R. L. TURK.

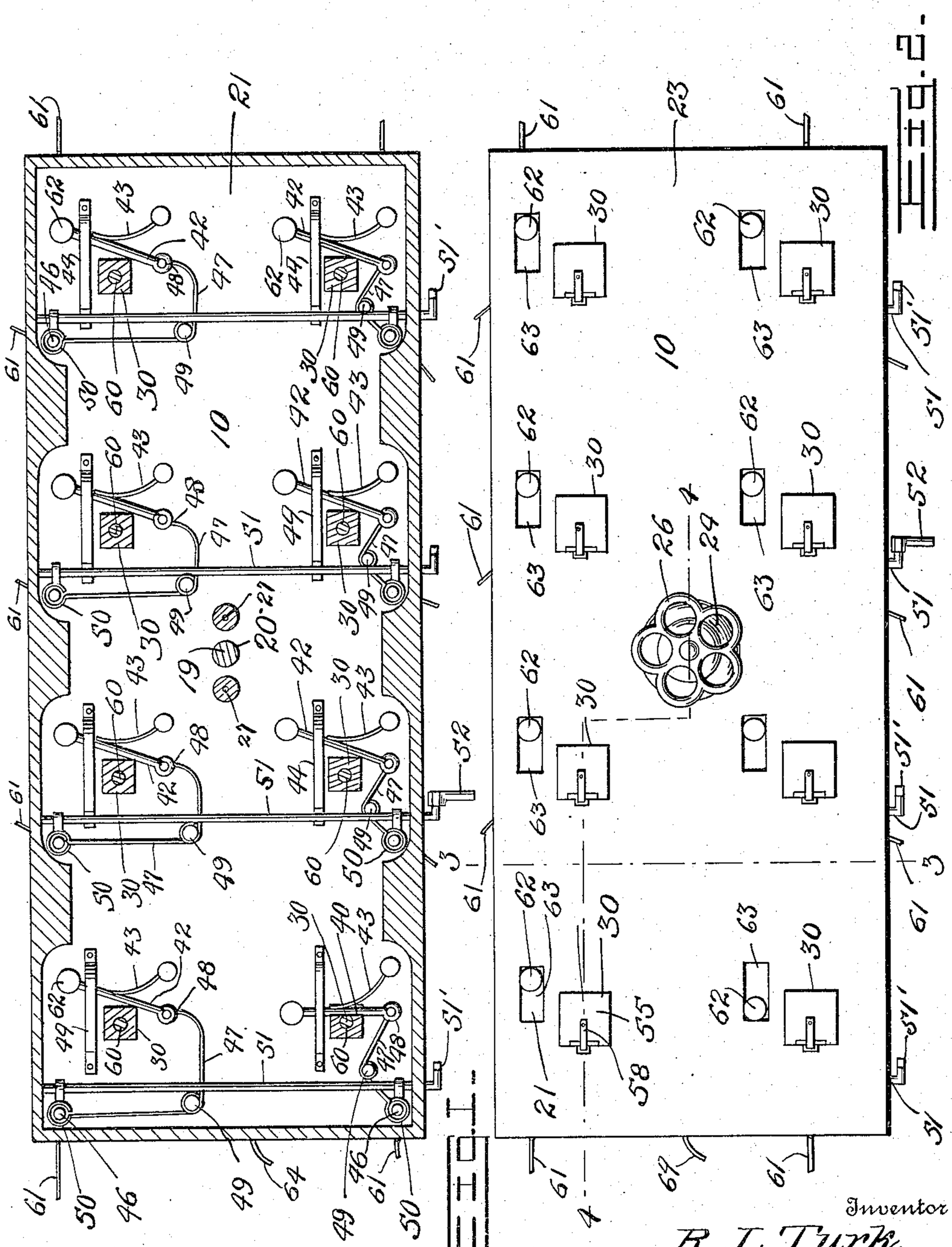
BLOCK SYSTEM SWITCHBOARD.

APPLICATION FILED MAR. 21, 1912.

1,167,138.

Patented Jan. 4, 1916.

