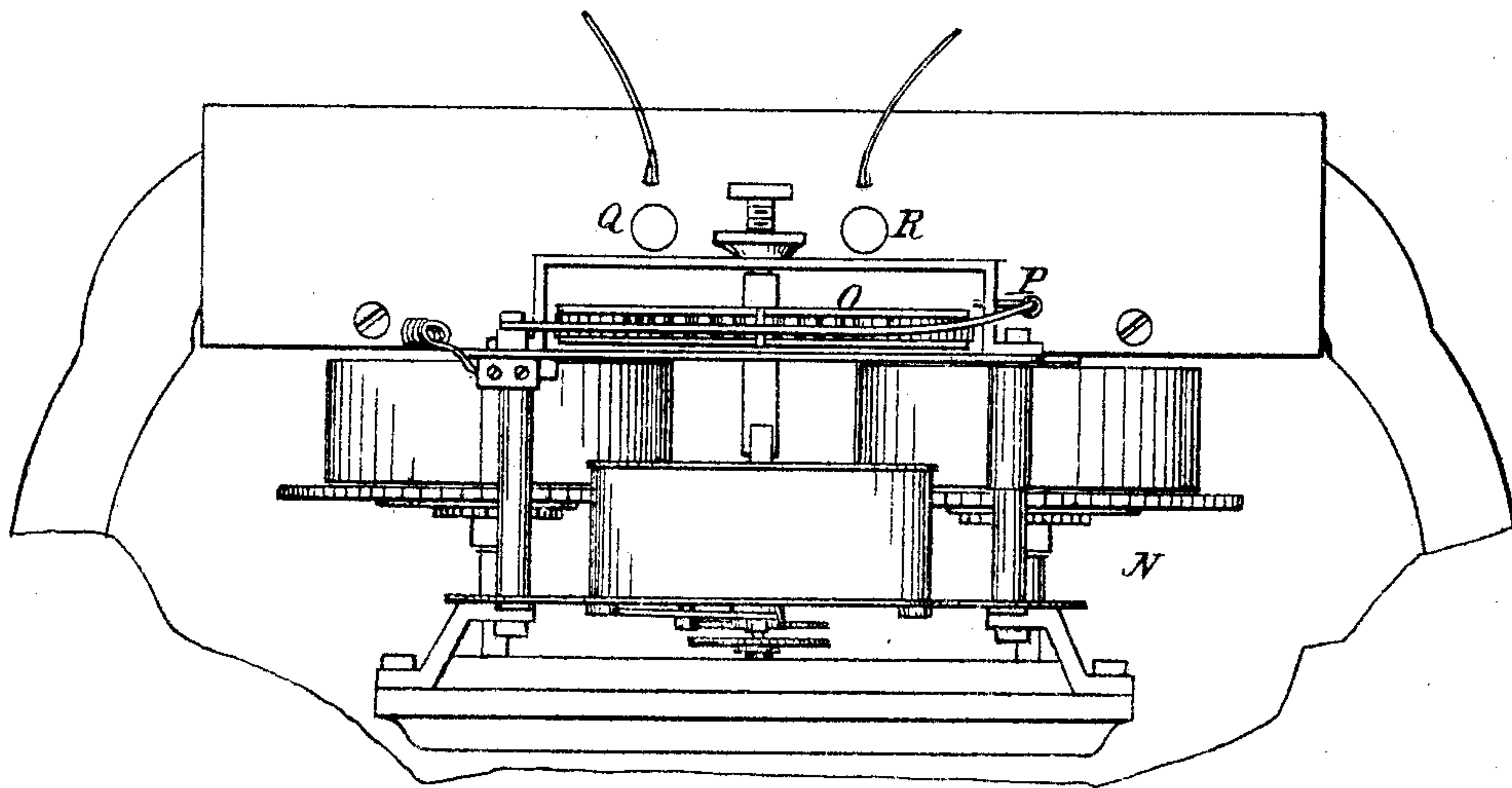
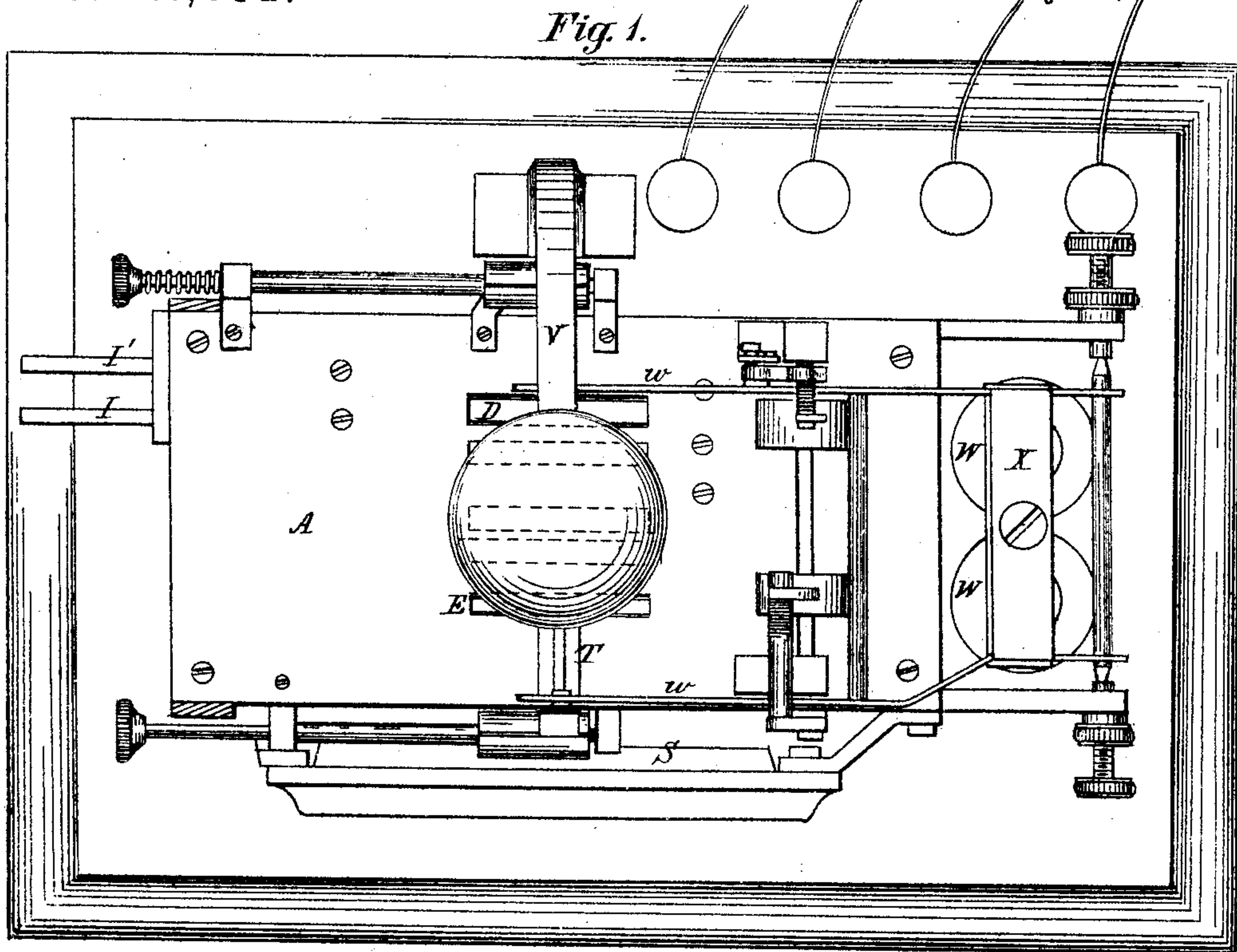


