

929,211.

Patented July 27, 1909.

4 SHEETS—SHEET 1.

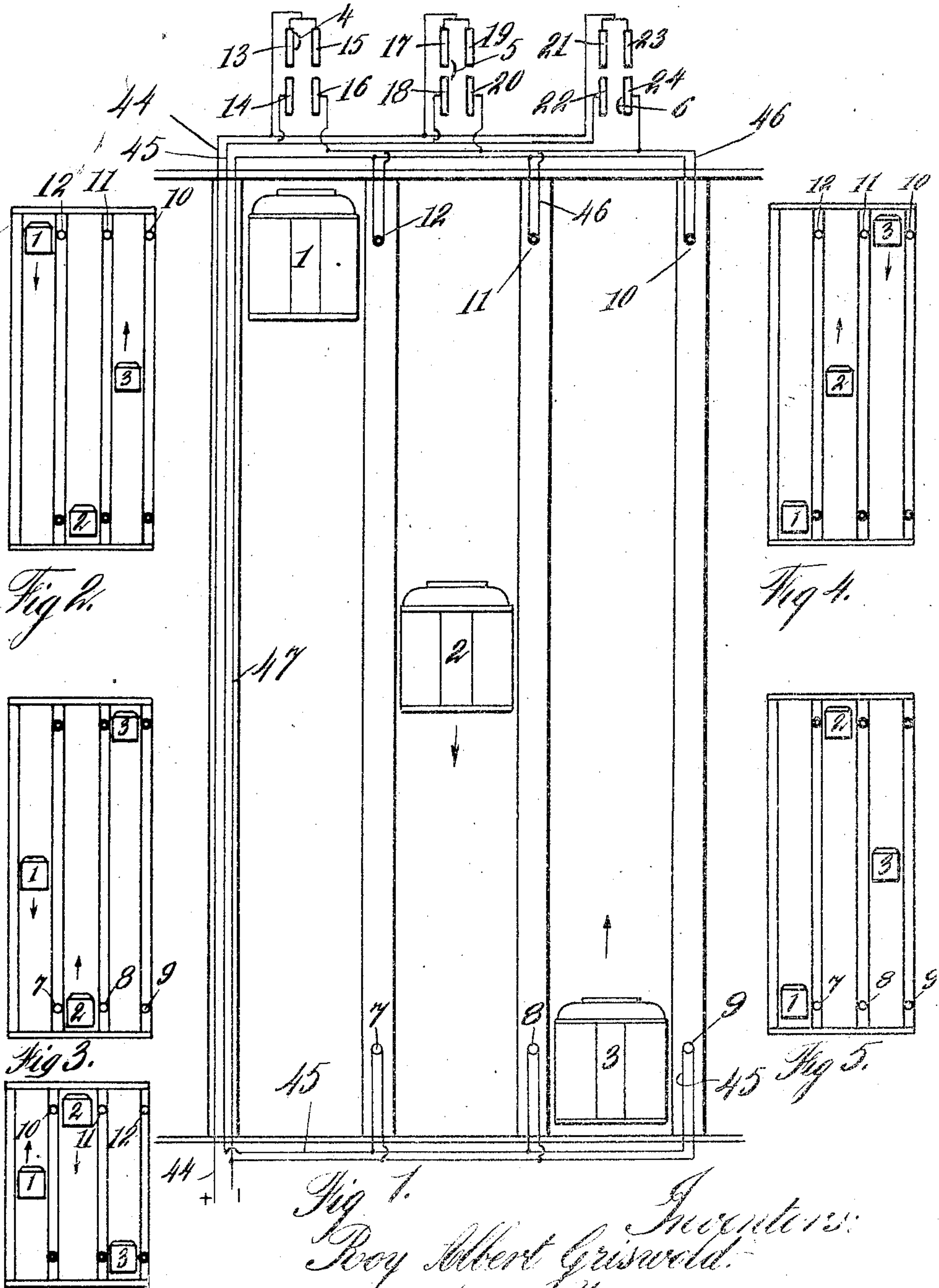


Fig 6  
 Witnesses  
 Chas Meyer  
 Bessie Brown

Fig 1.  
 Roy Albert Griswold.  
 John Henry  
 By *[Signature]*  
 Their Attorney.

R. A. GRISWOLD, & J. ZANG.  
 POSITION INDICATOR FOR ELEVATORS.  
 APPLICATION FILED MAY 26, 1908.

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 4 SHEETS—SHEET 2.

