

(No Model.)

A. STORER.
MESSAGE RECORDING INSTRUMENT.

No. 460,676.

Patented Oct. 6, 1891.

Fig:3.

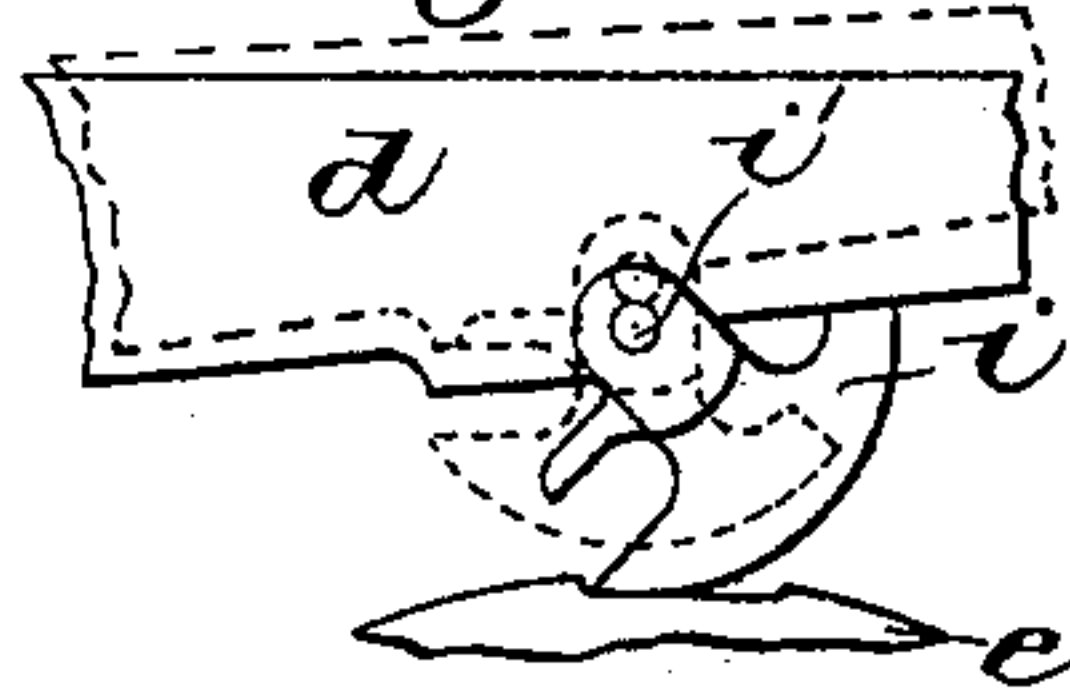


Fig:1.

