

No. 693,520.

Patented Feb. 18, 1902.

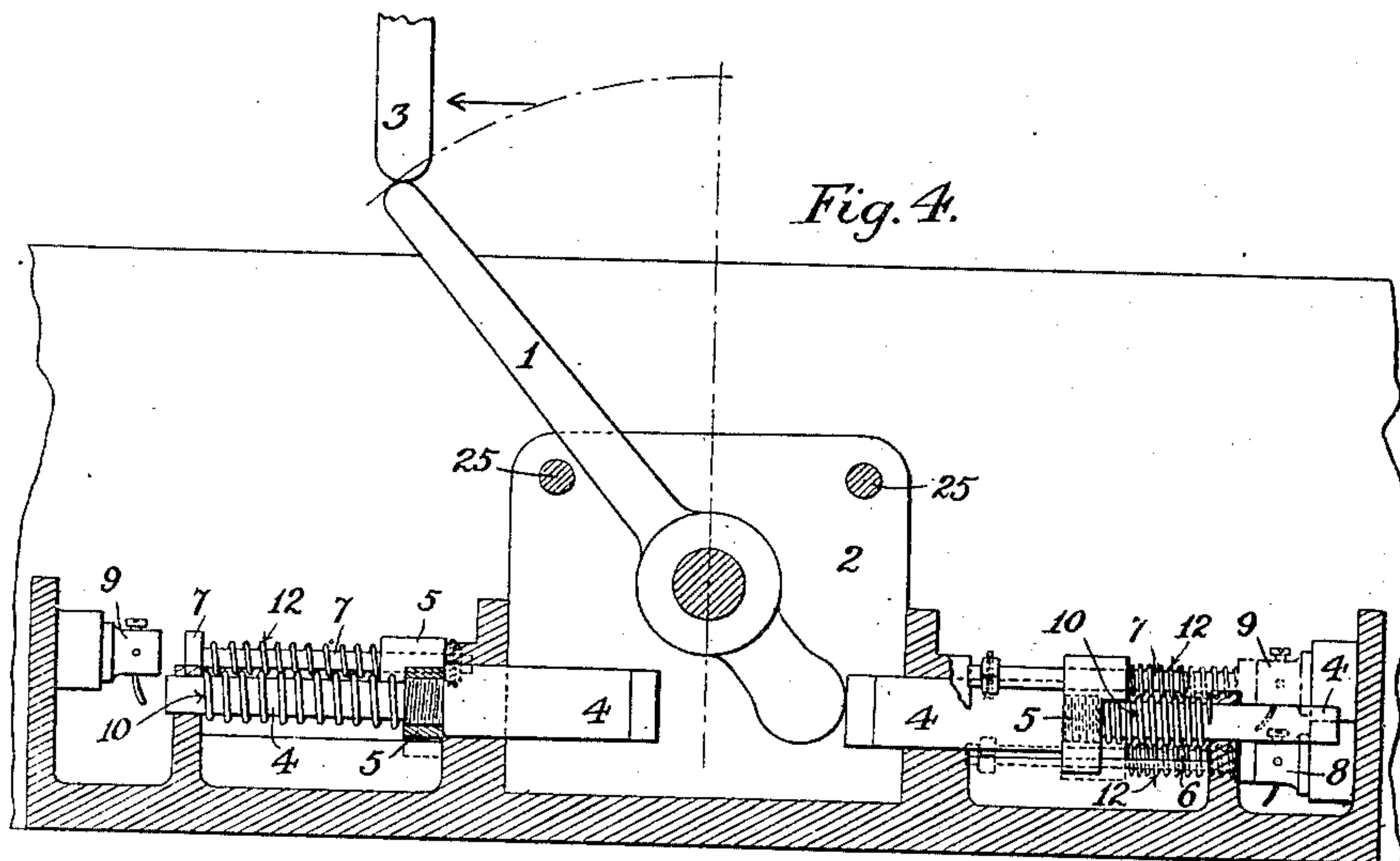
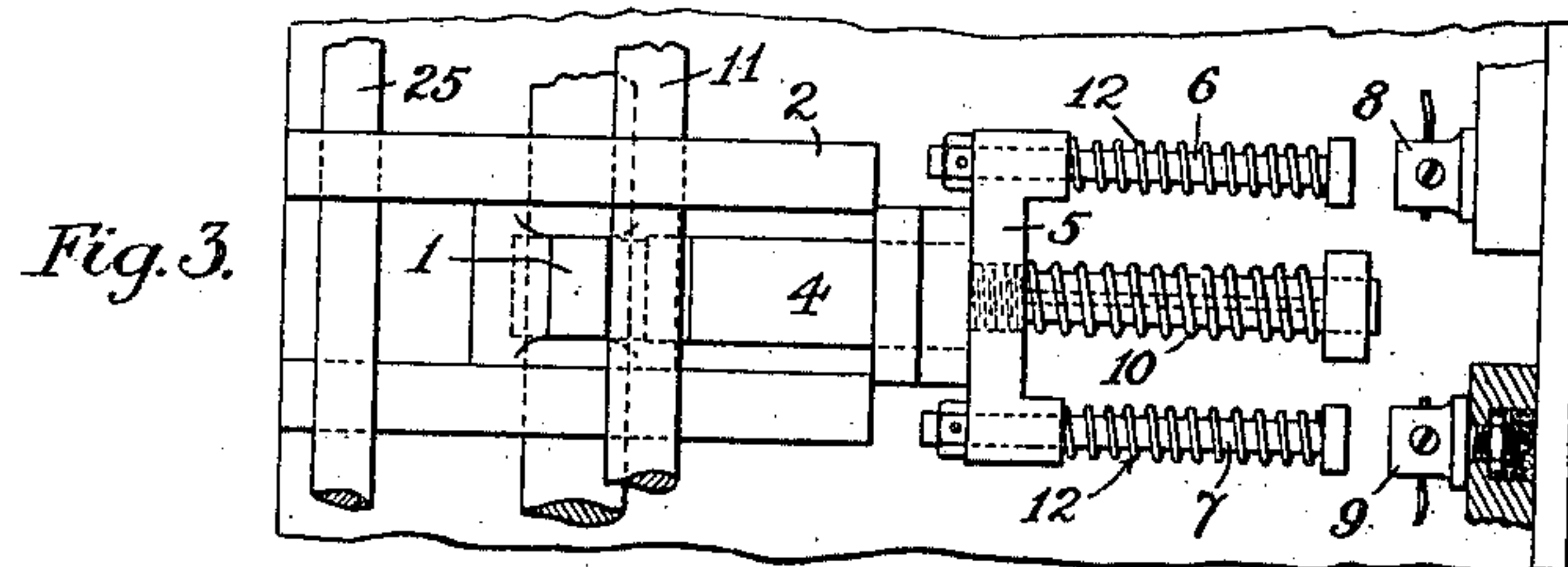