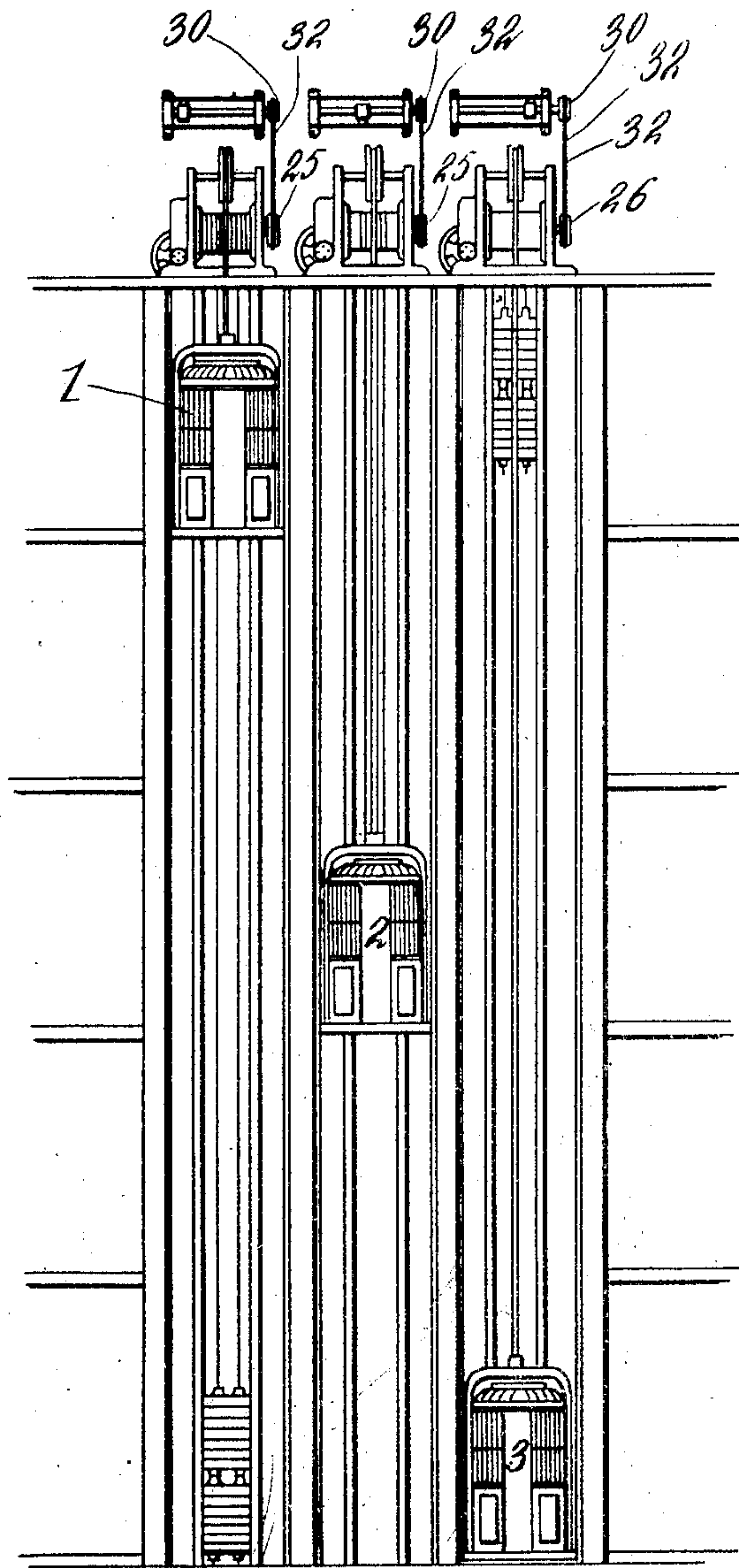


Fig. 7.

Witnesses:  
 Chas Meyers  
 Bessie Brown

Inventors:  
 Roy Albert Griswold.  
 John Zang.  
 By *[Signature]* Their Attorney.

