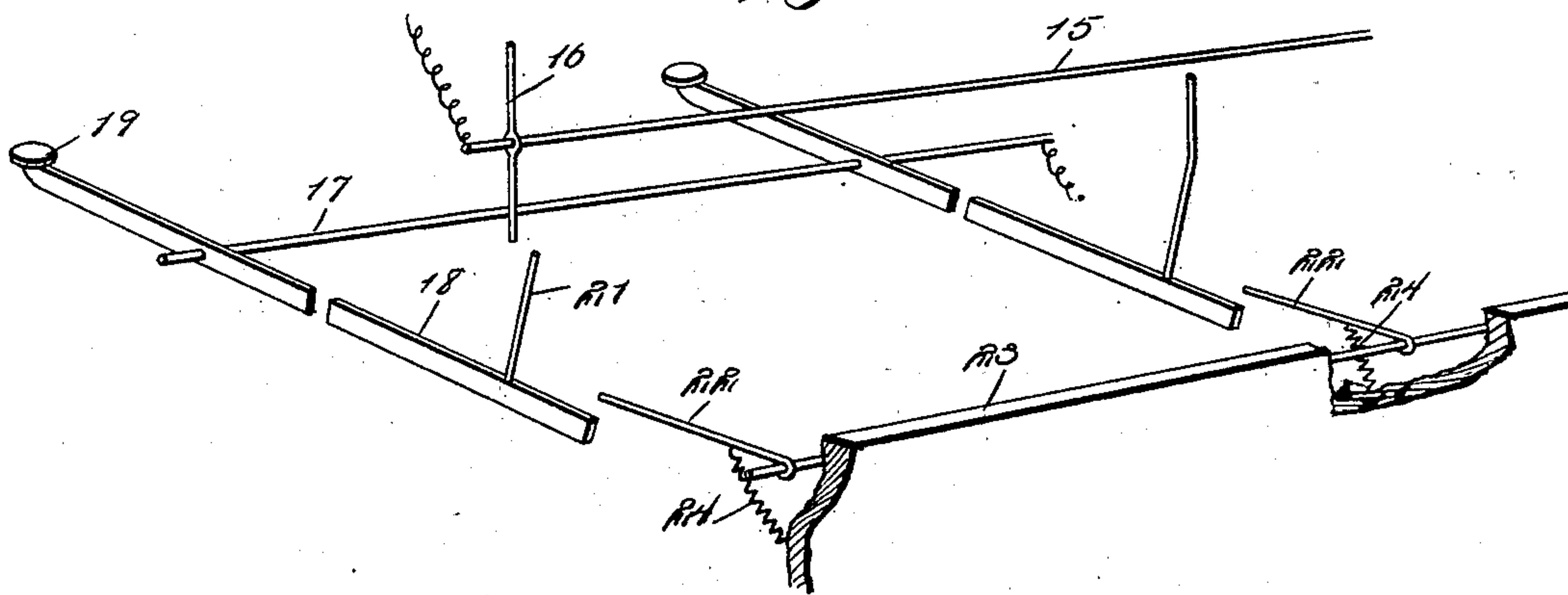


Fig. 6.



