

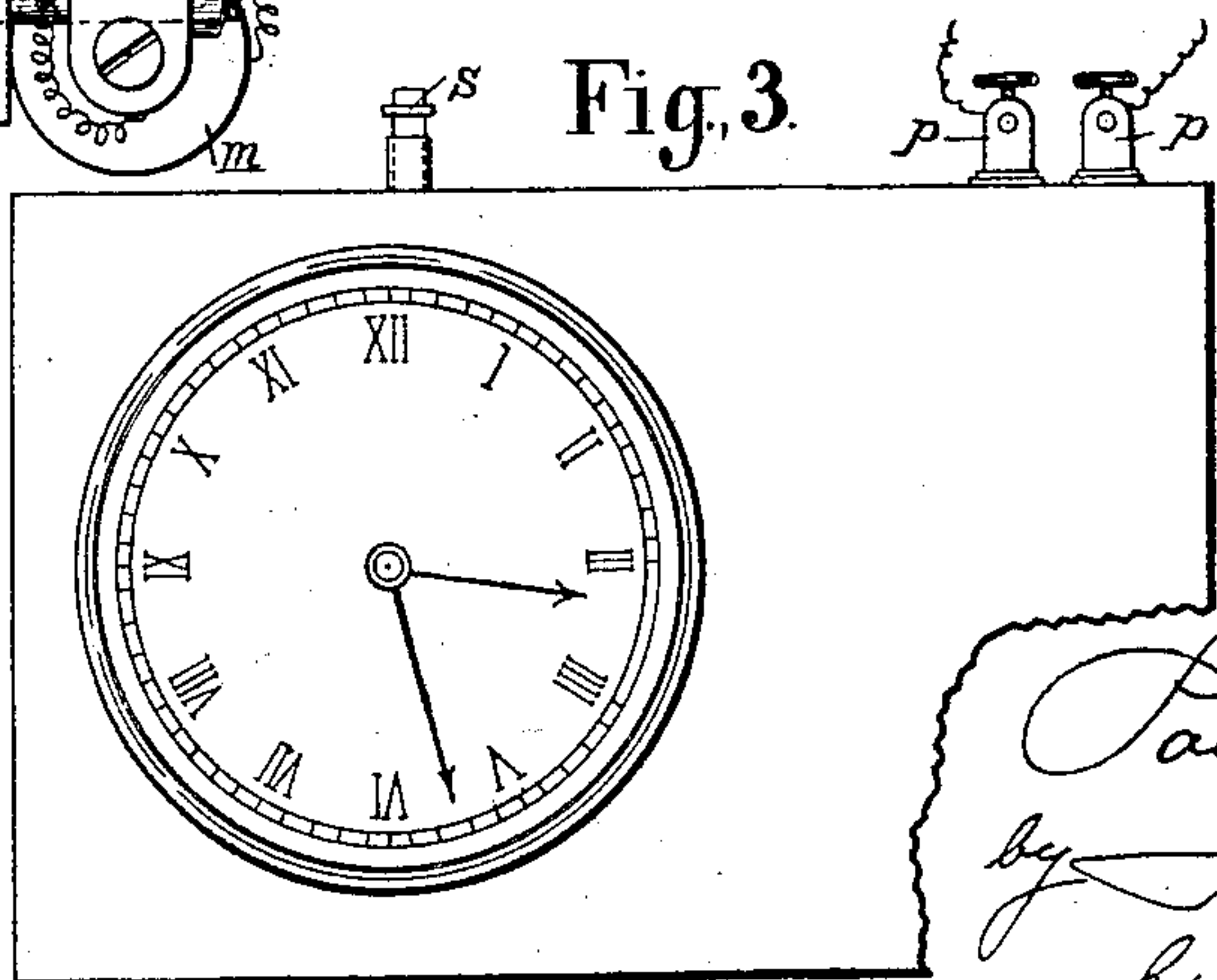
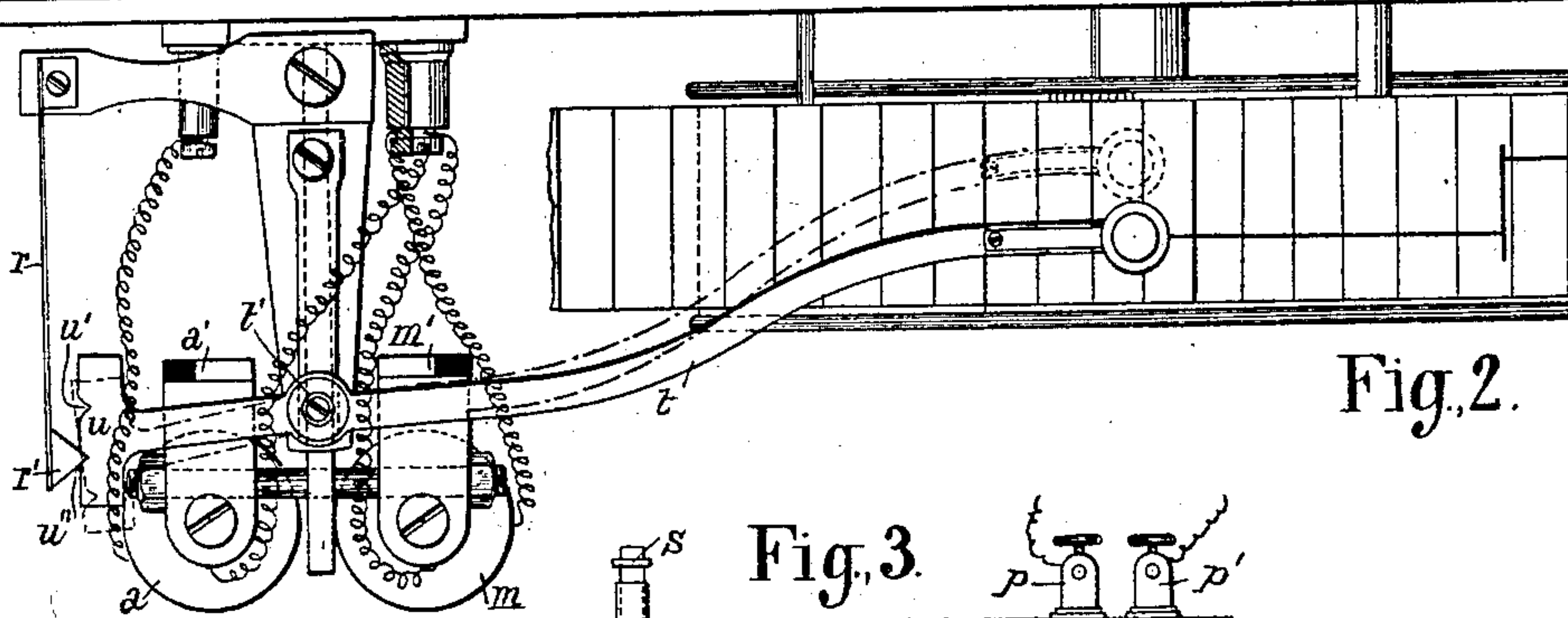
