

(No Model.)

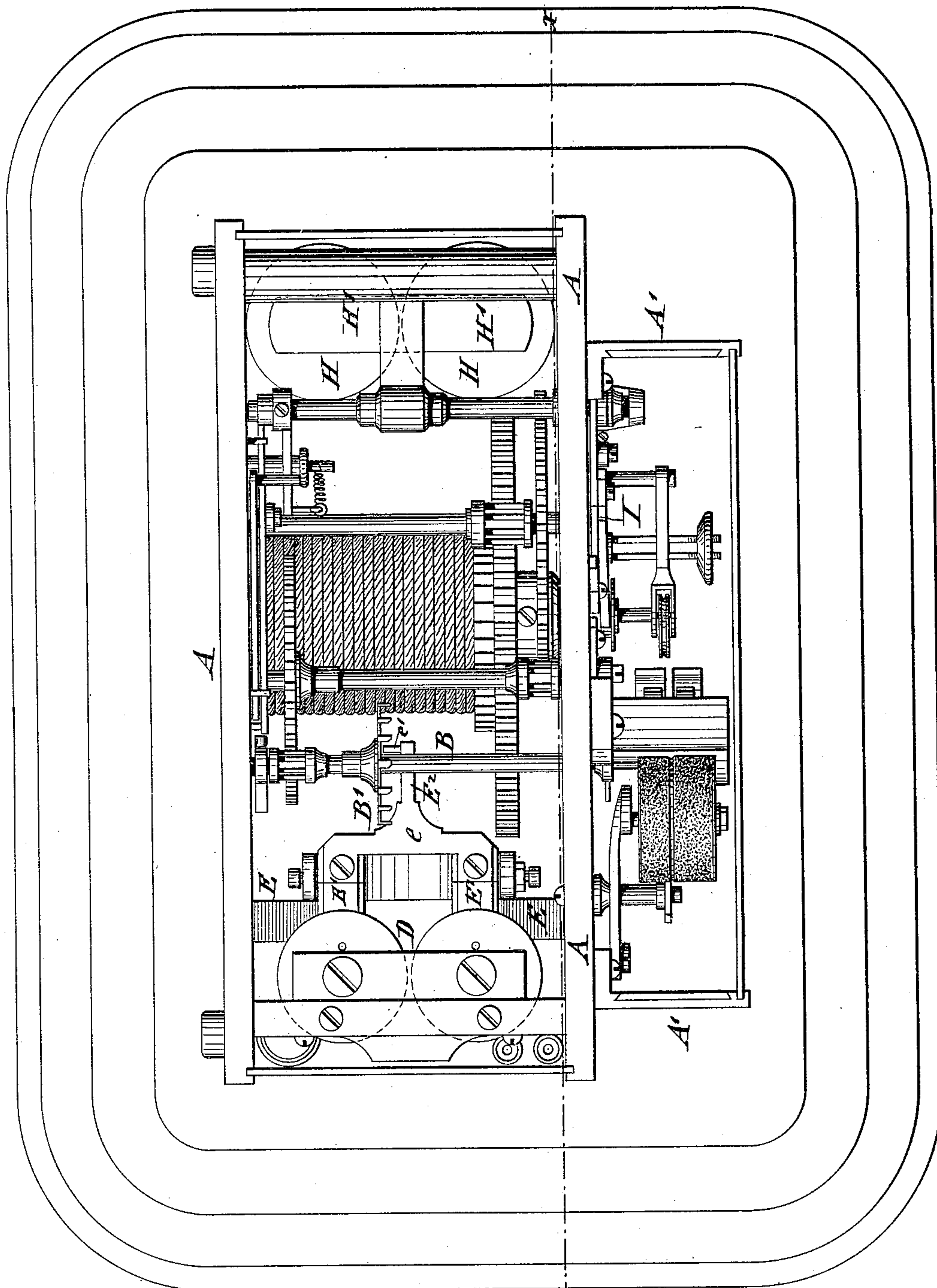
4 Sheets—Sheet 1.

A. WIRSCHING.

# PRINTING TELEGRAPH INSTRUMENT.

No. 354,001.

Patented Dec. 7, 1886.