J. C. HINCHMAN.
Electro-Magnetic Date Time Printers and Stamps.
 No. 141,352. Patented July 29, 1873.



Witnesses:

J. West Wagner.
Thos. Anderson

Inventor:

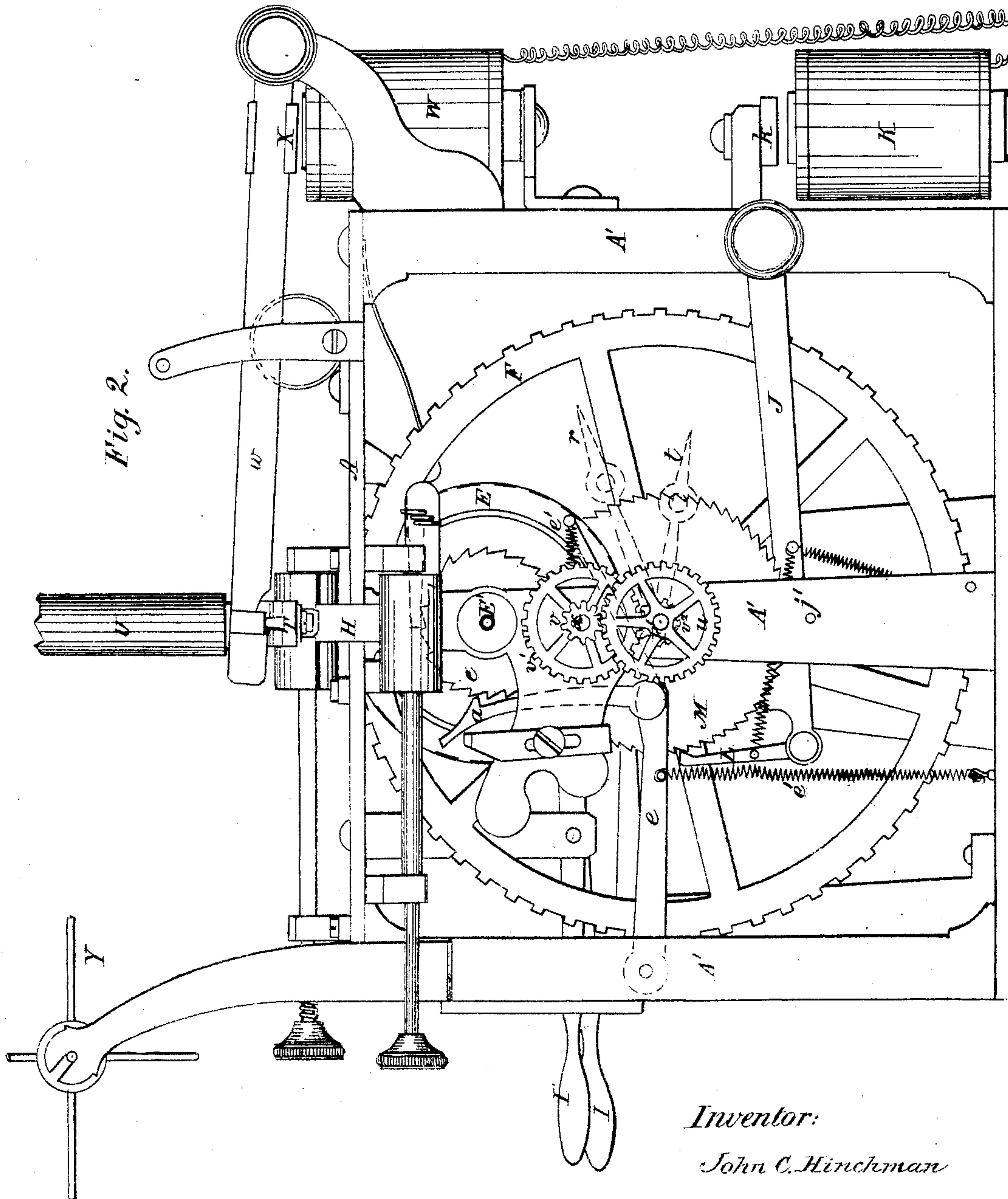
Jno. C. Hinchman.
 By *Johnson & Hawke*
his Attorneys.