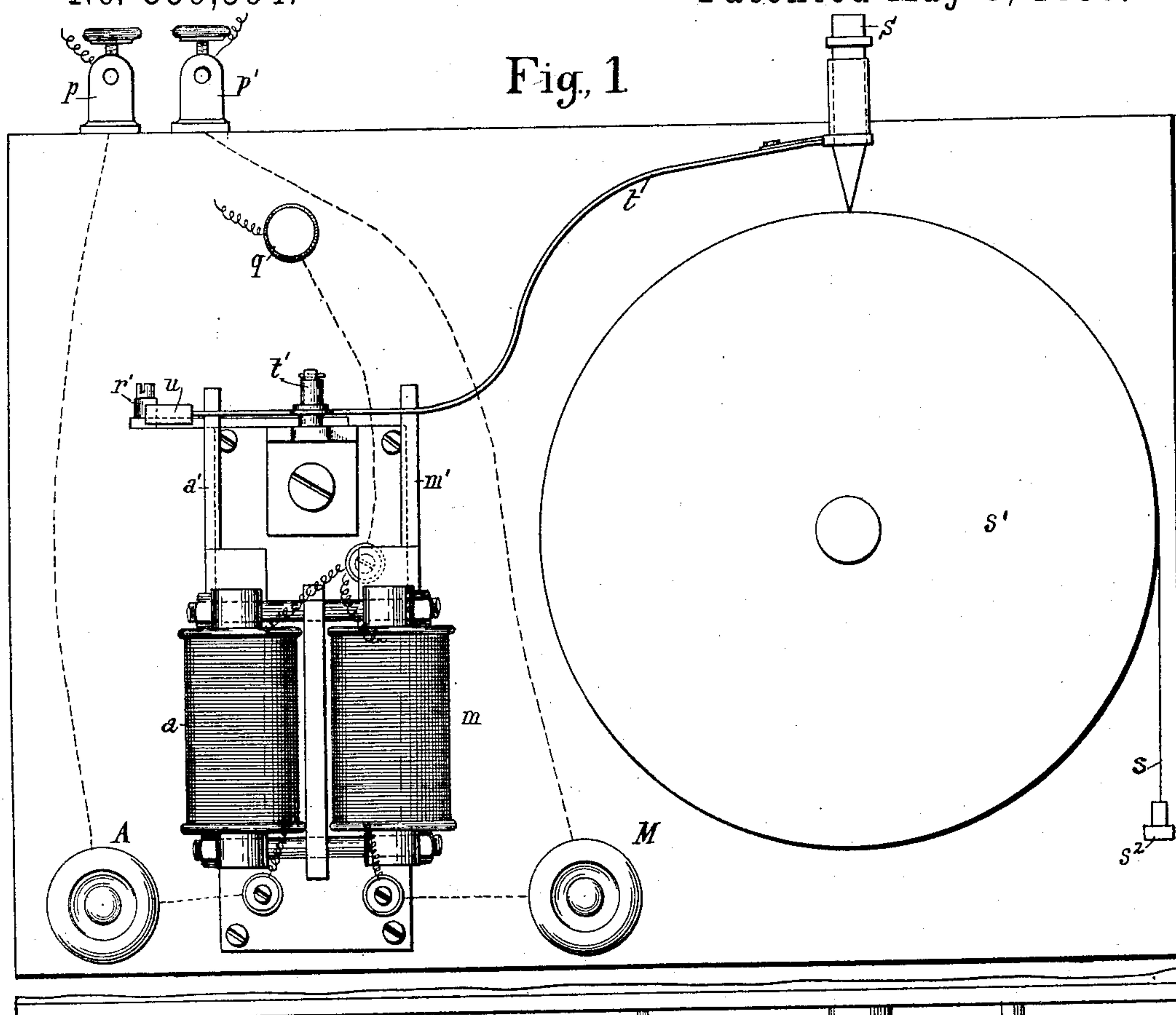
(No Model.)