WITNESSES:

A. Schiel.  
Martin Petry.

62

INVENTOR

INVENTOR  
Aloys Wirsching  
BY

BY

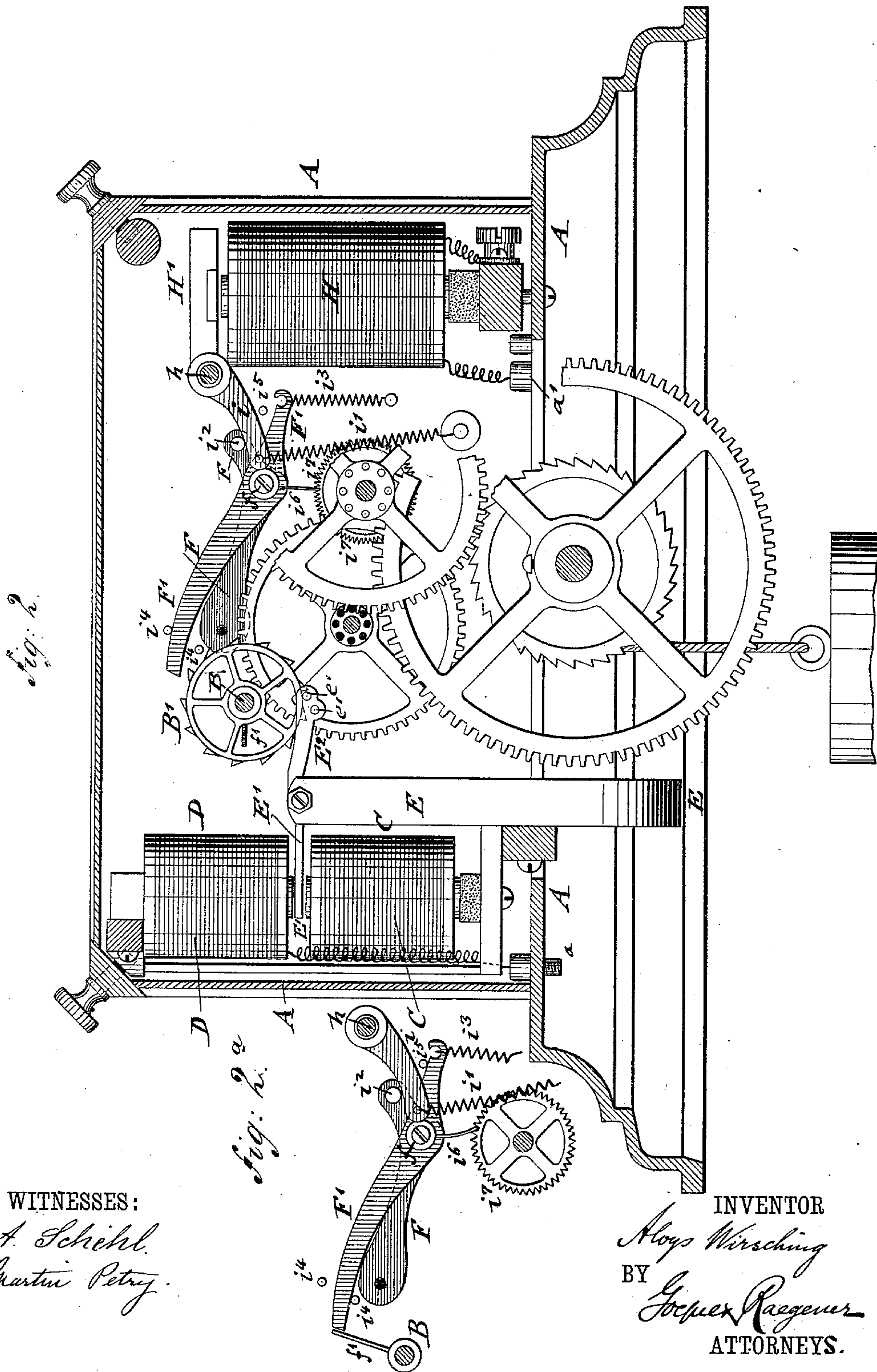
BY *George Paegener*

ATTORNEYS.

4 Sheets—Sheet 2.

No. 354,001.

Patented Dec. 7, 1886.



WITNESSES:

A. Schiehl.  
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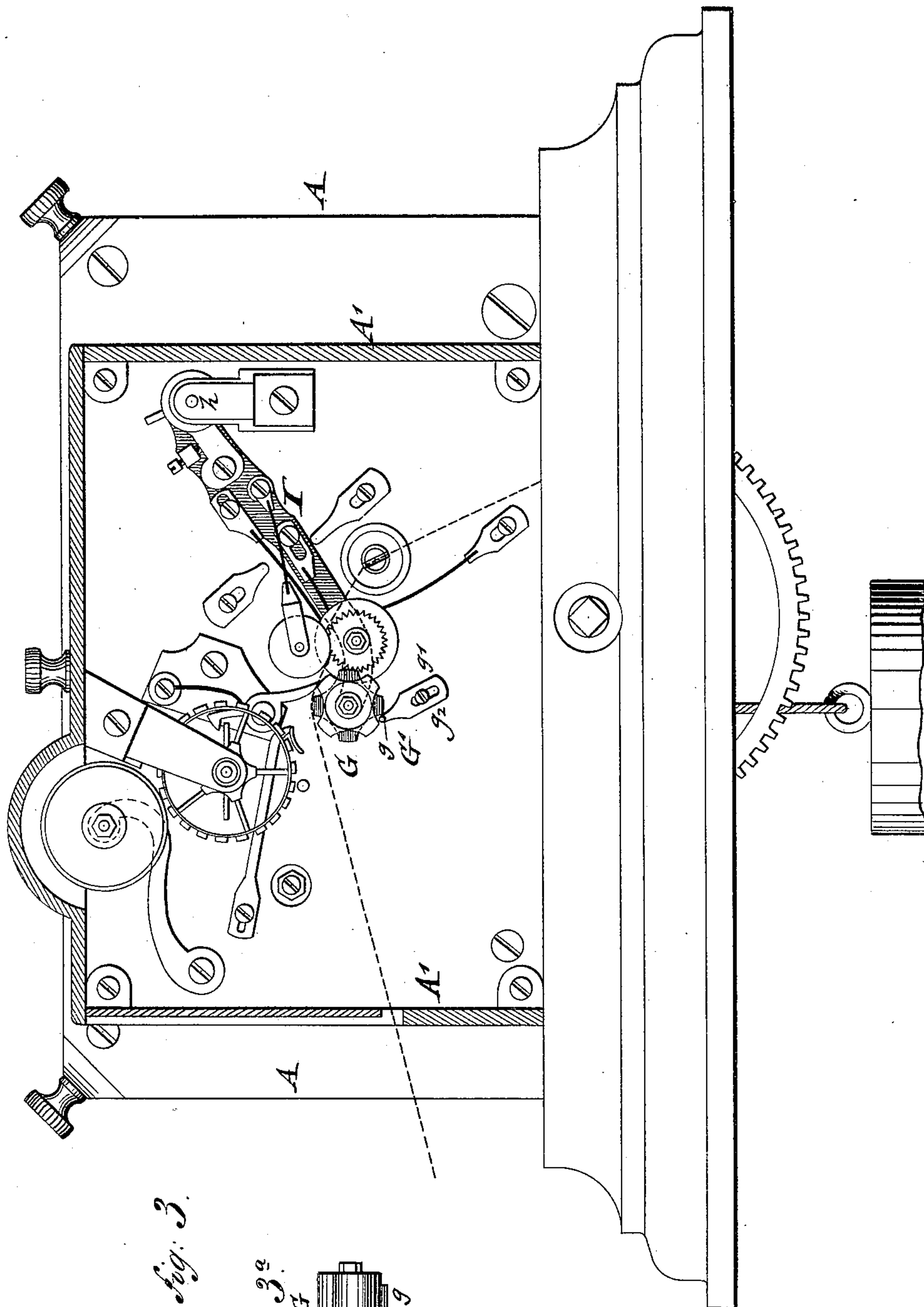
INVENTOR  
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BY  
*Grover Reger*  
ATTORNEYS.