3 SHEETS—SHEET 1.



Witnesses

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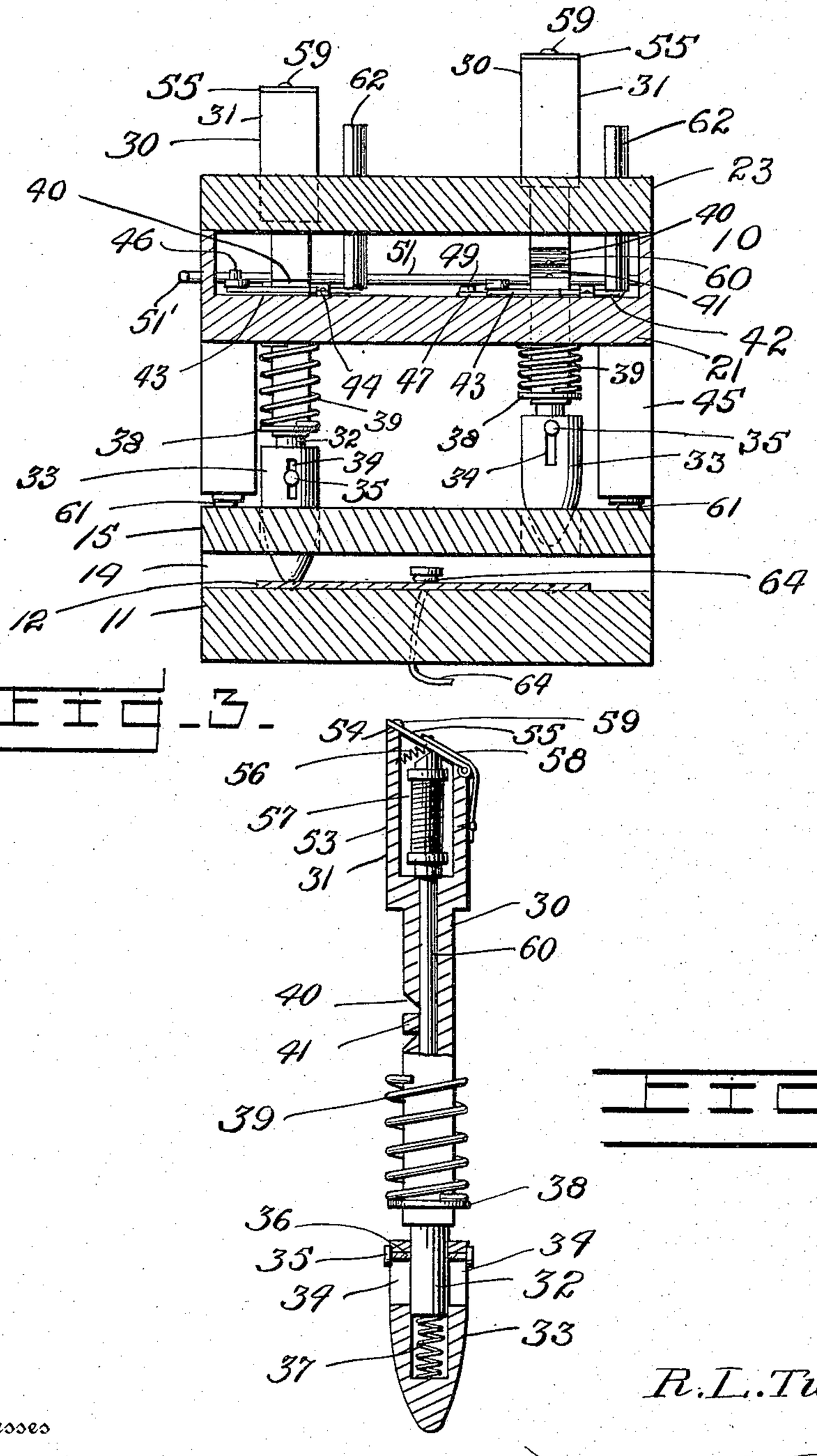

