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J. F. LOUGHLIN.

ELECTRIC STATION INDICATOR.

No. 267,437. Patented Nov. 14, 1882.

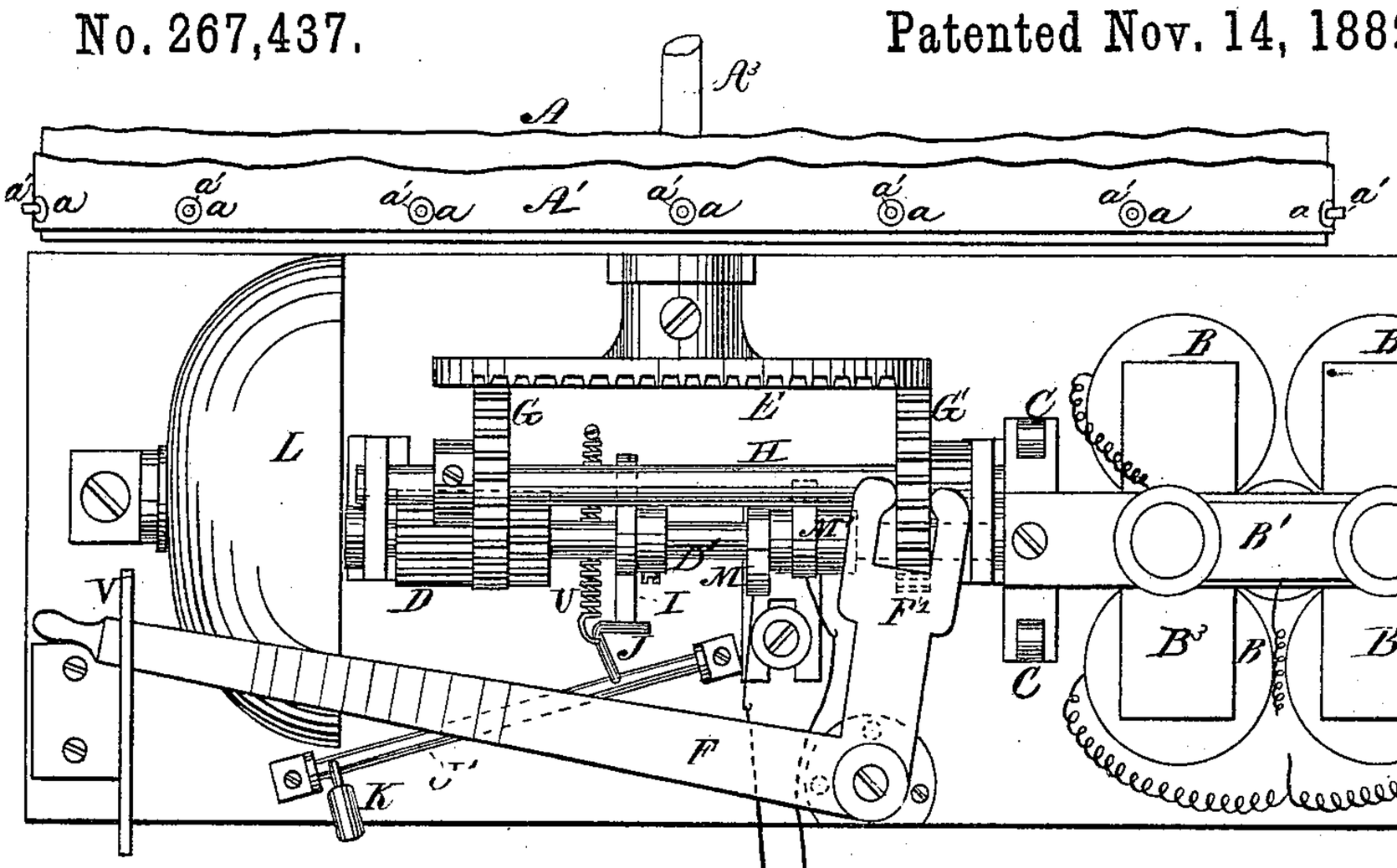


Fig. 1

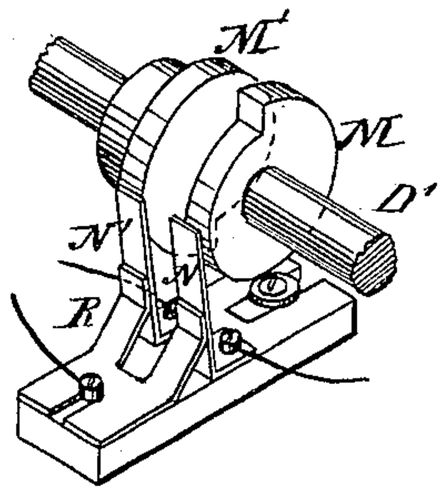
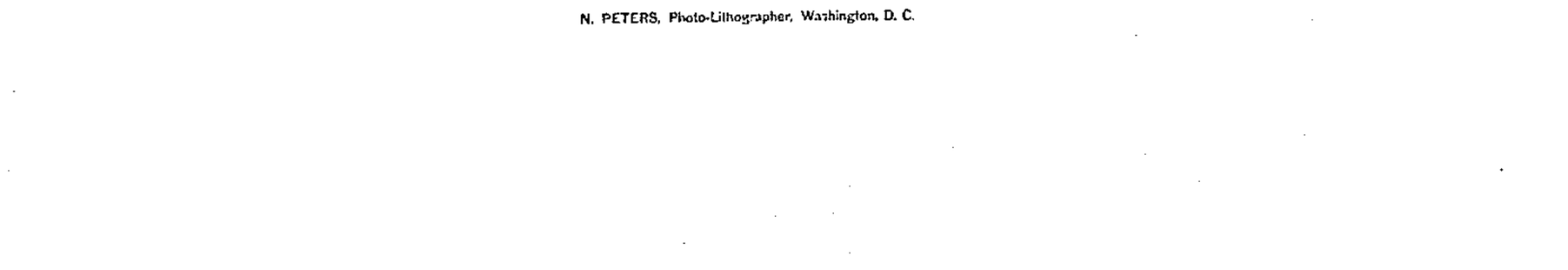