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4 SHEETS—SHEET 3

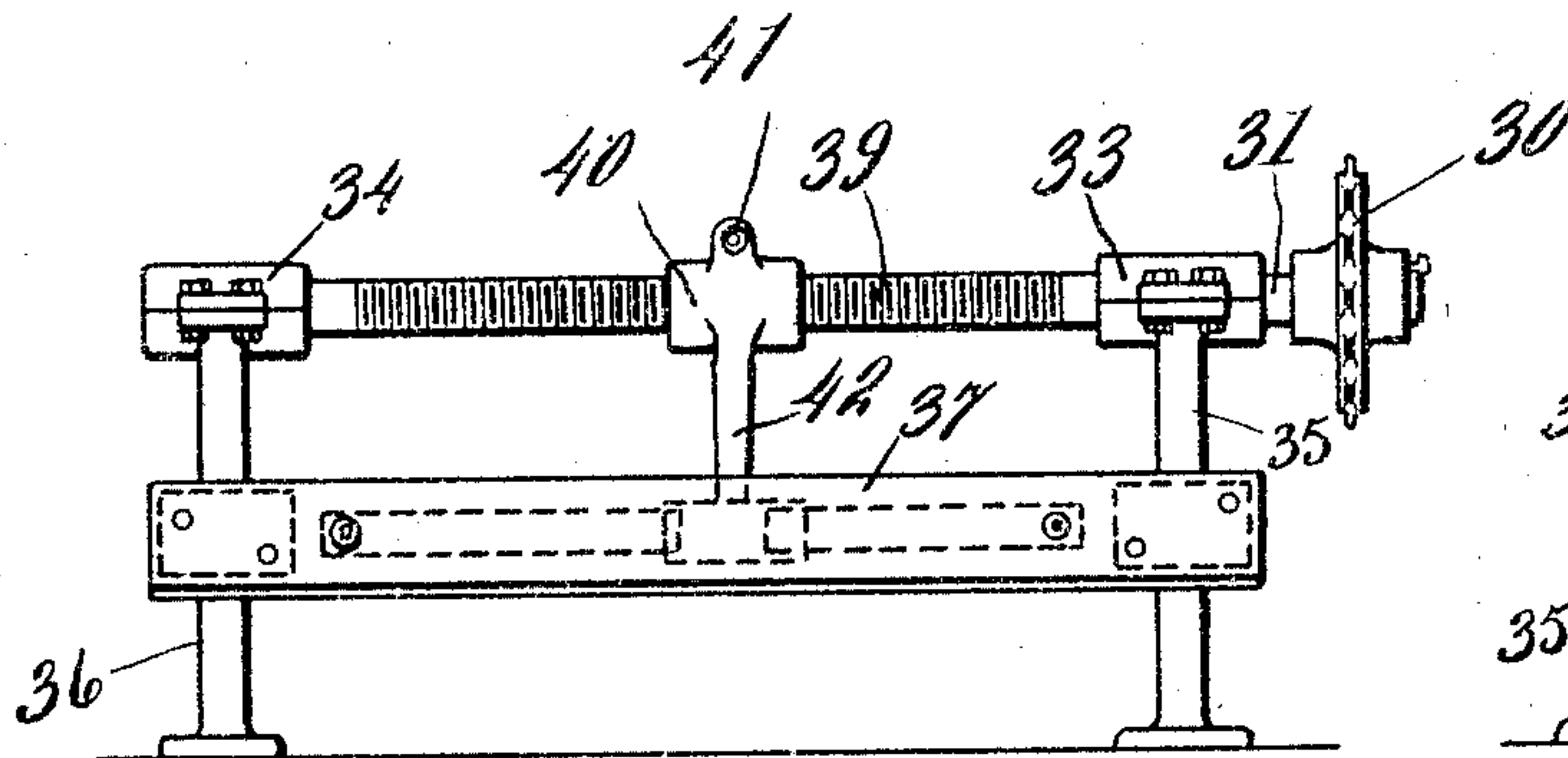


Fig 8.

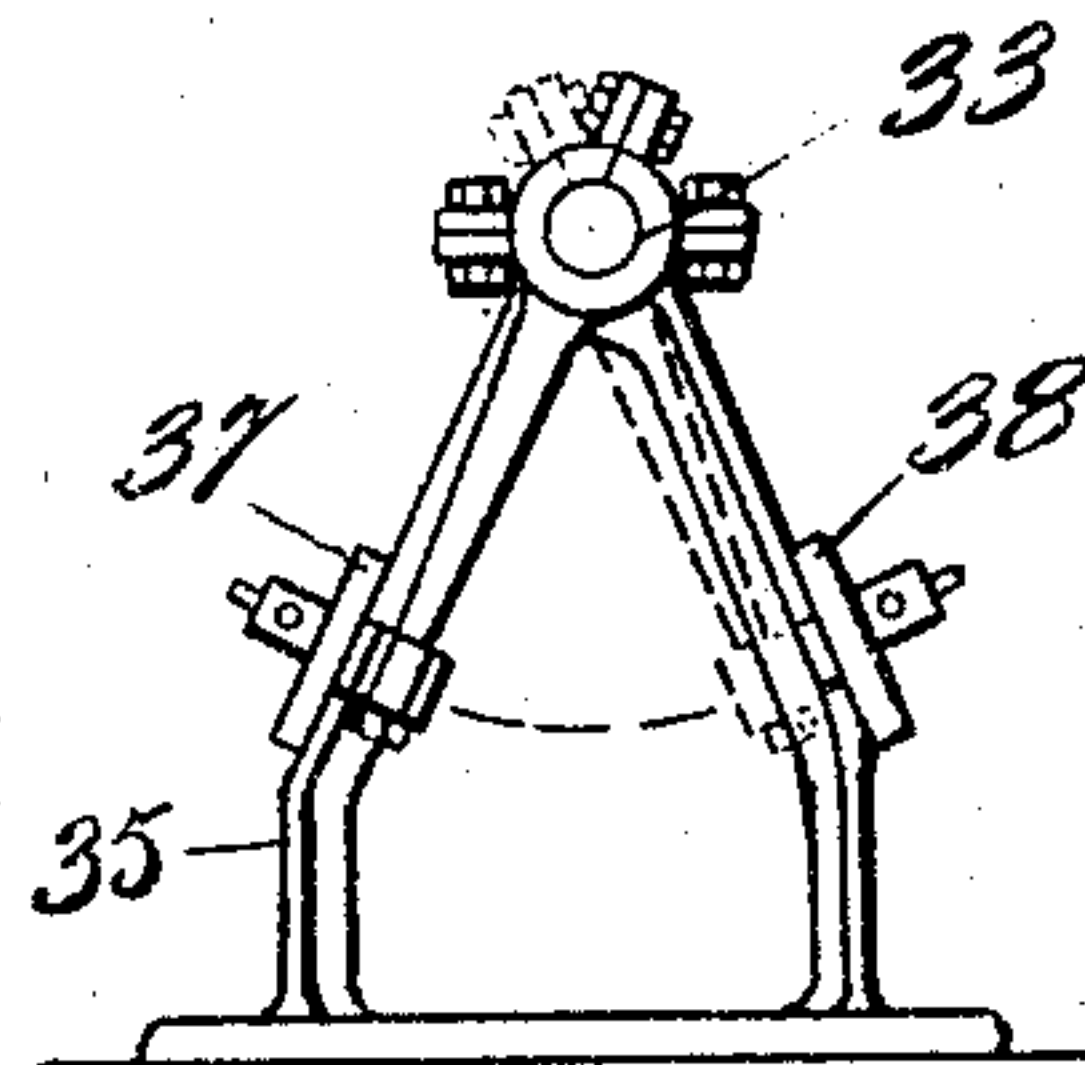


Fig 9.

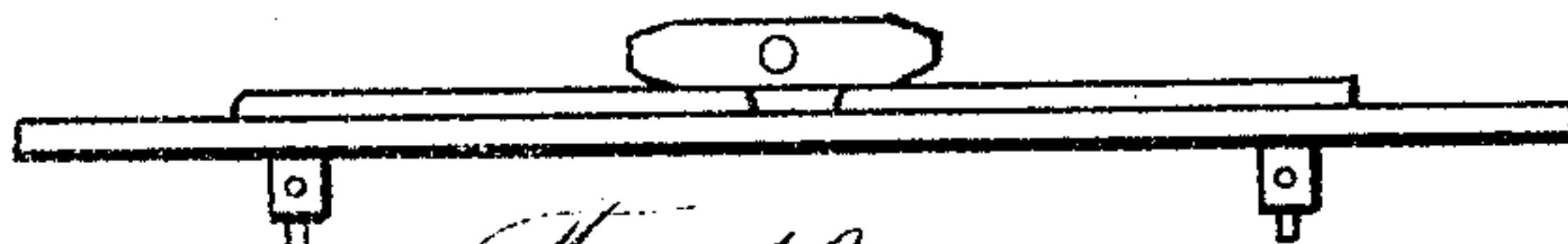


Fig 10.

