

No. 854,926.

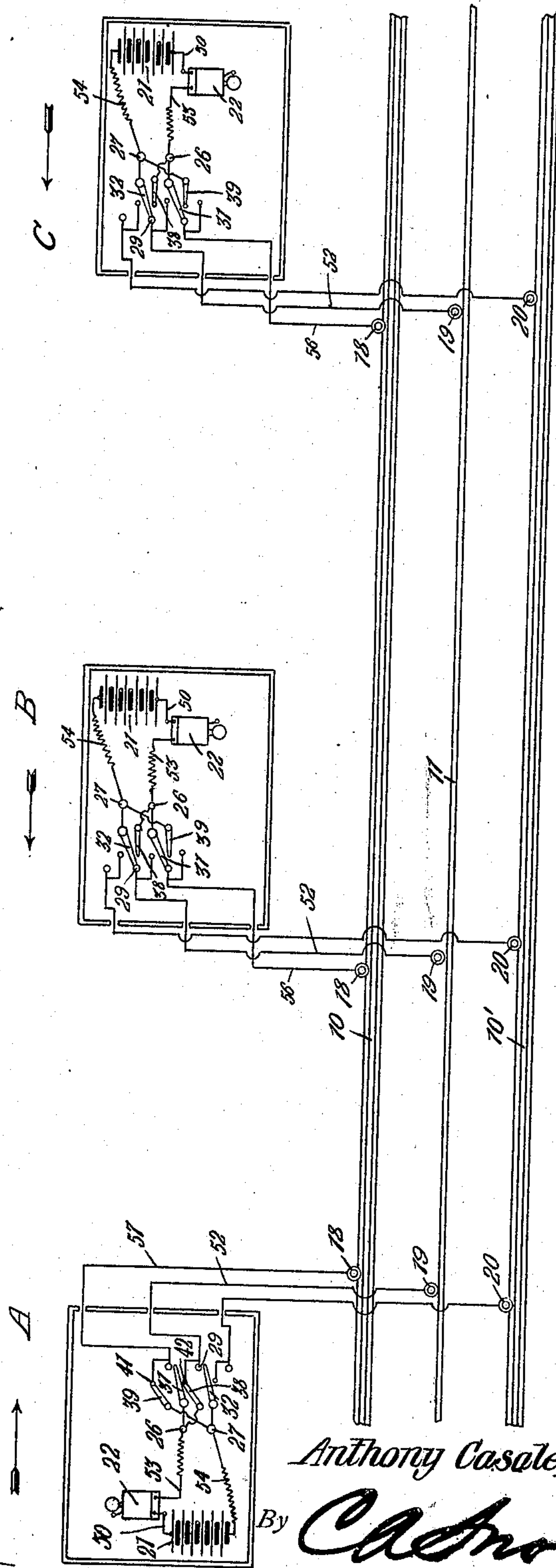
PATENTED MAY 28, 1907.

A. CASALE.
ELECTRIC RAILWAY SIGNALING SYSTEM.

APPLICATION FILED JUNE 23, 1906.

3 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

E. H. Stewart
J. W. Porter

Anthony Casale, INVENTOR.

By

C. H. Snow & Co.

ATTORNEYS

No. 854,926.

