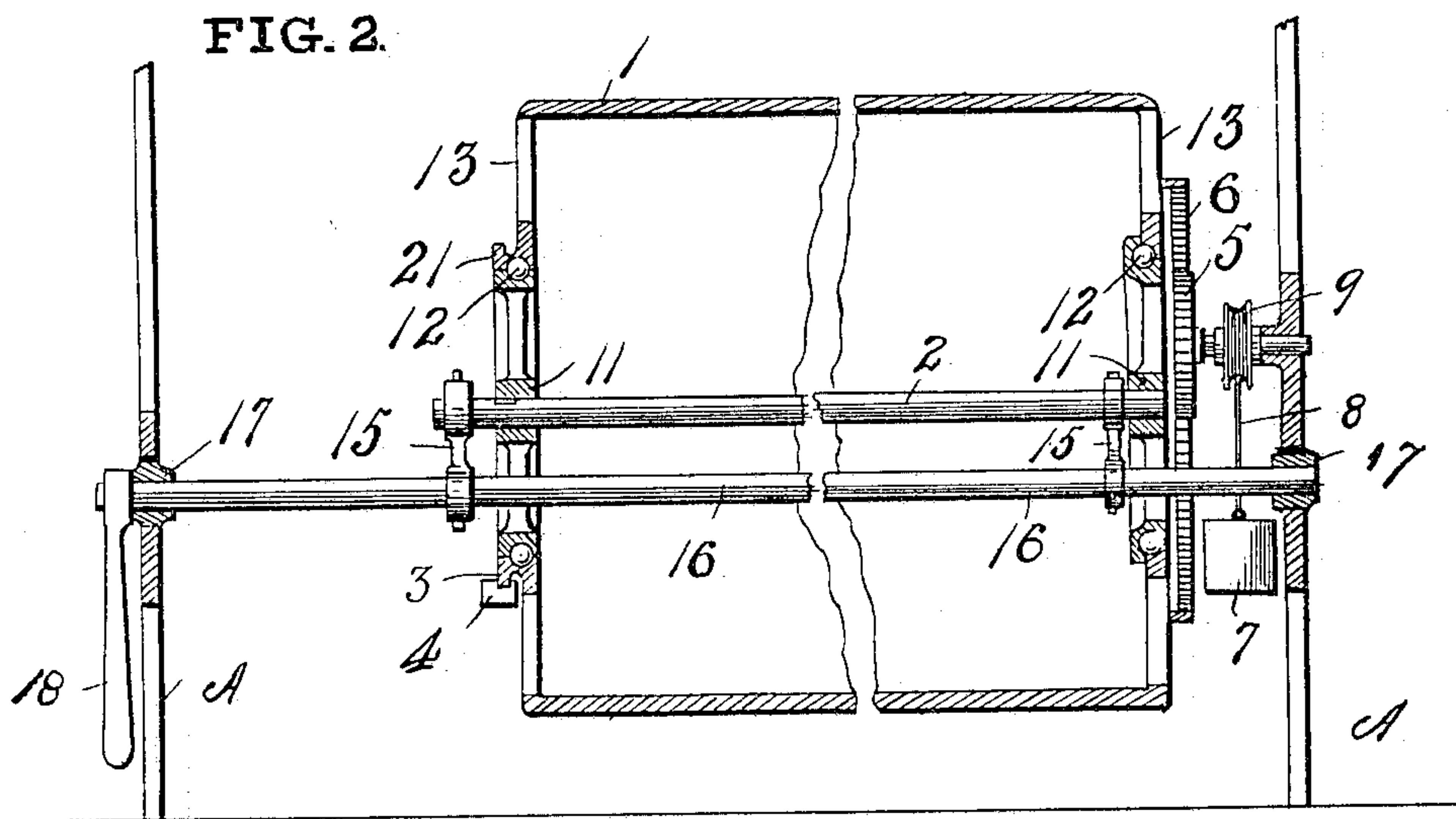