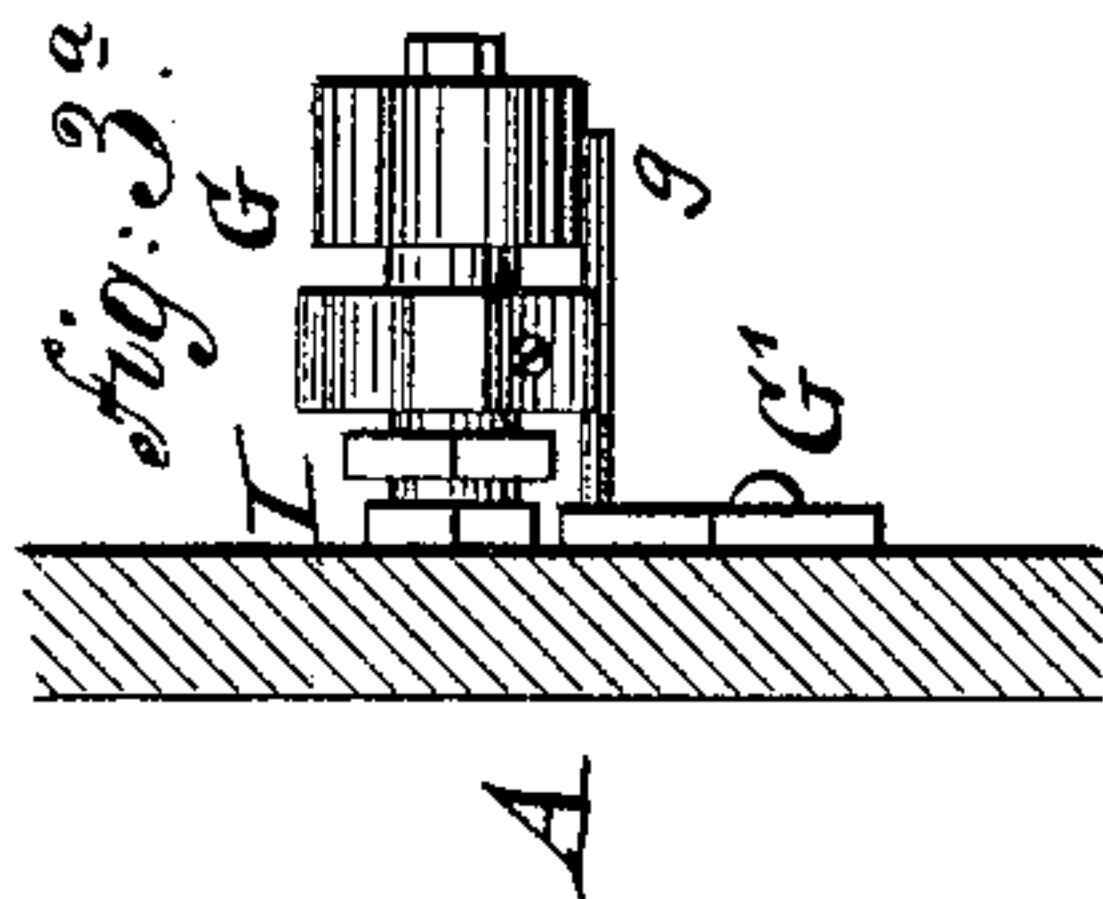
(No Model.)

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A. WIRSCHING.  
PRINTING TELEGRAPH INSTRUMENT.  
No. 354,001. Patented Dec. 7, 1886.



WITNESSES:  
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(No Model.)