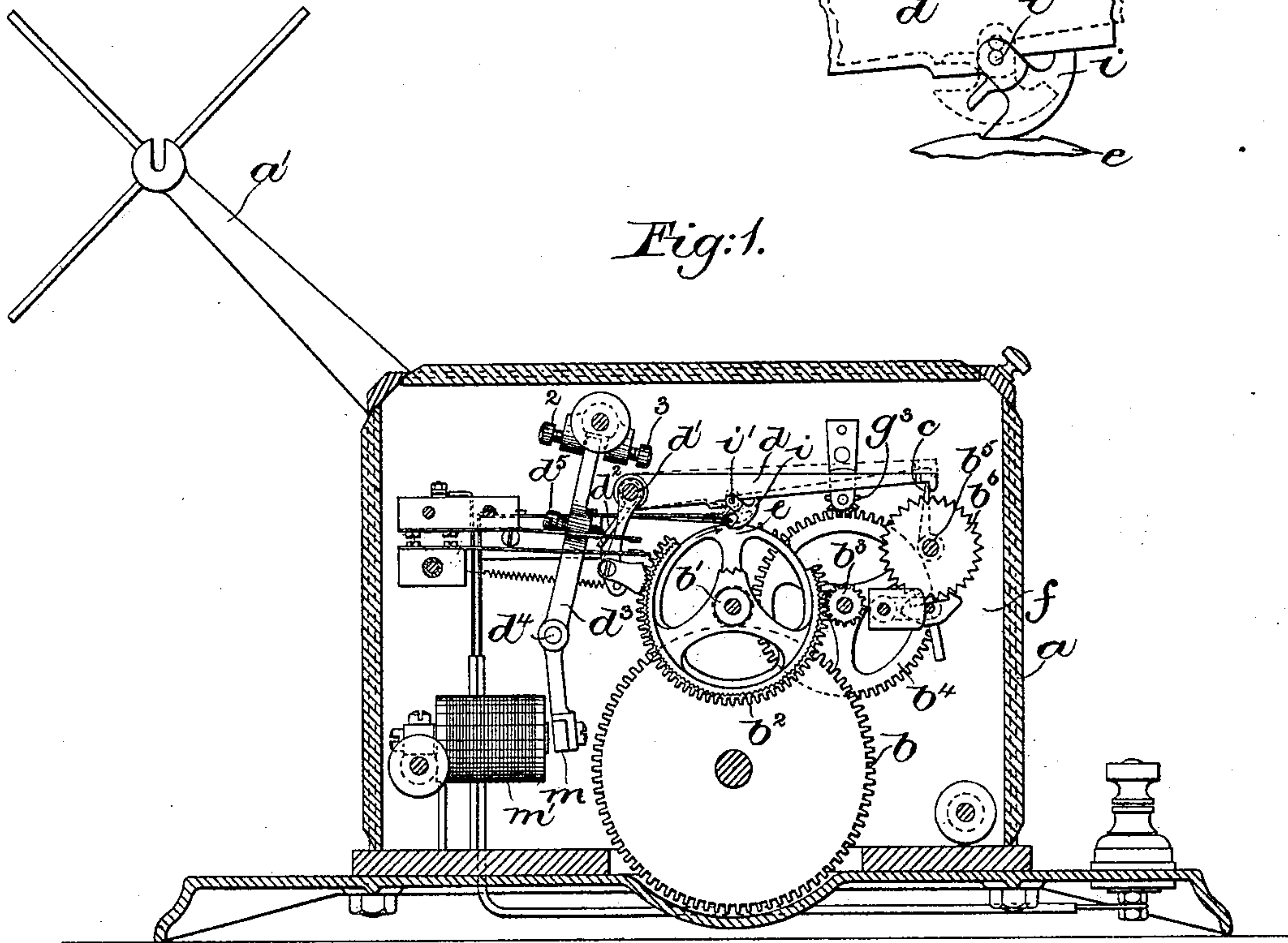
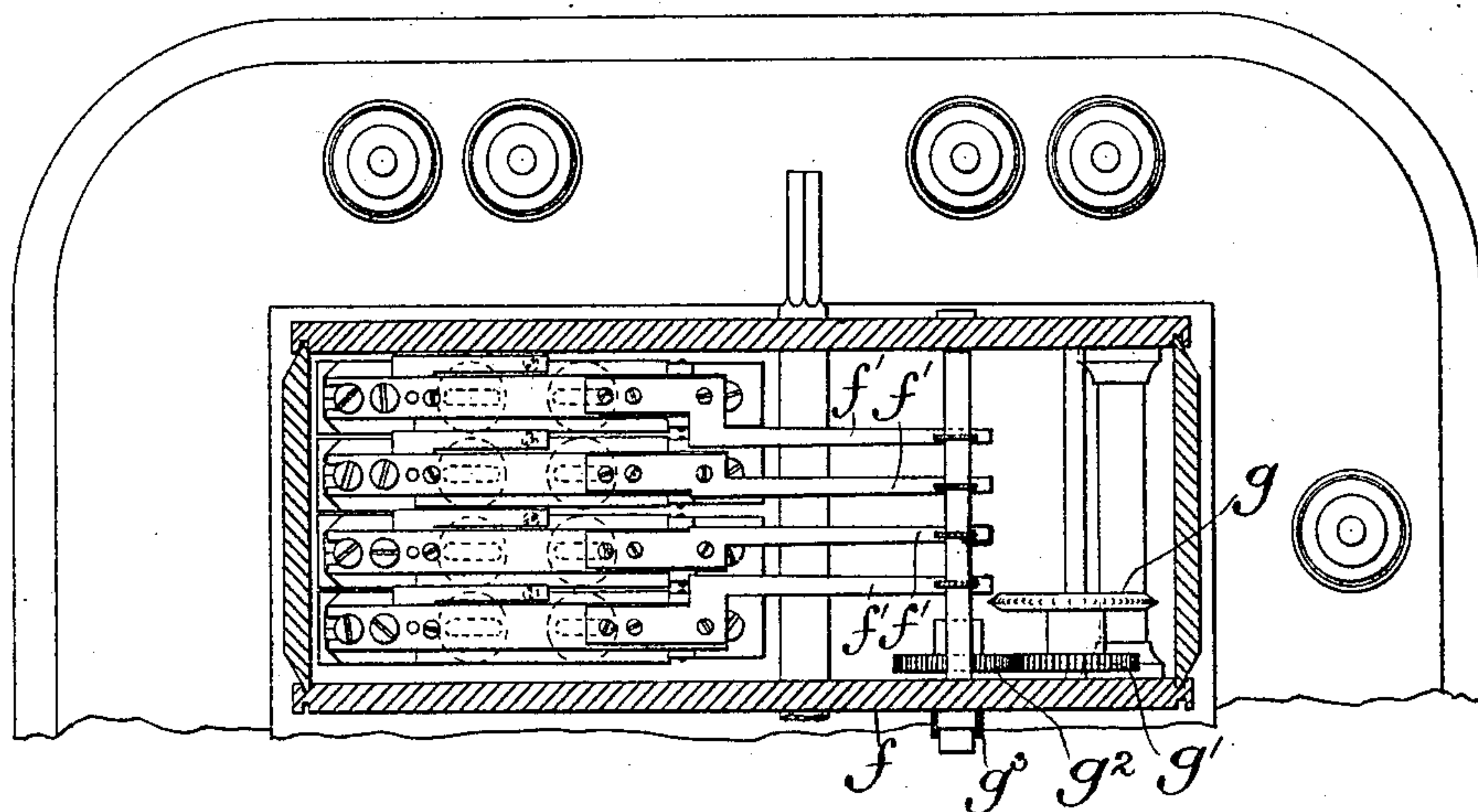