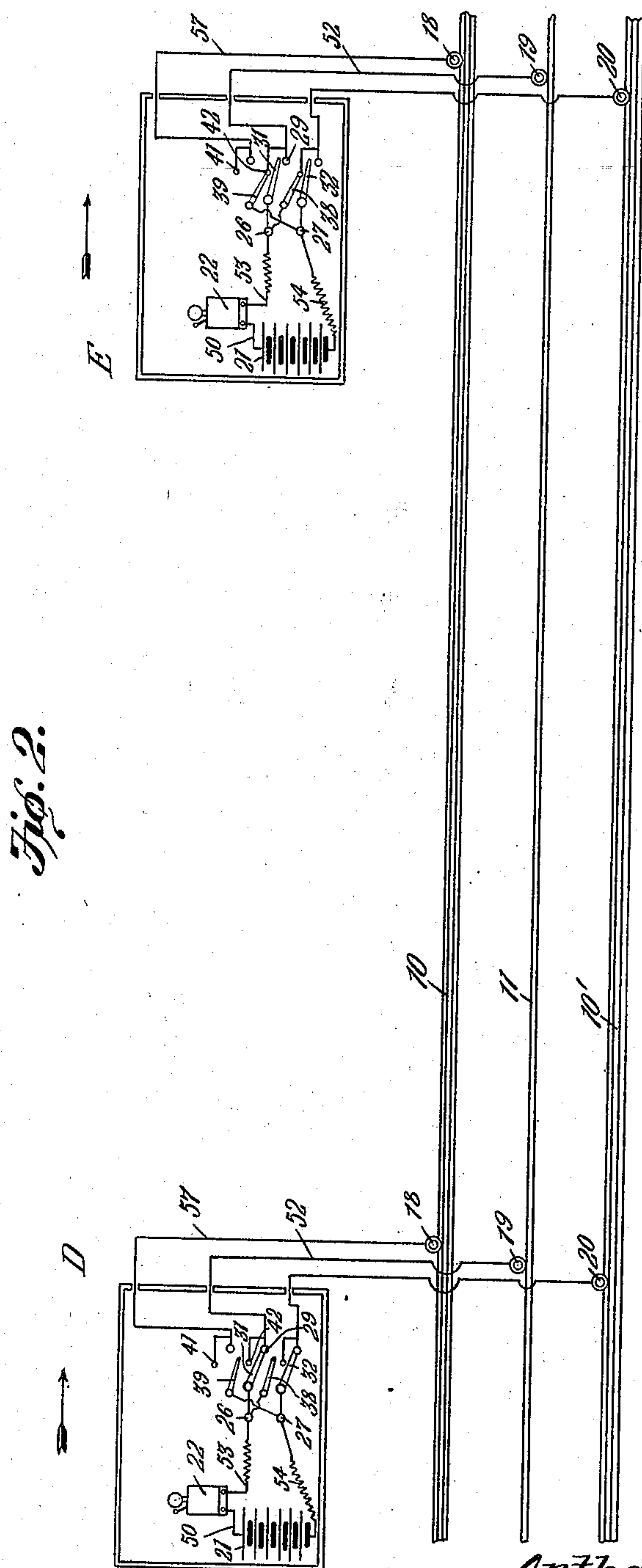
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3 SHEETS--SHEET 2,



WITNESSES:

E. Stewart
Jno C Parker

Anthony Casale,
INVENTOR,

By *Cashmore*
ATTORNEYS

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3 SHEETS—SHEET 3.

Fig. 3.