Fig. 3

Fig. 4



WITNESSES,

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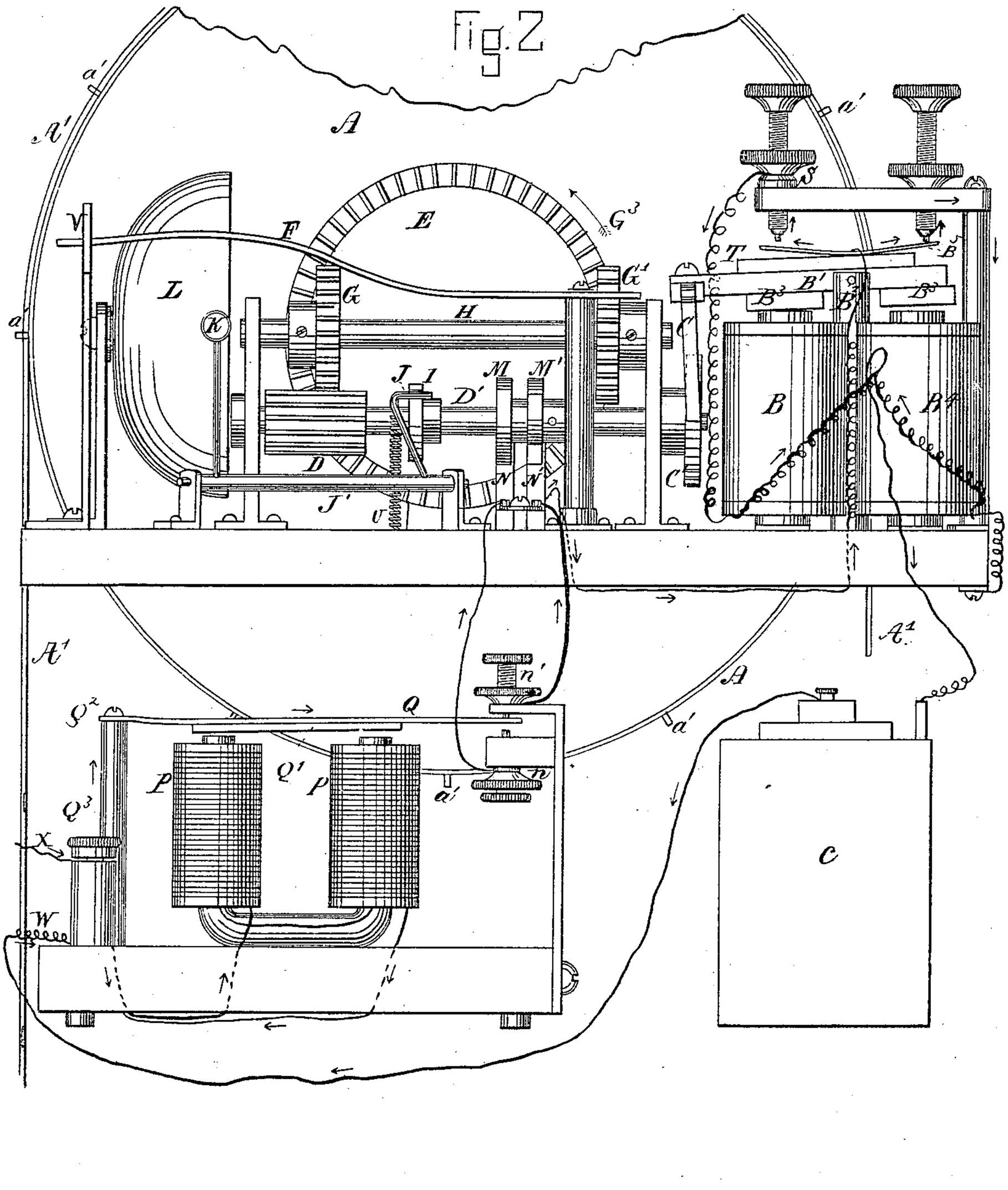
Fig. 2



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(No Model.)

4 Sheets—Sheet 3.

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ELECTRIC STATION INDICATOR.