P. MARIX.

INDICATING AND REGISTERING APPARATUS FOR METERS.

No. 559,394.

Patented May 5, 1896.



Witnesses.

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UNITED STATES PATENT OFFICE.

PAUL MARIX, OF PARIS, FRANCE.

INDICATING AND REGISTERING APPARATUS FOR METERS.

SPECIFICATION forming part of Letters Patent No. 559,394, dated May 5, 1896.

Application filed December 27, 1895. Serial No. 573,519. (No model.) Patented in France April 5, 1894, No. 237,555, and May 18, 1894, No. 238,606; in Luxemburg October 13, 1894, No. 2,142; in Belgium October 15, 1894, No. 122,250; in England October 20, 1894, No. 20,046; in Spain October 20, 1894, No. 37,473, and in Austria December 8, 1894, No. 44/6,322.

To all whom it may concern:

Be it known that I, PAUL MARIX, of Paris, France, have invented a new and useful Improvement in Indicating and Registering Apparatus for Meters, &c., which is fully set forth in the following specification, and for which I have been granted foreign patents as follows: in France, No. 237,555, dated April 5, 1894, and No. 238,606, dated May 18, 1894; in England, No. 20,046, dated October 20, 1894; in Belgium, No. 122,250, dated October 15, 1894; in Luxemburg, No. 2,142, dated October 13, 1894; in Spain, No. 37,473, dated October 20, 1894, and in Austria, No. 44/6,322, dated December 8, 1894.

This invention has reference to indicating and registering apparatus for meters, &c.