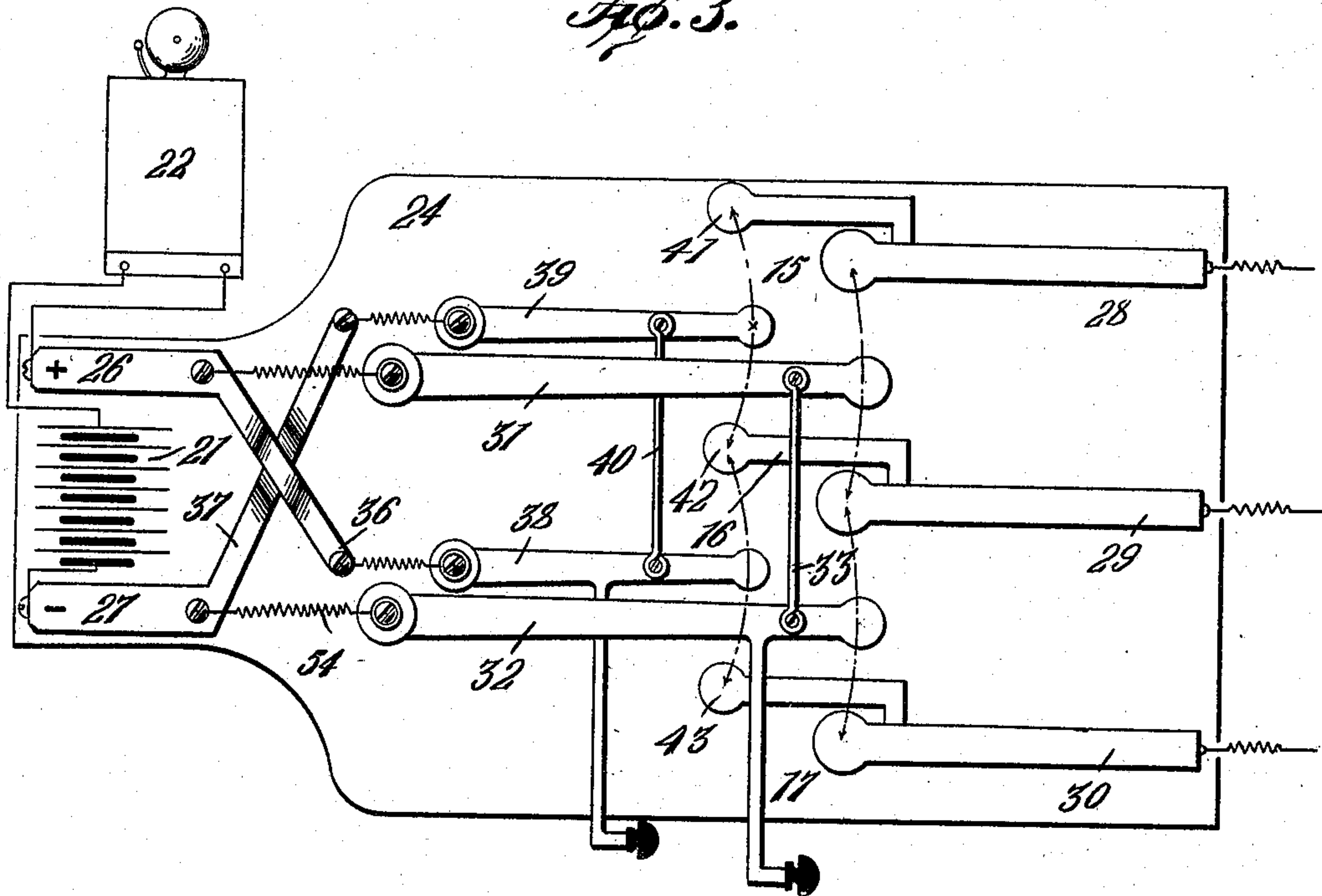
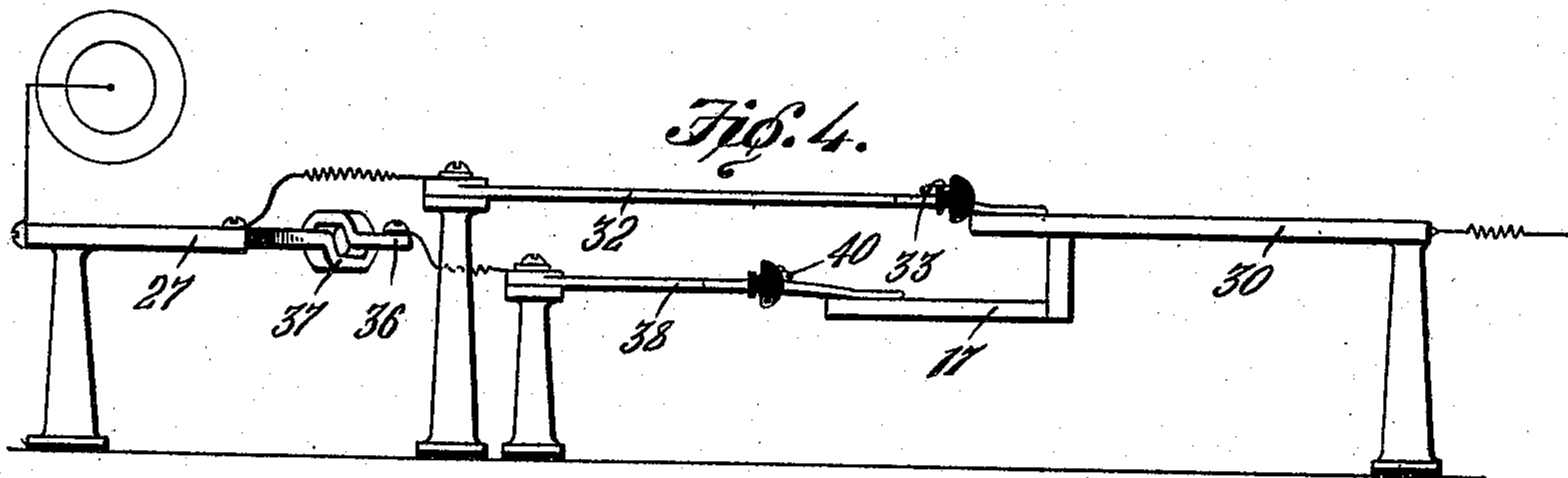