4 Sheets—Sheet 4.

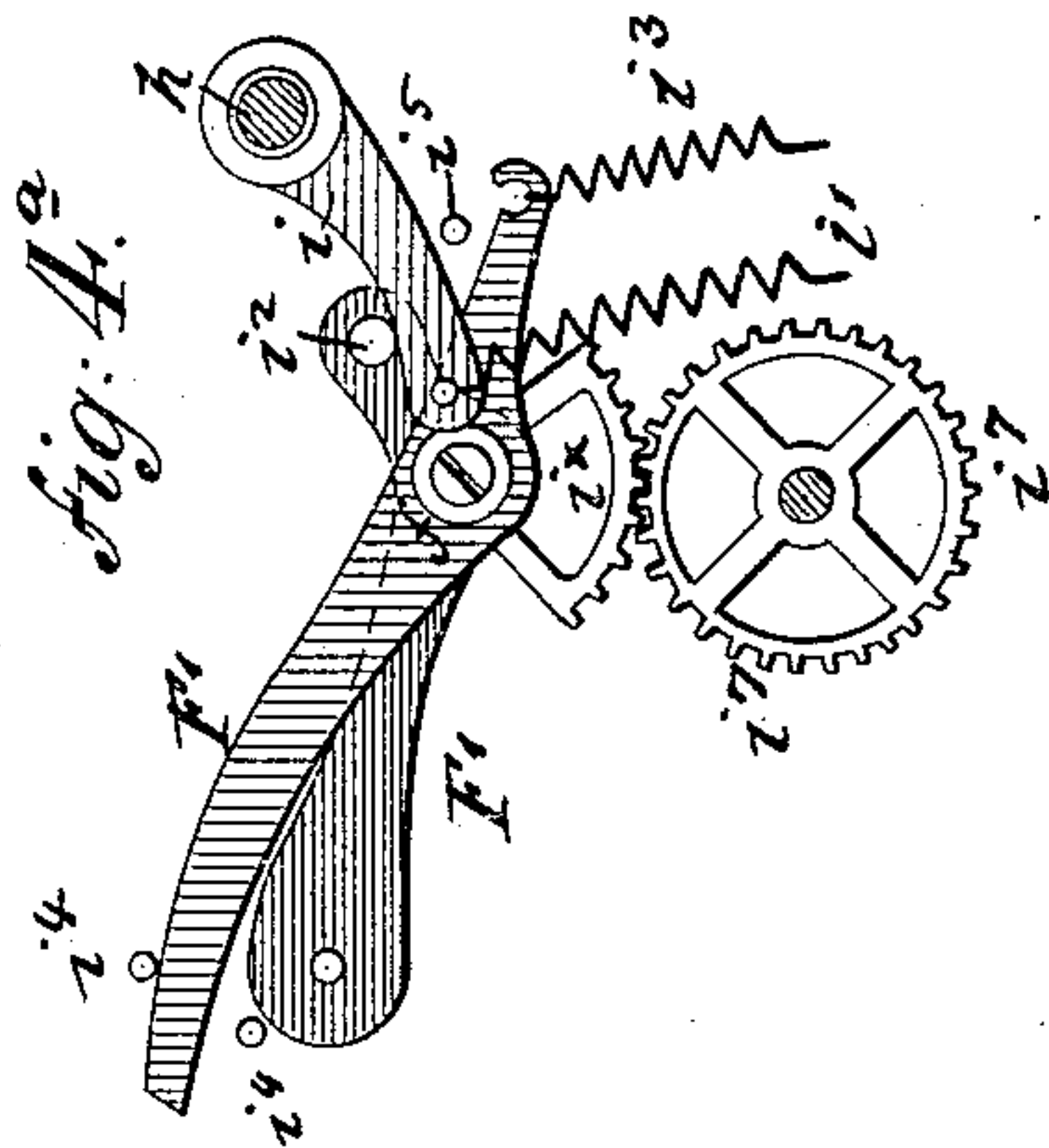
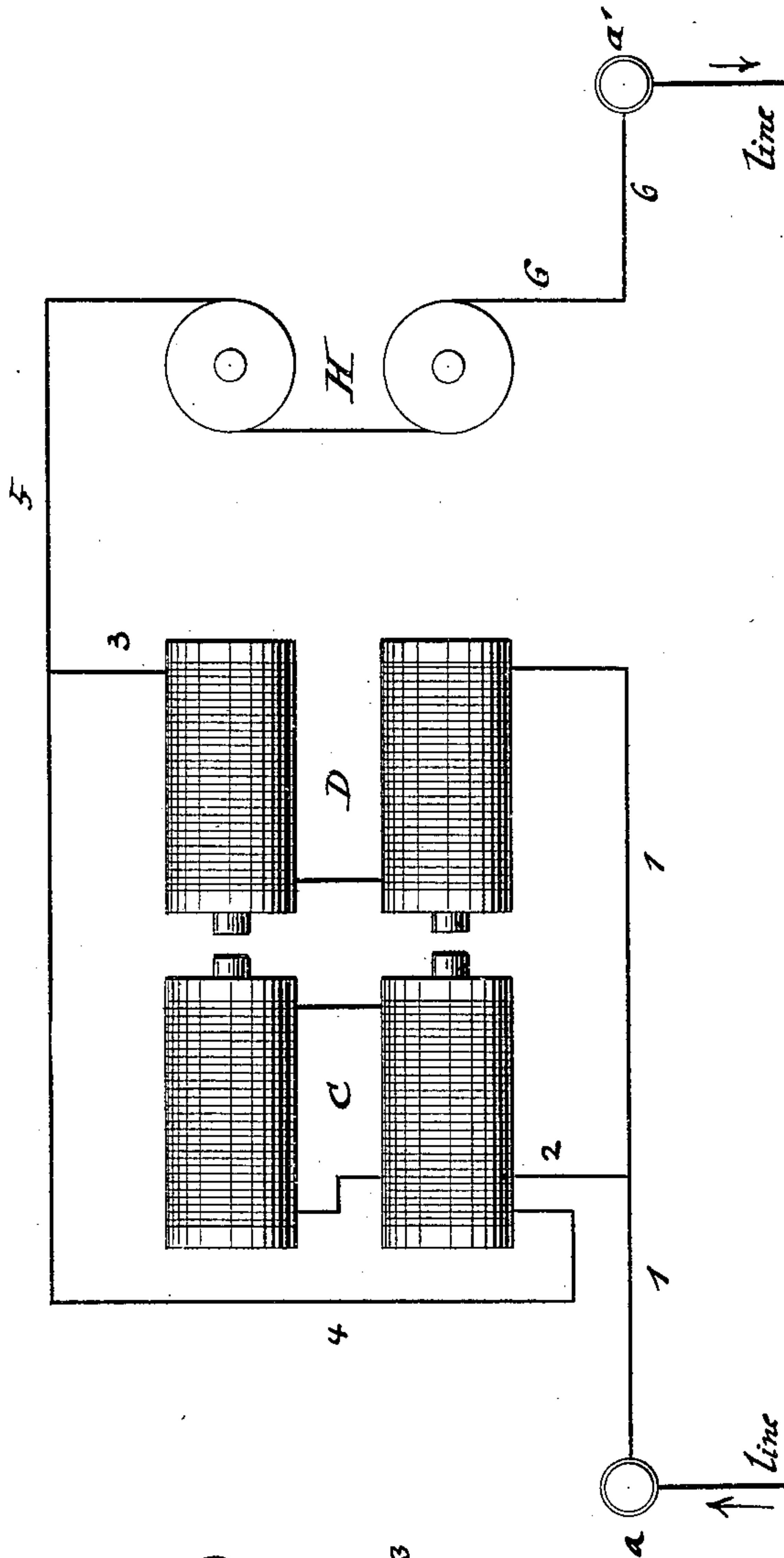
A. WIRSCHING.