With the apparatus described in my application, Serial No. 573,518, filed herewith, when a number of distinct operations are recorded the recording of the first operation is effected and the recording of the second operation succeeds that of the first without any record being taken of the extent of the interval between them.

It is often necessary or desirable not only to know the extent of the intervals of rest or inactivity (corresponding to periods of inoperativeness) of apparatus, devices, &c., but also to know of the extent of a period of rest or operation as compared with another operation of any kind which may be effected supplementary thereto. The object of the present invention is therefore not only to record periods of work, but also periods of rest.

In the apparatus described in my application above referred to the operation is controlled by two mechanisms, by one of which the action of the indicating and registering apparatus is arrested during periods of inactivity or inoperativeness of the apparatus connected therewith.

In accordance with my present invention the apparatus does not work intermittently, but continuously, the difference between periods of work and periods of rest being indicated by shifting the marker which effects the graphic indication upon the chart, diagram-plate, &c. This marker is controlled by two devices each for shifting it to one of

two positions, in one of which positions it makes a mark, while in the other it is raised so as to make no mark, or its position on the chart may be shifted, causing corresponding changes in the position of the lines which it makes. The latter mode is the preferable and is the one herein described.

As shown in the drawings, the position of the marker is controlled by electrical devices operated by suitable circuit-closing push-buttons, as hereinafter explained; but it will be understood that other means (such as purely mechanical devices) for effecting the same objects may be employed within the limits of my invention.

The invention will be more fully understood by reference to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an elevation of an instrument embodying the invention. Fig. 2 is a plan of the mechanism exterior to the casing, and Fig. 3 is a rear elevation of the apparatus shown in Fig. 1 on a reduced scale.

Any kind of clockwork, either with its own movement or with an electrically-operated movement, is arranged in a casing which carries a drum fixed on the arbor of the minute mechanism. For instance, let it be supposed that it is a time-measuring block-indicator, (although it might equally well be an indicator for measuring the consumption of water, gas, &c.) The diagram-paper is coiled on a sleeve fitted directly on the drum in such a way that it can be readily replaced when required. The sleeve is held on the drum either frictionally or by clips or in any other way, so that it will rotate with the drum which itself is fitted directly on the arbor aforesaid. By this arrangement the paper is easily changed and will work well and quickly owing to the speed of movement given it, being the same as that of the minute mechanism if the drum is on the minute-wheel, &c. There will be no slip during the travel of the paper. While the drum is rotating the paper is unrolled beneath a pencil, pen, or marker S, which is free in its holder, so that it will constantly press on the paper with an even pressure. For this purpose the marker-arm is terminated by a vertical sleeve, wherein

the pencil or pen can freely slide. The marker-arm is pivoted at t' , and at its opposite extremity is a special sector u , provided with two notches $u' u''$, a spring r having at its end a V-shaped tooth r' pressing its edge against this sector u .

Two electromagnets a and m , with their pole-pieces a' and m' , are so arranged that extensions of these pole-pieces abut behind the marker t on each side of the pivot t' . These electromagnets are connected, respectively, to a battery by the screws $p p'$ for the entrance of the current and by a common screw q for its exit. The two circuit-closing buttons A and M are placed in circuit with the inflowing currents at the two binding-screws $p p'$, whereby a current can be sent at will into the electromagnets a or m . These two buttons A and M can be arranged at any distance from the apparatus to allow of the apparatus being controlled at a distance.

To compensate for the frictional action of the marker on the paper and consequently on the movement which causes it to advance, a light weight s^2 may be arranged on one end of the paper band, the weight being calculated to accelerate the movement of the paper to an extent equal to the delay caused by the friction of the pencil.

By having the roll of paper on a drum a quantity of graduated paper for a fixed time can be used—for instance, for a week, for a month, or even longer; but when there is a large reserve of paper rolled on the drum the diameter of the paper roll decreases as the paper is unrolled, and thereby the speed of advancement of the paper is also reduced. It is thus necessary to remedy this inconvenience.

When the reserve is an ordinary one, (a week, for example,) the above variations in speed are so slight that no appreciable errors will occur; but when a reserve of a large number of rolls is used it is desirable to compensate, by specially graduating the paper, the differences arising from variations in speed.