J. C. HINCHMAN.

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Inventor:

John C. Hinchman

By

Johnson, Haward & Co.
his Attorneys

Witnesses:

West Wagner,
J. C. Hinchman

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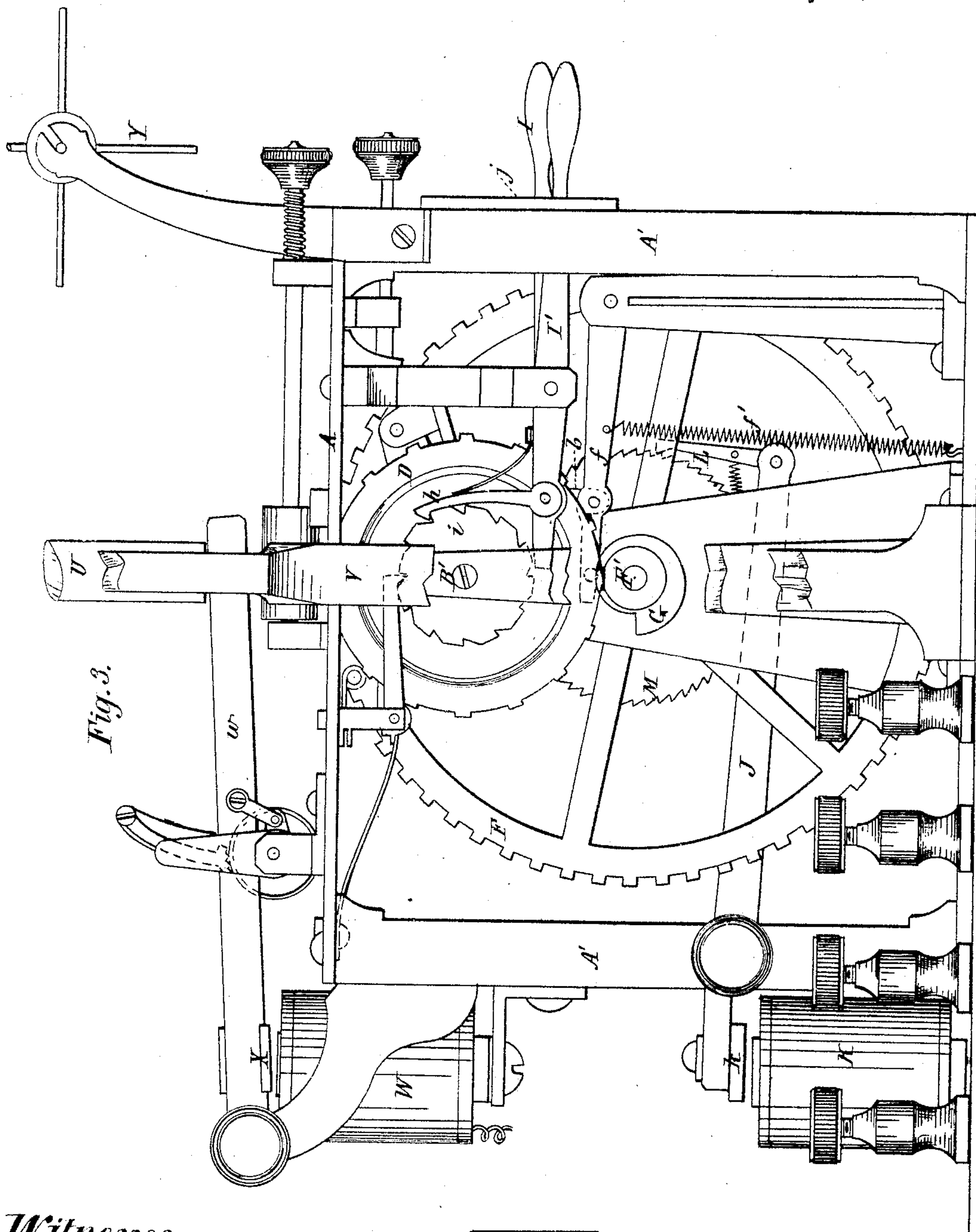
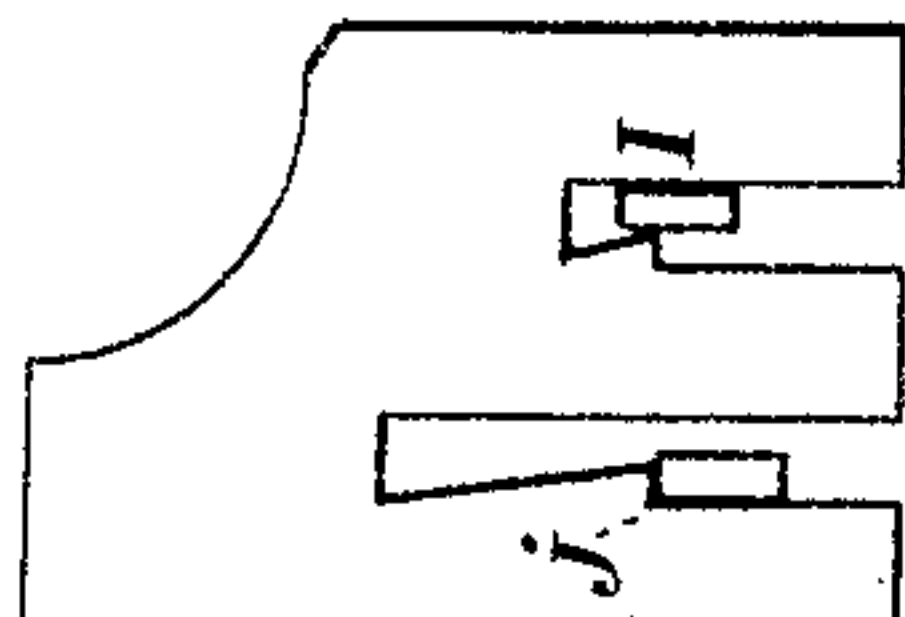