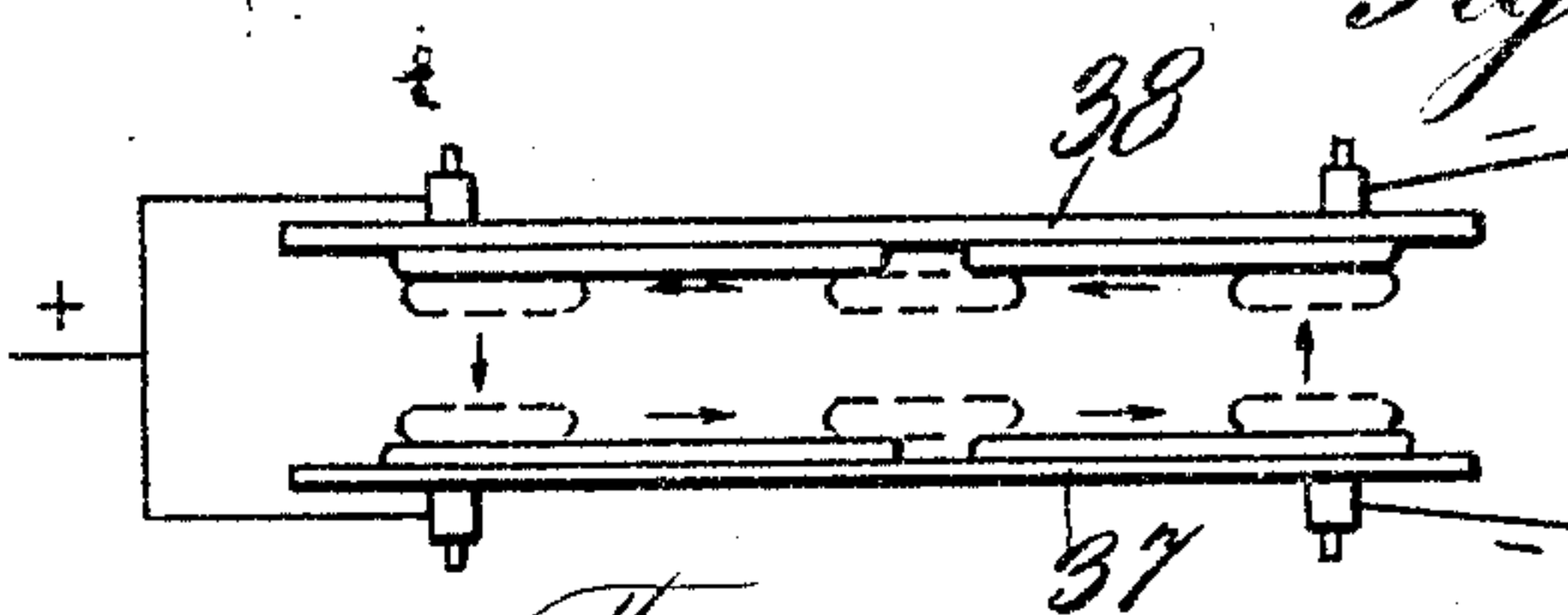


Fig 11.

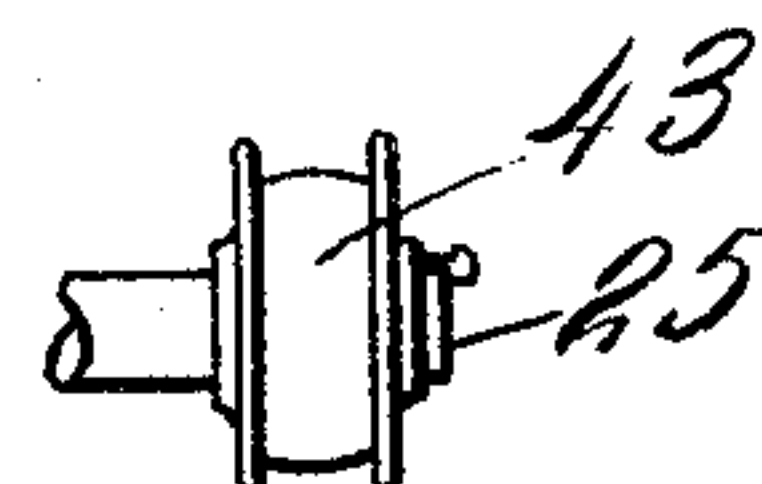


Fig 14.