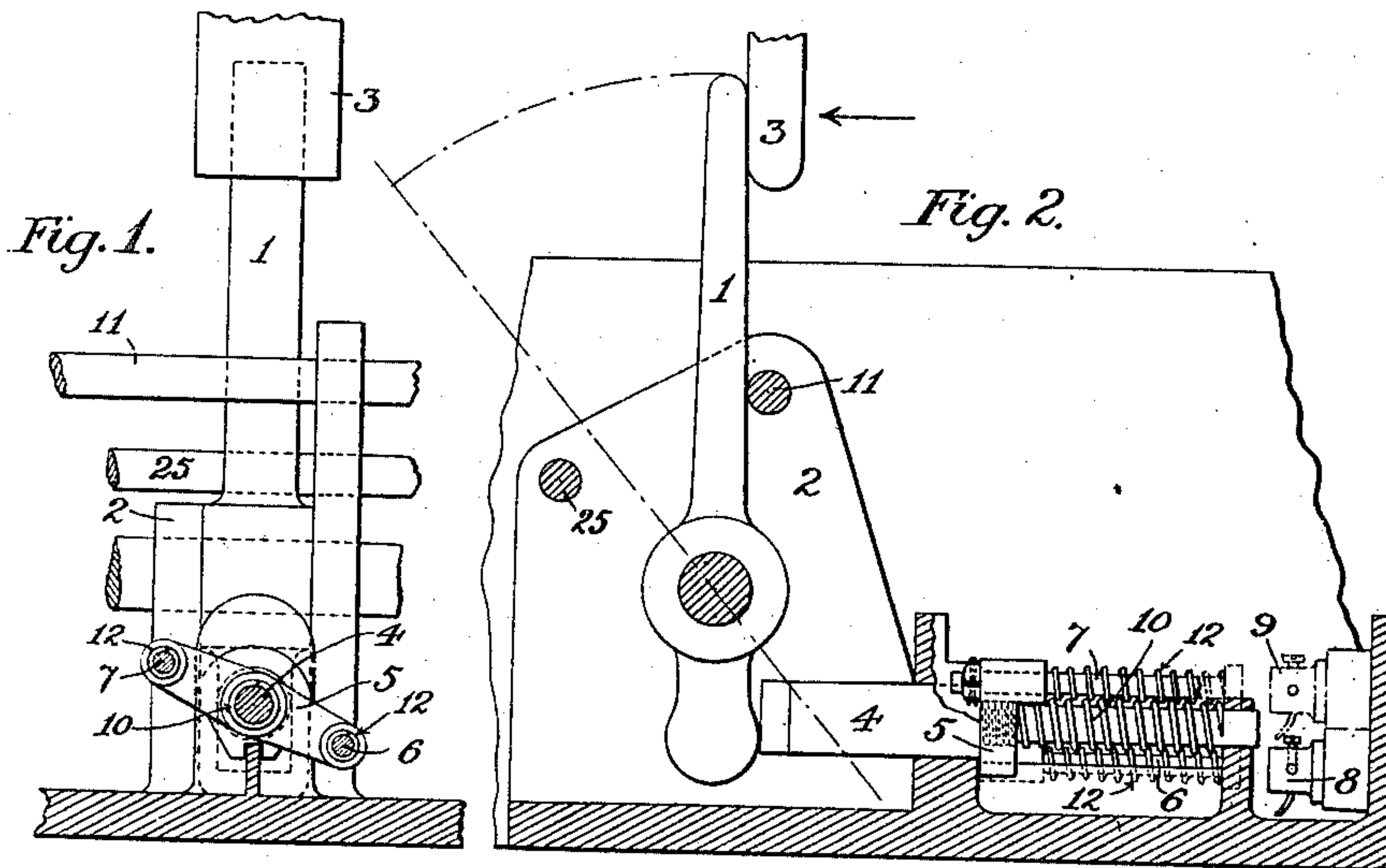
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RAILWAY ELECTRIC SIGNALING APPARATUS.