Fig: 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

ALBERT STORER, OF BOSTON, MASSACHUSETTS.

MESSAGE-RECORDING INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 460,676, dated October 6, 1891.

Application filed January 27, 1891. Serial No. 379,246. (No model.)

To all whom it may concern:

Be it known that I, ALBERT STORER, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Message-Recording Instruments, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

10 In United States Patents Nos. 426,554 and 426,555, dated April 29, 1890, message-recording instruments are shown comprising a single motor mechanism or train and several pen-magnets arranged in separate circuits. The
15 motor mechanism has a stop-arm which is adapted to engage and stop the train, which constitutes a main stopping device, and has also a stop-wheel operated by the train which constitutes an auxiliary stopping device, and
20 which is designed to allow the stop-arm to engage and stop the train at only regular intervals, that a definite length of paper may be fed forward, or that the train may run a definite length of time for each signal. It often-
25 times happens that while a signal is being received over one circuit another signal will begin to come in over another circuit, and hence two of the pen-magnets will be operating at the same time, and as soon as the first signal
30 has been received the stop-wheel will have arrived in position to allow the stop-arm to engage and stop the train, but as the second signal is still being received it is necessary that the train shall continue to operate. My
35 invention comprehends the provision of suitable means of accomplishing this result; and it consists in the employment of means whereby the said stop-arm shall not be allowed to resume its engaging position and stop the
40 train unless the circuit has remained in its normal condition a longer time than the longest similar condition of the circuit in any signal—that is to say, if the recorder is included in a local or open circuit and the normal
45 condition of the circuit is open, the stop-arm will not be allowed to resume its engaging position and stop the train unless the condition of the circuit remains open a longer time than the longest break in said circuit
50 caused by a signal.

In carrying out this invention the means

provided controls the co-operation of the main and auxiliary stopping devices, or their simultaneous action, whereby the train may be stopped, such means being governed by the
55 armature of the starting-magnet.