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Fig 5

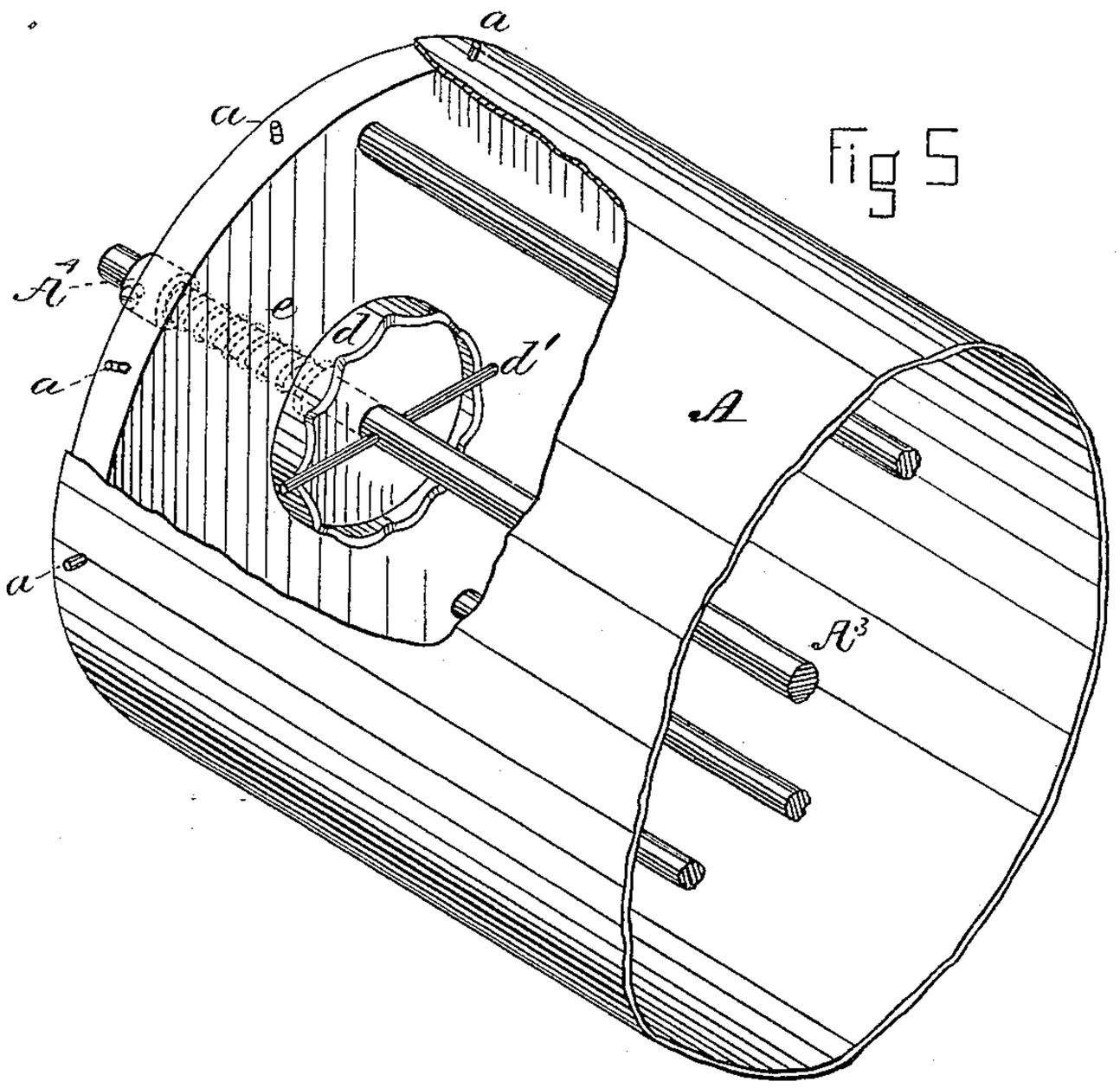
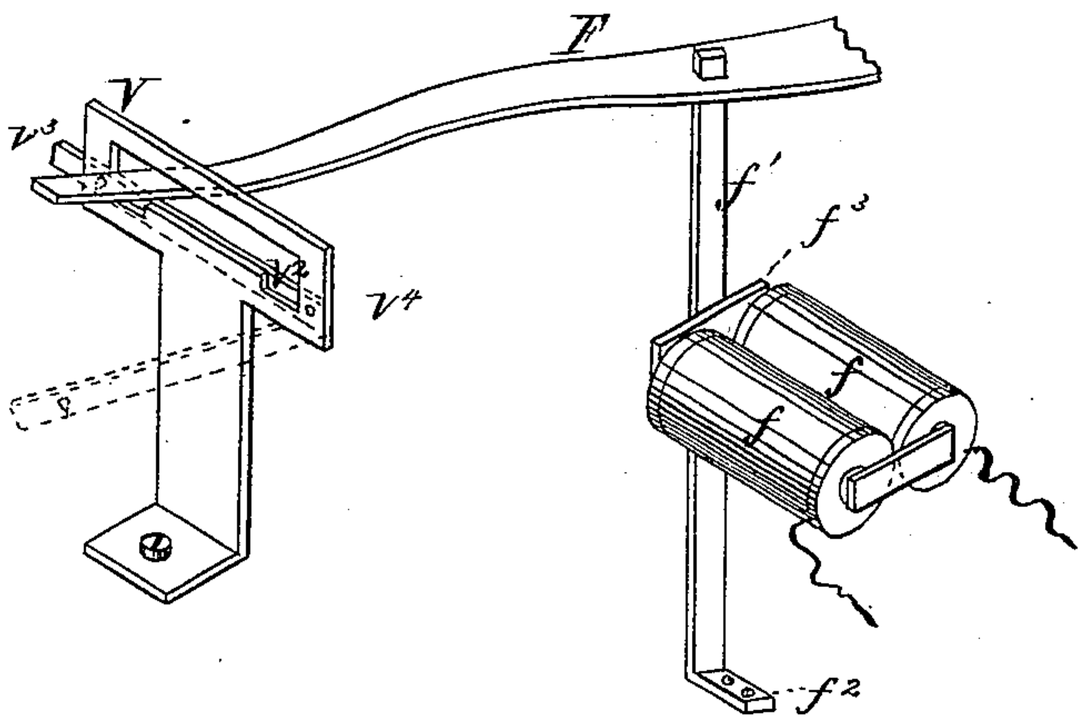