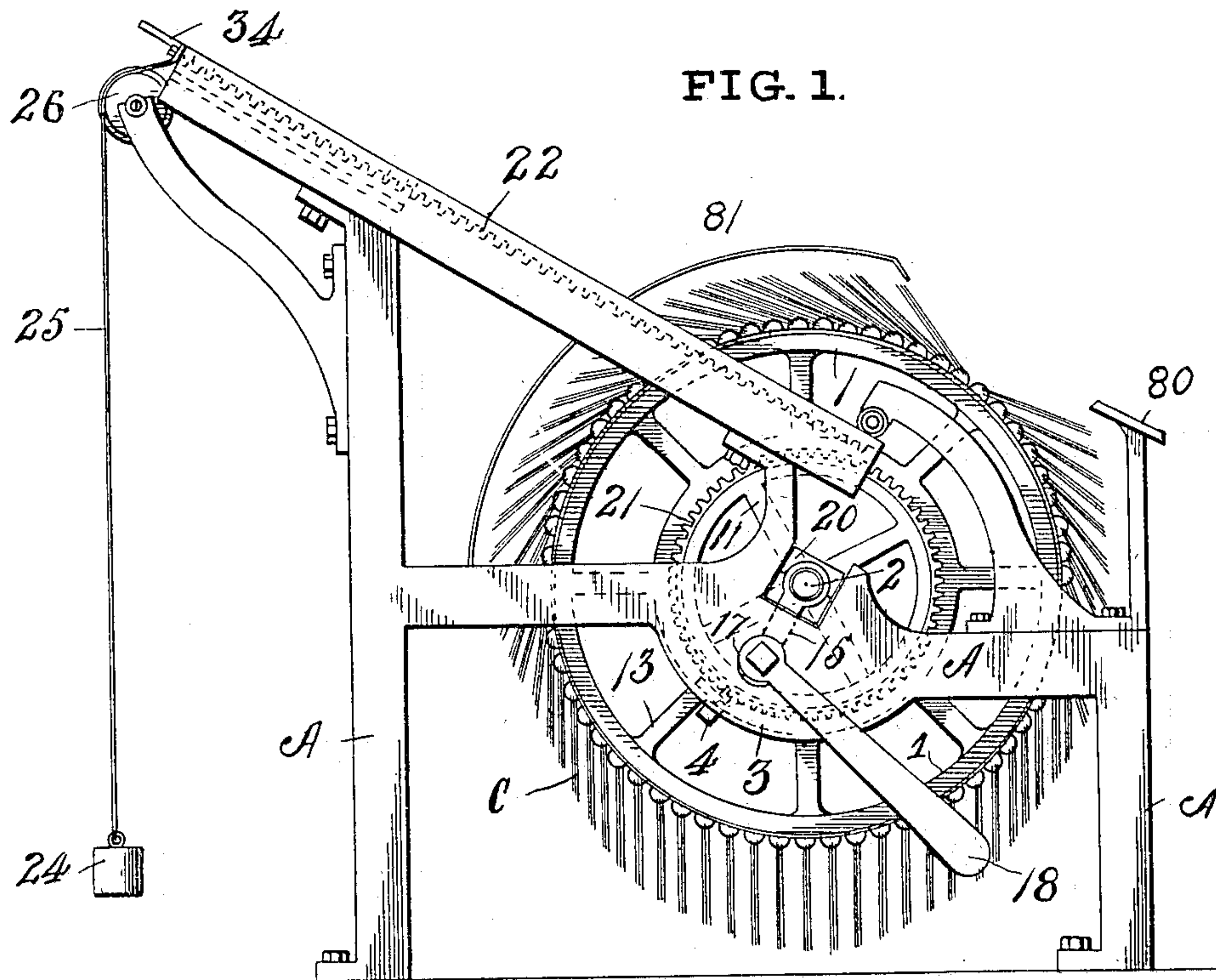


