

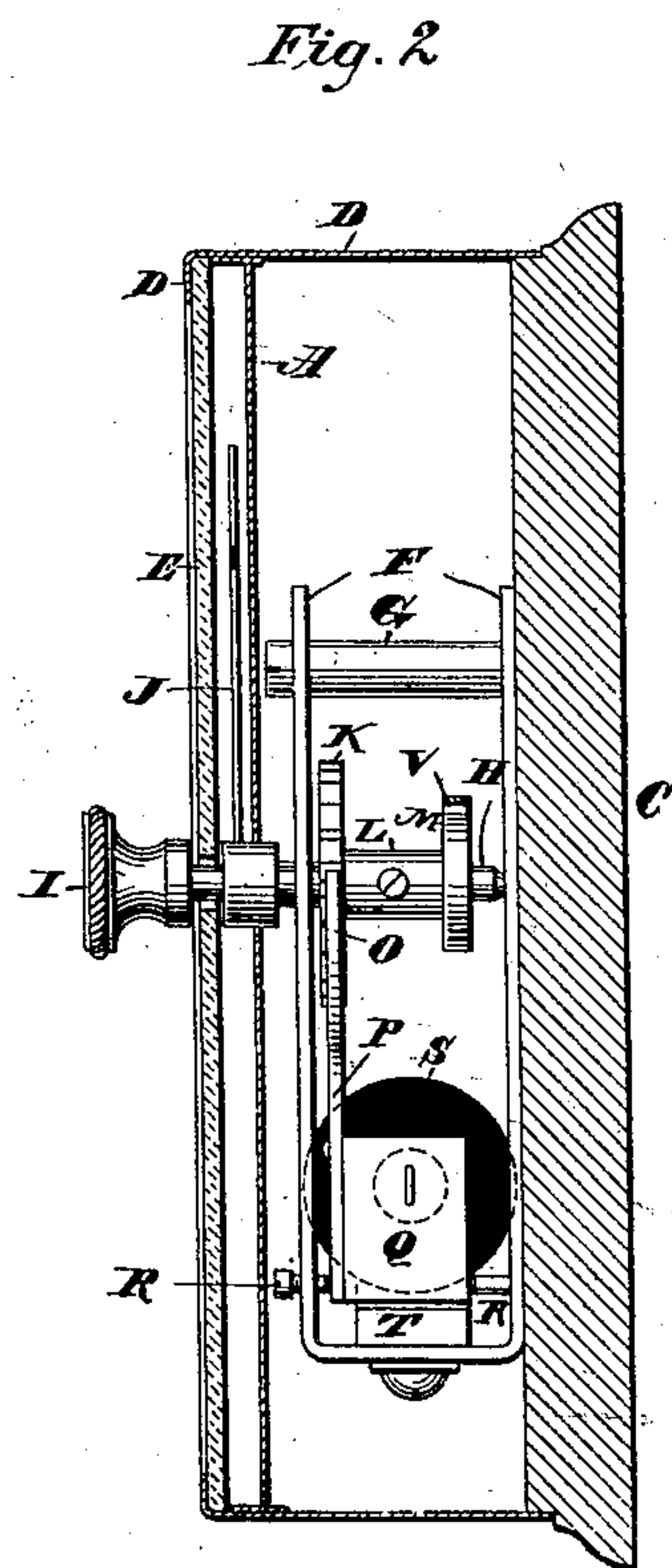
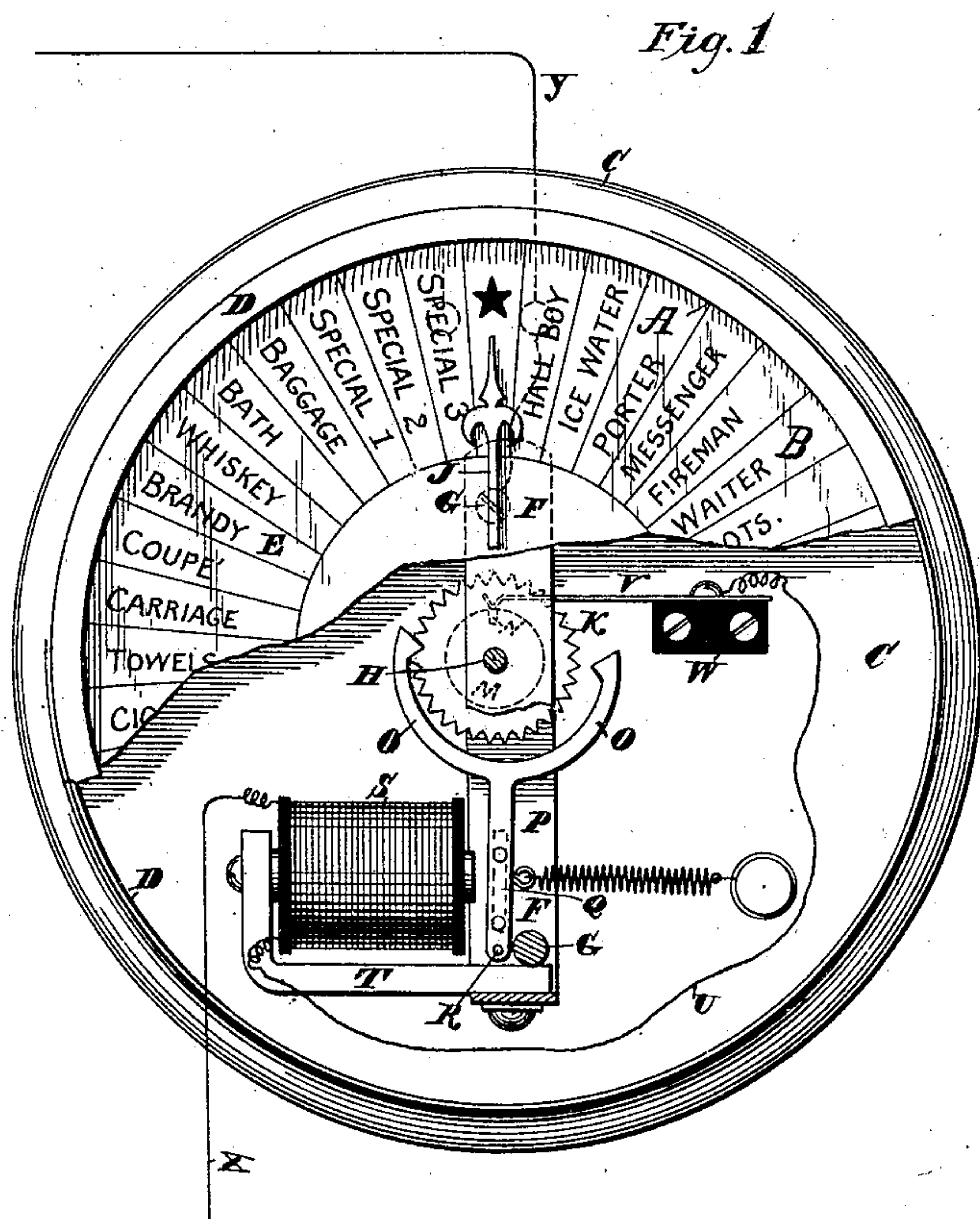
(No Model.)

6 Sheets—Sheet 1.

M. D. PORTER.  
ELECTRIC REPORTER.

No. 496,207.

Patented Apr. 25, 1893.



Witnesses

*Geo. W. Greck*  
*Chas. B. Hummery*

By his Attorney

Inventor

*Major Dore Porter*  
*by Geo. W. Seymour*  
*Atty.*

(No Model.)