Fig 6



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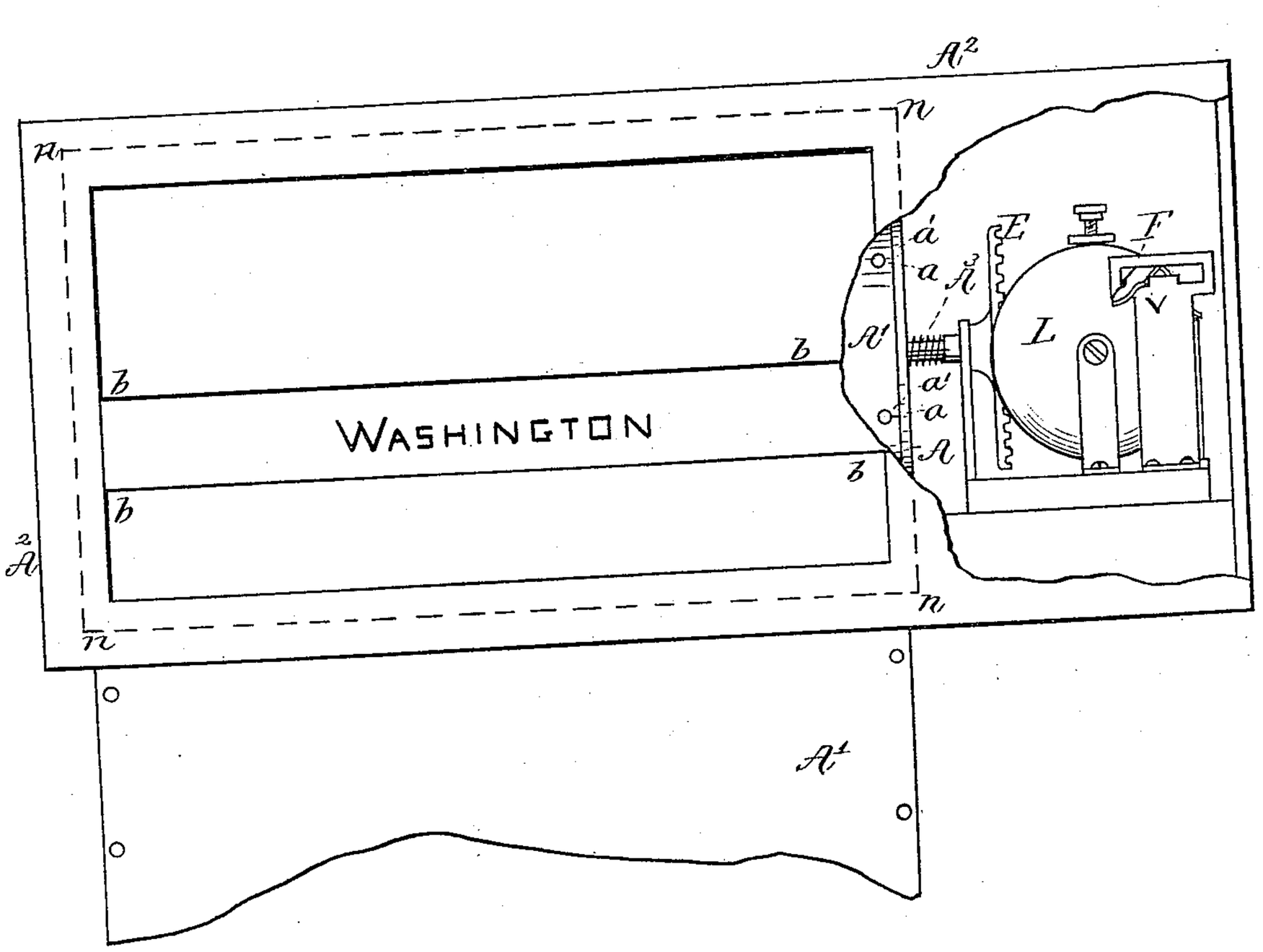