Fig. 3.

Witnesses:

J. W. Wagner.
Wm. H. Hanson.

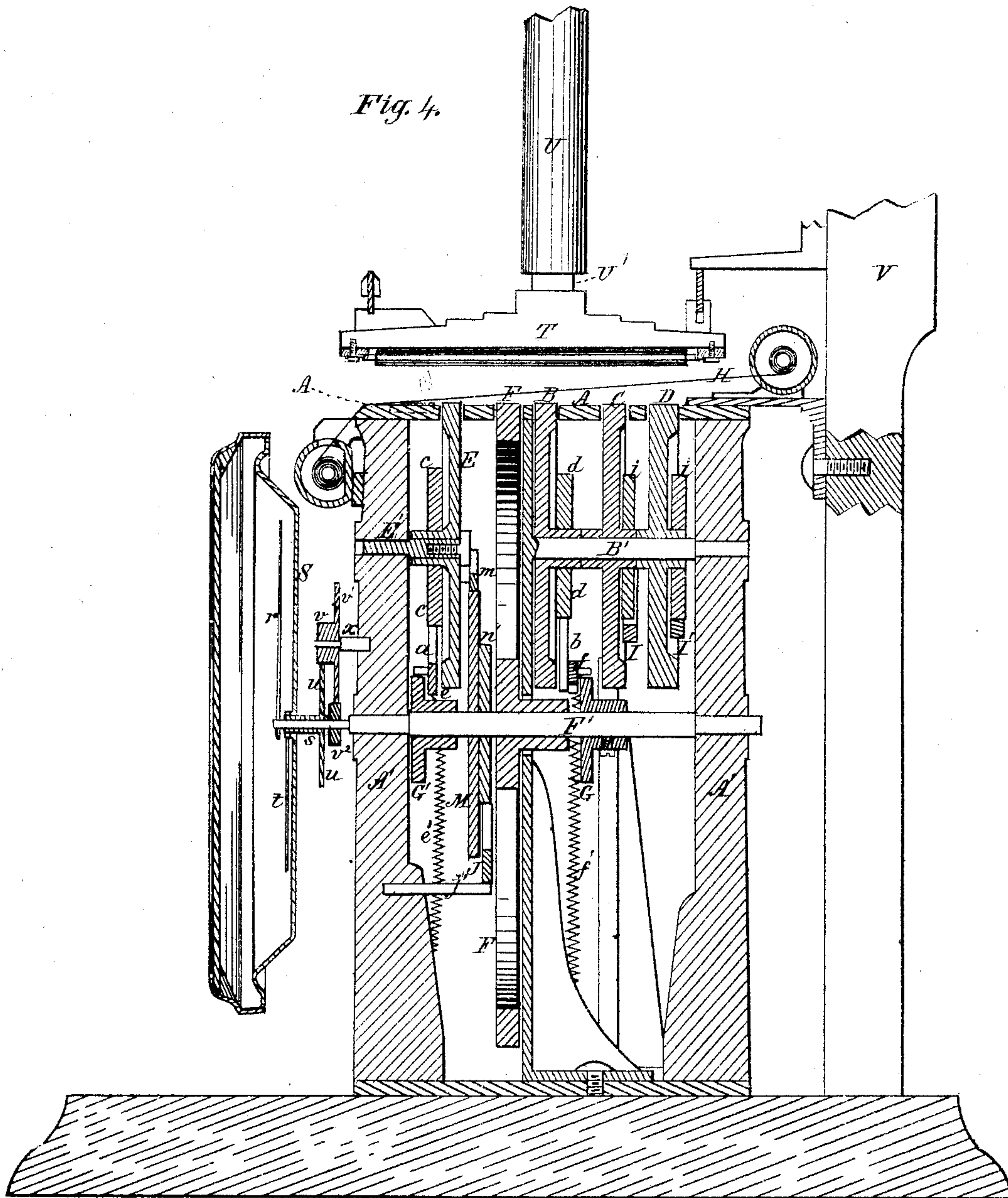


Inventor:

John C. Hinchman.