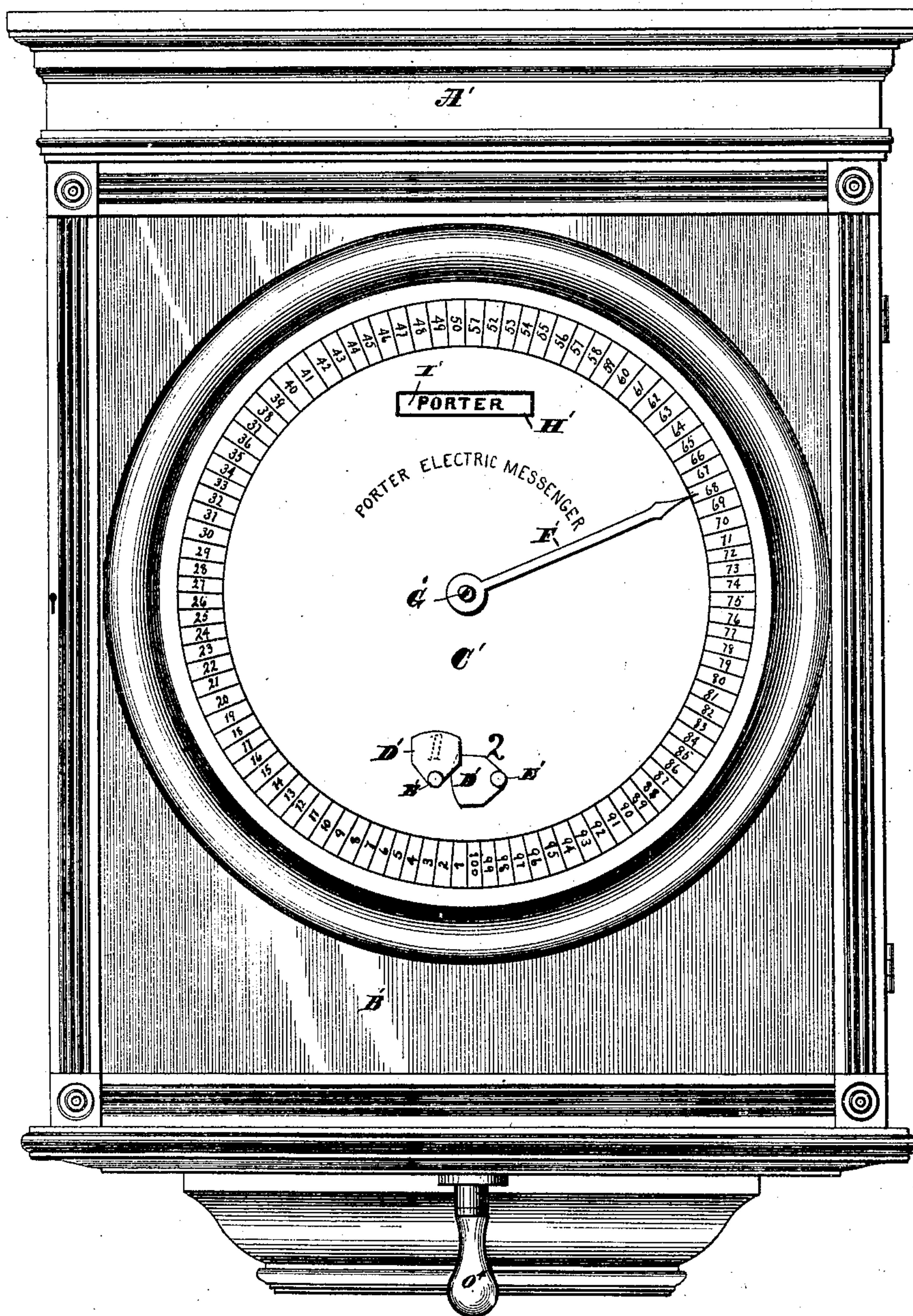
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*Fig. 3*



WITNESSES:

*Chas. B. Shumway*

*E. H. Rogers*

INVENTOR.

*Major Dan Porter*  
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(No Model.)

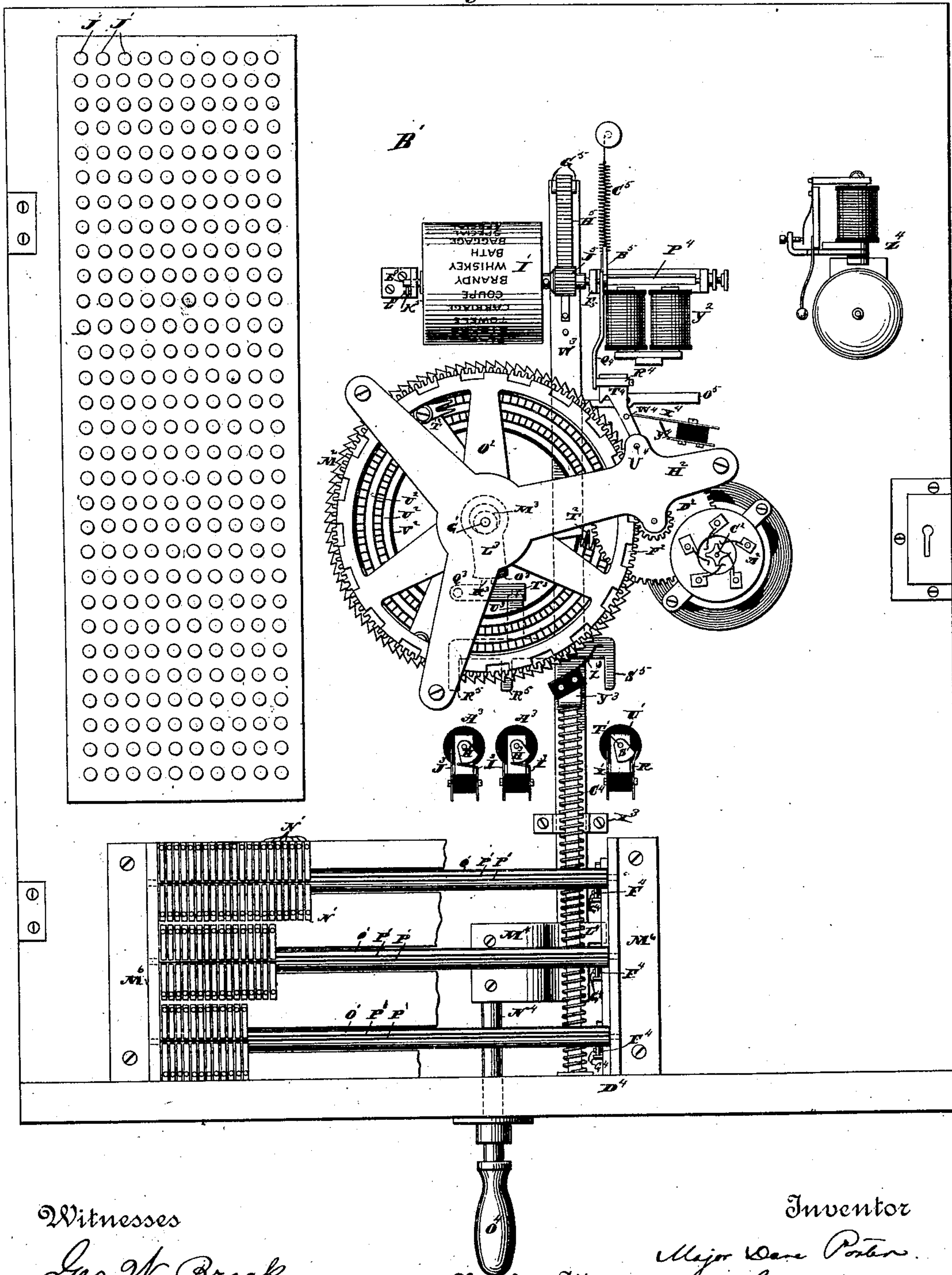
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Fig. 1



Witnesses

Geo. W. Breck.  
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By his Attorney