Witnesses

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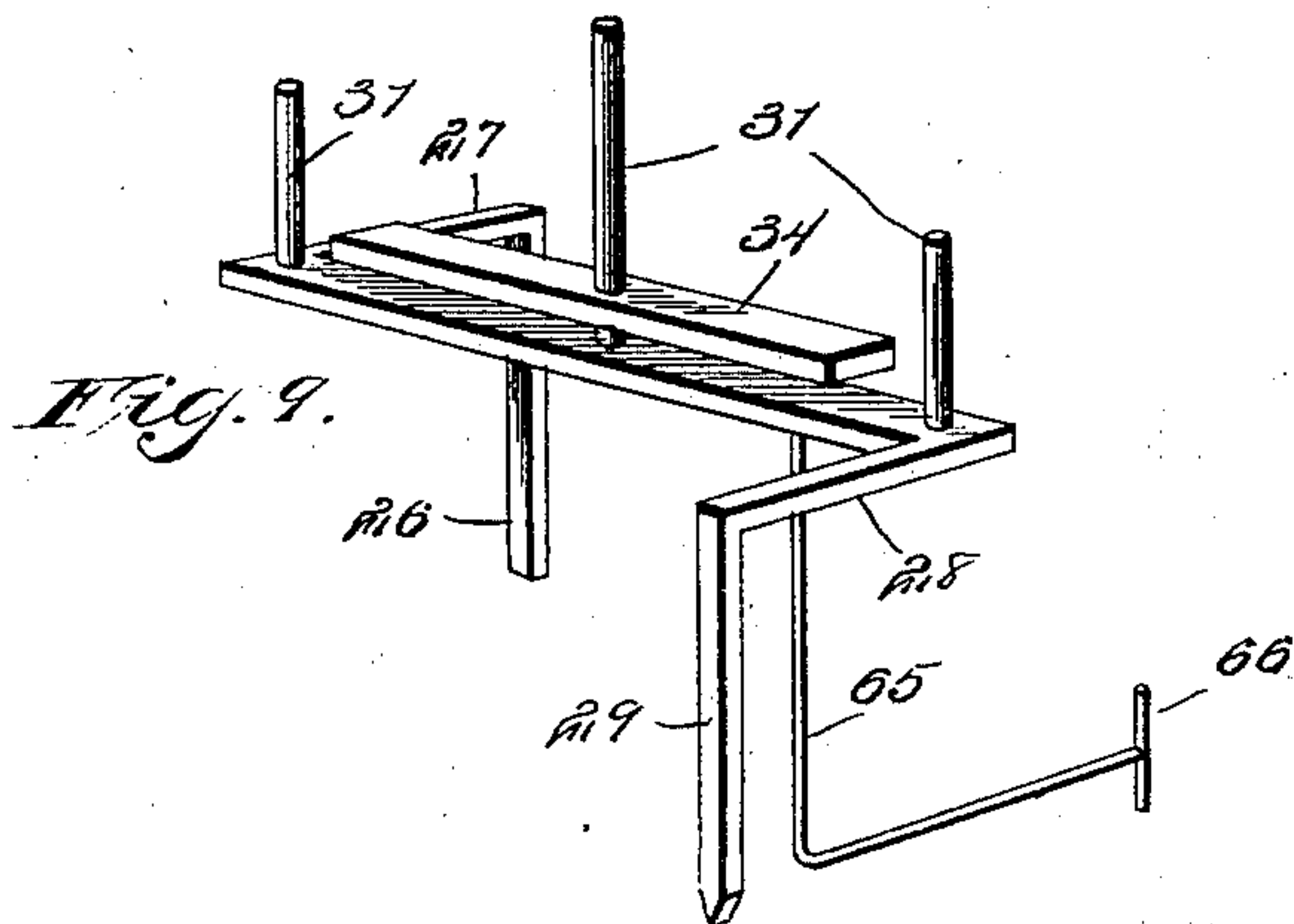
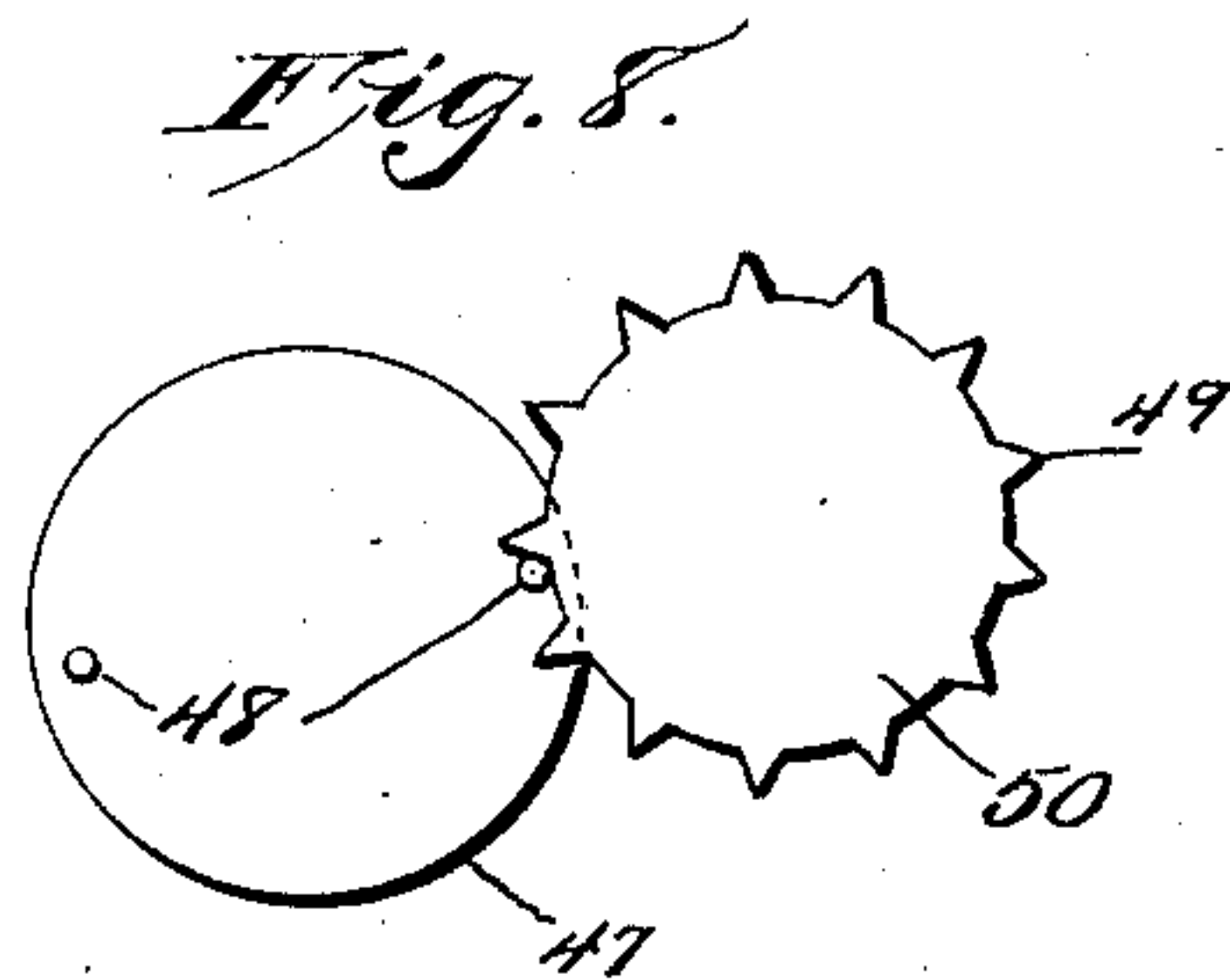