Fig. 7

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UNITED STATES PATENT OFFICE.

JOHN F. LOUGHLIN, OF HYDE PARK, MASSACHUSETTS.

ELECTRIC STATION-INDICATOR.

SPECIFICATION forming part of Letters Patent No. 267,437, dated November 14, 1882.

Application filed November 16, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. LOUGHLIN, of Hyde Park, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Station-Indicators, of which the following is a specification.

My invention relates to certain indicating devices to be used in railway and other carriages for the purpose of indicating the names of stations, or in public halls to indicate the order of exercises, the object being to so construct the devices that a number of them may be operated by one person, and that they will all indicate alike. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan of the invention. Fig. 2 is an elevation of the same. Fig. 3 is a detail in perspective to illustrate an electric-switch device. Fig. 4 is a diagram to illustrate the method of applying my device to a train of cars. Figs. 5 and 6 are details in perspective. Fig. 7 shows the inclosing case, a part being broken away, also showing a part of the annunciator-cylinder and its endless belt.

In Fig. 7 I have shown a general view of my invention, in which a part of the outer case, A^2 A^2, is represented as broken out to show a part of the operating mechanism and its connection with the moving show-belt or apron A′, that is operated by the revolving cylinder A, said cylinder being indicated by dotted lines *n n n n*, Fig. 7; also shown in end elevation at A, Fig. 2, and in perspective in Fig. 5. The large revolving cylinder A is hung on a shaft, A^3, Figs. 1, 5, and 7, and has at either end projecting pins *a a a a*, which engage with corresponding eyelets, *a′ a′ a′ a′*, made in the show-belt A′, (see Figs. 1, 2, and 7,) so that any movement of the cylinder A will cause a movement of the show-belt A′. Upon the show-belt A′, I place a number of names to indicate in the cars the station at which the train has arrived or at which it will next arrive, the indicating-name being so located in relation to the other parts of the device that it will show through the opening *b b b b* in the case A^2 A^2, Fig. 7, and thus inform the passenger as to his location.

In case the device is used for other purposes than train-indicators the legends placed upon the show-belt A′ will be varied accordingly.

The shaft A^3, which transmits motion to the cylinder A, and through it to the show-belt A′, has at one end a face-gear wheel, E, Figs. 1, 2, and 7, which is so located in relation to the sliding spur-gears G G′, Figs. 1 and 2, that it may be driven by one or the other of them, as determined by the position of the switch-lever F. The sliding gears G G′ are attached to a longitudinally-movable shaft, H, Figs. 1 and 2, the longitudinal movement of which gives what I have termed the "sliding movement" to the spur-gears G G′, the sliding movement being determined by the switch-lever F, Figs. 1 and 2, which is bent, as shown in Fig. 1, and terminates in a fork at F′, which engages with the spur-gear G′, so that any movement of this lever F F′ will cause a corresponding movement of the gear G′, shaft H, and gear G. Thus when the lever F F′ is in the position shown in Fig. 1, then the gear G′ engages with the wheel E, Fig. 1, and causes it to move in one direction; but if the lever F F′ was thrown to its other position, then the spur-gear G would gage with the wheel E and cause it to revolve in another direction.