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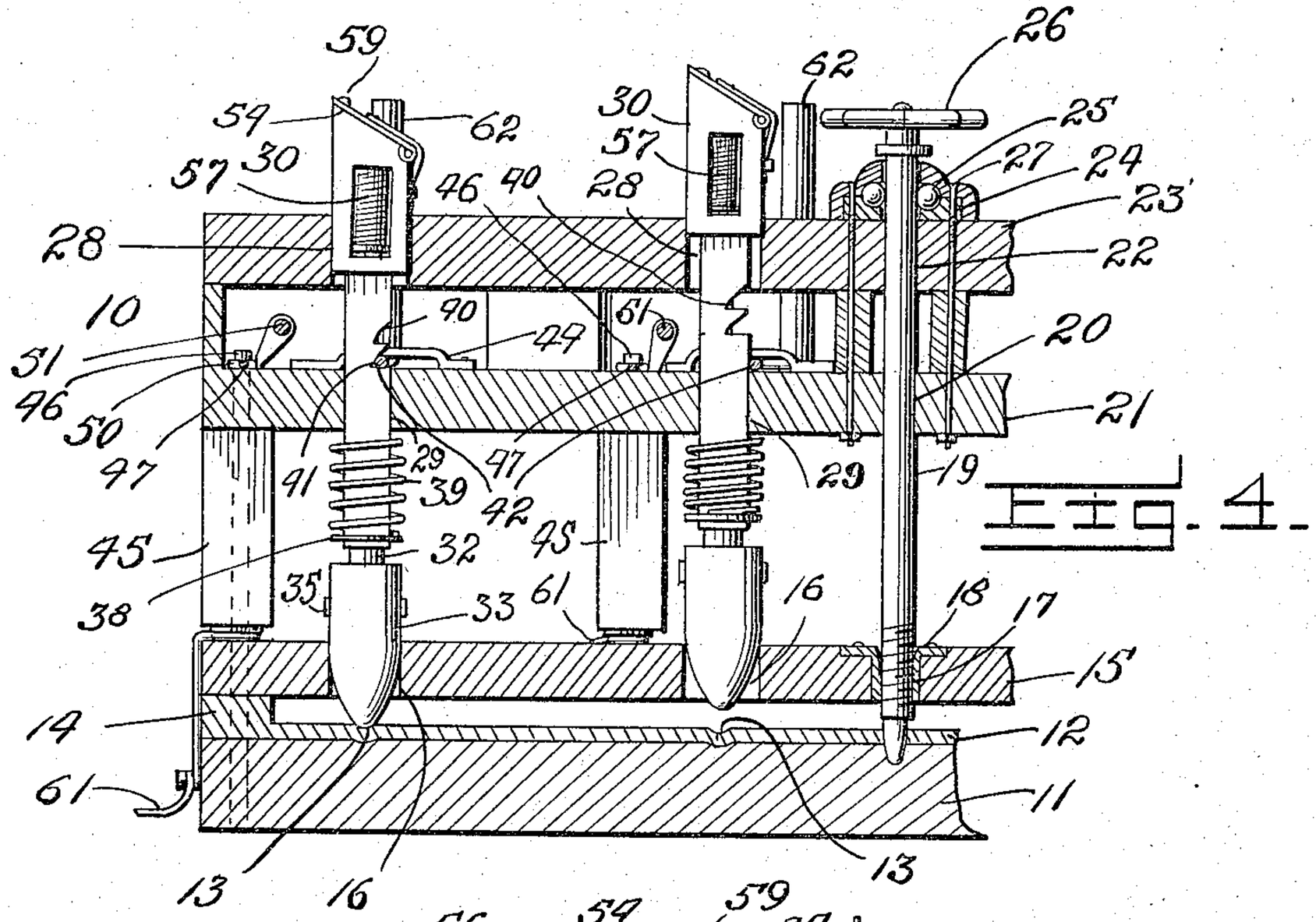

Fig. 4.