PRINTING TELEGRAPH INSTRUMENT.

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*fig. 4.*



WITNESSES:

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INVENTOR

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# UNITED STATES PATENT OFFICE.

ALOYS WIRSCHING, OF BROOKLYN, NEW YORK.

## PRINTING-TELEGRAPH INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 354,001, dated December 7, 1886.

Application filed July 10, 1886. Serial No. 207,678. (No model.)

*To all whom it may concern:*

Be it known that I, ALOYS WIRSCHING, of Brooklyn, county of Kings, and State of New York, have invented certain new and useful  
5 Improvements in Printing-Telegraph Instruments, of which the following is a specification.

This invention relates to improvements in that class of printing-telegraph instruments  
10 in which two type-wheels are employed and impressions from either one of the same produced at the will of the operator at the transmitting-station.

The invention relates more especially to certain improvements in the printing-telegraph for which Letters Patent were granted to me, No. 286,667, dated October 16, 1883, said improvements being designed with a view to  
15 simplify the construction of the instrument and to cause all the instruments in one circuit to respond in a more reliable and effective manner to the messages sent from the transmitting-station.

The invention consists of a printing-telegraph instrument in which two escapement-magnets are arranged in multiple are by placing them in a split circuit, while the printing-magnet is arranged in series or single circuit  
25 with reference to the escapement-magnets, by which arrangement the entire strength of the current is transmitted to the printing-magnet, while the resistance of the escapement-magnets is diminished.

The invention consists, secondly, of a simple and effective construction of the unison-lever and its connection with the armature of the printing-magnet and the stop-arm on the arbor of the escapement-wheel, and, lastly, in  
35 a stop device for the double impression pad, by which any axial change of position of the same when the printing-lever is at rest is reliably prevented.

In the accompanying drawings, Figure 1 represents a plan view of my improved printing-telegraph instrument. Fig. 2 is a vertical longitudinal section of the same on the line  $x$ , Fig. 1. Fig. 2<sup>a</sup> is a detail side view of the unison-lever, showing it in a position for stopping the escapement-wheel and bringing the  
45 instrument into unison. Fig. 3 is a side elevation of my improved instrument, partly in

section, through the auxiliary casing. Fig. 3<sup>a</sup> is a detail side view of the stop device for the impression-pads. Fig. 4 is a diagram illustrating the course of the current through the  
55 escapement and printing magnets, and Fig. 4<sup>a</sup> is a side view of a modified construction of the unison-lever mechanism.

Similar letters of reference indicate corresponding parts. 60

Referring to the drawings, A represents the supporting main casing, and A' the auxiliary casing, of my improved printing-telegraph instrument.

B is the arbor of the escapement-wheel B', 65 which is driven by any suitable mechanism—such as a train of gear-wheels actuated by a weight suspended on a cord running over a drum, as shown in Figs. 1 and 2.

C and D are two horseshoe electro-magnets 70 which are arranged one above the other, and E a permanent horseshoe magnet located in front of the electro-magnets C and D.