On the shaft D′, Figs. 1 and 2, I place a long pinion, D, which engages with the spur-gear G, the pinion D being made long, as shown, so that although the spur-gear G slides it will not become disengaged.

The shaft D′, which transmits motion to the other described parts, receives its motion from a ratchet-gear, C′, Fig. 2, attached to it, which is driven by pawls C C, Figs. 1 and 2, the pawls C C being pivoted at their upper ends to the arm B′, which oscillates on the pivots B^2, Fig. 2, and has attached to it two armatures, B^3 B^3, which are alternately operated upon by the electro-magnets B B B^4 B^4, the exciting current being changed from one set, B B, of magnets to the other set, B^4 B^4, by the automatic commutator B^5.

The automatic commutator B^5, Fig. 2, consists of a thin metallic spring fastened at its center to the arm B′, but insulated from it by an interposed non-conductor block. (See Fig. 2.) This metallic spring is bent up at each end, as shown, so that at each oscillation of the said arm it (the metallic spring) will alternately close the circuit of the coil. This controls the magnets B B and opens the one that controls the magnets B^4 B^4.

Upon the shaft D′, I affix a two-notched cam,

I, which, acting through the lever J, rocker-shaft J′, and hammer K, the spring U acting as a retractor, will sound the bell L, so as to announce the change of the indicating sign or legend on the show-belt. This enunciating takes place twice at each turn of the shaft D, a semi-revolution of which causes the large cylinder to turn sufficiently to cause the show-belt A′ to present a new name at the opening *b b b b* in the case A^2 A^2, Fig. 7.

The switch device for transmitting the electric current is shown at M M′, Figs. 1 and 2, and in detail at Fig. 3. This device consists of a pair of cams, M M′, made of non-conducting material, in the shape shown in Fig. 3, so arranged in relation to each other and in connection with the spring-conductors N N′ that at all times one of the cams M M′ is pressing its spring-conductor N or N′, as the case may be, against the broad conductor R, which is made so wide as to embrace both of the conductors N and N′, so that as the shaft D′ revolves the cams M M′ will, from their shape, alternately hold each of the conductors N N′ in contact with the conductor R, and, vice versa, alternately release each; or, in other words, the circuits throughout N R and N′ R will be alternately closed and opened by the action of the electro-magnets B B B^4 B^4.

As a supplement to the switch device just described, I attach the device shown in the lower part of Figs. 1 and 2, in which Q is a conducting-plate, having upon its under side an armature, Q′, placed within the influence of the electro-magnets P P. The conductor-plate Q is connected at its fixed end Q^2, by a post, Q^3, and a wire, W, to the battery *c*. The free end of Q is so placed between two conducting-points, *n n′*, that when the magnet P P is excited then the free end of Q will come in contact with conductor *n*, and through it and a wire to spring-conductor N; but when the magnet P P is not excited the conductor Q will connect *n′* and N′.

For convenience in adjusting the show-belt A′ so as to indicate the proper station, I connect the cylinder A to its shaft A^3 by the following device, (see Fig. 5, in which *d* represents a crown-wheel, notched as shown, which is made fast to the inside of the end of the cylinder A and is loose on the shaft A^3:) *d′* is a cross pin or bar, which passes through the shaft A^3, the ends of the cross-pin *d′* resting against the cylindrical edge of the crown-wheel *d*. *e* is a spring which surrounds the shaft A^3, one end of which acts against a collar, A^4, affixed to the shaft A^3, while its other end reacts against the outside of the end of the cylinder, thus causing the pin *d′* to press hard against the edge of the crown-wheel *d*. This device allows of adjustment of the cylinder A on the shaft A^3. In other words, when desirable, the cylinder A can be turned without turning its shaft A^3 on the connecting-wheels, and yet the connection between the shaft A^3 and the cylinder A is sufficiently firm to cause the cylinder A to do its work of moving the show-belt A′.