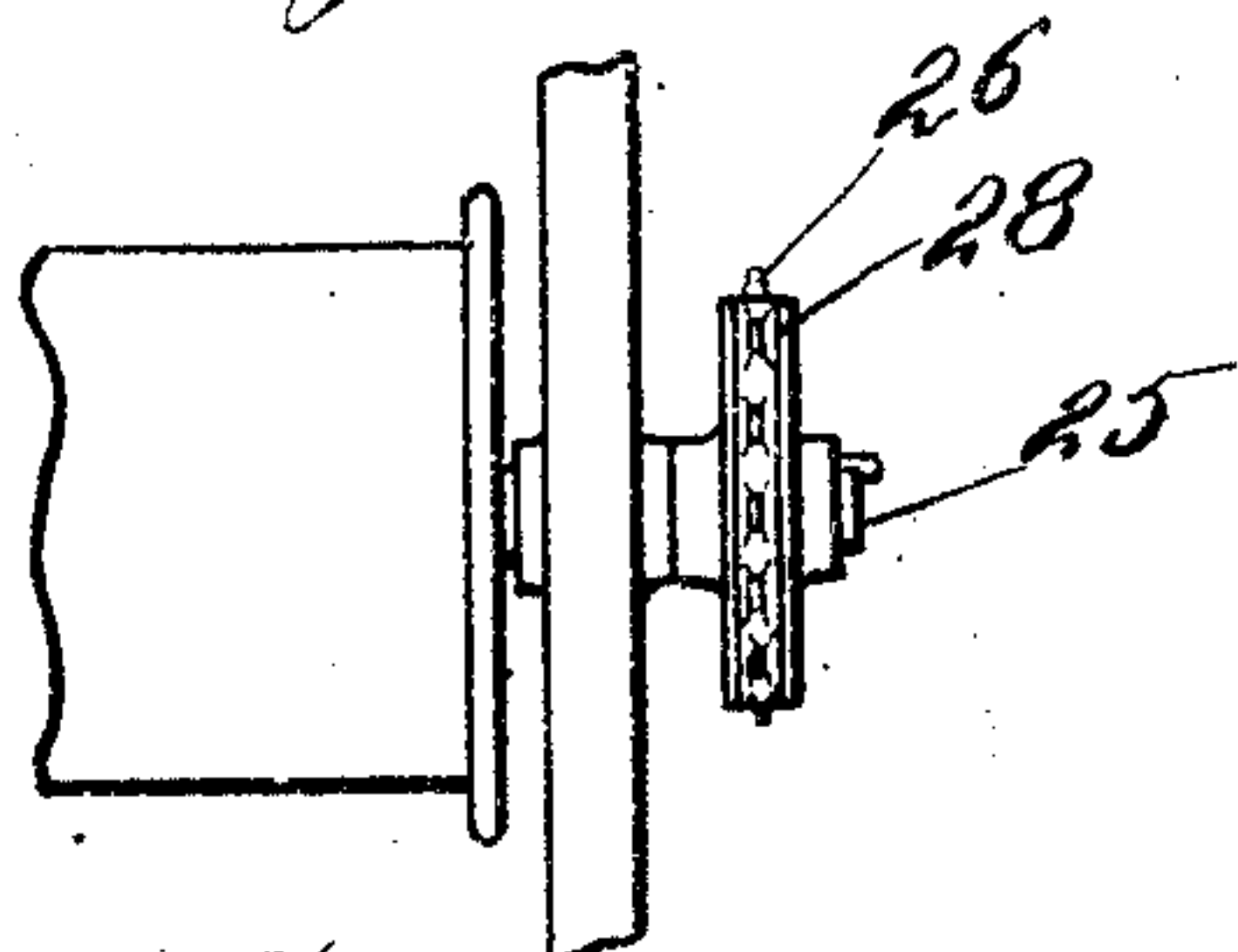


Fig 12.