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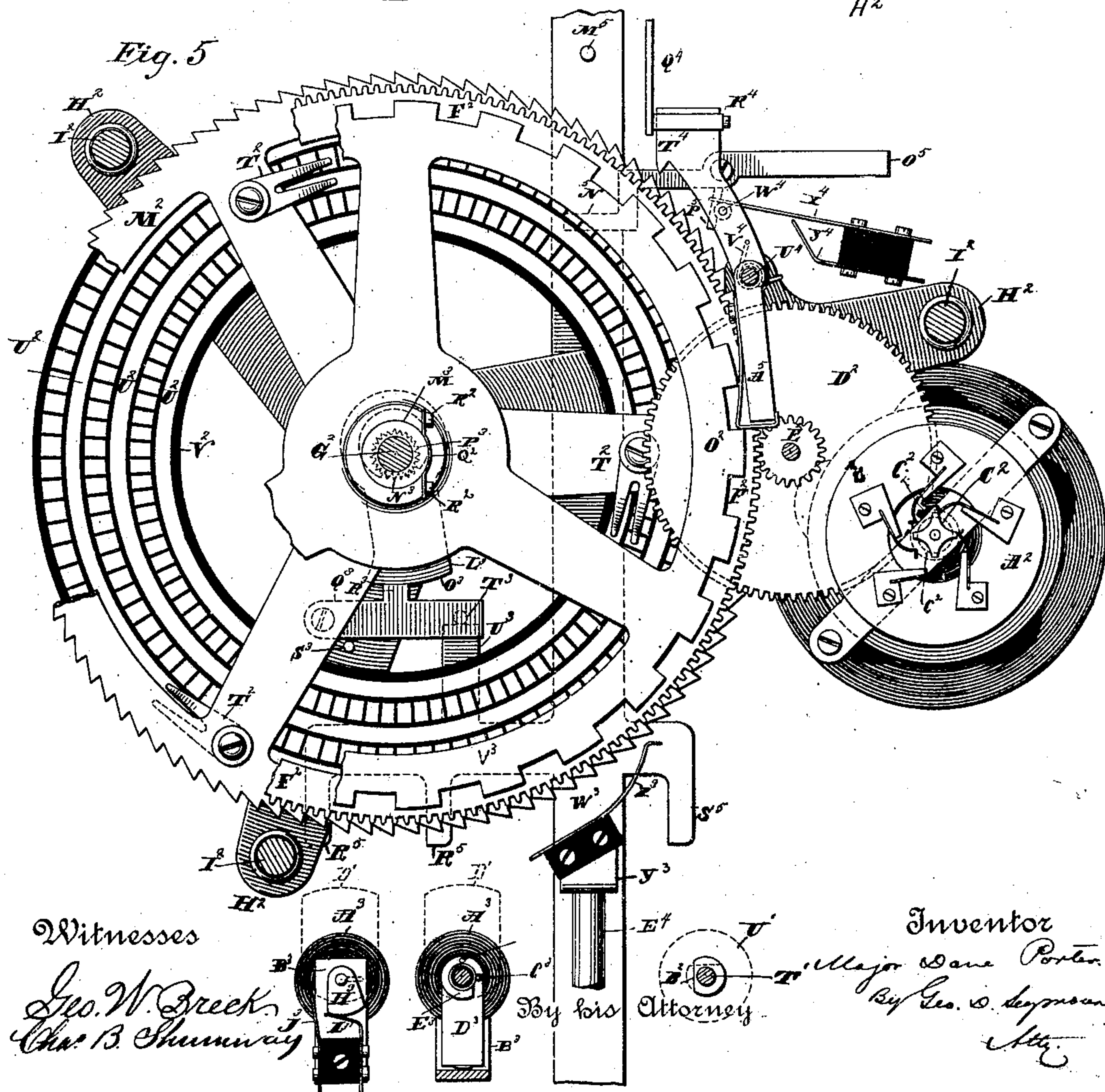
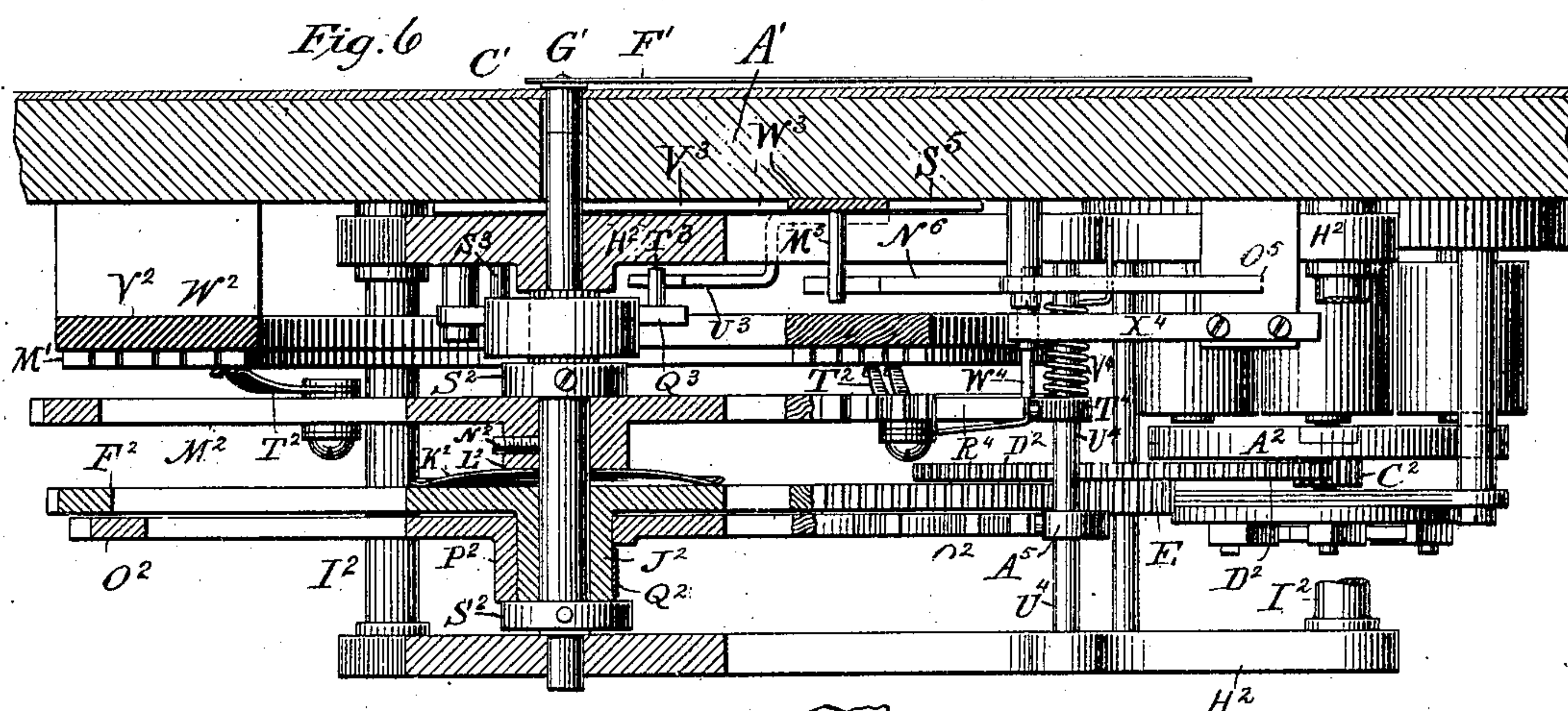
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(No Model.)

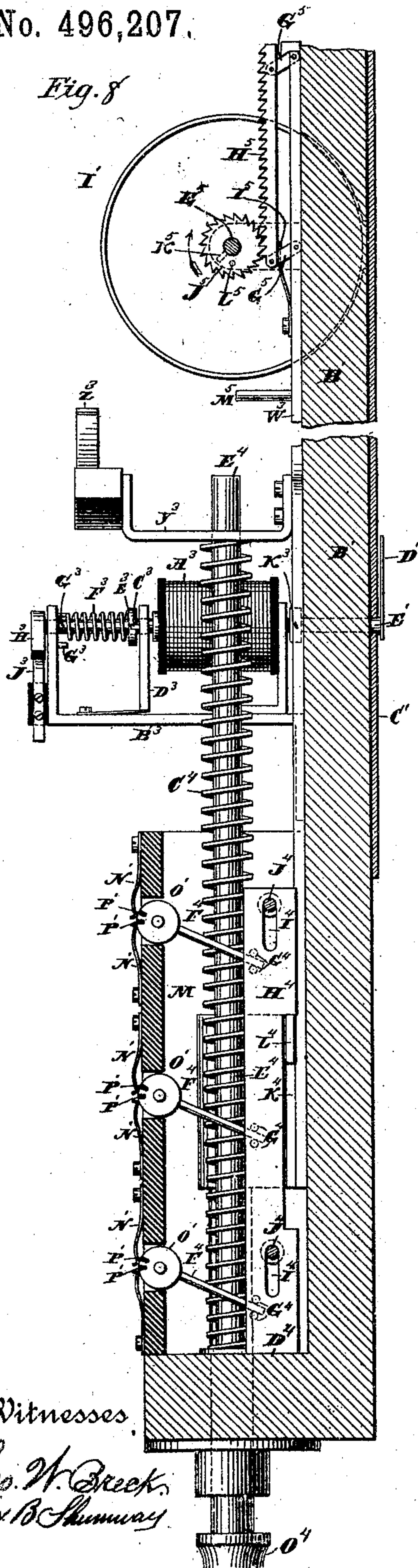
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M. D. PORTER.  
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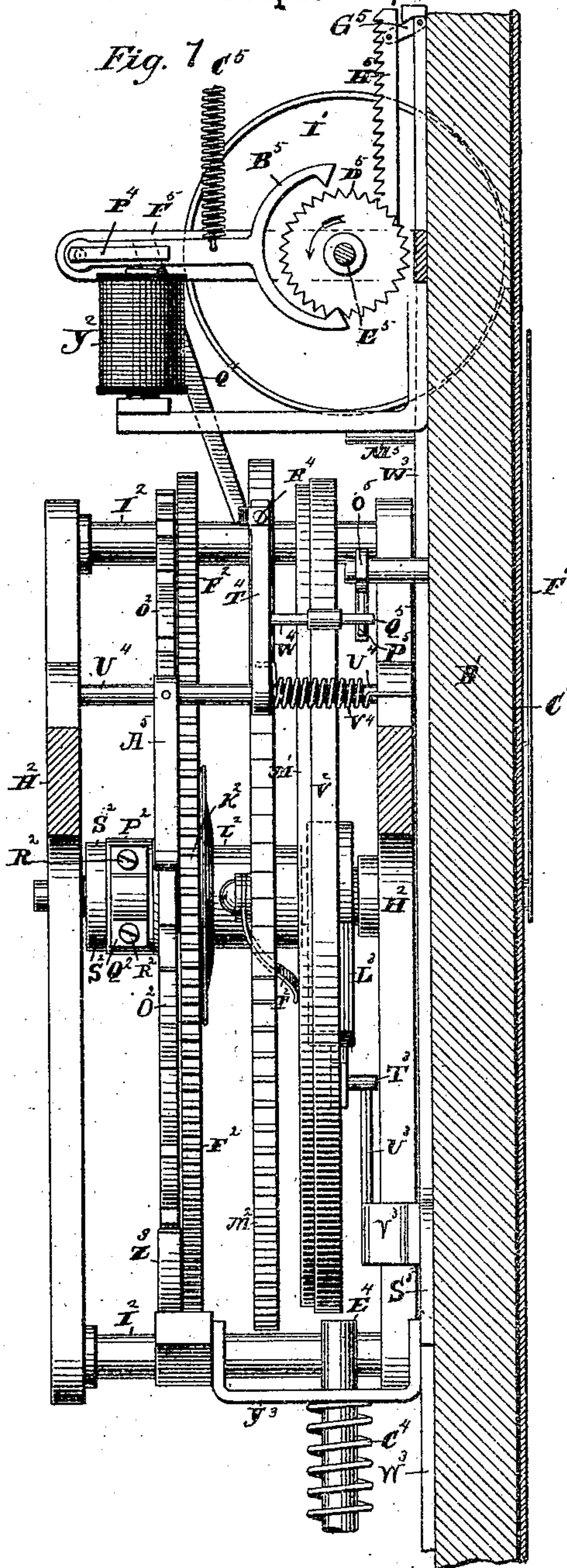
Fig. 8