PATENTED MAY 3, 1904.

APPLICATION FILED JUNE 4, 1903.

3 SHEETS—SHEET 1.



Inventor

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Witnesses

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C. HELLER.
EXHIBITIONAL INDEX AND DISPLAY DEVICE.

APPLICATION FILED JUNE 4, 1903.

NO MODEL.

3 SHEETS—SHEET 2.

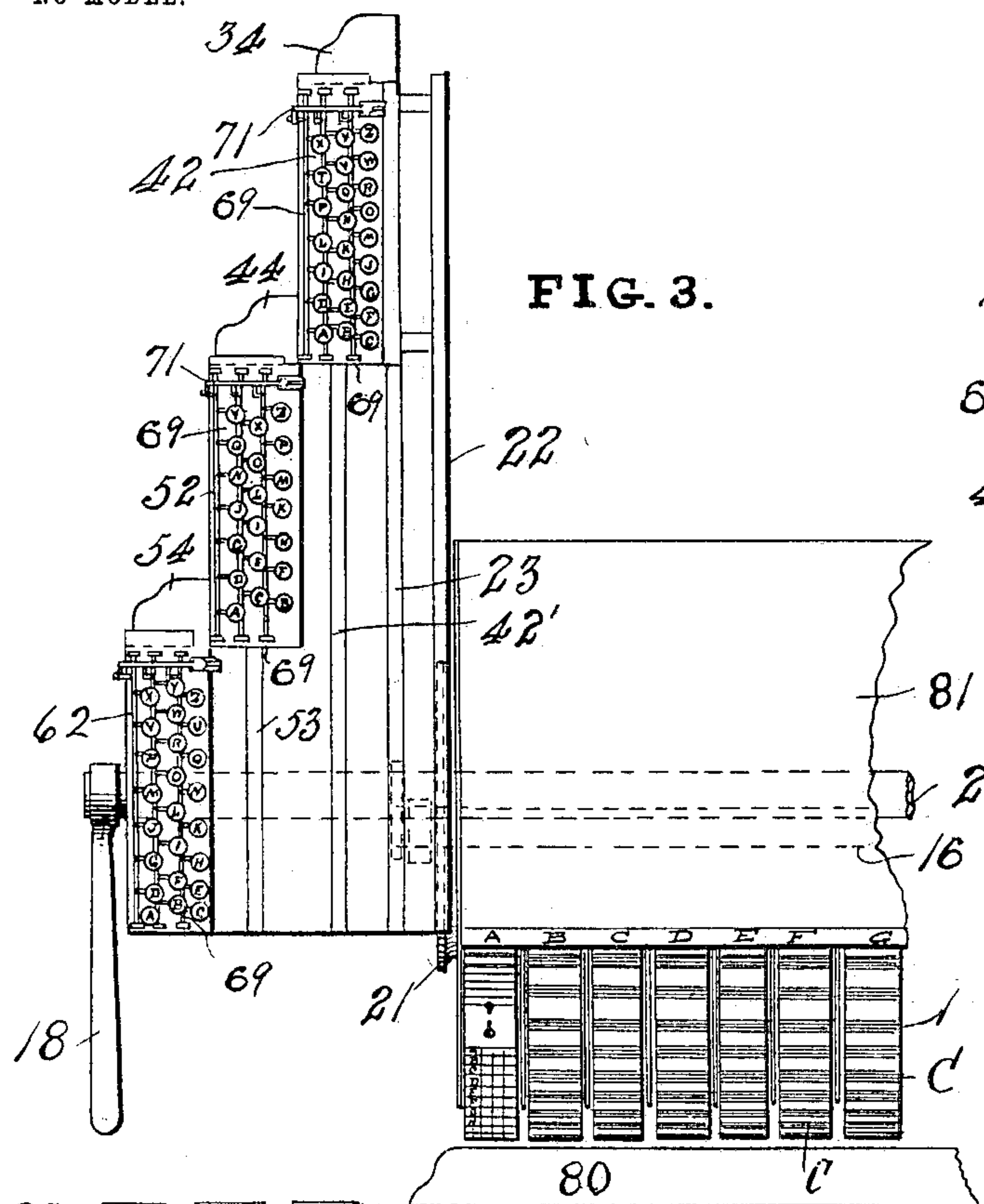


FIG. 5.