(Application filed May 28, 1901.)

(No Model.)

2 Sheets—Sheet 1.



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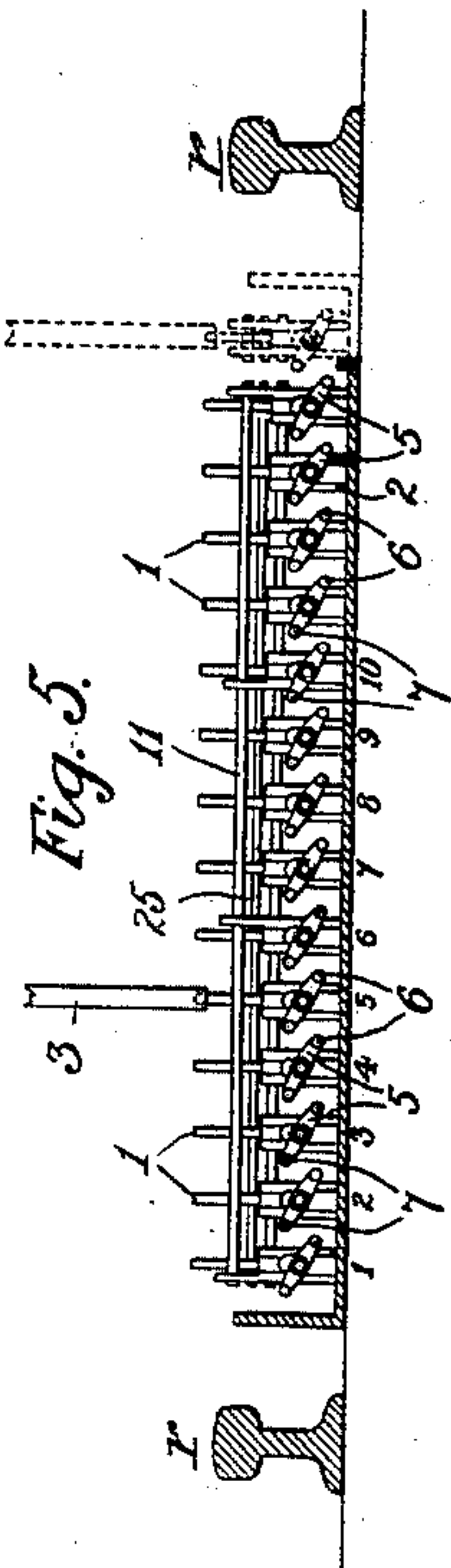