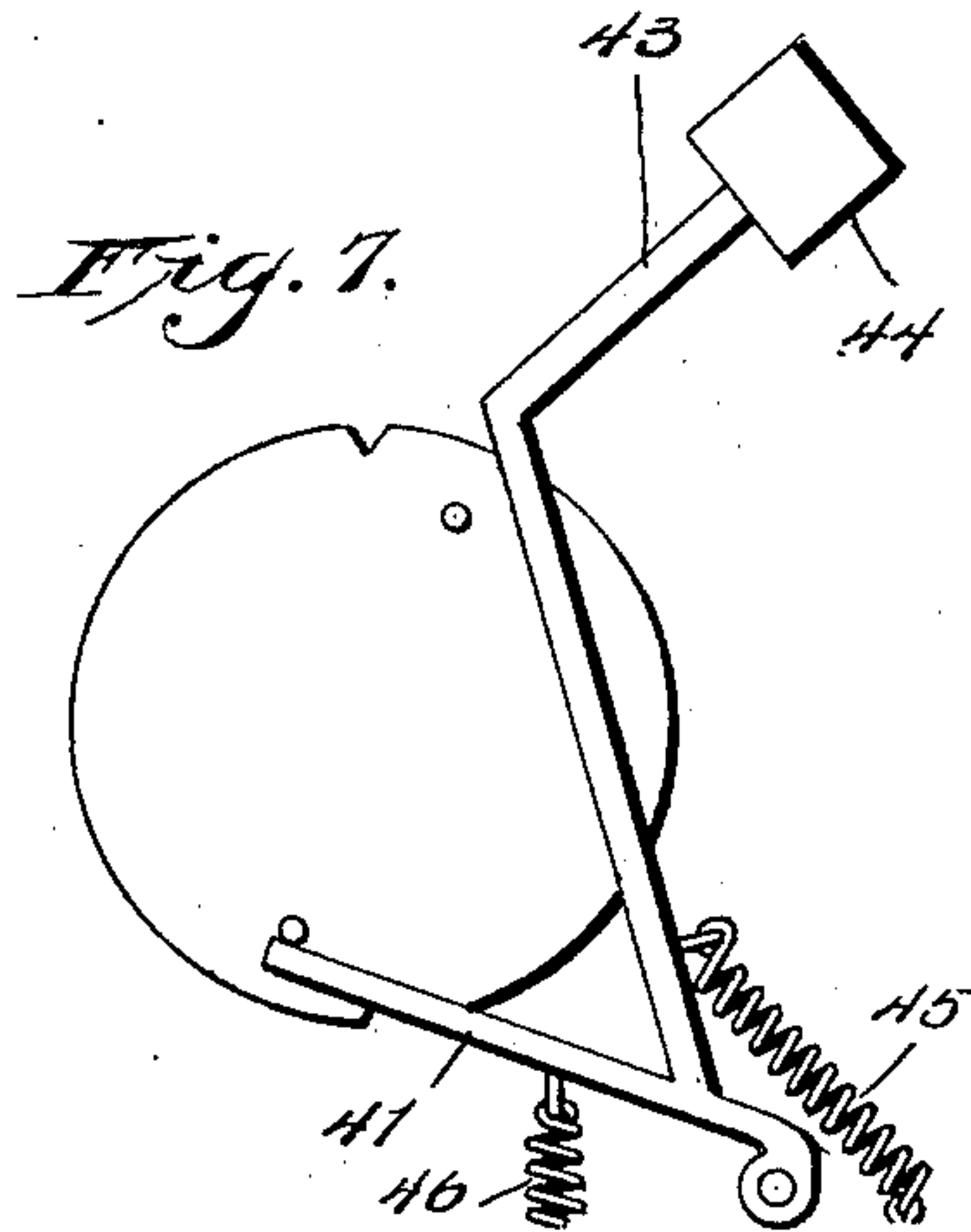
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7 Sheets—Sheet 6.