Witnesses

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Fig. 7



By his Attorney

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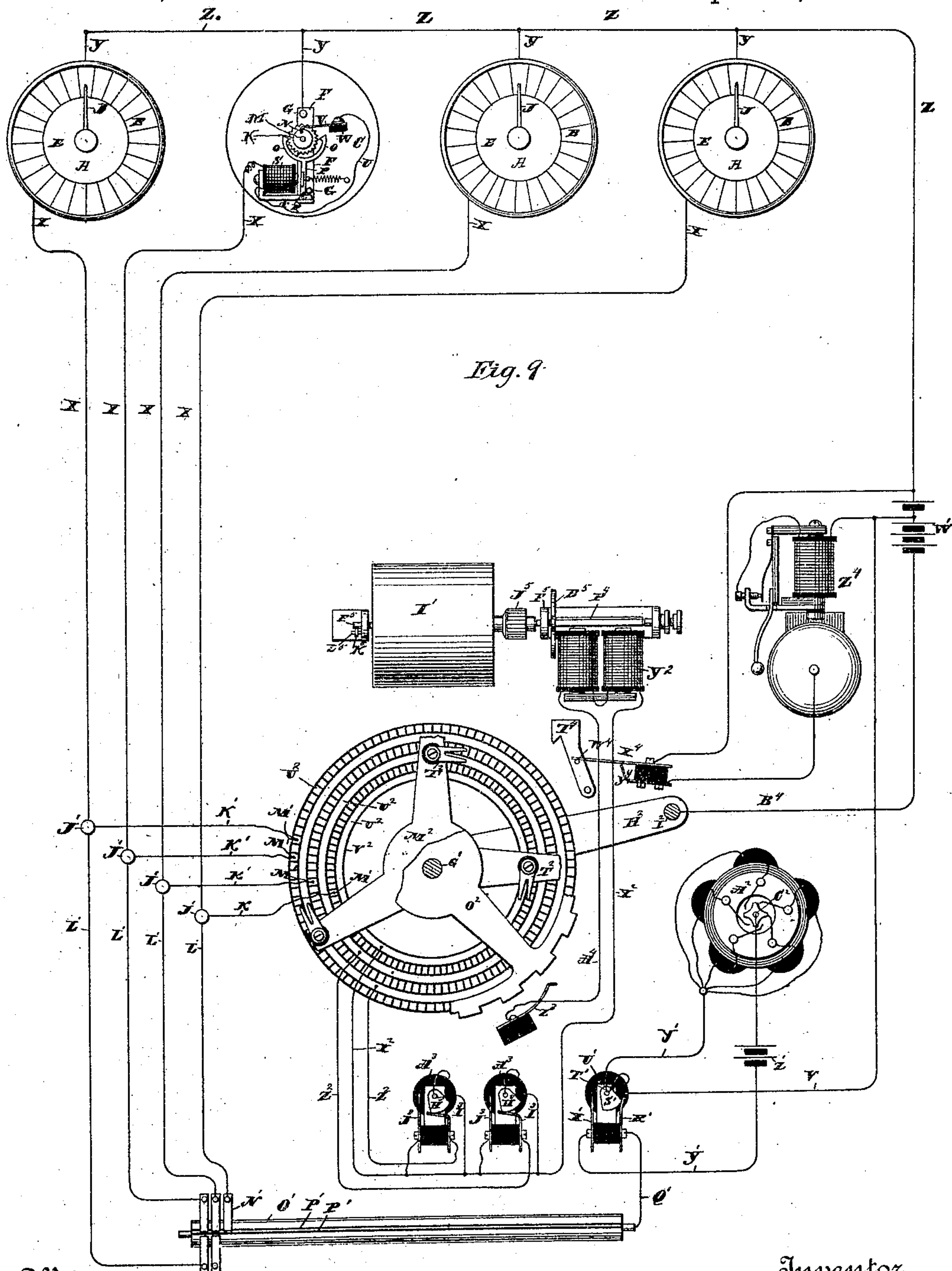
(No Model.)

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M. D. PORTER.  
ELECTRIC REPORTER.

No. 496,207.

Patented Apr. 25, 1893.



Witnesses

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Inventor

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# UNITED STATES PATENT OFFICE.

MAJOR DANE PORTER, OF BROOKLYN, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE NATIONAL ELECTRICAL MANUFACTURING COMPANY, OF NEW JERSEY.

## ELECTRIC REPORTER.

SPECIFICATION forming part of Letters Patent No. 496,207, dated April 25, 1893.

Application filed November 27, 1886. Serial No. 220,088. (No model.)

*To all whom it may concern:*

Be it known that I, MAJOR DANE PORTER, residing at Brooklyn, in the county of Kings and State of New York, have invented certain  
5 new and useful Improvements in Electric Reporters; and I do declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, which form a part of this specification.

10 My invention relates to an improvement in that form of electrical indicating apparatus in which reporters on variable signal transmitters located at sub-stations are respectively  
15 identified by an automatically operated receiver located at a central station and reproducing reports or wants designated by such reporters, the object being to simplify, widen the range and increase the general efficiency  
20 of such an apparatus.

With these ends in view my invention consists in certain details of construction and combinations of parts as will be hereinafter described and pointed out in the claims.

25 In the accompanying drawings Figure 1 is a view in front elevation of a reporter embodying my invention with the lower portions of its glass and dial broken away to expose its mechanism. Fig. 2 is a vertical sectional  
30 view of such reporter looking toward the outer face of its armature. Fig. 3 is a view in front elevation of the receiver. Fig. 4 is a general view in elevation of its mechanism which is attached to the back of the door of its casing.  
35 Fig. 5 is a view in elevation of the several circular series of terminal-plates, the contact rings, the circuit-closer, driving-, and make-, and break-wheels, the motor, the operating-lever, the locks and some adjuncts of such  
40 parts. Fig. 6 is a view of the said parts partly in plan and partly in section and showing also the door of the casing, the dial and the pointer of the receiver. Fig. 7 is a view in elevation from the motor side of the receiver, of the  
45 said wheels and lever, the main-magnet, the report-drum, and the operating connections of the latter. Fig. 8 is a view partly in elevation and partly in section looking in the same direction and showing the upper and  
50 lower ends of the operating-lever and their

connections; and Fig. 9 is a diagram showing the electrical connections in the respective reporters, in the receiver and between them.