By Johnson, Mauck & Co.
his Attorneys.

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Witnesses:

West Wagner.
Am. Hinchman.

Inventor:

Jno. C. Hinchman.
By Johnson, Klauke & Co.
his Attorneys

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Fig. 5.

Inventor:

Jno. C. Hinchman.

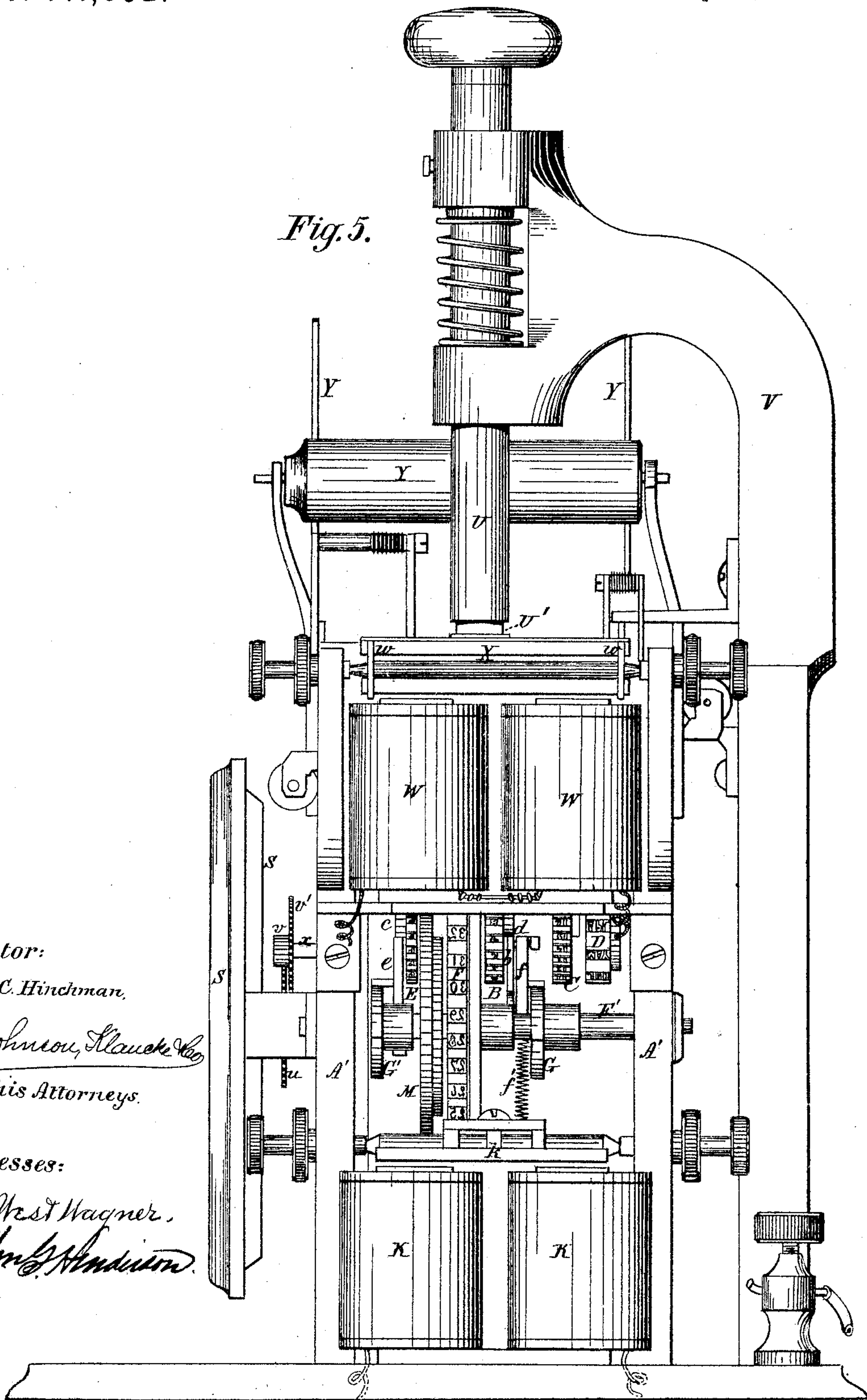
By

Johnson, Klauke & Co.
his Attorneys.