Fig. 4.



WITNESSES:

E. J. Stewart
John E. Porter

Anthony Casale,

INVENTOR,

By

C. A. Snow & Co.

ATTORNEYS

UNITED STATES PATENT OFFICE.

ANTONIO CASALE, OF SCRANTON, PENNSYLVANIA.

ELECTRIC RAILWAY SIGNALING SYSTEM.

No. 854,926.

Specification of Letters Patent.

Patented May 28, 1907.

Application filed June 23, 1906. Serial No. 323,097.

To all whom it may concern:

Be it known that I, ANTONIO CASALE, a citizen of the United States, residing at Scranton, in the county of Lackawanna and State of Pennsylvania, have invented a new and useful Electric Railway Signaling System, of which the following is a specification.

This invention relates to a system and apparatus for controlling railway traffic.

The principal object of the invention is to provide means whereby on the approach of two trains within a danger limit, a warning signal will be sounded in the cab of both trains, or any suitable mechanism will be operated for the purpose of throttling the steam, reversing the engine, or applying the brakes.

A further object of the invention is to provide a simple means whereby the polarity of the lines may be changed in order that communication may be established with trains traveling in opposite directions and in the same direction.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts, hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings:—Figure 1 is a general diagram of a railway signaling system constructed and arranged in accordance with the invention. Fig. 2 is a similar view, showing the positions of the pole changing switches on two trains traveling in the same direction. Fig. 3 is a plan view of the pole changing switch. Fig. 4 is a side elevation of the same.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

In carrying out the invention, the traffic rails 10, 10' are bonded in order to form continuous conductors, and at crossings, frogs, and like places, the bonding wires are preferably arranged to extend underground. Between the traffic rails, or at one side thereof is arranged a continuous conductor 11 which may be mounted on suitable supports 12, so as to maintain a level approximately the

same as the treads of the traffic rails. This continuous conductor is, also, carried underground at railway crossings, frogs and other obstructions.

To the locomotive, or to one of the cars of the train is secured three depending contact rollers or brushes, these contacts 18, 19 and 20 being insulated from each other and traveling on the traffic rails, and on the continuous conductor. Each train, also, carries a source of energy such, for instance, as a battery 21, and a safety device 22, which, in the present instance, is shown in the form of an ordinary electric alarm bell, although it may be in the nature of a visual signal, or means may be employed in place of, or in connection with the bell for operating the throttle lever, the reversing lever, or applying the brakes.

On the cab of each locomotive is a switch board 24, having two binding posts 26 and 27 which are connected, respectively, to the positive and negative poles of the battery. The switchboard also carries binding posts 28, 29 and 30, which are electrically connected to the traveling contacts 18, 19 and 20, respectively.