The dial A of each reporter is divided into a circular series of radial compartments B of  
55 which the uppermost contains a star indicating the zero point and each of the remainder a report, the whole number of reports embracing a series of wants covering the ordinary wants of a guest at a hotel with a few  
60 specials which will cover particular wants, identifying memoranda for which may be left with the operator at the office by each guest. The said dial is mounted in a case composed of a back C and a ring D, and  
65 protected by a centrally perforated glass disk E mounted in the outer edge of the said ring so as to leave a space between it and the dial. A frame F located within such case and secured to the back C thereof by  
70 pillars G, has journaled in it an arbor H projecting centrally through the dial and through and beyond the glass. This arbor is provided upon its projecting outer end with a knurled thumb-nut I through which it is turned to  
75 bring the pointer J, rigidly secured to it and located between the glass and the dial, into alignment with any of the several compartments of the latter. A spur-wheel K having the same number of teeth that the dial has  
80 compartments is also rigidly secured to the arbor, being located within the frame and arranged so that its respective teeth correspond to the respective compartments B and so that its rotation in either direction through a space  
85 represented by one or more of its teeth will be accompanied by a movement of the pointer over a corresponding number of compartments. The said wheel is provided with a sleeve L having at its rear end a flange M  
90 into the periphery of which is set a block N of insulating material. The wheel is embraced and actuated by an anchor-shaped pallet O provided with an arm P carrying an armature Q, and pivotally mounted in the  
95 frame F upon centers R. The said armature is located in the presence of one pole of a magnet S secured to an angle-plate T attached to and offsetting from the said frame. One end of the magnet-coil is connected 100



through a wire U with a flexible finger V engaging with the periphery of the flange M and with the block N located therein, and mounted upon a block W of insulating material secured to the back C aforesaid.

The wire X is a special wire and leads from the other end of the magnet-coil to the receiver. The wire Y leads from the frame F to the main wire Z also leading to the receiver and having all the reporter-magnets connected with it. The pointer J, the spur-wheel K and the insulating block N are relatively arranged so that normally the pointer will point to the star upon the dial A and so that the finger V will normally engage with the block N, leaving the circuit through the reporter open.

The receiver, as herein shown, is designed for a three hundred room hotel. It is located in a casing A' provided with a door B' carrying upon its outer face a dial C' having a circular series of numbers proceeding from one to one hundred, running from left to right and beginning at the center of the lower edge of the dial which is provided just above such point with the numbers 1 and 2 in large characters and normally concealed by drops D', D' carried by rotating spindles E', E' operated to reverse the positions of the drops and expose and conceal the said numbers as will be hereinafter described. The said numbers 1 and 2 are respectively used with the outer series of numbers to indicate all the numbers from one hundred and one up to two hundred and from two hundred and one up to three hundred, whereby the confusion which would result from, and the space which would be required by, a series running from one to three hundred is avoided. By the use of more single numbers and drops the range of the receiver may be further increased without enlarging the dial. A hand F' carried by a rotating spindle G' projecting through the dial, is normally at rest, being started and swept over the dial and stopped against the several numbers in the circular series aforesaid. Centrally above the said spindle and within the numbers is an opening II' formed in the dial and extending through the door B' into the interior of the casing A' and exposing separately or one at a time the reports of a series corresponding in matter to the reports upon the dials of the reporters but of reverse arrangement and displayed upon the periphery of a report-drum I' forming a part of the receiver and secured with the mechanism and the electrical connections thereof, to the back of the said door. Binding-posts J' secured to the back of the door respectively receive the special wires X leading from the reporters of which there are, in the apparatus herein shown, three hundred. At these posts the circuit of each reporter is branched, into what will be termed a main and a relay circuit, by wires K' and L' respectively leading from the posts to contact-plates M', of which there is one for each reporter, and to contact fin-

gers N' of which there is also one for each reporter. All of the so called main circuits are normally broken in the plates while all of the so called relay circuits are normally closed in the fingers. The said fingers are arranged for contact with three rotating make-and-break rods O' each having two inlaid insulated strips P', such rods being journaled in frames M' and connected through the wire Q' with a contact finger R' normally engaged by a cam S' mounted upon a rotary spring-actuated spindle T' extending through, and controlled in being released by, a relay-magnet U'. This magnet is connected through a line V', with the main line Z of the apparatus, taking in but one element of the main battery W' located in the line Z, so that when two or more reporters are set at the same time there will not be enough battery on to actuate their magnets S in advancing their pointers J a step ahead of the right relations of the same to the reports upon the drum I', and cause confusion of wants. One element of the battery will, however, be sufficient to operate the magnet, S, of one transmitter or reporter.

The closing of a circuit in any one of the reporters, the circuits through all of the contact fingers N' being closed, sends a current through the magnet U' which then releases the spring-actuated spindle T', permitting the same to be rotated by its spring and bring its cam S' into engagement with a contact-finger X' connected with a line Y' including a motor battery Z' and a motor A' and leading to the spindle T', whereby a circuit is closed through the said battery and motor, the latter being then started. A cam B' located at the opposite end of the spindle from the cam T' and shown by Fig. 5 of the drawings, is provided for turning the spindle back to its normal position as will be described hereinafter.

The actuation of the motor operates through pinion C', gear-wheel D' and pinion E' to start a driving-wheel F' mounted upon the spindle G' which is journaled in two three-armed frame-plates H', H' secured together by posts I' and to the door B' through which the forward end of the said spindle projects to carry the hand F' before mentioned. The said driving-wheel is provided with a hub J' and frictionally coupled with the spindle G' by means of a disk-spring K' attached to it and bearing against the hub L' of a circuit-closer wheel M', the same being rigidly secured to the spindle by a set-screw N' located in its hub. A make and break wheel O' having a hub P', is sleeved over the hub J' of the driving-wheel F' with which it is frictionally coupled through a spring-plate Q' engaging at its center with the hub J' and secured at its ends to the hub P' by screws R' which are adjusted for regulating the amount of friction developed between the two hubs. The said driving-circuit, closer, and make-and-break wheels are located between two collars S', S' which are adjusted on the spindle for regulating the



tension of the spring  $K^2$ . The circuit-closer wheel is provided at different distances from its center with three insulated circuit-closers  $T^2$  each having two flexible arms and respectively arranged for contact with the plates  $M'$  of three circular and concentric series of plates and rings, such plates and rings being insulated each from the other and from other parts of the receiver upon an insulating annulus  $V^2$  mounted upon three equidistant blocks  $W^2$  secured to the back of the door  $B'$ . One arm of each circuit-closer engages with the plates of the proper series and the other arm with the rings of such series. The said plates  $M'$  constitute the main-circuit terminals of the respective reporters of which those in the rooms of the hotel numbered from one up to one-hundred have their terminals in the inner series of plates, those in rooms numbered from one hundred and one through two hundred in the middle series and those numbered from two hundred and one through three hundred, in the outer series. The inner ring, which co-operates with the inner series of plates, is connected through line  $X^2$  with the main magnet  $Y^2$ , while the middle and outer rings, respectively co-operating with the middle and outer series of plates, are connected with such magnet by branch lines  $Z^2$   $Z^2$  connecting with the line  $X^2$  and having interposed in them, respectively, annular magnets  $A^3$ ,  $A^3$  for releasing the spindles  $E'$ ,  $E'$  carrying the drops  $D'$ ,  $D'$  normally concealing the large characters 1 and 2 upon the dial. The said spindles are journaled in frames  $B^3$ ,  $B^3$  secured to the back of the door  $B'$ , pass through the respective magnets  $A^3$ ,  $A^3$  which are mounted in the said frames, project through the said door and carry the drops upon their projecting outer ends. Each of the said magnets is provided with an armature  $D^3$  carrying a pin  $C^3$  and each of the said spindles is encircled by a spiral-spring  $F^3$  carrying at its forward end a toothed collar  $E^3$ , the opposite ends of the springs being attached to the respective frames  $B^3$ ,  $B^3$ . Each spindle and each frame are also provided with a pin  $G^3$ , such pins being arranged to stop the spindles at the half rotation. Normally the pins  $C^3$  are engaged with the toothed collars, whereby the spindles are held with the drops  $D'$ ,  $D'$  in inverted positions. When, however, circuits are closed through the magnets their armatures are attracted, disengaging the pins  $C^3$  from the collars  $E^3$  and leaving the spindles free to rotate and reverse the drops. The extreme inner end of each spindle is provided with a cam  $II^3$  as shown. A bent contact-finger  $I^3$  and a contact-finger  $J^3$ , respectively connected with the lines  $Z^2$  and  $Z^2$ , are provided for each of the cams  $II^3$ . Normally such cams are in contact with the respective bent fingers but when the spindles are turned they are engaged with the fingers  $J^3$ ,  $J^3$  without, however, breaking contact with the bent fingers. The magnets are thus cut out of circuit after they have done their work of releasing the

spindles, and the resistance in the main line during the later phases in the operation of the apparatus reduced. Each spindle is also provided with a cam  $K^3$  located between the forward end of its magnet and the door  $B'$ , for turning it back to its normal position and thus restoring its drop, as will be described later on.

It may be here noted that the relay-magnet  $U'$  and its spring-actuated spindle  $T'$  as herein shown are of essentially the same construction as the magnets and spindles just above described.