Witnesses:

J. West Wagner.

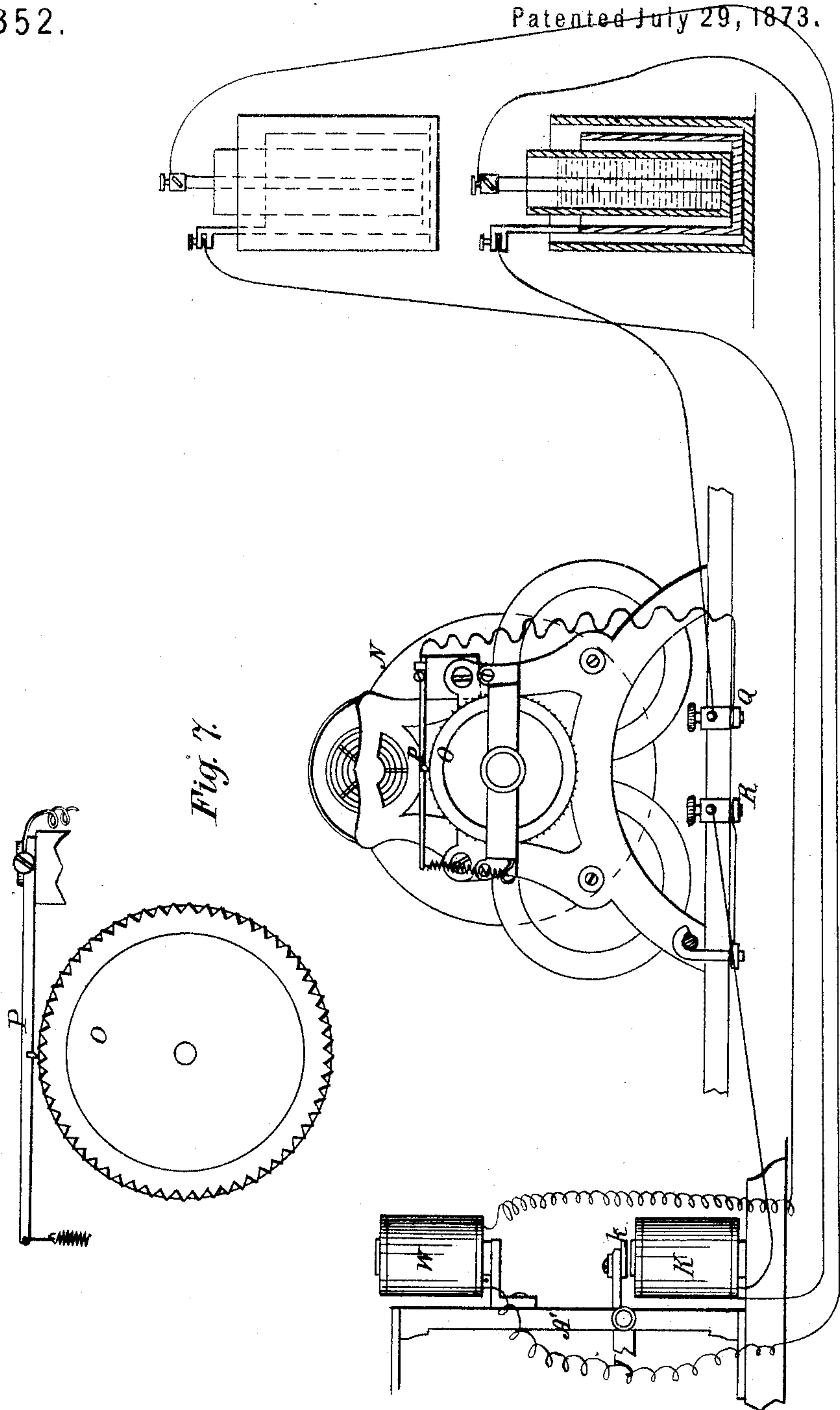
Wm. S. Anderson.



J. C. HINCHMAN.

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Patented July 29, 1873.



Witnesses:

J. West Wagner,
J. C. Hinchman.

Inventor:

Jno. C. Hinchman,
By Johnson, Klauke & Co.
his Attorneys.

UNITED STATES PATENT OFFICE.

JOHN C. HINCHMAN, OF SUMMIT, NEW JERSEY.

IMPROVEMENT IN ELECTRO-MAGNETIC DATE-TIME PRINTERS AND STAMPS.

Specification forming part of Letters Patent No. **141,352**, dated July 29, 1873; application filed February 24, 1873.

To all whom it may concern:

Be it known that I, JOHN C. HINCHMAN, of Summit, in the county of Union and State of New Jersey, have invented a certain new and useful Improvement, being an Electro-Magnetic Time-Printer, of which the following is a specification:

The object of my invention is to record dates and time by printing mechanism operated by an electro-magnet; and the invention which forms the subject-matter of this patent consists: First, of a time-printing machine having the combination therein of an electro-magnet, printing-wheels, a time-transmitter, and a lever, which unites these things and operates by such connection the time-printing wheels. Second, of a time-printing machine having the combination therein of printing-wheels or other printing devices, an electro-magnet as a motor for such devices, a time-transmitter to said motor, and a printing-presser, the motor whereof is an electro-magnet. Third, an electrical time-printing machine having the combination therein of a printing-presser whose motor is an electro-magnet, and a hand-stamp arranged to operate said presser with the printing-wheels without interfering with its electro-magnetic connection, and thereby combine an automatic stamp and a hand-stamp in one and the same machine, so that a record of time may be taken either by the magnet-motor or by hand without regard to the adjustments of the machine for automatic operation. Fourth, of a time-printing machine having the anti and post meridian divisions A and P of the meridian-wheel, arranged for operation with a fixed meridian-division, M, to obtain the advantages of economy and convenience. Fifth, in the combination, with the hour and meridian wheels, of cams, arranged upon the axis of the minute-wheel, to effect the simultaneous operation of the hour and meridian wheels by means of spring-pawls. Sixth, in the construction and arrangement of the escapement-lever and its parts for holding the minute-wheel from either turning forward or backward except when operated by said lever, whereby the minute-wheel is held secure and prevented from jumping more than a single tooth by the throw of the lever. Seventh, in the arrangement, in a

time-printing machine, of an indicator upon the axis of the minute-wheel, to show the positions of the minute, hour, and meridian wheels, and as a means of determining their positions for correct time-printing, the said indicator being controlled for that purpose by the time-transmitter, located and arranged between the battery and the electro-motor for the printing-wheels.