Witnesses

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7 Sheets—Sheet 7.

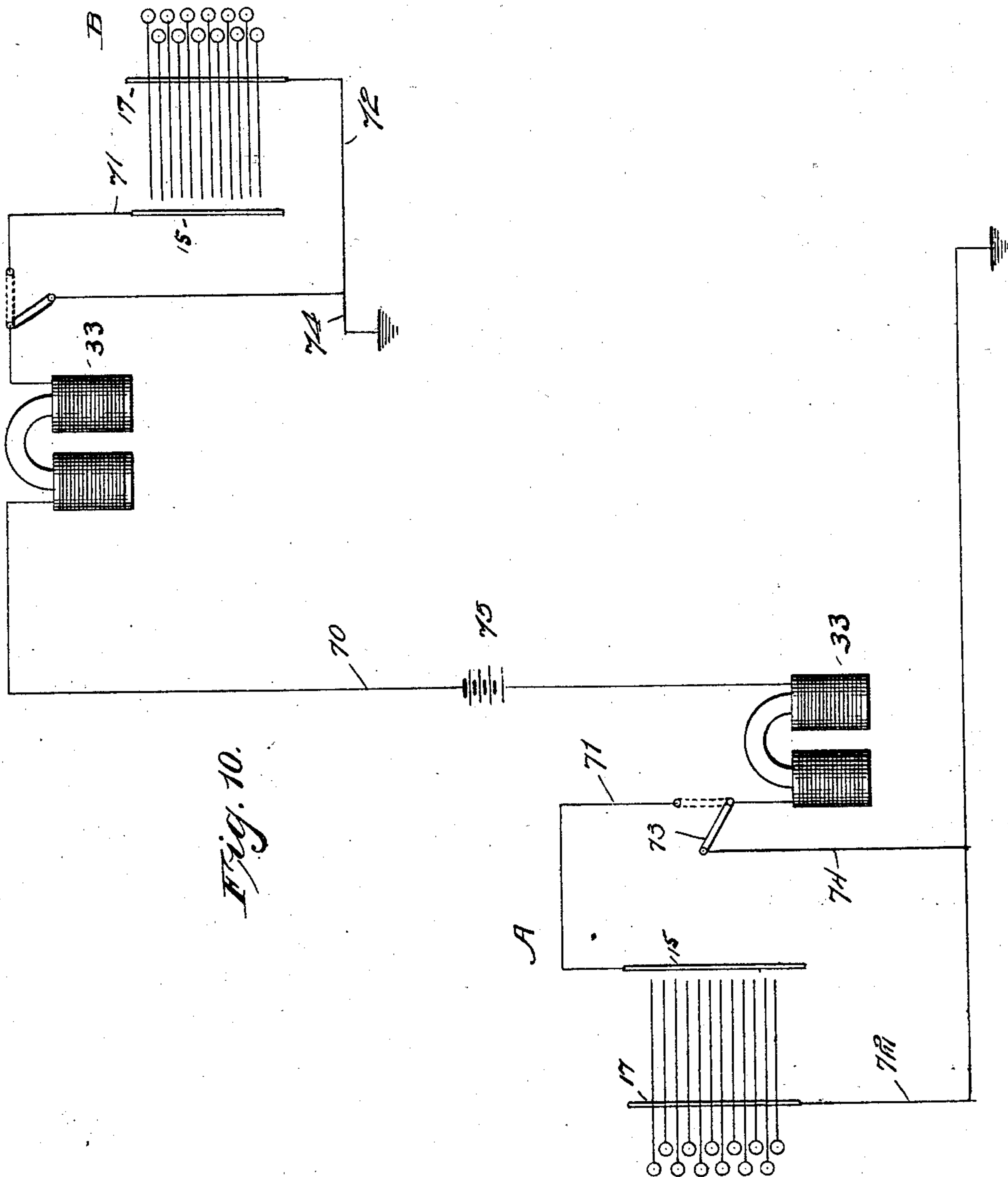


Fig. 10.

Witnesses

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UNITED STATES PATENT OFFICE.

ARTHUR J. FARMER, OF DETROIT, MICHIGAN.

LONG-DISTANCE TYPE-WRITER.

SPECIFICATION forming part of Letters Patent No. 673,429, dated May 7, 1901.

Application filed June 4, 1900. Serial No. 19,087. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR J. FARMER, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented new and useful Improvements in Long-Distance Type-Writers, of which the following is a specification.

This invention relates to new and useful improvements in long-distance type-writers; and its primary object is to provide a device of this character which may be readily attached to an ordinary electric circuit and which will record in printed letters or figures at a point where there is no attendant a message or number sent by an operator from an identical instrument at another point within said circuit.

A further object is to provide means of novel construction whereby the transmitting and receiving instruments are operated in unison and an impression of the proper character is made at each end of the line.

Another object is to provide a machine of compact form which may be used both as a transmitting and as a receiving instrument.

To these ends the invention consists in providing two machines which are similar in construction and each of which, as before stated, may be used as either a transmitting or receiving device. Each of these instruments is provided with a wheel having type suitably arranged thereon and projecting from the edge thereof, and said wheel is propelled in a suitable manner, as by means of a spring secured thereto. These wheels of the two machines are driven by the springs at the same speed and at the same time, and it is obvious that they will therefore revolve together when released. The wheel is held normally stationary by means of a catch, which is disengaged therefrom by an electromagnet adapted to be charged through a circuit formed when the proper key on the keyboard is depressed, as will be hereinafter more fully described. The raising of said catch will release novel hammer-operating mechanism, which will cause a hammer of suitable construction to strike the proper type and make an impression thereof upon paper, which is mounted adjacent to the type and so operated as to prevent doubling up of the characters thereon. The two machines are so connected

as to be released in unison from one keyboard. Suitable means is employed for locking the type-wheels of the transmitting and receiving machines at the same time, and as said wheels are released together and revolve at the same speed it is obvious that similar type will be held stationary above the platens of the two machines at the same time ready to make an impression.

The invention also consists in providing means of novel construction whereby a circuit is made at the proper time upon both machines upon depressing the proper character upon the keyboard.

The invention also consists in the further novel construction and combination of parts hereinafter more fully described and claimed, and illustrated in the accompanying drawings, showing the preferred form of my invention, and in which—

Figure 1 is a side elevation thereof with the casing removed. Fig. 2 is a section on line *x x*, Fig. 1. Fig. 3 is a rear elevation of the mechanism with the casing removed. Fig. 4 is a side elevation of the type-wheel, key-lever, and the means for placing said lever in circuit. Fig. 5 is a bottom plan view of the type-wheel. Fig. 6 is a detail view of key-levers and means for placing the same in circuit. Fig. 7 is a side elevation of the hammer and its operating-wheel. Fig. 8 is a similar view of the means for operating the paper-carrying roller. Fig. 9 is a perspective view of the combined release and locking catch. Fig. 10 is a diagrammatical view showing the relative positions of the two machines upon a circuit.