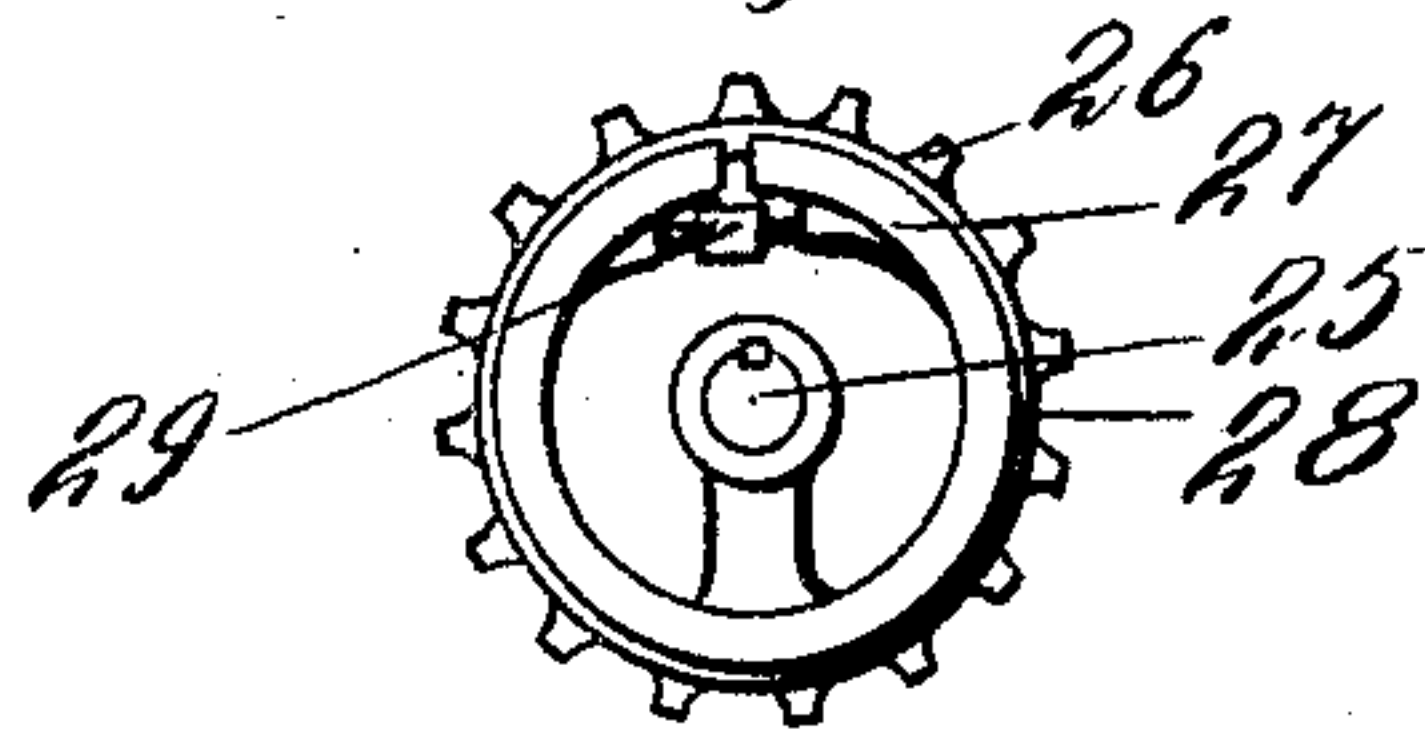


Fig 13.

Witnesses:  
 Chas Meyer  
 Bessie Brown

Inventors:  
 Roy Albert Griswold.  
 John Zang.

By

*[Signature]*  
 Their Attorney

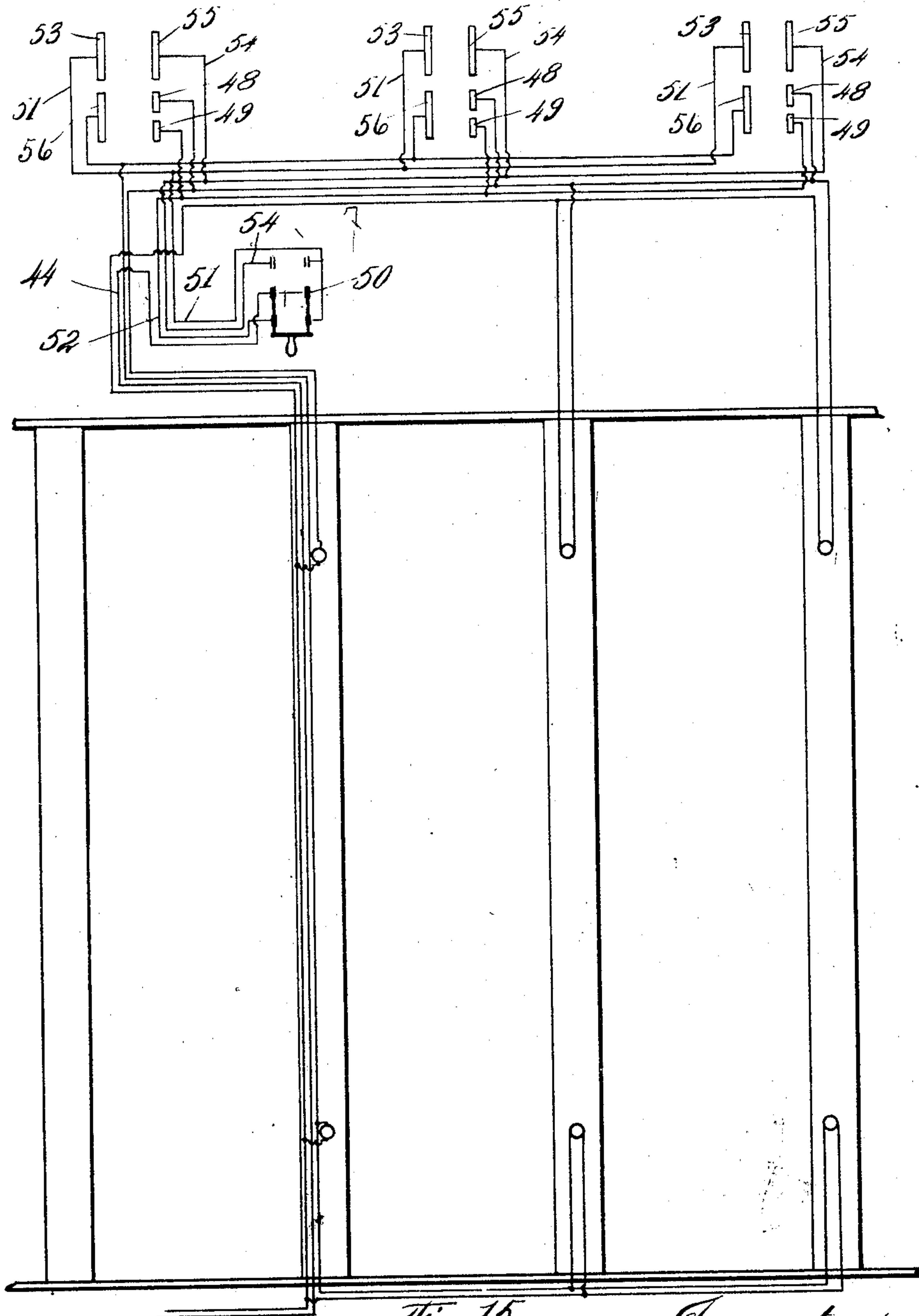


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4 SHEETS—SHEET 4.

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Witnesses:  
 Chas Meyer  
 Bessie Brown

Fig 15.  
 Roy Albert Griswold  
 John Wang  
 By

Inventors:  
 Roy Albert Griswold  
 John Wang  
 Their Attorneys.



# UNITED STATES PATENT OFFICE.

ROY ALBERT GRISWOLD AND JOHN ZANG, OF SEATTLE, WASHINGTON.

## POSITION-INDICATOR FOR ELEVATORS.

No. 929,211.

Specification of Letters Patent.

Patented July 27, 1909.

Application filed May 26, 1908. Serial No. 435,147.