The circuit having been closed in any one of the reporters and the motor having been started in turning the driving-wheel, an interval ensues before the main circuit is closed in the receiver and before all of the relay circuits are broken by the rotation of the make-and-break rods. This interval is secured by automatic mechanism including an interval cam  $L^3$  provided at one end with an opening  $M^3$  having teeth  $N^3$  at its lower extremity, and at its other end with a rounded edge  $O^3$  as shown. It is mounted through its openings upon the spindle  $G'$  which is provided with a circular series of teeth  $P^3$  adapting it for the coupling with it of the said cam which is lifted for the engagement of its teeth  $N^3$  with the teeth  $P^3$ . This is done by means of a lifting-lever  $Q^3$  provided upon its upper face with a lug  $R^3$  engaging with the edge  $O^3$  of the cam, located below the spindle  $G'$ , pivoted to the door  $B'$ , supported in operative position by a stud  $S^3$  and furnished at its free end with a pin  $T^3$  engaged by an upward extension  $U^3$  from the cross-arm  $V^3$  of the operating lever  $W^3$ . The said lever is movably secured by a strap  $X^3$  to the back of the door and provided with a projecting arm  $Y^3$  carrying an insulated contact-finger  $Z^3$  connected with the main magnet  $Y^2$  through a line  $A^4$ . Such finger is arranged for its engagement with the periphery of the make-and-break wheel through which and the spindle  $G'$ , the frame-plates  $II^2$  and the line  $B^4$  the circuit is completed through the main line. When, in the rotation of the spindle  $G'$  by the motor, the interval-cam has been carried beyond the lug  $R^3$  of the lifting-lever, the operating-lever is at once elevated to engage the contact-finger  $Z^3$  with the make-and-break wheel, by a spiral spring  $C^4$  interposed between the arm  $Y^3$  and a ledge  $D^4$  projecting inwardly from the lower edge of the door, and encircling a rod  $E^4$  mounted upon such ledge and extending upward through such arm.

The mechanism above described secures an interval between the closing of a circuit through any reporter and the closing of a circuit through the receiver-terminal of the same. Such interval is necessary in order to give time for setting the reporters and for the reason that as the motor circuit is closed and the circuit-closer wheel started as soon as the pointer of a reporter is moved in either direction away from its zero point, it is nec-



essary to provide time in which to move the  
 pointer at least half way around the dial if  
 need be before the circuit is closed through  
 the receiver-terminal of the reporter; other-  
 wise if it happened that the circuit-closer  
 5 of the series of terminal-plates including  
 the plate of the particular reporter being set  
 were near, and to the rear of, such plate,  
 then in the rotation of the wheel and the  
 10 sweeping of the circuit-closer over the plates  
 the circuit would be closed in the receiver  
 before the guest had had time to move the  
 pointer to the desired report in which case  
 15 the report displayed by the receiver would be  
 that under the reporter-pointer at the actual  
 time that the closing of the circuit in the re-  
 ceiver occurred and this would probably be  
 when the pointer was against one of the com-  
 20 partments next adjacent to the star or zero  
 compartment. All confusion like this is  
 avoided by the interposition, as it were, of an  
 interval between the closing of the circuit in  
 any reporter and the starting of the appara-  
 tus and the closing of a circuit through to the  
 25 circuit-closers. At the same upward move-  
 ment of the operating-lever that engages the  
 finger  $Z^3$  with the make-and-break wheel and  
 just before such engagement occurs, the cir-  
 cuits through all of the fingers  $N'$  are simul-  
 30 taneously broken by the rotation of the make-  
 and-break rods  $Q'$  to bring their inlaid, insu-  
 lating strips  $P'$  under the ends of the said fin-  
 gers, the rods being each provided with an  
 arm  $F^4$  connected through pins  $G^4$  with a plate  
 35  $H^4$  made vertically movable through elongated  
 slots  $I^4$  formed in it and receiving headed pins  
 $J^4$  securing it to one of the frames  $M^6$ . The  
 said plate is also provided with an elongated  
 slot  $K^4$  receiving an arm  $L^4$  offsetting from the  
 40 lower end of the operating-lever and normally  
 located at the upper end of the said slot  $K^4$  so  
 as to immediately lift the plate and turn the  
 rods when the operating-lever is elevated at  
 the termination of the interval. Opposite  
 45 from the arm  $L^4$  is an arm  $M^4$  to which is se-  
 cured a rod  $N^4$  extending through the ledge  
 $D^4$  and terminating in a handle  $O^4$  by means  
 of which the operating-lever is restored to its  
 normal position as will be hereinafter ex-  
 50 plained. After the termination of the inter-  
 val and after the closing of the main-circuit  
 through to the circuit closers by the engage-  
 ment of the finger  $Z^3$  with the periphery of  
 the make-and-break wheel, the circuit closer-  
 55 wheel keeps on rotating with the hand  $F'$   
 sweeping over the face of the dial  $C'$  until  
 one of the circuit-closers finds the terminal-  
 plate of the particular reporter which has  
 been set and had the circuit closed in it. Such  
 60 terminal plate having been found a circuit is  
 closed through the circuit-closer, the contact-  
 ring engaged by it, the line  $X^2$ , the main-mag-  
 net  $Y^2$ , the line  $A^4$ , the contact-finger  $Z^3$ , the  
 make-and-break wheel, the spindle  $G'$ , the  
 65 frame-plates  $II^2$ ,  $II^2$ , the line  $B^4$ , the battery  $W'$ ,  
 the main-line  $Z$ , the line  $Y$  of the reporter, the  
 reporter-magnet, the line  $X$  of the reporter,

the branch line  $K'$  leading from the line  $X$  and  
 the terminal plate  $M'$  of the reporter, such  
 plate being in contact with the circuit-closer 70  
 aforesaid. If the said plate is located in  
 either the outer or the middle series the cir-  
 cuit will also be closed through one of the  
 magnets  $A^3$ . The energization of the main  
 magnet resulting from the closing of the 75  
 main circuit as described causes it to attract  
 its armature  $P^4$  and move an arm  $Q^4$  depend-  
 ing therefrom and provided at its lower end  
 with a spring catch  $R^4$  engaging with detent  
 $T^4$  mounted upon a rocking-arbor  $U^4$  jour- 80  
 naled between the frames  $H^2$ ,  $H^2$  and encir-  
 cled by a spring  $V^4$  arranged to exert a con-  
 stant tendency to turn the arbor and throw  
 the detent toward the circuit-closer wheel.  
 The moving of the said arm  $Q^4$  by the arma- 85  
 ture disengages the spring-catch  $R^4$  from the  
 detent  $T^4$  which is at once thrown forward  
 and engages with a tooth of, and stops, the  
 circuit-closer wheel, also stopping the spindle  
 $G'$  with the hand  $F'$  against that number 90  
 upon the dial which corresponds to the num-  
 ber of the room containing the reporter which  
 has been set.

In case the circuit was closed through one  
 of the magnets  $A^3$  one of the drops  $D'$ ,  $D'$  95  
 will fall and expose one of the large numbers  
 1 and 2 upon the dial, the number so exposed  
 indicating, in conjunction with the number  
 against which the pointer was stopped, the  
 number of the room in which the reporter 100  
 operated is located.

It will be understood that the detent oper-  
 ates as described to stop the circuit-closer  
 wheel immediately upon the closing of a cir- 105  
 cuit through the terminal plate of the re-  
 porter. The said detent  $T^4$  is provided with  
 a stud  $W^4$  which in the normal and ele-  
 vated position of the detent is engaged with  
 a contact-finger  $X^4$  which is thereby normally  
 held out of contact with a contact-finger  $Y^4$  110  
 forming the other terminal of the circuit of  
 a bell  $Z^4$  interposed in the main line  $Z$  and of  
 any approved construction. When the de-  
 tent is thrown forward the finger  $X^4$  drops  
 and engages with the finger  $Y^4$  closing the 115  
 bell-circuit. The ringing of the bell attracts  
 the attention of the operator to the dial which  
 indicates the room from which the call is  
 sent. This bell is not considered an essen-  
 tial feature of the apparatus and may be left 120  
 out if desired.