To the poles of the permanent electro-magnet E are pivoted laterally-extending pieces 75 or tongues E', of soft iron, which are connected by a bridge,  $e$ , of non-magnetic material, and extended between the poles of the electro-magnets C and D, so as to constitute therewith a so-called "double polarized armature." 80 One of the tongues E' is influenced by one of the poles of the upper and one of the poles of the lower electro-magnet, while the other tongue is influenced by the remaining poles of the two electro-magnets C and D. From the  
85 transverse bridge  $e$  of the tongues E' extends in opposite direction the escapement-lever E<sup>2</sup>, that engages by pallets  $e'$   $e'$  the teeth of the escapement-wheel B', as customary in printing-telegraph instruments. 90

H is the printing electro-magnet, and H' the armature of the same, which is attached to the arbor  $h$  of the printing-lever I. The course of the current by which the escapement-magnets and printing-magnet are energized is 95 shown in diagram, Fig. 4, in which the escapement-magnets are located in a horizontal plane in place of a vertical plane, so as to facilitate the explanation. The current enters alternately through the binding-posts  $a$   $a'$ , according as a current of positive or negative 100 polarity is sent through the instrument from



the transmitter. When the current enters at the binding-post *a*, it passes along the connection *l*, and is then split into two currents, which pass through the coils of the electro-magnets C and D, which are wound with fine wire. The split currents, after leaving the coils of the electro-magnets C and D, are conducted, respectively, by the wires 3 and 4 to the wire 5, which conducts the united current to the printing magnet H, that is wound with coarser wire. From the printing-magnet the current passes over wire 6 to the binding-post *a'*, and from the same either to the ground or over the line-wire to the second instrument, and so on. It will thus be seen that a direct connection of the electro-magnets of each instrument is made with the line-wires, without the use of any circuit-breaking devices, whereby the construction is simplified and the circuit interfered with to a less extent than when the circuit-breaking device shown in my prior patent is used. By splitting the current before it passes into the escapement-magnets the latter are placed in multiple arc, while the printing-magnet is placed in series, by which the full strength of the current is exerted on the printing-magnet whenever a signal has to be printed, while sufficient force is exerted on the escapement-magnets to actuate the escapement-lever and escapement-wheel to perform their proper functions.

To the axis *h* of the printing-lever I is applied an arm, *i*, which extends in opposite direction to the armature H', and which is connected to a spiral spring, *i'*, that is attached to the side wall of the main casing A, and which serves as the adjusting-spring of the armature H'. The arm *i* bears against a pin, *i''*, of a lever, F, that is pivoted at its opposite end to the side wall of the main casing A.

To the pivoted lever F is fulcrumed, near the pin *i''*, a second lever, F', one end of which is connected to a spiral spring, *i'''*, while the opposite end is extended alongside of the pivoted lever F, toward the arbor of the escapement-wheel B', and adapted to oscillate between fixed stop-pins *i''*, one on each side of said lever, as shown respectively in Figs. 1, 2, and 2<sup>a</sup>. A third stop-pin, *i''''*, is located above that end of the fulcrumed lever F' to which the spiral spring *i'''* is connected.

To the hub of the fulcrumed lever F' is attached a downwardly-extending resilient arm, *i''''*, which is engaged by the spurs of a minutely-toothed wheel, *i'''''*, located on one of the intermediate shafts of the driving-train of gear-wheels. By the turning motion of the spur-wheel *i'''''* the resilient arm *i''''* is carried along, and thereby the lever F' turned on its fulcrum *f*, so that the arm located between the stop-pins *i''* is lowered and placed into the path of the unison-stop *f'* on the arbor B of the escapement-wheel B'. When the unison-stop *f'* arrives at the end of the fulcrumed lever F', as shown in Fig. 2<sup>a</sup>, the escapement-wheel B' is arrested. If the armature H' of the printing-magnet is attracted, while the escapement-

wheel B' is thus stopped, the arm *i* of the armature H' engages the pin *i''* at the outer end of the pivoted lever F and lifts the same, together with the lever F'; but as simultaneously with this lifting motion the adjoining end of the lever F' abuts against the stop-pin *i''* the lever F' will be retained, while the lever F will be lifted; consequently the levers F F' are spread apart like the blades of a pair of scissors, so that the end of the lever F' between the stop-pins *i''* is lifted and moved out of the path of the unison-stop, permitting thereby the escapement-wheel to continue its step-by-step rotary motion.

In place of the resilient arm *i''''*, a minutely-toothed segment, *i'''''*, may be used, which is attached to the hub of the lever F', and which meshes with the correspondingly-toothed spur-wheel *i'''''* on the arbor of one of the intermediate transmitting-wheels, as shown in Fig. 4<sup>a</sup>. By the lifting of the lever F the resilient arm *i''''* or the segment *i'''''* is also lifted, so as to clear the teeth of the spur-wheel *i'''''* and be returned again into mesh with the latter when the lever F is released by the dropping of the armature H'. In case the unison-lever F' is lowered and arrives at the lowest stop-pin before the stop-arm on the axis of the escapement-wheel comes around, the resilient arm *i''''* will "give" sufficiently and pass over the teeth of the spur-wheel without changing its position. In case the segment *i'''''* is used, it will be slightly lifted, together with the levers F F', so as to clear the teeth of the spur-wheel, but without changing its position of contact with the lower stop-pin, *i''*.