Referring to said figures by characters of reference, 1 is a casing having a vertical stationary shaft 2 therein, upon which is loosely mounted a horizontal wheel 3, to the upper surface of which is secured one end of the spring 4. The opposite end of this spring is fastened to a sleeve 5, loosely mounted upon the shaft 2, and said sleeve extends upward through the casing 1 and is provided with a head or knob 6, whereby the spring may be readily wound by hand. A ratchet-wheel is secured to the sleeve 5, at the bottom thereof, and rests within a recess 8, formed within the wheel 3, at the center thereof. This ratchet is normally engaged by a pawl 9 with-

in the recess and is thereby prevented from moving backward, as will be obvious. Projecting from the edge of the wheel 3 are a suitable number of spring-plates 10, to the end of each of which is secured a type 11, as shown. These types are arranged at equal distances from each other and are equal in number to the keys upon the keyboard of the machine. The type are mounted in such a manner as to permit the same to be slightly depressed when receiving a blow from a hammer, such as will be hereinafter described. This is preferably permitted by employing the spring-plates 10 heretofore referred to.

I do not limit myself to the particular means herein shown and described for securing the type to the wheel, as any connection which will permit the depression of the type may be employed.

At one point upon the edge of the wheel 3 a space is provided between two type 11^a 11^b equal to twice the ordinary distance between the type. A groove 12 is formed within the upper surface of the wheel, near the edge thereof, and is concentric thereto. This groove lies outside of the spring 4 and is provided at a suitable point with a bridge 13, which is located at a point equidistant from the type 11^a 11^b. Arranged upon the under surface of the wheel 3 are suitable projections 14, formed of insulating material, equal in number to the type employed. These projections are each located on the radius extending from its type to the center of the wheel, and each succeeding projection is located at a greater distance from the center than the preceding one, as is clearly shown in Fig. 5.

A rod 15 is located beneath the wheel 3, at a suitable distance therefrom, and is parallel to that radius thereof which extends from the center through the bridge 13, and the supporting ends thereof are insulated in any suitable manner. Upon this rod are mounted rocking pins 16, equal in number to the number of projections 14 upon the wheel 3 and so spaced apart that each one thereof will contact with but one of said projections. A second rod 17, insulated at its ends, extends transversely of the casing, and mounted thereon are bars 18, equal in number to the keys 19 of the keyboard. These bars are normally held depressed at their rear ends and may rest upon a cross-strip 20, as shown. An arm 21 extends upward from each bar 18 and is adapted to lie within the path of its pin 16 when its key 19 is depressed. Arms or supports 22 are pivotally mounted upon a bracket 23 and lie normally in a horizontal position, one arm being provided for each bar 18. These arms are each held in position, preferably by means of a spring 24, and are pressed upward when the key 19 is depressed by the rear end of the bar 18 contacting therewith. Each of these arms serves as a rest for its bar 18 and holds the arm 21 within the path of its pin 16 until said bar 18 is thrown downward beneath the end of said arm 22 by the

projection 14 of pin 16 coming into violent contact with pin 16 and the latter coming into violent contact with said arm 21.

The wheel 3 is normally held in the position shown in Fig. 2 by means of a catch 25, which is of peculiar construction. This catch is provided with a downwardly-extending arm 26, which projects into the groove 12 and forms a stop, against which bears the bridge 13, as shown. This arm is connected to the body or central portion of the catch preferably by means of a horizontal portion 27, as shown. The opposite end of said body is provided with a strip 28, which extends therefrom in a direction opposite to that of the part 27, and an arm 29 extends downward from this strip into engagement with a toothed wheel 30. The body 25 of the catch is provided at the center and near each end thereof with upwardly-projecting pins 31, which are slidably mounted within a plate 32, secured to the bottom of the coils of an electromagnet 33, which is mounted within the casing in any suitable manner. Secured to the central pin 31 is an armature 34, which is adapted to be attracted by the electromagnet when the same is charged, as will be obvious. It will be seen that the catch 25 will be carried upward with the armature 34, and the pins 31 serve as guides therefor and prevent the same from twisting or becoming displaced.

The wheel 30 is mounted upon a shaft 35, preferably journaled within a suitable standard 36 and in the side of the casing 1. The wheel 30 is fixed to this shaft and is connected to a spring 37, the opposite end of which is fixed to a sleeve 38. This spring may be wound thereon by means of a head 39, projecting from the side of the casing, a pawl and ratchet similar to those heretofore described being employed to hold the spring in retracted position. It is obvious that the arm 29 of the catch will prevent the wheel 30 from revolving except when removed from engagement with the teeth thereof.

Preferably two projections 40 extend from the inner face of the wheel 30 at diametrically opposite points and are adapted to successively engage an arm 41 of a hammer. This hammer is pivoted to a suitable bracket 42, secured to the base of the casing, and is provided with a second arm 43, which extends upward at an angle to the arm 41 and thence inwardly, as shown, terminating in a head 44, which is adapted to swing downward and contact with a type when the same has reached a point above the center of the platen. This hammer is held normally in the position shown in dotted lines in Fig. 1 by means of springs 45 and 46, the spring 46 being of sufficient strength to hold the head 44 at a point slightly above the upper edge of the type.