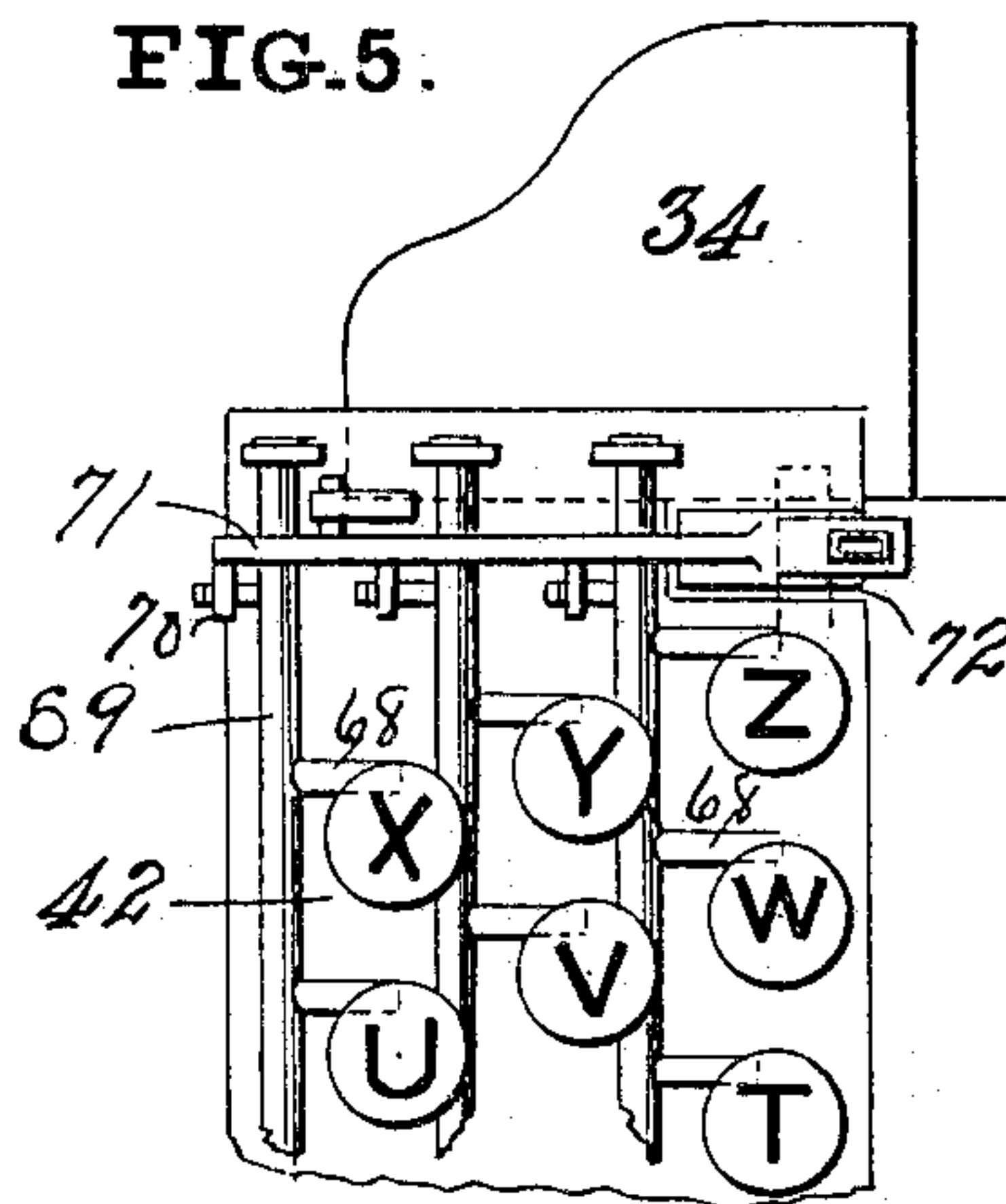


FIG. 6.