The unison mechanism described is of simple construction and very positive in action, as by the lifting of the levers F F' by the arm of the armature of the printing-magnet the resilient arm or its equivalent the toothed segment, is bodily lifted and taken out of mesh with the motion-transmitting spur-wheel and returned into mesh with the same, by the action of the spiral spring *i'''*, when the levers are returned into their normal position. (Shown in Fig. 2.)

The arrangement of the printing-lever, type-wheels, and the double impression pads provided with alternating teeth or impression-surfaces, together with the mechanism for feeding the paper and actuating the double-impression pad, are fully described in my prior patent referred to, and need no special description in this connection. The double-impression pad, however, was liable to be shifted out of its proper relative position to the type-wheels when strain was exerted thereon in taking up and pulling the tape on which the quotations or news were printed. To prevent this and hold the double-impression pad G in position, a stop device, G', is employed, which is shown in Figs. 3 and 3<sup>a</sup>. This stop device consists of a pin, *g*, which is supported by a slotted plate, *g'*, that is attached by a set-screw, *g''*, to the side wall of the supporting-casing A. The pin *g* projects into the space or depres-



sion between a tooth of the front part and the next adjoining tooth of the rear part of the impression-pad. When the printing-lever I is raised for printing, the teeth of the impression-pad G clear the stop-pin *g*, while, when the printing-lever is lowered, the stop-pin enters into the space between the adjoining teeth of the impression-pad and checks the latter, so that no change of position can take place, even when the tape on which the type-wheels have printed is pulled with considerable force or strain in reading the quotations or news printed on the tape. The stop-pin *g* prevents the turning of the impression-pad on its axis when the printing-lever is in a position of rest, and retains it in its proper relative position to the type-wheels. From the foregoing it will be readily seen that by the improved arrangement of the escapement-magnets in multiple arc and the printing-magnets in series to the former they perform their functions in a more accurate and reliable manner, so as not to interfere with the line and the other instruments in the same circuit, and produce the reliable printing of the messages sent over the circuit.

The simplified construction of the unison-lever produces the more accurate and reliable action of the same, so that all the instruments in one circuit are made to work in unison, while the stop device of the double-impression pad prevents any change in the position of the same when the printing-lever is at rest and holds the impression-pad in proper relative position to the type-wheels.

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

1. In a printing-telegraph instrument, the combination, with two escapement-magnets arranged in multiple arc, of a printing-magnet arranged in series with reference to the former, substantially as set forth.

2. In a printing-telegraph instrument, the combination of two electro-magnets located vertically one above the other, a permanent horseshoe-magnet located in front of the electro-magnets, an escapement-lever pivoted to the poles of said permanent magnet and provided with soft-iron tongues extending be-

tween the poles of the electro-magnets, an escapement-wheel engaged by said lever, and means for actuating said escapement-wheel, substantially as set forth.

3. In a printing-telegraph instrument, the combination, with the escapement-wheel and its arbor having a stop-arm, of a printing-magnet and a unison mechanism operated by the armature of the printing-magnet and composed of two levers, one pivoted to the casing of the instrument and the other fulcrumed to the pivoted lever, a spur-wheel on one of the arbors of the actuating mechanism of the escapement-wheel, a device by which the fulcrumed lever is connected with said spur-wheel, and stop-pins for said fulcrumed lever, substantially as set forth.

4. In a printing-telegraph instrument, the combination of the escapement-magnets, an escapement-lever operated by the same, an escapement-wheel having a radial stop-arm, means for actuating said escapement-wheel, a printing-magnet, an armature actuated by the same, a unison mechanism operated by the armature of the printing-lever and composed of a lever pivoted to the casing of the instrument, a second lever fulcrumed to the first lever, and a resilient arm attached to the fulcrumed lever, a spur-wheel on one of the arbors of the motion-transmitting mechanism of the escapement-wheel, stop-pins between which one end of the fulcrumed levers is oscillated, and a stop-pin by which the opposite end of the same is arrested, substantially as set forth.

5. In a printing-telegraph instrument, the combination of a printing-lever having a double-impression pad with alternating teeth, with an adjustable stop-pin that projects into the space or depression between two adjoining teeth of the double pad, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

ALOYS WIRSCHING.

Witnesses:

PAUL GOEPEL,  
SIDNEY MANN.