Fig. 5.

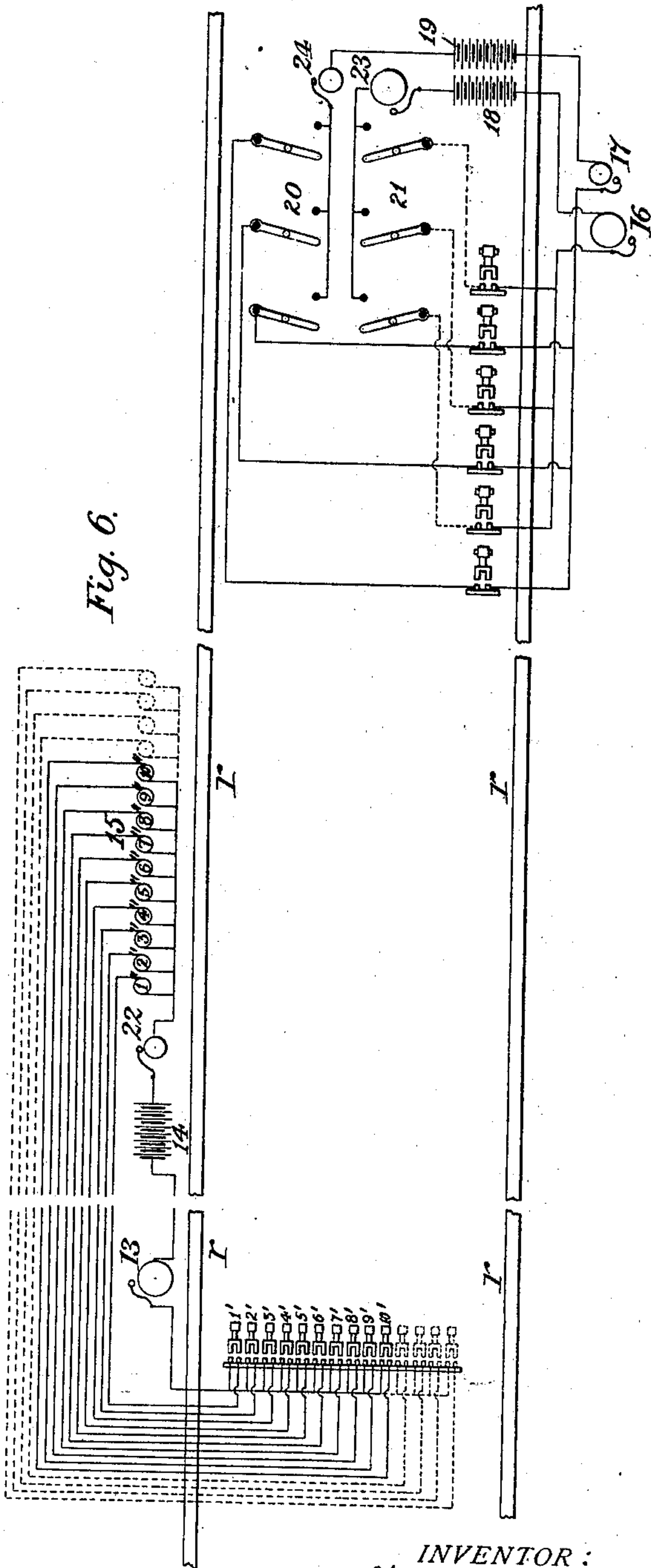


Fig. 6.