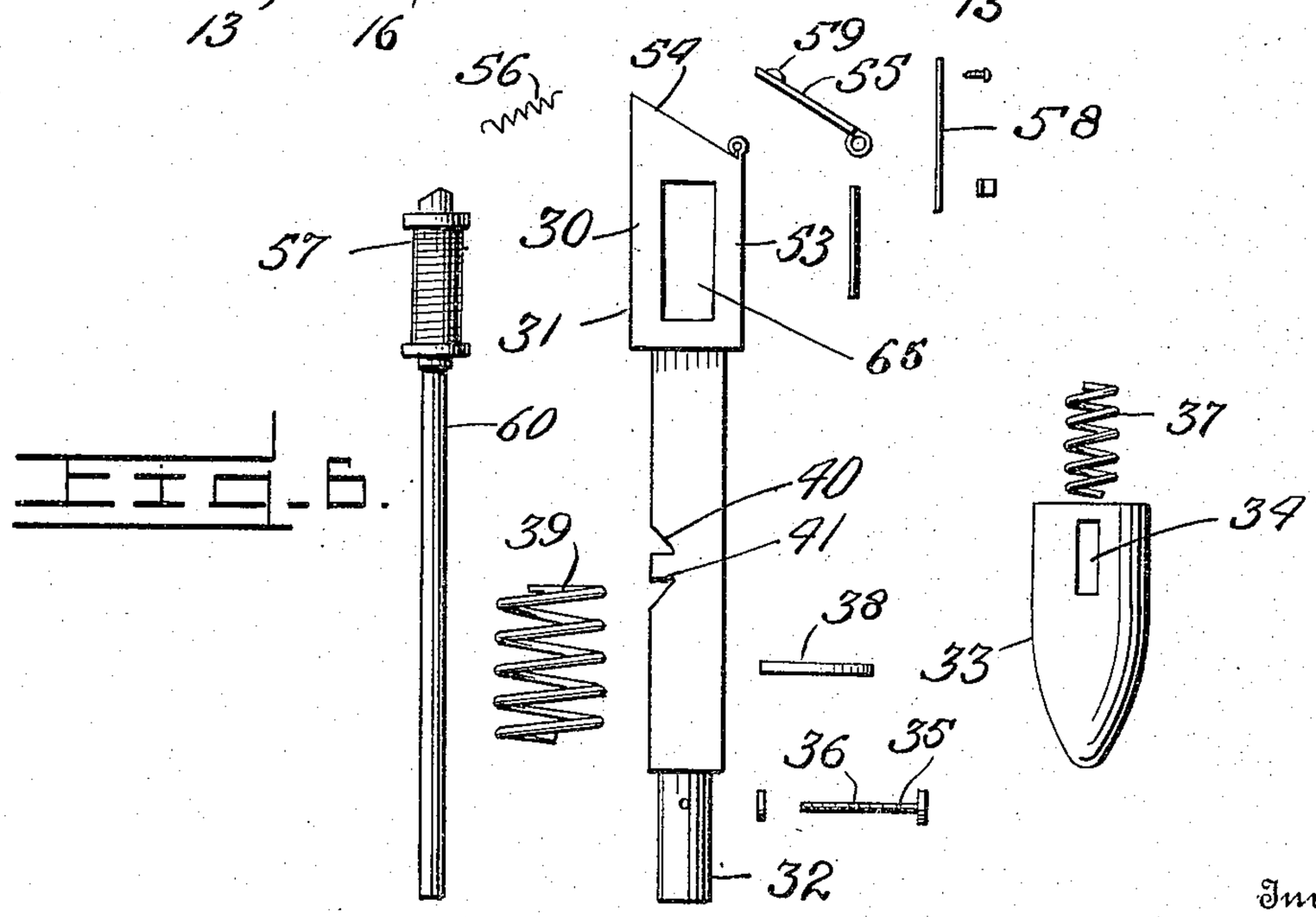

Fig. 6.

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UNITED STATES PATENT OFFICE.

RUFUS L. TURK, OF MINNEAPOLIS, KANSAS.

BLOCK-SYSTEM SWITCHBOARD.

1,167,138. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed March 21, 1912. Serial No. 685,199.

To all whom it may concern:

Be it known that I, RUFUS L. TURK, a citizen of the United States, residing at Minneapolis, in the county of Ottawa, State of Kansas, have invented certain new and useful Improvements in Block-System Switchboards; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to new and useful improvements in switch boards for telephone systems or the like.

The principal object of this invention is the provision of a switch board which employs the use of a plurality of plugs which are movable to and from engagement with a contact plate and which make it possible to eliminate the use of the removable plugs now employed in such devices.

Another object of this invention is the provision of a switch board comprising a base plate which supports a contact plate and a supporting plate in which are located a plurality of spring actuated plugs which are limited in their movement and engaged by suitable means whereby they may be retained in engagement with the said contact plate.