When the apparatus is in the position shown in dotted lines in Fig. 2 of the drawings, in which the tooth r' has entered the notch u' —that is, when the electromagnet m has received a current by pressing the button M—the marker t will have oscillated so as to lie in the plane for tracing the working periods. When the pole-piece m' draws the marker t in the above manner, it causes it to slightly swing beyond the position indicated above; but the tooth r' in pressing against the inclined edge of the notch u' , to thoroughly engage in said notch, will draw the marker into its true position, and this small recoil movement has for its object to produce on the diagram a small projecting line, which very clearly marks the commencement of the work.

When two periods of work succeed without any intervals of rest, an indication of the commencement of these successive working periods may be obtained by a pressure at

each commencement on the button M. When the button A is pressed, it is the electromagnet a which operates its pole-piece a' , causing the marker t to oscillate in a reverse direction to the movement obtained by the electromagnet m , and to thus draw the marker into the position for indicating the standstill period of rest. In this case also the tooth r' and the notch u'' serve, as has been seen above, to determine the commencement of the periods of rest by the sliding of the tooth r' on the inclined plane, which exteriorly borders the notch u' .

In conclusion, in this apparatus, where an unwinding diagram-paper is employed, new combinations have been described—first, to easily exchange the daily, weekly, monthly, &c., rollers; second, to directly place the roll of paper on the same axis as the minute-hand; third and finally, to allow the electromagnets to control the markers without modifying, by the variations of their positions, the regularity of the movement. It is quite evident that though these arrangements are supposed to be the best they might be varied. For instance, drums might be employed with a single roll of paper, or two rollers might work in connection, so that the paper would be drawn like a pulley-belt, &c. The diagram also might be arranged on the flat on a rotating disk. All these arrangements or varieties of the diagram parts do not in any way modify the principle of the invention. In like manner, in place of one marker there could be two, and in place of being worked by electromagnets these markers could be controlled by chains, cords, handles, &c.

As an example of the employment of the register just described, let it be assumed that the quantity of cubic meters passing through a gas-meter is to be registered while a gas-motor is at work and during a given time. By the clockwork of the gas-meter an electric contact will be made at each revolution of the wheels corresponding to a given number of cubic meters passed. The contact-pieces will be connected by a wire to the register, the arbor of rotation of which will advance a notch at each contact. The length of the paper band unrolled will then indicate the quantity of cubic meters passed. If the mechanism or devices M and A for varying the position of the marker work in unison with the gas-meter, the lines recorded by the marker will comprise for the line of work the cubic meters used during the period of work and for the line of rest the cubic meters, if any, used during the time the motor is at rest.

If the device, instead of recording quantity, record the time, the hours of the work of the motor and those of its standstill periods will be indicated. In this latter case there can be simultaneously obtained a record of the cubic meters of gas passed. It will suffice to connect the wires going to the buttons A and M to a wire going to the contacts of the meter. There can thus be had a record on each of the

lines of the diagram of the passage of the cubic meters during these periods. It is the arrangement which furnishes the recording of the commencements of work which will
5 furnish the account of the cubic meters. In this latter case, as in all cases where the shifting of the marker is controlled by electrical contacts, it is necessary to take care to add automatic interrupters, so that the duration
10 of the contact will never falsify the indications of the apparatus.

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

15 1. In an indicating and registering apparatus of the kind described, the combination with a moving diagram card or chart upon which the record is made, of a pivoted lever carrying at one end a marker in contact with
20 said diagram card or chart, and being notched at its other end, electromagnetic mechanism in proximity to said lever, circuit-connecting devices controlling the energizing circuit for the magnet, whereby the lever is shifted from
25 one position of contact on the diagram paper

or chart to another, making distinct lines corresponding to different periods, such as periods of rest and of work, respectively, of an apparatus, and a spring-actuated tooth adapted to engage the notches in the lever, substantially as described. 30

2. In an indicating and registering apparatus, the combination with a clockwork mechanism of a diagram-chart in the form of a paper roll mounted on a horizontal arbor of
35 said clockwork mechanism, a marker carried by a vibratory arm and bearing with light friction upon said roll, means for shifting the arm, thus changing the position of the marker and thereby producing distinct lines, and
40 means for compensating for the friction of the marker upon the paper, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses. 45

PAUL MARIX.

Witnesses:

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