*To all whom it may concern:*

Be it known that we, ROY ALBERT GRISWOLD and JOHN ZANG, residing in the city of Seattle, in the county of King and State of Washington, citizens of the United States, have jointly invented a new and useful Position-Indicator for Elevators, of which the following is a clear and concise specification.

Our invention relates to a position indicator to facilitate starting a plurality of elevators thus obviating the necessity of a man employed for this purpose.

The objects of our invention are to afford a means for signaling the position of the several elevators for the purpose of starting the same at uniform periods; to provide a means whereby two or more elevators may be kept in operation at evenly divided distances throughout their respective routes of travel. We accomplish these as well as minor objects by the construction now preferred by us and illustrated in the accompanying drawings in which—

Figure 1 is an elevation showing the application of our device; Figs. 2, 3, 4, 5, and 6 are diagrammatical views showing the position of the elevators and the view of lights due to said position; Fig. 7 is an elevation showing the elevator shafts and machinery connected therewith; Fig. 8 is an elevation of the automatic current switching device; Fig. 9 is an end view of Fig. 8 with the sprocket removed; Fig. 10 is a plan view of the insulated bar and parts attached thereto; Fig. 11 is a plan view showing the travel of the movable contact members; Fig. 12 shows the application of a friction sprocket secured to the drum shaft of the elevator; Fig. 13 is an elevation of the friction sprocket; Fig. 14 is a modification showing a pulley secured to the drum shaft; Fig. 15 is a wiring diagram used where it is desired to indicate the position of a part of the elevators.

Similar reference numerals refer to similar parts throughout the several views of our device as illustrated in the accompanying drawings.

Our invention consists of a system of wiring and also parts connected by said wiring and operated by the relative positions of the elevators such as are common in use in office buildings, etc. and we have shown for the purpose of illustration an elevator 1, an elevator 2 and an elevator 3 and by referring to Figs. 1 to 6 inclusive of the accompanying

drawings the following description will illustrate the operation of our device. The detailed description of the parts, etc. will be hereinafter more fully set forth. The elevator 1 operates in fixed relation to the movable contact member 4; elevator 2 operates relative to the movable contact member 5 and the movable contact 6 travels in fixed relation to the elevator 3 and in Fig. 1 we will consider elevator 3 as being started upwardly by the elevator 2 which has passed the center of travel, thus lighting the lower lights 7, 8, and 9 of which said light 9 is visible from said elevator 3. Said elevator 2 travels downwardly as indicated by the arrow and said elevator 3 travels upwardly until the position is reached as shown in Fig. 2 of the accompanying drawings in which said elevator 3 will cause the upper lights 10, 11, and 12 to be turned on, the light 12 being visible from the elevator 1 causing said elevator to travel downwardly until reaching the central position as shown in Fig. 3 of the accompanying drawings in which position said elevator 1 lights the lower lights 7, 8, and 9 of which the light 8 is visible from the elevator 2 whereby said elevator is signaled to advance upwardly until reaching the position as shown in Fig. 4 of the accompanying drawings, thus lighting the lights 10, 11, and 12 signaling said elevator 3 to start on its downward travel until arriving at the position shown in Fig. 5 in which said elevator 3 turns on the lights 7, 8, and 9 in which said light 7 is visible from said elevator 1, thus signaling said elevator to advance upwardly until arriving at the position illustrated in Fig. 6 in which the upper lights 10, 11, and 12 are shown as lighted, the light 11 signaling the elevator 2 to travel downwardly which will bring the next signaling position of the elevators similar to that shown in Fig. 1. Thus it is obvious that by rearranging the stationary contact members 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, and 24 and movable contact members 4, 5, and 6 that any number of elevators may be wired to start at uniform periods when in continuous operation. The wiring and automatic current switch are constructed substantially as follows.

The drum shaft 25 which serves to raise and lower the elevator 1 is preferably provided with a friction sprocket 26 comprising a grooved split rim 27 rigidly secured to said shaft adapted to receive the toothed band



28 thus forming said friction sprocket, the tension being adjusted on the inner surface of said toothed band by means of a right and left hand screw 29. Said friction sprocket 26 drives the sprocket wheel 30 which is secured to the screw shaft 31 by means of the chain 32. Said screw shaft 31 is mounted in the bearings 33 and 34 which are supported by the brackets 35 and 36 which also support the insulated bars 37 and 38. The screw shaft 31 is provided with a threaded portion 39 which journals the friction nut 40 which is adjusted by means of the screw 41 to snugly fit said threaded portion 39, thus when the direction of travel of said screw shaft 31 is changed said friction nut 40 will swing as illustrated in Fig. 9 toward and from the insulated bars 37 and 38.

Each of the elevators is provided with a similar device to that just described and the stationary contact members 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, and 24 are secured to the several insulated bars 37 and 38 and the movable contact members 4, 5, and 6 are secured to said friction nut by the swinging arm causing a travel of the movable contact member as indicated by the arrows in Fig. 11.

To obviate the relation between the drum shaft 25 and the screw shaft 31 from being changed we have provided a friction sprocket 26 which when the nut 40 strikes either of the bearings 33 or 34 will cause said screw shaft 31 to remain stationary until the direction of travel of the drum shaft as well as the elevator operated thereby has changed, thus the relation between said drum shaft and said screw shaft will be adjusted each time the elevators travel the full length of their respective routes. In Fig. 14 we have shown a pulley 43 secured to said drum shaft 25 and may also represent a similar pulley on the screw shaft 31 thus as said nut 40 strikes either of the bearings 33 or 34 the belt traveling on said pulley will slip performing the same function as said friction sprocket 26.