In the accompanying drawings, Figure 1 represents a top view of an electrical time-printing machine, and the time-transmitter with which it is connected, embracing my invention. Fig. 2 represents an elevation of the right side of the printing-machine. Fig. 3 represents a similar view of the left side of the same. Fig. 4 represents a transverse section of the machine. Fig. 5 represents an end view thereof. Fig. 6 represents a sectional view of the minute-printing wheel and the device which operates it from the magnet. Fig. 7 represents the time-transmitter, showing its connection with the printing-machine and the battery. Fig. 8 shows an impression of the time as printed; and Fig. 9, a top view of the table and the printing devices.

The machine consists of three principal parts, viz: A printing mechanism carrying an electro-magnet or magnets as its motor, a battery, and an intermediate time-transmitter. The printing mechanism is mounted in a suitable frame, consisting of a table or top-plate, A, and supporting-standards A', in the middle pair of which are the bearings for the axes of the several printing-wheels. These wheels are arranged upon separate axes, the hour, day, and month wheels B C D upon the axis B', the meridian-wheel E upon a short axis, E', and the minute-wheel F upon the lower axis F', by the revolutions of which latter the hour and meridian wheels B and E are operated, as will be presently described. These wheels are provided on their circumference with proper printing-characters, indicating the divisions of time, and they are arranged so as to project through openings in the top plate A to receive the action of the vertical presser to print the time, Figs. 4 and 9. The hour, meridian, and date wheels B E C D turn freely upon their respective axes B' E', while the minute-wheel F is fixed upon

and turns with its axis F' , which carries two cams, G G' , shown in Figs. 3, 4, and 5, of like construction, arranged to lift and release spring-pawls a b , Figs. 2 and 4, which take into ratchet-wheels c d to turn or move the hour and meridian wheels B and E one point for each revolution of the minute-wheel F , the said pawls a b being carried by pivoted arms e f , Figs. 2, 3, and 4, upon the free ends of which the cams G and G' act to raise them, and when released are suddenly depressed with their pawls a b by springs e' f' , Figs. 2 and 3, and thus move the hour and meridian wheels B E . The meridian-wheel E is only provided with the ante and post divisions A and P on its circumference, divided by its diameter, while the meridian division M is fixed upon the table A , so as to print in a line with either A or P , according to the time, and thus make a very convenient arrangement for the purpose, as shown in Figs. 8 and 9. The figures indicating the year are also placed on the table to print in a line with the meridian-division, as shown in Fig. 9. The minute-wheel F is arranged between the hour and meridian wheels B E , and the date-wheels C and D on the other side of the hour-wheel. The inking-band H is suitably arranged across the printing devices and adjusted in the usual manner. The date-wheels C and D are adjusted as may be required for the day and month by means of pivoted levers I I' , Figs. 2, 3, and 4, carrying spring-pawls g h , Fig. 3, which, as the levers I I' are vibrated, catch into toothed wheels i and move the wheels C D one point, the movement of the levers I I' being governed by stops j at their outer ends, Fig. 3, and by their inner ends striking upon the lower sides of the toothed wheels i i , which also holds the wheels C D . The minute-wheel F is operated by an escapement-lever, J , the movement whereof is regulated and controlled by an electro-magnet, K , arranged in convenient position, so that the armature k will operate the said lever J , and impart a movement to the minute-wheel corresponding to the intervals communicated to the magnet by the transmitter. This same movement produced by the electro-magnet K operates, at the intervals of an hour, the hour and meridian wheels B E by the cams G G' . The escapement-lever J is held in position by a stop, j' , and operates the minute-wheel by means of a spring-pawl, L , Figs. 2, 3, and 6, which, as the free end of the lever J is raised, catches into the teeth of a ratchet-wheel, M , and moves the minute-wheel F one point, which movement is governed by the limit of the movement of the armature k and stop j' . As this movement, however, is sudden, it might throw the minute-wheel beyond the proper point, and to prevent which I have arranged, in connection with the lever, holding and escapement devices for the minute-wheel, and which prevent it from moving in either direction except by the lever. These consist of a spring-pawl, m , Fig. 6, fitting into the ratchet-wheel M to pre-

vent the minute from turning back, and a pawl, n , fitting into a smaller ratchet-wheel, n^1 , to prevent said wheel F from turning forward except when raised by an arm, n^2 , from the lever J , which releases said pawl n from its lock of the minute-wheel, so that the latter can move, and as the lever J rises to make this movement a stop, n^3 , Fig. 6, thereon locks with the teeth of the ratchet-wheel n^1 , and thus holds the minute-wheel and ratchets M n^1 in position after having been turned until it is again locked by the spring-pawls m n , and in this way produce a very certain acting lever and minute-wheel. The time-transmitter (see Figs. 1 and 7) is connected in circuit with the time-printer, and may be any suitable time-piece with a proper arrangement for breaking and closing the circuit at regular intervals to accord with the recording devices. The transmitter, shown in the drawings, consists of a time-keeper, N , provided with a circuit-wheel, O , of sixty metallic divisions, and a circuit-closer, P , of any suitable construction, these parts being connected in circuit, the latter by the screw-post Q , and the circuit-wheel O by the screw-post R , Figs. 1 and 7. The circuit may, however, be opened and closed by any devices which will communicate to the printing mechanism intervals of time.