My invention therefore consists in the combination of the following instrumentalities: an actuating-train, a starting-magnet and its
60 armature, a main and an auxiliary stopping device for said train, one of which is controlled by the armature and the other by the train in running, a controlling device which causes or permits the main and auxiliary stopping
65 devices to co-operate and stop the actuating-train after the circuit has remained in its normal condition a longer time than the longest time that the circuit remains in its normal condition during the transmission of any
70 signal, substantially as will be described.

Figure 1 shows in side elevation a message-recording instrument embodying this invention, the case being shown in section to better expose the operating parts within it; Fig.
75 2, a plan view of a portion of a message-recording instrument shown in Fig. 1, and Fig. 3 a detail of the controlling device to be referred to.

The inclosing case *a*, having attached to it a support *a'* for the paper-reel, is of any suitable shape and construction. The motor
80 mechanism or actuating-train consists of a toothed wheel *b*, secured to a shaft, upon which is mounted a main spring, a pinion *b'*, engaging therewith and secured to a shaft to
85 which is secured a toothed wheel *b''*, which engages a pinion *b'''*, secured to a shaft to which is secured a toothed wheel *b''''*, which engages a pinion (not shown) secured to a shaft
90 *b''''''*, to which is secured the escape-wheel *b''''''''*. A tooth or projection *c* is secured to the shaft carrying the escape-wheel *b''''''''*, which is engaged by a stop-arm *d*, secured to a rod *d'*,
95 having its bearings in the side walls of the case *a*. An arm or projection *d''* is also secured to said rod *d'*, which extends downwardly, and a lever *d'''* is pivoted at *d''''*, through one portion of which an adjusting-screw *d''''''*
100 passes, which as the said lever is moved strikes the short arm *d''''*, turns the rod *d'*, and raises the stop-arm *d*. The stop-arm *d*, constructed and arranged as shown or otherwise

adapted to engage and stop the train, constitutes the main stopping device. The armature m of the starting-magnet m' is also secured to the said lever d^3 , by means of which it is moved. The movement of the lever d^3 is limited in each direction by set-screws 2 and 3. A stop-wheel e , having a single notch, is secured to the shaft carrying the toothed wheel b^2 , and said stop-wheel e , with its co-operating member or members, constitutes the auxiliary or secondary stopping device for the train.

The inclosing case a is divided longitudinally by a wall f , and in the chamber back of this wall f the pen-magnets are placed, (see dotted lines, Fig. 2,) the armatures of each of which carry a pen, as f' , four being herein shown. The several pen-magnets are included in separate circuits and therefore operate independently.

The paper-feeding mechanism consists of a feed-wheel g and another feed-wheel beneath it, (not shown,) between which feed-wheels the paper is fed, a toothed wheel g' , secured to the shaft of the roll carrying the feed-wheel g , and the toothed wheel g^2 , which engages and drives wheel g' , and to the shaft to which the toothed wheel g^2 is secured a pinion g^3 , which engages a toothed wheel b^4 of the actuating-train.

The recorder herein represented is designed to be arranged in a local or normally-open circuit, and hence the armature is normally retracted, as represented in Fig. 1. When the armature is attracted by a closure of the circuit, the lever d^3 is moved and its adjusting-screw d^5 , engaging the short arm d^2 , lifts the stop-arm d to disengage the projection c and thereby release the train. A controlling device is provided, which controls the co-operation of the main and auxiliary stopping devices, which controlling device is herein represented as a segmental plate i , loosely connected to the stop-arm d at i' at a point just above the stop-wheel e . With the parts at rest in their normal position, as represented in Fig. 1, one end of the segmental plate i is in the notch in the stop-wheel e , while the other end bears against the under side of the releasing or stop arm d . This allows the stop-arm to fall sufficiently to engage the projection c . When the armature is attracted and the stop-arm raised, the said projection c is disengaged and the segmental plate i turns on its pivot by gravity into the dotted-line position shown, and while the armature is held attracted the said segmental plate is free from contact with the stop-wheel. As soon as the armature has again retracted, the stop-arm d falls until the segmental plate bears upon the periphery of the stop-wheel, said plate then serving as a prop or holder to hold the stop-arm up, so that it will not engage the projection c . As the stop-wheel e is rotated, the segmental plate i will be turned on its pivot i' toward the right, and if the armature remains retracted a sufficient