A further object of this invention is to improve and simplify devices of this character rendering them comparatively simple and inexpensive to manufacture, reliable and efficient in use and readily operated.

With the above and other objects in view this invention resides in the novel features of construction, formations, combinations and arrangements of parts to be hereinafter more fully described, claimed and illustrated in the accompanying drawings, in which:—

Figure 1 is a plan view of the switch with the cover removed. Fig. 2 is a plan of the same with the cover in place. Fig. 3 is a section on the line 3—3 of Fig. 2. Fig. 4 is a section on the line 4—4 of Fig. 2. Fig. 5 is an enlarged detailed sectional view taken through one of the movable plugs, and Fig. 6 is a detailed view illustrating the various parts comprised in said plug.

Referring to the accompanying drawings by similar characters of reference, the numeral 10 designates generally a switch board constructed in accordance with my invention and comprising a base plate 11, to the upper side of which is secured a contact plate 12 of any desired conducting material and provided at convenient points thereon with depressions or indentations 13 for a purpose which will later appear. The opposite sides of the plate 12 have enlargements 14 thereon, to the upper sides of which a guide plate 15 is secured. This guide plate 15 has extending therethrough a plurality of openings 16 which are located in alinement with the before mentioned depressions or indentations 13. The central portion of the plate 15 is also apertured as indicated by the numeral 17 and has firmly secured in the said aperture a threaded sleeve 18 in which is located the lower threaded terminal of a shaft 19. This shaft 19 extends loosely through a central aperture 20 formed in a supporting plate 21 and through a similar opening 22 formed in a closure plate 23, said closure plate having secured to its upper side a bearing 24 in which are located a plurality of balls 25 which engage the upper end of the shaft 19, adjacent the hand wheel 26 keyed thereto, and hold the shaft from binding when rotated. This bearing 24 is secured to the upper face of the plate 23 by any suitable fastening device designated by the numeral 27. When the hand wheel 26 turns the shaft 19 the thread 18 in the sleeve 17 will move the plate 15 so as to bring all of the plugs extending through the plate 21 and the plate 23 in contact with the plate 12 when the plugs are held on the plate 21 by the levers 42 engaging the notches 40. The closing plate 23 constitutes the upper face of the switch board and is provided with alining openings 28, which together with openings 29 formed in the supporting plate 21 aline with the openings 16 located in the plate 15 as well as the indentations 13 formed in the plate 12. Each of the alining apertures 16, 28 and 29 have slidably located therein contact plugs 30—each of which comprises a squared body portion 31 rounded at its lower end as at 32 for slidably engaging caps 33 supported thereon for engagement with the indentations 13. These caps 33 are formed from a conducting material and have formed in their opposite sides slots 34 through which extend pins 35 threaded at their intermediate points as at 36, for engagement with the threaded apertures formed in the lower ends of the body portion 31 of the plug 30. These caps, as before mentioned, are slidable upon the plugs 30 and are retained normally at the

downward limit of their movement by coil springs 37 which are located in the said caps and bear against the lower ends of the said body portions 31. The plugs 30 have secured thereto in spaced relation above said caps, collars 38 which contact with the lower ends of springs 39, the opposite ends of which bear against the under sides of the supporting plate 21 to which they are secured for the purpose of normally retaining the plugs raised from engagement with the plate 12.