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UNITED STATES PATENT OFFICE.

WASHINGTON HUME, OF LONDON, ENGLAND.

RAILWAY ELECTRIC SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 693,520, dated February 18, 1902.

Application filed May 28, 1901. Serial No. 62,276. (No model.)

To all whom it may concern:

Be it known that I, WASHINGTON HUME, a subject of the King of Great Britain, residing at Dashwood House, 9 New Broad street, London, in the county of Middlesex, England, have invented new and useful Improvements in Railway Electric Signaling Apparatus, (for which I have made applications for patents in Great Britain, No. 4,098, dated February 26, 1901; in France, dated March 5, 1901; in Belgium, dated March 5, 1901, and in Germany, dated March 5, 1901,) of which the following is a specification.

This invention relates to improvements in the system of railway electric signaling apparatus of the kind described in the specifications of my prior United States patents, No. 637,337, dated November 21, 1899, and No. 668,819, dated February 26, 1901, which enabled a train passing over any section of line of railway to automatically notify the signalman ahead of the fact and to inform him of the particular train which was so passing, and, further, permitted such signalman to then communicate with the driver of the train, so as to instruct him what his movements were to be. The means employed for this purpose in such prior specifications consisted, broadly, of a contact brush or brushes carried on the train in such a position as to come in contact each with a given one of a series of pairs of electric bar-terminals arranged on the track side by side at a given point in each section of line, so as to close a normally open electric circuit, and thus sound a bell or gong alongside the bars, and at the same time to cause one or more of the flaps of an annunciator in the signal-box to fall and a call-bell to ring, and so indicate to the signalman the particular train he had to receive and instruct, each of the pairs of terminals according to its position corresponding with a particular flap of the annunciator. The signalman then sets one or more switches, so as to connect up in any given order his ends of the electric circuits normally open at both ends and corresponding to a number of other pairs of terminals similar to those already described, but ranged on the track ahead of them and situated one in front of the other in the same line and connected with a gong or gongs alongside these bars. A second brush on the

train, and which is in the same position on all trains in passing over these latter terminals, completes the circuits in succession in those terminals in which the signal-box ends have been connected up by the switches, and a blow or a series of two or more blows is thus struck on the gong or gongs placed alongside the line close to the said terminals and by their number and order by a predetermined code indicate to the driver of the train the particular course he is required to adopt. The terminals I proposed to employ in my prior specifications consisted in a number of pairs of metal bars insulated from each other and arranged in two sets, one being connected with a signaling-gong alongside the first set and with the annunciator and the other with the gongs alongside the same and with the switches controlled by the signalman in his box.

I have found in practice that in spite of providing the bar-terminals with a cover or flap to protect the same from sun, snow, rain, or dirt such bar-terminals were liable to become short-circuited through the moisture, snow, or dirt deposited thereon, and by means of the apparatus to be hereinafter described, (consisting in a pivoted lever actuated by the train to close the circuit and other accessories,) which apparatus replaces the bar-terminals, I am able to overcome this difficulty. The manner in which I effect this object is illustrated in the accompanying drawings, in which—