The stationary contact members 13, 15, 17, 19, 21 and 23 are connected to the main line 44 and the stationary contact members 14, 18 and 22 are connected to the lower lights 7, 8, and 9 by means of the wire 45 and the stationary contact members 16, 20 and 24 are connected to the upper lights 10, 11 and 12 by the wire 46. The negative side of all of the lights being connected to the wire 47, thus when the movable contact member 4 makes the connection between the stationary contact members 13 and 14 the elevator 1 will be in the central position traveling downwardly and the contact members 15 and 16 will be connected at the central position of said elevator 1 when traveling upwardly. The same may be said of all of the elevators in the signaling system as the members 14, 18 and 22 are connected

together and the members 16, 20 and 24 are also connected operating the lights connected thereto.

In Fig. 15 we have shown the wiring as adapted to change the signaling point from the center to the end of the travel of the elevator, thus the current is switched from the stationary contact member 55 to the stationary contact member 49 thus changing the point of signaling from the center of travel to substantially the end of the travel of the elevator, thus the elevator at the bottom when starting upwardly will signal for the top elevator to advance downwardly, the third elevator not being in use. This feature is accomplished as follows. A double pole double throw switch 50 is disposed in a convenient position and is connected to the main line 44 which in Fig. 15 conveys the current through said switch 50 wires 51 and 52, said wire 51 being connected to the stationary contact member 53 and said wire 52 being connected to the stationary contact member 49, thus causing the stationary contact member 55 to remain dead while the two elevators are running. When it is desired to run the three elevators as hereinbefore set forth said switch 50 is thrown in the opposite direction from the position illustrated in Fig. 15, thus conveying the current from said main line 44 to the wire 54 which is connected to the stationary contact member 55 and making the connection at the middle of the travel of the elevator as may be clearly understood by referring to the description of the three elevator systems, thus as the elevator advances upwardly the stationary contact member 48 being connected to the top light said light will be illuminated when the elevator is half way to the top floor by making contacts between the stationary contact members 48 and 55. The stationary contact members 56 are connected in substantially the same manner as with the three elevator systems hereinbefore set forth which description relative to the travel of the elevators applies to the wiring shown in Fig. 15 when said switch 50 is thrown in the opposite direction from that shown therein.

We do not wish to be limited to the specific construction illustrated in the accompanying drawings and herein set forth, as we may desire to use such equivalent constructions as fall within the scope of the appended claims.

Having thus described our invention what we claim as new and desire to secure by Letters Patent of the United States, is—

1. An elevator starting and signaling device, comprising, in combination with a plurality of elevators, a plurality of automatic multipolar switches operative by said elevators and a signal at each end of each shaft, all of said signals being in circuit with each



of said switches, said signals being adapted to be operated at predetermined intervals and in predetermined groups by the elevators *en route*.

5 2. An elevator starting and signaling device, comprising, in combination with a plurality of elevators, a plurality of automatic multipolar switches operative by said elevators and a signal at each end of each shaft,  
10 all of said signals being in circuit with each of said switches, said signals being adapted to be operated at predetermined intervals by an approaching car, *en route* in either shaft.

15 3. An elevator starting and signaling device, comprising, in combination with a plurality of elevators, a plurality of automatic multipolar switches operative by said elevators and a signal at each end of each shaft,  
20 all of said signals being in circuit with each of said switches, said switches comprising two series of oppositely disposed stationary contacts, a movable contact adapted to travel between said contacts and engage  
25 each series of contacts in succession, and means for operating said movable contact from its respective elevator.

4. In an elevator starting and signaling device, a plurality of elevators and a plurality of movable contact members operated  
30 thereby in predetermined relation therewith, stationary contact members connected to certain lights whereby one of the elevators signals to another of said elevators to start  
35 on the respective direction of travel thereof, and means whereby the system of wiring and lights may be made operative for a change of the number of elevators in the system.

40 5. In an elevator starting apparatus, elevators, stationary contact members, movable contact members traveling in predetermined relation to said elevators, lights operated by said stationary contact and said  
45 movable contact members, and a switch adapted to change the signaling point relative to the travel of said elevators.

6. In an elevator starting apparatus, elevators, stationary contact members, movable

50 able contact members traveling in predetermined relation to said elevators, lights operated by said stationary contact and said movable contact members, and means whereby the relation of the point of signaling may be changed relative to the disposition  
55 of said elevators in their respective routes of travel.

7. An elevator starting and signaling device comprising in combination with a plurality of elevators and shafts, lights located  
60 at each shaft and intervisible from each elevator, and means in circuit with all of said shafts and operative from each of said elevators for lighting said lights at predetermined intervals and in predetermined groups. 65

8. In an elevator starting device, a plurality of elevators, lights visible from the terminal stops of all of said elevators and means whereby one of said elevators at a  
70 predetermined point throughout its route of travel illuminates all of said lights to signal another of said elevators waiting at its terminal stop to depart therefrom.

9. In a starting device, a plurality of lights and a plurality of elevators, said lights  
75 being disposed at the upper and lower terminal stops, and means for lighting all of said lights at the upper terminal when any of said cars pass a predetermined point in their upward travel and means for lighting  
80 all of said lights at their lower terminal when any of said elevators pass a predetermined point in their downward route of travel.

10. In an elevator starting device, a plurality of elevators, a light disposed at each  
85 end of the route of each elevator and means operated by any of said elevators to light all of the lights at the end of the route being approached by said elevator.

In testimony whereof we have signed our  
90 names to this specification, in the presence of two subscribing witnesses.

ROY ALBERT GRISWOLD.  
JOHN ZANG.

Witnesses:

PAUL A. TALBOT,  
BESSIE BROWN.