Mounted upon the shaft 35, adjacent to the wheel 30, is a wheel or disk 47, having projections 48, arranged at diametrically opposite points thereon, adapted to contact with teeth 49, projecting from the periphery of a

wheel 50, which is detachably secured to, but movable with, a shaft 52. This shaft 52 is mounted at one end within a bracket 51 and at its other end in a standard 51^a, said shaft 5 being detachable from its support. This shaft extends through a paper-carrying roll 53, secured to one end of a strip of paper 54, which extends over a platen 55, mounted upon suitable standards 56, secured to the base of the casing in any desired manner. It will be seen that the roll 53 is thus detachable to enable any message printed thereon to be read. The platen is formed of any preferred material, preferably rubber, and serves as a bearing 15 for the paper 54, as is obvious. The paper 54 is loosely mounted upon a roller 57, journaled within standards 58, which are secured to the base at one side of the platen. Brackets 59 extend from the standards 58 and support a roller 60, upon which is mounted a ribbon 61, which extends over the paper strip 54 and down over an arm 62. This arm preferable extends outward from the inner standard 51^a, and the ribbon passes thereover to a roller 63, preferably journaled in standards 25 36, and a bracket 64, as shown in Fig. 3. This ribbon may be slowly moved during the operation of the machine in any well-known manner.

30 Extending downward from the catch 25, near one end thereof, is an arm 65, which projects inward at a point below the type 11 and is provided with a vertically-extending end or head 66, which is adapted to lie within the path of said type when the catch 25 is raised 35 by the magnet 33, and thereby retard the revolution of the wheel 3. This head is so located as to engage the type at the moment the type containing the proper character arrives at a point above the center of the 40 platen 55.

One of the key-bars 18 is provided with suitable means, as a hook 67, whereby the same may be locked when the key is in depressed position, and an arm 68, which is employed in lieu of the arm 21 of each key-bar 18, is pivoted thereto and adapted to project upward into contact with, preferably, the inner one of the pins 16 when the wheel 3 is in 50 its normal position, said pin being swung forward and held there when the wheel is in said position by means of its projection 14. The arm 68 is preferably held in a normal position by means of a spring 69, as shown, and 55 the pin 16 will be swung out of contact therewith and assume its normal position when the projection 14 becomes disengaged therefrom at the beginning of the revolution of the wheel. The pin will be again thrown into 60 contact with the arm 68 when the wheel completes its revolution. The projection 14, contacting with the pin 16 of this arm 68, is arranged upon the radius passing from the center of the wheel through the bridge 13.

65 These machines are placed in the ordinary telegraph-circuit, having a source of electricity, by a switch, (not shown in the drawings,)

which will throw out the signaling apparatus of the telegraph when including the herein-described type-writer, and vice versa. The 70 arrangement shown in Fig. 10 presents the terminal connections and line-wire 70 with the machines used on any electric circuit. (Source of electricity not shown.) The magnet of each machine is then connected by 75 means of a wire 71 to the rod 15 thereof, and a ground-wire 72 extends from the rod 17, as shown.

In order to cut the keyboard of the machine out of circuit, a switch 73 and a wire 74, as 80 shown, have been provided. The switches 73 are normally so arranged as to hold the keyboards of the machines out of circuit.

When it is desired to print a message upon the receiving-machine, the switch of the transmitting-machine A, Fig. 10, is thrown into 85 contact with the wire 71, and the instrument is then ready for use. The key of the lock-bar 18 is then depressed, causing its arm 68 to swing up into contact with its pin 16. This 90 will immediately form a circuit from the source of electricity, which may be a battery 75, and the current will pass into the magnet of the transmitter A and thence to the bar 15. From this bar it will pass through the 95 contacted pin 16 to the arm 21, bearing thereagainst, and then through the type-bar of said arm to the rod 17. As this rod is connected to the wire 72, the current will be conducted to the ground by said wire and will 100 pass to the ground-wire of the receiving-machine B and to its magnet 33 by way of the wire 74 and the switch 73 thereof. The two magnets 33 will thus be energized at the same time, and the current will return to its source 105 by way of the wire 70. As soon as the two magnets are energized their armatures will be attracted thereto, thereby removing the arms 26 of the catches from the grooves 12. The arms 66 are so located between the type 110 when the arms 26 are raised out of contact with the bridges 13 as to permit a movement of the wheel of the transmitting-machine sufficient to remove the projection 14 corresponding with the arm 68 out of contact with 115 its pin 16, thereby breaking the circuit and dropping the catches upon the bridges or into the grooves in rear thereof. The arms 66 will at the same time drop from between the type, and the wheels are free to revolve, motion being 120 imparted thereto by the springs 4. As the wheels 3 revolve the key of the proper character to be printed is depressed, causing the arm 21 of its bar 18 to lie within the path of its pin 16. As the wheel 3 of the transmitter continues to revolve the projection 14 belonging to the desired type upon the wheel will press the pin 16 into contact with the arm 21, forming a circuit through the rods 15 and 17 and the bar 18 and through the wires, as 130 hereinbefore described, energizing the magnets and causing the catches 25 to be raised at that instant. This will, as is obvious, carry the locking-arms 65 upward, bringing the