Figure 1 is an end elevation; Fig. 2, a side elevation, showing the arrangement for a line upon which the trains pass in one direction only; Fig. 3, a plan view of the improved form of contact-maker and terminals which I now propose to employ as an alternative for the pairs of contact-bars described in my previous specifications. Fig. 4 is also a side elevation of such apparatus and represents the arrangement I employ when the apparatus is desired to be operated by the passage of a train in either direction, as in the case of a single line of rails, and shows on the right-hand side the parts in the position they occupy when the circuit has been closed by the passage of a train, the left-hand side showing the parts in the position they occupy when the circuit is open. Fig. 5 is a transverse section through the track, showing the position

of the first set of contact-makers in full lines and one of the second set of contact-makers which are situated at any suitable distance ahead of the former set in broken lines. Fig. 5 6 is a diagrammatic view showing the connections between the terminals, the gongs, the annunciator, and the switches. In this figure or diagram, *r r* are the rails. 1' to 10', inclusive, indicate the position between the 10 rails of the chairs and levers described below and shown in detail in Figs. 1 to 4, inclusive. 1" to 10", inclusive, indicate the annunciators in circuit with terminals with which said levers make contact on the passage of a train. 15 indicates the conductor-wires of the respective circuits. The remaining elements are described below.

Referring to the drawings, it will be seen that a pivoted lever or trigger 1 is mounted 20 on a chair 2. Referring to Figs. 5 and 6, it will be seen that in the case of the means for automatically notifying the signalman of the approach of any given train these chairs, with their levers or triggers, are secured side by 25 side between the rails of the line, there being as many thereof as it is desired to have separate or distinct indications communicated by passing trains to the signalman, from ten to fifteen by preference, while in the case of 30 the means employed to enable the signalman to give instructions to the driver what he is to do similar chairs, with their levers, are arranged one in front of the other in the same line, near to and parallel with one or 35 other of the rails, and so that the bar actuating them will escape those of the first set, which are connected with the annunciator. A convenient arrangement of the means for automatically notifying the signalman the 40 numbers of the trains consists in the employment of ten separate chairs and levers numbered from 1' to 10' consecutively and corresponding to similar numbers 1" to 10" on the flaps of the annunciator, such chairs and levers 45 being spaced equally apart and corresponding to ten different trains and then to fit the succeeding ten trains after the first ten with means for acting upon the first and following levers again in succession, and so on 50 for each ten trains, so as to avoid as far as possible any confusion to the signalman in the case of any derangement of the service. In addition to these ten levers or triggers, which are for the special purpose of signaling 55 the train-numbers, additional ones may be provided to supplement these, so as to allow of the indication of special trains, trains which may be behind time, or trains coming from other lines and joining the one on which 60 the triggers are set, four such additional levers or triggers being shown in the drawings to the right of those numbered from 1' to 10', above referred to, and their circuits in the diagrammatic plan view, Fig. 6, being indicated in dotted lines. The buffer-beam or 65 other part of either the engine or last vehicle on each train, the latter by preference,

would be provided with means for fixing the bar or bars 3 in any of the positions at will corresponding to the various sets of triggers 70 and contacts. The trains numbered 1, 11, 21, 31, and so on, would make contact with trigger No. 1 and trains 2, 12, 22, 32, 42, &c., with bar No. 2, and so on consecutively with the other numbers up to the tenth trigger, while 75 a separate bar would be used to act upon any of the other triggers for special purposes.

The upper end of each of the levers or triggers 1 projects upward, so that a bar or projection 3, mounted upon each train in a given 80 position corresponding to the respective number, will upon the passage of such train come in contact with and depress a given one of such levers. Opposite the lower end of each lever or trigger a bar or rod 4 is mounted, so 85 that it can slide in bearings at right angles thereto. This bar or rod 4 carries a cross-head or traverse 5, provided at its opposite ends with smaller rods 6 and 7, the free ends of which form contact-blocks and each ar- 90 ranged opposite one of the terminals 8 9 of the circuit which the operation of the given lever is desired to close. The main rod 4 is acted upon by a spring 10, tending to force 95 its outer end against the lower end of the lever or trigger 1 and to keep the latter normally in a vertical position, the movement of the latter against the action of such spring 10 being limited by a stop 11 on the chair 2. The traverse 5 is suitably guided to prevent 100 same turning, and the contact-rods 6 7 are capable of sliding in the ends thereof, and each is surrounded by a light spiral spring 12, so that the whole forms an efficient buffer 105 for deadening the shock due to the impact of the ends of such rods 6 7 against the terminals 8 9 when trigger 1 is depressed by the bar or projection 3 on the train. It will be seen that by this construction no moisture, snow, or dirt will be able to rest upon the 110 terminals, so as to establish a short circuit. The traverse 5 is preferably arranged slantingly, as shown in Fig. 1, instead of horizontally, so as to economize space, as the top end of one traverse can in this case then be made 115 to overlap the lower end of the preceding one to a certain extent.