The make-and-break wheel  $O^2$  is normally  
 locked by a stop  $A^5$  secured to and depend-  
 ing from the rocking-arbor  $U^4$  and swung  
 away from and releasing the make-and-break 125  
 wheel simultaneously with the forward move-  
 ment of the detent for locking the circuit-  
 closer wheel which with the spindle  $G'$  and  
 the driving-wheel  $F^2$  has been rotated against  
 the friction developed between the hubs  $P^2$  130  
 and  $J^2$  and the friction-plate  $Q^2$  already de-  
 scribed. The closing of a circuit through a  
 terminal-plate and its appropriate contact-  
 rings having effected the stopping of the cir-



5 cuit-closer wheel and the release of the make-  
 and-break wheel, the latter is now rotated by  
 the motor against the friction between the  
 disk-spring  $K^2$  and the hub  $L^2$  of the circuit-  
 closer wheel and with the finger  $Z^3$  in engage-  
 10 ment with its notched periphery, whereby the  
 circuit through the apparatus is alternately  
 opened and closed. Each time that this oc-  
 curs the main magnet  $Y^2$  is energized and at-  
 15 tracts its armature  $P^4$  to which is attached an  
 anchor-shaped pallet  $B^5$  controlled by an ad-  
 justing-spring  $C^5$  and actuating a star-wheel  
 $D^5$  mounted upon a shaft  $E^5$  journaled in  
 20 bearings  $F^5$  secured to the door  $B'$ , one of  
 such bearings being extended to carry the  
 said armature and pallet which are pivoted  
 to it. The drum  $I'$  is mounted upon the said  
 shaft and displays upon its periphery the  
 25 same reports as are found upon the dials of  
 the reporters, under a reversed arrangement.  
 Every time the circuit in the main line is  
 made and broken the said drum is advanced  
 to expose a different report through the aper-  
 30 ture  $H'$  in the dial  $C'$  of the receiver. Every  
 time also that such circuit is made and broken  
 the magnet in the distant reporter is ener-  
 gized and operates the pallet thereof in ro-  
 tating the spur-wheel of the reporter a dis-  
 35 tance represented by one of its teeth in a re-  
 verse direction from which it was rotated  
 when the reporter was set by the hand of  
 the guest. The making and breaking of the  
 main circuit, effected by the rotation of the  
 40 make-and-break wheel, the advancing of  
 the drum and the retrograde movement of  
 the spur-wheel of the reporter continue un-  
 til the insulating block  $N$  of the reporting  
 instrument is brought under the contact-fin-  
 45 ger  $V$  thereof when the circuit through the  
 main line will be broken, leaving the pointer  
 $J$  against the star or zero compartment of  
 the dial of the reporter and the drum  $I'$  of  
 the receiver exposing through the aperture  
 50 in the dial thereof a report corresponding  
 to that to which the pointer  $J$  was moved  
 in setting the reporter. The room number  
 and the want having now been brought in  
 and indicated upon the dial of the receiver,  
 the latter has done its work and it remains  
 55 only to put it in condition to be operated by  
 another reporter to indicate another room and  
 want. It is to be noted in this connection  
 that the stepping back of the pointer of the  
 reporter, as described, at once indicates to the  
 60 guest that his want is known to the operator  
 at the office. The restoration of the receiver  
 to its normal condition is effected by pulling  
 down through its handle  $O^4$ , the operating le-  
 ver  $W^3$  which is provided at its upper end  
 65 with two links  $G^5$ ,  $G^5$  carrying a rack  $H^5$  held  
 by a spring  $I^5$  in contact with a ratchet-wheel  
 $J^5$  frictionally coupled with the shaft  $E^5$  car-  
 rying the report-drum as aforesaid. As the  
 lever is pulled down the rack rotates the  
 70 ratchet-wheel, the shaft and the drum until  
 the shaft and hence the drum is stopped by  
 the pins  $K^5$  and  $L^5$  respectively secured to the

shaft and to one of the bearings  $F^5$  thereof,  
 such pins being arranged to stop the shaft in  
 position to leave the drum with its zero point, 70  
 which corresponds to the star compartment  
 of the dial of each reporter, in front of the  
 opening  $H'$  in the dial of the receiver. If the  
 stop pins engage before the lever is pulled  
 clear down, the ratchet-wheel then slips upon 75  
 the shaft until the lever reaches the limit of  
 its downward movement. The pulling down  
 of the operating lever also operates to unlock  
 the circuit-closer wheel and to lock the make-  
 and-break wheel and this through a pin  $M^5$  80  
 located upon the lever and engaging with the  
 end  $N^5$  of a lever pivoted to the back of the  
 door  $B'$ , having its outer end,  $O^5$ , weighted,  
 and provided with an arm  $P^5$  engaging with  
 a pin  $Q^5$  located upon the rear face of the de- 85  
 tent  $T^4$  as shown. As the end  $N^5$  of the  
 weighted lever is depressed by the pulling  
 down of the operating-lever, the detent is  
 lifted away from the circuit-closer wheel and  
 re-engaged with the spring-catch  $R^4$ , while 90  
 the stop  $A^5$  is carried toward and engaged  
 with the make-and-break wheel. Also, when  
 the operating-lever is pulled down the inter-  
 val-cam  $L^3$  swings back over the lug  $R^3$  upon  
 the upper face of the lifting-lever  $Q^3$  so as 95  
 to be in position to be lifted by the said  
 lever and coupled with the spindle  $G'$  when  
 the operating-lever makes the partial up-  
 ward movement as will be explained. In be-  
 100 ing pulled down the operating-lever also re-  
 stores the drops  $D'$ ,  $D'$  to their normal po-  
 sitions, in case they have been thrown down  
 as herein provided for, by the engagement  
 of fingers  $R^5$ ,  $R^5$  depending from the cross-  
 arm  $V^3$  of the lever, with the cams  $K^3$ ,  $K^3$  105  
 secured to the spindles  $E'$ ,  $E'$  carrying the  
 drops. Furthermore in being pulled down the  
 operating lever breaks the motor circuit and  
 stops the motor by turning the spindle  $T'$   
 back to its normal position through the cam 110  
 $B^2$  which is engaged by a finger  $S^5$  depending  
 from the said cross-arm of the operating lever.  
 Finally, in being pulled down the operating  
 lever turns all of the rotary make-and-break  
 115 rods and closes circuit through all of the fin-  
 gers  $N'$ . After the lever has been carried to  
 the limit of its downward movement it is re-  
 leased when it is lifted by its spring  $C^4$ , mak-  
 ing a partial upward movement in which it  
 elevates the lifting-lever  $Q^3$  which in turn 120  
 raises the interval cam  $L^3$  and couples it with  
 the spindle  $G'$ . The said lifting-lever, and  
 its connections, as may be further explained,  
 sustain the interval-cam normally coupled  
 with the spindle  $G'$  with which it moves 125  
 through a short arc while its rounded edge  $O^3$   
 rolls or slides over the lug  $R^3$  until, in the ro-  
 tation of the spindle, the said edge of the cam  
 is carried beyond the lug. After this the cam  
 drops down by gravity, whereby its teeth are 130  
 disengaged from those of the spindle from  
 which it now hangs idly in a canted position  
 until the pulling down of the operating-lever  
 removes the lug  $R^3$  from its path and permits



it to swing back over the said lug which, in the partial upward movement just described of the operating-lever, lifts the cam and recouples it with the spindle G'. This movement of the operating-lever also brings the parts into position for immediately turning the rods O' to bring their inlaid insulating strips P' in contact with all of the fingers N' and for the immediate contact of the finger Z<sup>3</sup> with the make-and-break wheel, at the expiration of the interval obtained by the interval-cam as has been fully set forth.

Having fully described my improved apparatus I will now give an example of its operation. Let it be assumed that the guest in room numbered 268 desires that a porter be sent to him. He goes to the reporter in his room and turns its pointer against the word "Porter" which beginning with the star-compartment on the dial is in the fourth compartment to the right, the described movement of the pointer also moving the spur-wheel of the reporter in the same direction through a distance represented by three of its teeth. This closes a circuit through the instrument by bringing its flange M into contact with its finger V, and sends a current through that particular one of the fingers N' with which it is connected and through the relay-magnet U', the same at once operating to release the spring-actuated spindle T' which rotates and closes the motor-circuit. The motor then starts the circuit-closer wheel and the spindle G' in rotation, the latter carrying the interval-cam which after an interval is carried beyond and disengaged from the lifting-lever, permitting the operating-lever to be lifted by its spring to the limit of its upward movement. Such elevation of the operating-lever operates to turn all of the make-and-break rods and break all of circuits through the fingers N' and then to engage the finger Z<sup>3</sup> with the make-and-break wheel. The circuit-closed wheel continues to rotate until its outer circuit-closer finds the contact-plate of the reporter in room 268, when a circuit will be closed through such circuit-closer, the outer contact-ring, the branch line Z<sup>2</sup> leading from such ring, the magnet A<sup>3</sup> located in such branch, the line X<sup>2</sup>, the magnet Y<sup>2</sup>, the line A<sup>4</sup>, the finger Z<sup>3</sup>, the make-and-break wheel, the spindle G', the frame-plates H<sup>2</sup>, H<sup>3</sup>, the line B<sup>4</sup>, the battery W', the main-line Z, the line Y of the reporter in room 268, the magnet of such reporter, the line X of the reporter, the line K' leading from the line X and the terminal-plate of the reporter, such plate being in contact with the outer circuit closer. The energization of the said magnet A<sup>3</sup> causes it to release the spindle passing through it, the spindle being then rotated to reverse the drop carried by it and expose the large figure 2 upon the dial, while the simultaneous energization of the main-magnet causes it to attract its armature which moves the arm Q' so as to release the detent J' which is at once thrown forward by the