heads 66 thereof into engagement with the type-wheels and preventing their revolution. Each time the magnets are energized the wheels 30 will be released, causing one of the
 5 pins 40 of each wheel to contact with the arm 41 of its hammer and depress the same, drawing the heads 44 upward. The arms will be released by the lower pins 40 of the wheels 30 and will cause the hammer-heads 44 to
 10 swing downward, propelled by the springs 45, and impart blows to the type located above the platens 55. The operations of the hammers are so timed that the same will drop just as the type of the arms 16, forming the circuit, arrive in position above the platens. A
 15 blank type is provided upon each wheel which is adapted to be struck by its hammer when the release-key is depressed, and this will not therefore make a legible impression upon the
 20 paper. Preferably two notches are provided in the periphery of each wheel 30, and these are arranged diametrically opposite to each other. The catches will ride upon the edges of the wheels after being released therefrom
 25 and dropped and will permit a one-half revolution thereof.

As before stated, the head 66 is so arranged in relation to the bridge that the same will not lock the wheel 3 against rotation until
 30 after the bridge has passed under the point of the catch. When the pin 16 strikes the arm 21 and forms a circuit, said arm will be swung backward by said pin immediately afterward, forcing the bar 18 below the sup-
 35 porting-arm 22, thereby breaking the circuit and causing the catch 25 to drop back into position upon the wheels 3 and 30. When the wheel completes its revolution and the bridge 13 again contacts with the arm 26 of
 40 the catch 25, the projection 14 upon the radius running through said bridge will again form its circuit through the arm 68 and its pin 16 if said bar 18 is locked in position and again release the catch, causing the wheel to revolve,
 45 and the operation is then repeated, as in the manner heretofore described.

It is not necessary to lock the release-bar, as, if desired, the same may be depressed manually at the completion of each revolution
 50 of wheel 3.

It is obvious that as the magnet of the receiving-machine is charged at the same time as the magnet of the transmitting-machine the catches thereof as well as the hammers,
 55 &c., will be operated synchronously, and as each of the wheels 3 starts from the same point and at the same speed it will be seen that they will both be locked when similar type are above the platen. The blows from
 60 the hammer will also be imparted at the same time, and it will thus be seen that similar characters will be produced upon the paper at each end of the circuit.

Projections 48 are arranged upon the wheel
 65 47, which is secured to the shaft 35, and these projections are adapted to contact with the teeth of the wheel 50, and said wheel and the

roller 53, which is secured thereto, are slowly revolved upon each stroke of the hammer 44, as heretofore described, and by this arrange-
 70 ment type will not strike more than once at one point upon the paper strip 54.

It will be seen that by mounting the ribbon 61 between the paper and the type 11 an impression is readily secured upon said paper.
 75

The type-wheel 3 may be of any desired size and provided with either numerals or letters, or both. It will be also understood that any desired arrangement or duplication of characters upon the wheel 3 may be made.
 80

In the foregoing description I have shown the preferred form of my invention; but I do not limit myself thereto, as I am aware that modifications may be made therein without departing from the spirit or sacrificing the
 85 advantages thereof, and I therefore reserve the right to make such changes and alterations as fairly fall within the scope of my invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters
 90 Patent, is—

1. The combination with a type-wheel having projections thereon at varying distances from the center; of rocking pins adapted to
 95 contact with said projections; key-bars; arms thereto adapted to be thrown into the paths of the rocking pins; and means for supporting said bars in raised position.

2. The combination with a type-wheel having projections thereon at varying distances from the center; of rocking pins adapted to
 100 contact with said projections; key-bars; arms upon the bars adapted to be thrown into the paths of the rocking pins; and spring-
 105 supported arms to retain the key-bars in raised position.

3. The combination with a shaft; of a grooved type-wheel loosely mounted thereon; a bridge across said groove; a sleeve upon the
 110 shaft and having a knob thereto; a ratchet secured to a sleeve; a pawl upon the wheel engaging said ratchet; a spring secured to the sleeve and wheel at opposite ends respectively; and a catch within the groove of the
 115 wheel normally bearing against the bridge to prevent rotation thereof.

4. The combination with a shaft; of a grooved type-wheel mounted thereon; means for imparting motion thereto; a bridge with-
 120 in the groove; a catch projecting into said groove at one end; a toothed wheel engaged by said catch at the opposite end; a projection upon said wheel; a hammer adapted to be engaged by said projection; an armature
 125 secured to the catch; and a magnet.

5. The combination with a type-wheel having a groove therein and a catch engaging said groove; of a toothed wheel; an arm to the catch engaging said wheel; a pivoted ham-
 130 mer; an arm thereto adapted to be automatically engaged and released by said wheel when the same is revolved; and means for releasing the catch from the wheel.

6. In a device of the character described, the combination with a grooved type-wheel and a toothed wheel; of a catch engaging said groove and teeth at its opposite ends respectively; an arm to said catch extending under the type and adapted to engage therewith when in raised position; an armature secured to the catch; and a magnet.

7. In a device of the character described, the combination with a grooved wheel; of springs projecting from the periphery thereof; type secured to said springs; a hammer pivoted to the base and extending over and adapted to contact with said type; an arm to the hammer; a spring-operated wheel having projections adapted to engage and release the arm; a catch engaging said wheel and the groove of the type-wheel; and means for releasing said catches synchronously.