It will be readily understood that the form of the actual contact-makers and the terminals may be modified without departing from 120 the spirit of my invention.

When a trigger is desired to work in both directions, (to suit the requirements of a single line of rails,) as shown in Fig. 4, I duplicate the arrangement of rods 4, contact-rods 125 6 7, and terminals 8 9, placing one set opposite the other, so that according to the direction of travel of the train such trigger 1 will be depressed to one side or the other, and the corresponding circuit for communicating the 130 signal to the signalman will be completed in one direction or the other, according as it should be an up or a down train. In this case the stop 11 on the chair 2 will of course

be abolished to permit of the depression of lever 1 in either direction, and the latter will be normally held in its vertical position by the equal pressure of the rods 4 on opposite sides under the action of their respective springs 10. Another stop 25 is provided to prevent too great a depression of the trigger under the blow of the bar acting thereon, one of such stops being employed in the case where the trains travel in one direction only and two in the case of trains traveling in both directions. I prefer also to cause the depressing of the lever or trigger 1 to complete another circuit leading back to an annunciator in the signal-box of the section of line the train has last left and to give a signal therein that the train in question has left such section, so that the signalman may know that said section is then clear, and for this reason the bars 3 would be placed on the rear of the train by preference. Small and large gongs 23 and 24 are arranged in the signal-box, so that the signal set by the signalman may be repeated to him on the passage of the train, and so reduce the risk of error on his part in setting the signals.

In the diagrammatic view shown in Fig. 6 13 is the gong alongside the triggers of the first set of contacts and 14 the battery in the circuit in which the annunciators and the call-bell 22 in the signal-box are included, while 16 17 are the gongs alongside the second set of contacts, which would be placed at a sufficient distance in advance of the first set to give time to the signalman to set what signals he might desire before the arrival of the train. 18 19 are the batteries and 23 24 the repeating gongs in the circuits controlled by the signalman through the switches 20 21 in the signal-box for the purpose of communicating the necessary instructions to the driver of a train which has signaled him.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. Railway signaling apparatus consisting of pivoted levers or triggers spaced apart across the track, an electric circuit or circuits, with suitable terminals between the tracks, means for energizing said circuits, sliding bars

each carrying two contacts adapted to make contact with said terminals, train-number annunciators corresponding with the pivoted levers or triggers and located at a signal box or station, electrical connections between one of the terminals of each pair and one terminal of the corresponding train-annunciator, an audible signaling device located at said signal box or station, an audible signaling device located in proximity to said pivoted levers or triggers, said audible signaling devices being in circuit with the second terminal of each pair of terminals and with the second terminal of each of said train-number annunciators, and a bar or projection mounted in a prearranged position on the vehicle whose approach is to be notified, so as to depress the lever or trigger and so complete the circuit between the corresponding pairs of terminals in passing over such pivoted lever or trigger, substantially as described.

2. Railway signaling apparatus comprising pivoted levers or triggers spaced apart one behind the other across the track, an electric circuit or circuits with suitable terminals between the tracks, means for energizing said circuits, sliding bars each carrying two contacts adapted to make contact with said terminals, corresponding switches located at a signal box or station, electrical connections between each of said pairs of terminals and said switches, audible signaling devices of different tones placed alongside the rail in circuit, adapted to be operated by the closing of the circuits between the pairs of terminals, and one or more bars or projections carried by a traveling vehicle, adapted to depress the pivoted levers or triggers so as to connect and close a circuit between the successive pairs of terminals, substantially as described and for the purpose specified.

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

WASHINGTON HUME.

Witnesses:

NICASIO ROBERT JAURALDE,
HARRY ELLMERS.