spring V' and engaged with the circuit-closer wheel, stopping the same and the spindle G' with the hand T' against the number 68 of the circular series of numbers on the dial. Such number being read with the figure 2 disclosed by the inversion of the drop indicates that the reporter in room No. 268 has been set. The falling of the said detent as described permits the finger X<sup>4</sup> to contact with the finger Y<sup>4</sup> and so close the local bell circuit. The bell then rings and calls the attention of the operator to the dial of the receiver. As the detent is thrown forward the stop A<sup>5</sup> is thrown outward and disengaged from the make-and-break wheel which at once begins to rotate with the driving-wheel with which it is frictionally coupled and which slips on the shaft against the friction between the spring-disk K<sup>2</sup> and the hub L<sup>2</sup> of the circuit-closer wheel, the same, together with the spindle G' being now locked against rotation by the detent. As the make-and-break wheel is rotated the circuit above described is alternately made and broken and for each time that this occurs the pointer of the reporter in room 268 will be stepped back one step or in other words through the distance represented by one tooth of the spur wheel of the reporter, one tooth of such wheel being also equivalent to one compartment of the dial, while the drum will be advanced one step, which is to say one tooth of its star-wheel and one report upon its periphery. As the reporter-pointer moves to its fourth step bringing the block N' under the finger V of the instrument the circuit will be broken in the reporter leaving the pointer thereof at the star compartment and the drum advanced four steps and hence exposing the word "Porter" through the dial of the receiver, the order of the reports in the reporters and upon the report drum being reversed. The receiver having now automatically brought in the number of the room and the want, the handle of the operating-lever is seized and the lever pulled down, thereby turning the drum back to its starting or zero point. This movement of the lever together with its partial upward movement occurring immediately afterward also restores the other parts of the receiver to their normal positions. In case more than one reporter is set at once that one will be first to have its number and report brought in, which, after the interval, has its terminal plate in advance of and nearest to its circuit-closer. After the number and want of such reporter have been brought in the operating-lever is pulled down and let go to restore the parts of the receiver to their normal positions. The receiver will then go on and bring in the number and want of that reporter having its terminal in advance of and nearest to its circuit-closer and so on, the handle being pulled down and let go between each operation of the receiver and there being sufficient time between the successive actuations of the apparatus for the operator at the receiver to



give any orders that may be called for by the reports. It will thus be seen that although several reporters are set at the same time no interference results but that the several numbers and wants are brought in without confusion in the order of the nearness of their terminal-plates to the circuit-closers which discriminate only in favor of plates ahead of them.

10 If desired each block or group of reporters may have a separate return wire. Thus in the apparatus illustrated there might be a return wire for each hundred reporters.

15 It is apparent that my invention is not limited to the application herein shown but that it may be used in all situations where it is desired to specify a report at one station and reproduce it at another with means for identifying the specifying station. I would therefore have it understood that I do not limit myself to the exact construction and arrangement of parts herein shown and described but hold myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of my invention.

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

1. The combination with a number of reporters, of a receiver having a series of terminals respectively connected with the reporters, a circuit-closer for contact with such terminals, automatic interval mechanism including an interval-cam for producing an interval between the closing of a circuit through a reporter and through its receiver-terminal and a circuit-closer co-operating with the said cam, substantially as set forth.

2. The combination with a number of reporters, of a receiver having a series of terminals respectively connected with the reporters, a circuit-closer for contact with such terminals, automatic interval mechanism including an interval-cam located at the receiving-station for securing an interval between the closing of a circuit through a reporter and through its receiver-terminal, and a circuit-closer co-operating with the said cam substantially as set forth.

3. The combination with a number of reporters, of a receiver having a series of terminals respectively connected with the reporters, a circuit-closer for contact with such terminals, an automatic interval mechanism located at the receiving-station and including an interval cam, for producing an interval between the closing of a circuit through the reporter and through its receiver terminal, and a circuit-closer co-operating with the said cam substantially as set forth.

4. The combination with a number of reporters, of a receiver having a circular series of terminals respectively connected with such reporters, a revolving circuit-closer for contact with such terminals, a shaft carrying such circuit-closer, an interval-cam, and circuit-closing mechanism released by the cam

after the shaft has been started rotating, substantially as set forth.

5. The combination with a number of reporters, of a receiver having a circular series of terminals respectively connected with the reporters, a revolving circuit-closer for contact with such terminals, automatic interval mechanism including an interval cam for producing an interval between the closing of a circuit through a reporter and through its receiver-terminal, and a movable contact-point or circuit-closer co-operating with the said cam to close a circuit to the said revolving circuit-closer, substantially as set forth.

6. The combination with a number of reporters, of a receiver having a circular series of terminals respectively connected with the reporters, a dial for specifying the reporters, means for specifying the reports, a pointer to sweep the dial, a rotating shaft carrying such pointer, a circuit-closer wheel, a circuit-closer carried thereby, a lock for such wheel, a make-and-break wheel, a lock therefor and a magnet located in the main circuit which extends between the reporters and the said receiver, the said lock being controlled in locking the circuit-closer wheel and unlocking the make-and-break wheel by such magnet and the circuit made and broken by the make and break wheel operating to restore the reporter at the sending station to zero and to operate the means for specifying or reproducing the report, substantially as set forth.

7. The combination with a number of reporters, of a receiver having a circuit-closer wheel and a make-and-break wheel, locks mounted on the same center and swinging in opposite directions for such wheels and a handle lever adapted to be coupled with such locks and swing them to unlock the circuit-closer wheel and to lock the make-and-break wheel, substantially as set forth.

8. The combination with a number of reporters, of a receiver gaged in its operation by the specific operation of any of the reporters and having interval mechanism for obtaining an interval between the closing of a circuit in a reporter and the closing of a circuit through the receiver-terminal of the same circuit-closing mechanism released for operation by the interval mechanism and a manually operating-lever to restore the circuit-closing mechanism to its normal position, substantially as set forth.

9. The combination with a number of reporters, of a receiver gaged in its operation by the specific operation of any of the reporters and having a circuit-closer, interval mechanism set in operation by closing the circuit at a reporter and co-operating with the circuit closer for securing an interval between the closing of a circuit in any of the reporters and the closing of a circuit through the receiver-terminal of the same, and an operating-lever carrying a terminal of the main line and released and normally engaged by the interval mechanism, substantially as set forth.



10. The combination with a number of reporters, of a receiver having a terminal of each reporter, the said terminals being grouped in blocks respectively located in branches of the main line, the said receiver being also provided with block-indicators located in the said branches and with a hand lever for restoring such indicators to their normal positions, substantially as set forth.

11. The combination with a number of reporters, of a receiver having two or more circular series of reporter-terminals, each forming an isolated block, and respectively located in branches of the main-line which extends between the reporters and the receiver; an electrically moved, revoluble, insulated circuit-closer and a concentric contact-ring engaged thereby, for each of said series, the said rings being located in the said main line; an electrically started gang-switch in which the individual circuits leading from the receiver to the respective reporters are simultaneously broken and closed, a dial specifying the reporters and located in a plane above that of the reporter-terminals, a pointer sweeping the dial and connected with the circuit-closer shaft, locking mechanism for locking the pointer or locating-indicator after its operation, drops for indicating the respective blocks, located in the branches thereof, and placed within the area swept by the pointer, a want-indicator, a make-and-break or want wheel, co-operating with the said want-indicator; and a hand lever constructed to in one movement operate the gang-switch, the drops, the locking-mechanism and the want-indicator, substantially as set forth.

12. The combination with a number of reporters, of a receiver having two or more circular series of reporter-terminals, each forming an isolated block and respectively located in branches of the main-line which extends between the reporter and the receiver; an electrically moved, revoluble, insulated circuit-closer, and a concentric contact ring engaged thereby for each of the said series, the said rings being located in the main line; an electrically started gang-switch in which the individual circuits leading from the receiver to the respective reporters are simultaneously broken and closed, a dial specifying the reporters, and located in a plane above that of the reporter terminals, a pointer sweeping the dial, a circuit-closer wheel carrying the said circuit-closers, a shaft carrying the said wheel and the pointer, locking-mechanism to engage with the said circuit-closer wheel to lock the same after its operation, a make-and-break wheel, a want-indicator co-acting with the make-and-break wheel, drops for locating the respective blocks, located in the branches thereof, and placed within the area swept by the pointer; and a hand-lever constructed to in one movement operate the gang-switch, the drops, the locking-mechanism and the want-indicator, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

MAJOR DANE PORTER.

Witnesses:

CHAS. B. SHUMWAY,  
JAMES G. CLARK.