8. The combination with a type-wheel and a catch engaging therewith; of a shaft; a spring-operated toothed wheel thereon; a second wheel secured to said shaft; projections thereon; a toothed wheel engaged by said projections; a roller secured to said wheel; and a paper-carrying roller secured to, and movable with, said toothed wheel.

9. The combination with a type-wheel having a concentric groove therein and a catch engaging said groove; of a shaft; a spring-operated wheel mounted thereon and engaged by the catch; a hammer pivoted to the base and adapted to contact with the type of the type-wheel; an arm to said hammer, projections upon the toothed wheel for engaging and releasing said arm; a wheel secured to the shaft and having projections thereon; a toothed wheel suitably mounted and adapted to be engaged by said projections; and a paper-carrying roller movable with, and detachable from, the toothed wheel.

10. The combination with a casing; of a shaft secured therein; a spring-operated grooved type-wheel upon said shaft; projections upon said wheel at varying distances from the center; a rod secured within the casing; rocking pins thereon adapted to contact with said projections; key-bars pivoted within the casing; arms projecting from said bars and adapted to be thrown into the path of said rock-pins; means for supporting the bars in such raised position; a horizontal shaft within the casing; a spring-operated toothed wheel thereon; projections upon the wheel; a hammer pivoted within the casing; an arm thereto adapted to be engaged by said projections; a catch engaging the groove of the type-wheel and the toothed wheel at opposite ends respectively; an armature secured to said catch; and a magnet.

11. The combination with type-wheels; projections thereon; means for imparting motion thereto; rods having rocking pins thereon adapted to be contacted by said projections; rods provided with key-bars; a hammer to each wheel; catches, each engaging one of the type-wheels and the operating mechanism of

one of the hammers; of an armature secured to each catch; a magnet for each armature; a wire connecting said magnets; a wire connecting each magnet with its rocking-pin bar; an electrical connection between the key-bar rod and the similar bar of the second machine; and means for cutting the keyboard of each machine out of circuit.

12. The combination with a normally open electric circuit; of a type-wheel, means for revolving the same, a key-bar within the circuit, an insulated projection upon the type-wheel in alinement with the center thereof and each type, and means operated by said projection for closing the circuit through the key-bar.

13. The combination with a normally open electric circuit; of a type-wheel, means for revolving the same, a catch normally engaging the wheel, an armature secured to said catch, a magnet within the circuit, an insulated projection upon the wheel, a key-bar in the circuit, and means operated by said projection for closing the circuit through the key-bar and thereby energizing the magnet and releasing the catch.

14. The combination with an electric circuit; of a type-wheel, an insulated projection thereon, a rocking pin within the circuit, and a key-bar within the circuit and adapted to be moved into the path of said pin, said projection being adapted to force the key-bar and pin into contact and thereby close the circuit.

15. The combination with a type-wheel having a concentric groove therein; of a bridge in said groove, a catch within the groove, an armature to said catch, a projection upon the wheel, and an electric circuit including a magnet of the armature, a key-bar and a rocking pin, said bar and pin being adapted to be forced into contact with each other by the projection and thereby close the circuit and release the catch.

16. The combination with a type-wheel having a concentric groove therein; of a bridge in said groove, a catch within the groove normally bearing against the bridge, an armature to said catch, guides therefor, a projection upon the wheel, and an electric circuit including a magnet of the armature, a key-bar, and a rocking pin, said bar and pin being adapted to be forced into contact with each other by the projection and thereby close the circuit and release the catch.

17. The combination with a type-wheel having a projection thereon; of a hammer pivoted thereto, an arm extending from the hammer, a shaft having a suitable support therefor, a spring-operated, toothed wheel upon the shaft, projections thereon adapted to engage the arm of the hammer, a catch engaging the toothed wheel, an armature thereto, and an electric circuit including a magnet of the armature, a key-bar and a rocking pin, said bar and pin being adapted to be forced into contact with each other by the projec-

tion and thereby close the circuit and release the catch from engagement with the toothed wheel.

18. The combination with a wheel having
5 type projecting from the periphery thereof,
and a concentric groove therein; of a bridge
in said groove, a catch engaging the groove,
an arm to said catch having an upward ex-
tension, an armature to the catch, an elec-
10 tric circuit including a magnet, a key-bar and
a rocking pin, and a projection upon the
wheel adapted to force said bar and pin to-
gether, thereby closing the circuit and rais-
ing the catch out of and the extension into
15 engagement with the type-wheel.

19. The combination with a rotatable type-
wheel having a projection thereon; of an elec-
tric circuit including a magnet, a key-bar and
a rocking pin, said projection being adapted
20 to make and break the circuit between the
bar and pin as the wheel revolves, an arma-

ture to the magnet, and a catch to said arma-
ture normally engaging the wheel.

20. The combination with a type-wheel hav-
ing a concentric groove therein, and a catch 25
engaging said groove; of a spring-operated,
toothed wheel engaged by said catch, a ham-
mer adapted to contact with the type of the
type-wheel, means upon the toothed wheel
for raising and releasing the hammer as said 30
wheel revolves, a wheel movable with the
toothed wheel and having projections there-
on, a second toothed wheel adapted to be
engaged by said projections, and a paper-car-
rying roller movable with the second toothed 35
wheel.

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

ARTHUR J. FARMER.

Witnesses:

CLARENCE S. COOKE,
SILAS FARMER.