length of time the said segmental plate will resume its full-line position, (see Fig. 1,) so that its end portion can enter the notch in the stop-wheel as soon as said notch presents itself; but if the armature is again attracted the stop-arm will be again lifted, so that the segmental plate will be freed from contact with the stop-wheel, when it will again turn on its pivot by gravity and assume the dotted-line position represented. The time required for the segmental plate to move from its dotted-line position to its full-line position shown is longer than the longest break of the circuit in which the register is included, which is caused by the signal coming in, so that the armature of the starting-magnet shall remain in its normal retracted position a longer time than such break before the segmental plate will occupy a proper position to enter the notch of the stop-wheel.

It is to be understood that the starting-magnet responds to each and every impulse of the signal coming in over any one of the independent circuits. Thus it will be seen that if one signal commences to come in before another signal ceases the recorder will continue to operate until such time as the circuit remains in its normal condition for a definite length of time, and the notch in the stop-wheel thereafter presents itself to the segmental plate.

I do not desire to limit myself to the exact construction shown for carrying out my invention, as it is obvious that many forms of controlling devices may be provided for controlling the operation of the main and auxiliary stopping devices; and furthermore I desire it to be understood that the continuously-operating train, combined with the main and auxiliary stopping devices controlled by an electro-magnet, is applicable to other devices than that herein shown, so I do not desire to limit my invention to its employment in connection with message-recording instruments.

I claim—

1. In a message-recording instrument, the combination of the following instrumentalities: an actuating-train, a starting-magnet and its armature, a main and an auxiliary stopping device for said train, one of which is controlled by the armature and the other by the train in running, and a controlling device which causes or permits the main and auxiliary stopping devices to co-operate and stop the actuating-train after the circuit has remained in its normal condition a longer time than the longest time that the circuit remains in its normal condition during the transmission of any signal, substantially as and for the purposes set forth.

2. In a message-recording instrument, the combination of an actuating-train, a starting-magnet and its armature, a main stopping device controlled by the said armature, an auxiliary stopping device controlled by the train, and a controlling device governed by the armature which controls the co-opera-

tion of the main and auxiliary stopping devices to stop the train, substantially as described.

3. In a message-recording instrument, an actuating-train, a starting-magnet and its armature, a main stopping device consisting of an arm, as *d*, adapted to engage and stop the train, and an auxiliary stopping device consisting of a train-operated stop-wheel with which the said arm *d* co-operates, combined with a controlling device interposed between the arm *d* and stop-wheel and operated by the actuating-train and governed by the armature, substantially as described.

4. In a message-recording instrument, an actuating-train, a starting-magnet and its armature, a main stopping device comprising an arm, as *d*, controlled by the armature, an auxiliary stopping device comprising a train-operated stop-wheel, as *e*, with which the arm *d* co-operates, and a controlling device comprising a segmental plate, as *i*, movement of which in one direction is governed by the armature and in the other direction is governed by the train, substantially as described.

5. In a message-recording instrument, an actuating-train, a stop-arm *d*, stop-wheel *e*,

and controlling member *i*, consisting of gravitating plate, which controls the co-operation of the stop-arm *d* and stop-wheel, whereby the train may be stopped, and a starting-magnet and its armature, which latter controls the operation of the arm *d* and also of the controlling member *i*, substantially as described.

6. The actuating-train and main and auxiliary stopping devices therefor, one of which is controlled by the armature of an electro-magnet and the other by the train in running, combined with a controlling device governed by the said armature, which causes or permits the main and auxiliary stopping devices to co-operate and stop the actuating-train after the circuit has remained in its normal condition a longer time than the longest time that the circuit remains in its normal condition during the transmission of any signal, substantially as described.

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

ALBERT STORER.

Witnesses:

GEO. W. GREGORY,
BERNICE J. NOYES.