The body portions of the plugs 30 are provided with a pair of notches 40 and 41, the former being for engagement with the intermediate portions of pivoted levers 42 formed from a conducting material and thrown into contact with the said plugs by springs 43. The notch 41 is arranged for engagement with the lever 42 to prevent movement of the plug 30 downward at the time the plugs are raised from contact with the depressions 13 in the plate 12. When the levers 42 are in engagement with the notches 40 in the plugs 30 the plugs will be in contact with the plate 12 and the levers will positively maintain the plugs in such position against the tension of the springs 39. When the levers 42 are in engagement with the notches 41 the plugs 30 will be raised from the plate 12 and the levers will positively lock them in their raised positions. It is desirable to lock the plugs 30 in such position that they will be raised from the plate 12 for should this locking not be possible when the springs 39 became weakened they would not operate to maintain the plugs out of contact with the plate 12 and consequently the circuit through any particular plug could not be broken and maintained so. Guide straps 44 extend over the said levers 42 and normally prevent their upward displacement which would serve to break the contact between the caps 33 and the plate 12. The guide plate 15 has extending vertically therefrom spacing blocks 45 located thereon and holding the plate 21 in spaced relation to the plate 15 and through the said plate 21 to points adjacent one side of the plate or closure 23 are posts 46 which are connected to the levers 42 by a spring conducting member 47. These spring conductors 47 are secured at their terminals to the pivotal point of the levers 42, as indicated by the numeral 48, while their intermediate portions are secured to the face of the plate 21 by pins or other fastening devices 49. The outer ends of these spring contact members are looped, as at 50, and surround the posts 46 being normally held in engagement therewith by the resiliency of their free terminals. Shafts 51 are rotatably secured adjacent these loops 50 and are provided with cam extensions for engagement therewith, whereby when the shafts are rotated through the medium of the squared extensions 51′ and wrench 52 connected thereto, the said springs will be forced out of engagement with said posts and the connection broken.

It will be noted that there are two of the cam extensions on each of the shafts 51 and thus the loops can be forced out of engagement with the posts temporarily two at a time. It will also be noted that when the cams are released the contacts may again be made between the posts and the loops, the resiliency of the latter returning them to their original positions.

As clearly illustrated in the drawings, the plugs 30 are provided with upper enlarged heads 53 of preferably square cross-sectional formation and provided with upper beveled faces 54, to the sides of which are connected hinged plates 55, which are held normally to cover the upper ends of the heads by springs 56, which together with the magnets 57 located in the ends of the plugs retain the said plates firmly in engagement with the ends thereof. These plates 55 have secured thereto springs 58 which when the magnets are deenergized are of greater strength than the before mentioned springs 56, thereby causing the plates 55 to be swung outwardly. Each of the plates 55 is provided with a button 59 by means of which the same may be moved to their closed position. The magnet 57 in each of the plugs 30 will be deënergized when the party on the corresponding line hangs up the receiver and consequently at this time the plate 55 on the plug will be drawn to its open position.

The plugs 30 have extending therethrough cores 60 of conducting material which when two or more of the plugs are pressed inwardly complete a circuit through the line wires 61 which are secured to the posts 46 between the lower faces of the blocks 45 and upper face of the plate 15, and the posts 46 together with the plugs and plate 12, thereby making it possible to connect two or more parties by simply pressing the heads 53 upon which are located the desired numbers. The levers 42 have secured to their outer ends handles 62 which project through slots 63 formed in the plate 23 for engagement by the operator, whereby upon the proper movement of the same the plugs will be released from their engagement with the plates 12 through the medium of the springs 39.

The numeral 64 designates a flexible conductor which is connected with the telephone located in the central operator's office and in order to connect central with one of the parties it is merely necessary to press the one desired plug.

From the foregoing disclosure taken in connection with the accompanying drawings, it will be manifest that a switch board of the character described is provided for which will fulfil all of the necessary requirements of such a device.

Having thus particularly described this

invention, what I claim as new and desire to protect by Letters Patent is:—

1. The combination in a switch board, of a contact plate, a supporting plate, plugs movable through said supporting plate, caps formed upon the plugs for engagement with the contact plate, conducting means extending through the plugs, posts extending through the supporting plate, conductors connected to the posts, notches provided in the plugs, levers engaging said notches for retaining the plugs in engagement with the contact plate and engaging the conductors extending through the plugs and means for connecting the levers with the posts.

2. The combination in a switch board, of a contact plate, supporting means, a plurality of plugs movable through said supporting means, caps secured slidably upon the ends of the plug, springs urging said caps toward said contact plate, springs interposed between the caps and the supporting means for normally retaining the caps out of engagement with the contact plate, notches provided in the plugs, levers engaging said notches and retaining the plugs in engagement with the contact plate, indicating plates secured to the heads of the plugs, posts extending through the supporting means, flexible conductors connected to the posts, spring contact means connecting the levers and the posts, and means for throwing the spring contact members out of engagement with the posts.

In testimony whereof, I affix my signature, in presence of two witnesses.

REV. RUFUS L. TURK.

Witnesses:

HENRY CARNEY,

HENRY SOCHRIST.