In the event of the minute and hour printing-wheels being out of time from any cause, so that they will not indicate the correct time, I have arranged a time-indicator, S , upon the axis F' of the minute-wheel F to show the exact position of these wheels, and thus show the time they will print, and, if requiring adjustment, to correct the time, then to exhibit such correction. This indicating feature, although separate and distinct from the time-transmitter, is controlled by it and must be adjusted by it, and is a highly-advantageous feature in connection with time-printing wheels. It consists of a clock-dial, S , fixed to the standards A' , the minute-hand r fixed to the end of the axis F' , and the hour-hand t fixed upon a sleeve, s , Fig. 4, upon whose inner end a small cog-wheel, u , is fixed, matching with a pinion, v , on a short bearing, x , on which a toothed wheel, v^1 , also turns and gears with a pinion, v^2 , on the minute-wheel axis F' , whereby the minute and hour hands r and t are turned with the printing minute and hour wheels, and thus always show the time they will print. The printing-presser T is carried by and suspended by a spring in a socket-stem, U , across the table A and just above the printing-line of the wheels. The socket-stem U is supported by a curved standard, V , on the frame. The presser is designed to be operated by an electro-magnet, W , side arms w from the armature X whereof extend toward and over the ends of the presser T , whereby to depress the latter by simply closing the circuit either automatically by hand or by mechanical devices. When operated automatically it may be by a passing railroad train, the open-

ing of the door of a bank or safe, or, in fact, for any purpose for which it might be useful, and could be conveniently effected by closing the printing-circuit. When so operated the paper is fed automatically from a reel, Y, after each impression by the feeding-roller devices, shown in Fig. 1, or any other suitable intermittent feed devices that will draw the paper beneath the presser T at each opening of the circuit.

In order to increase the capacity of the machine for usefulness, I have joined with the automatic feature of the printing-presser that of the hand-stamp, and thus combine in one the facilities and convenience of two machines. This I accomplish by the usual hand-stamp spring-stem U, arranged to telescope with the stem U' of the presser, so that the latter can be depressed by the electro-magnet independently of the hand-stamp or by it, whereby the machine is, in fact, an automatic and a hand time-printer, from which records may be made by hand without interfering with the electro-magnetic connections.

The arrangement of the dial S and its clock devices upon the arbor which carries the minute-wheel is a means for determining the positions of the minute, hour, and meridian printing wheels, and to make apparent whether they are printing correct time, and to show what changes are necessary to make the time correct; and, although such device is separate from the printing-wheels, yet is operated by the motor, which also operates them, and is important in such connection in a time-printing machine.

The escapement or escapements for working the printing wheels or devices will not answer without a positive lock-step, because in a time-printer the conditions of resistance to motion vary as the minute-wheel revolves. The required force of the lever gradually increases until finally the lifting power of the lever is released. This requires an escapement adapted for the purpose, as described, for if the ordinary escapement were employed, the maximum force being continuous, it would cause the minute-wheel to jump when the resistance was low.

The electro-magnet K k operates the printing-

wheels, and the magnet W the presser-stamp, each performing separate functions and worked in independent circuits.

Having described my invention, I claim—

1. In a time-printing machine, the combination of an electro-magnet, K k, and a time-transmitter, N O P, with printing-wheels and a lever, J, connecting with and operating said wheels.

2. A time-printing machine having the combination therein of printing devices, an electro-magnet for operating such devices, a transmitter of time thereto, and a presser operated by an electro-magnet.

3. In a time-printing machine having the combination next-above stated, a hand-stamp arranged to be operated to make the record of time without interfering with the electro-magnetic connection, thus combining the facilities of an automatic and a hand stamp in one machine.

4. In a time-printing machine, the meridian-wheel E, having its ante and post divisions A and P arranged to operate in combination with a fixed meridian division, M, as described.

5. The hour and meridian wheels B E, operated by means of cams G G', arranged upon the axis F' of the minute-wheel F, as described.

6. The escapement-lever J with its pawls L n^2 , stop n^3 , and ratchet-wheels M n^1 , and their stop-pawls m n, to form a positive lock to the lever, as described, in a time-printing machine.

7. The arrangement, in a time-printing machine, of the dial S and its indicating-hands upon the shaft F' of the minute-wheel, in combination with the lever J, which operates both the printing-wheels and the indicator, to determine the position of the printing-wheels for correct time printing and to indicate the required changes of the wheel for that purpose, as described.

In testimony whereof I have hereunto set my hand this 23d day of January, A. D. 1873.

JOHN C. HINCHMAN.

Witnesses:

A. E. H. JOHNSON,
WILLIAM MACKINTOSH.