Connected to the binding posts 26 and 27 are two pivotally mounted switch blades 31 and 32 which are connected to each other by a suitable cross bar 33 formed of insulating material, and these switch blades are simultaneously moved, so that the positive pole of the battery may be connected to the binding post or contact 28 or 29, while the negative pole of the battery may be connected to the binding post or contact 29 or 30. Under normal conditions, the blades 31 and 32 are held in engagement with the contacts 28 and 29, respectively, this being the position in which the batteries and bells of trains approaching each other will be connected in series, and when said trains approach within a danger limit, and the resistance of the traffic rails and continuous conductor are reduced to a sufficient extent, the safety devices of the trains will be operated.

Leading from the binding posts 26 and 27, respectively, are metallic strips 36 and 37, which are insulated from each other, and to these are connected pivoted switch blades 38 and 39, respectively, these blades being connected to each other by a cross bar or link 40. The free ends of the blades are movable into engagement with contacts 41, 42 and 43, respectively, these contacts being electrically

connected to the binding posts 28, 29 and 30, respectively. The blades 38 and 39 are moved to one position for placing the contact 28 in electrical connection with the negative pole of the battery, and contact 29 in communication with the positive pole thereof, or when in the other position, the negative pole of the battery may be connected to the contact 29, and the positive pole to the contact 30, it being possible by the aid of this pole changing mechanism to connect any one of the road bed conductors, *i. e.*, the traffic rail and the central conductor, with either the positive or the negative pole, and another one of said road bed conductors with the opposite pole.

When the parts are in the position illustrated in Fig. 1, the three trains A, B and C are in communication with each other. Starting from the positive pole of the battery 21 of train A, the circuit may be traced through wire 50 to the safety device 22, binding post 26, switch blade 38, contact 42, wire 52, traveling contact 19, continuous conductor 11 to both trains B and C where the current flows up through the wire 52 of each train to binding post 29, switch-blade 32, binding post 27, wire 54 to the negative pole of the train battery, thence by wire 50, safety device 22, wire 53, binding posts 26, switch blade 31, wire 56, traffic rail 10, back to train A, traveling contact 18 of train A, wire 57, binding post 41, switch blade 39, binding post 27, wire 54 to the negative pole of the battery of train A, so that the safety device of each train will be actuated if the three trains approach within a danger limit.

The two trains A and B which are traveling toward each other have their batteries connected in series, while the batteries of trains B and C are in opposition, and under these conditions the safety device of train C will not be operated unless it followed train B so closely as to also approach within a predetermined distance of the train A.

To provide for the operation of safety devices of trains traveling in the same direction, the pole changing switch may be adjusted in the manner shown in Fig. 2, where the two trains D and E are placed in com-

munication, the circuit being readily traced from the positive pole of the battery of train D through the safety device and switch to the continuous conductor 11, thence to train E through the switch to the negative pole of the battery of train E, the safety device of the latter, and through the switch of train E to the traffic rail 10', thence to train D and through the switch of the latter to the negative pole of the battery, thus connecting the batteries and safety devices of both trains in series. In some cases two conductors, instead of the three conductors, may be employed and the apparatus may be used to establish telephonic or telegraphic communication between trains, or between the trains and the stations along the line.

I claim:—

In a system of the class described, three continuous road bed conductors arranged in parallel relation, three traveling contacts carried by each train and engaging the respective conductors, switch points to which the three contacts are electrically connected on each train, the switch points each having a laterally extended portion, a source of electrical energy, and an alarm on each train, and a pair of double throw pole reversing switches, each having one end connected to the terminals of the source of energy, the switches being movable independently of each other, one to engage any two of the switch points, and the other to engage any two of the laterally extended portions of such switch points, whereby either pole of the source of energy may be electrically connected to any one of the road bed conductors, and the other pole connected to any of the other road bed conductors, thereby permitting the closing of circuits between a train running ahead, running backward, or standing, with other trains moving in either direction.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ANTONIO CASALE.

Witnesses:

CHAS. JORDAN,
T. A. DONAHOE.