In Fig. 6 I have shown a device by which the reversing-lever F may be operated by electric currents, in which *f f* represent an electric magnet, the armature f^3 of which is attached to a spring-plate, f^2 *f′*, which also acts as a retractor for throwing the armature f^3 back when the magnet *f f* is not excited. When this device is to be used the plate V^3 V^2, Fig. 6, is to be raised up, as indicated by full lines, so that the notches in the guide V will not interfere with the free movement of the lever F when the same is acted upon either by the magnet *f f*, or, when the magnet is not excited, by the retractor f^2 *f′*. The notches shown at the lower corners of the slot in the guide-plate V are for the purpose of holding the lever F in the position desired. The dotted lines in Fig. 6 indicate the position of the plate V^3 V^2 when let down so as not to interfere with the movement of the lever F. There will be one of these devices at each annunciator; but they may be all operated by one battery and by one switch, which may be called the "reversing" switch.

It should be understood that each machine—of which Fig. 4 shows two in each car, one at each end—has its own separate battery—equivalent to about two cups Leclanché—placed under the floor or nearest seat of the car, or within the case, as may be found most convenient, and the current from this is simply directed to N or N′ by the "controlling-current" acting through P; also, that at each change of the "controlling-switch" and consequent operation of each machine by its proper current the bell is struck and the name next in order on the curtain or cylinder appears, and when one or more stations are passed or stops omitted it is only necessary to change the controlling-switch a corresponding number of times, allowing only such time between the changes as experience shall have shown requisite for full assurance that the change has taken place throughout the train, and this will be found to be about three seconds.

The whole invention is used on railway-trains in the following manner: Before leaving the terminus the indicator is made to show the name of the first stopping-place for the trip. This may be done by opening the case, adjusting the switch at the proper niche, and moving the cylinder and show-belt A′ till the required name appears in the slot, and closing the case for the trip. On leaving this first stopping-place the engineer, fireman, or any train-hand moves the switch at the controlling-battery *b*, Fig. 4, when all the controlling-magnets throughout the train successively attract their armature, and thereby bring into circuit with the spring N the conductor Q, conducting the operating-currents through to the operating-magnets B B B^4 B^4, keeping the machine in motion till the cam M releases the spring N from contact with the spring R, and thus breaks the current, when all action ceases until the switch at *b* is made to release the controlling-armature *y y y*, Fig. 4, and conductors

making circuit with N′, which has been during the preceding action forced into contact with R, when the operating-current acts as before.

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

1. In an electric-annunciator device, the combination of the pawls C C and their operating-armature B^3 B^3 and magnets B B B^4 B^4 with the ratchet-wheel C′, shaft D′, pinion D, sliding gear G G′ face-gear driving-wheel E, cylinder A, and show-belt A′, all operating together substantially as described, and for the purpose set forth.

2. In an electric-annunciator device, the combination of the lever F F′ and the sliding gears G G′ with the face-gear E, operating substantially as described, and for the purpose set forth.

3. In an electric annunciator, the combination of commutator M M′ N N′ R with the conductor *n n′* conductor Q, armature Q′, and magnet P P, all operating together substantially as described, and for the purpose set forth.

4. In an electric annunciator, the combination of the notched guide-plate V, having a movable plate, V^2 V^3, and the lever F F′, with the vibrator-plate *f′*, armature f^3, and electromagnets *f f*, all operating together substantially as described, and for the purpose set forth.

JOHN F. LOUGHLIN. [L. S.]

In presence of—
JOHN J. MCCLUSKEY,
WM. S. PELLETIER.