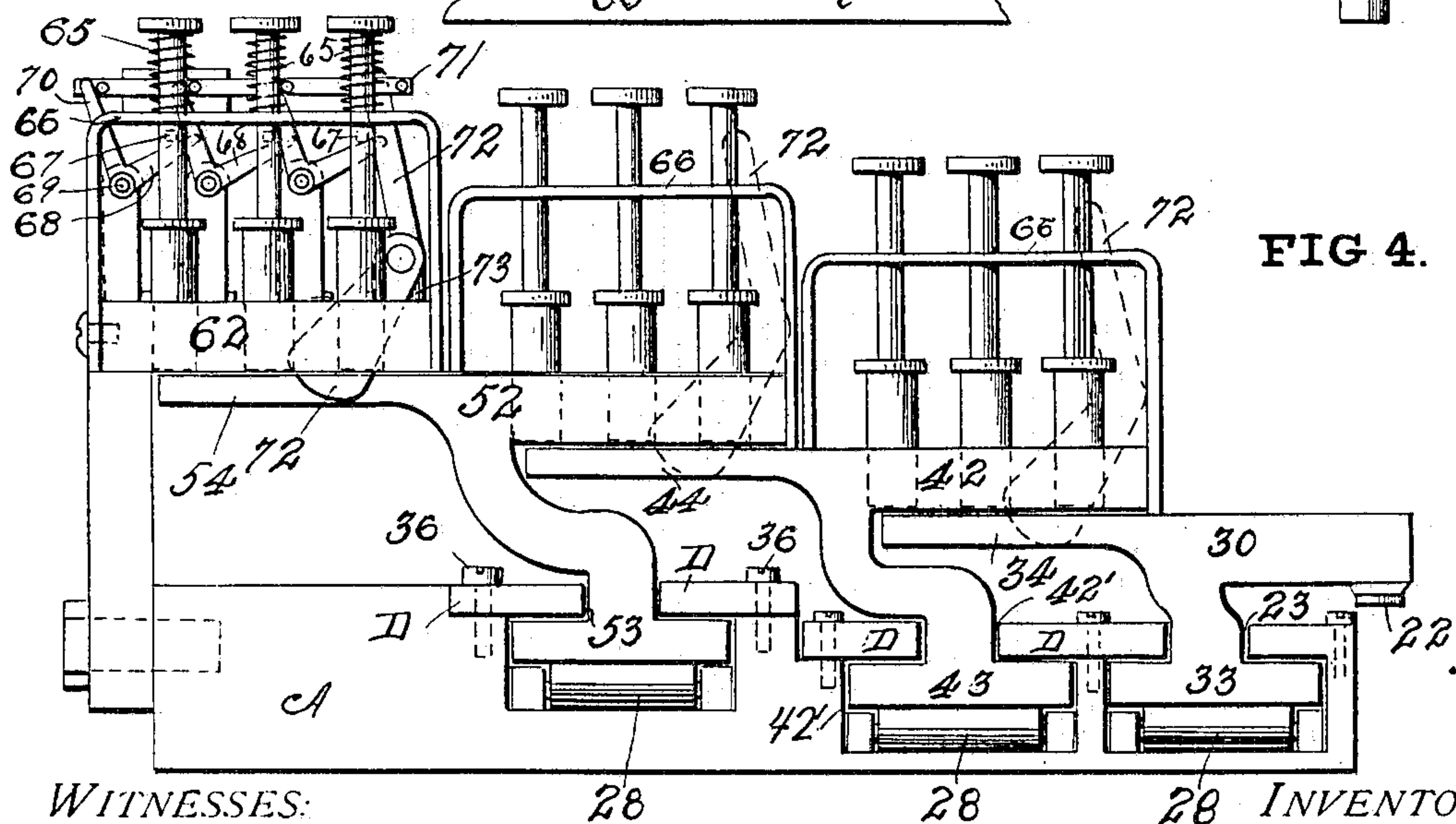
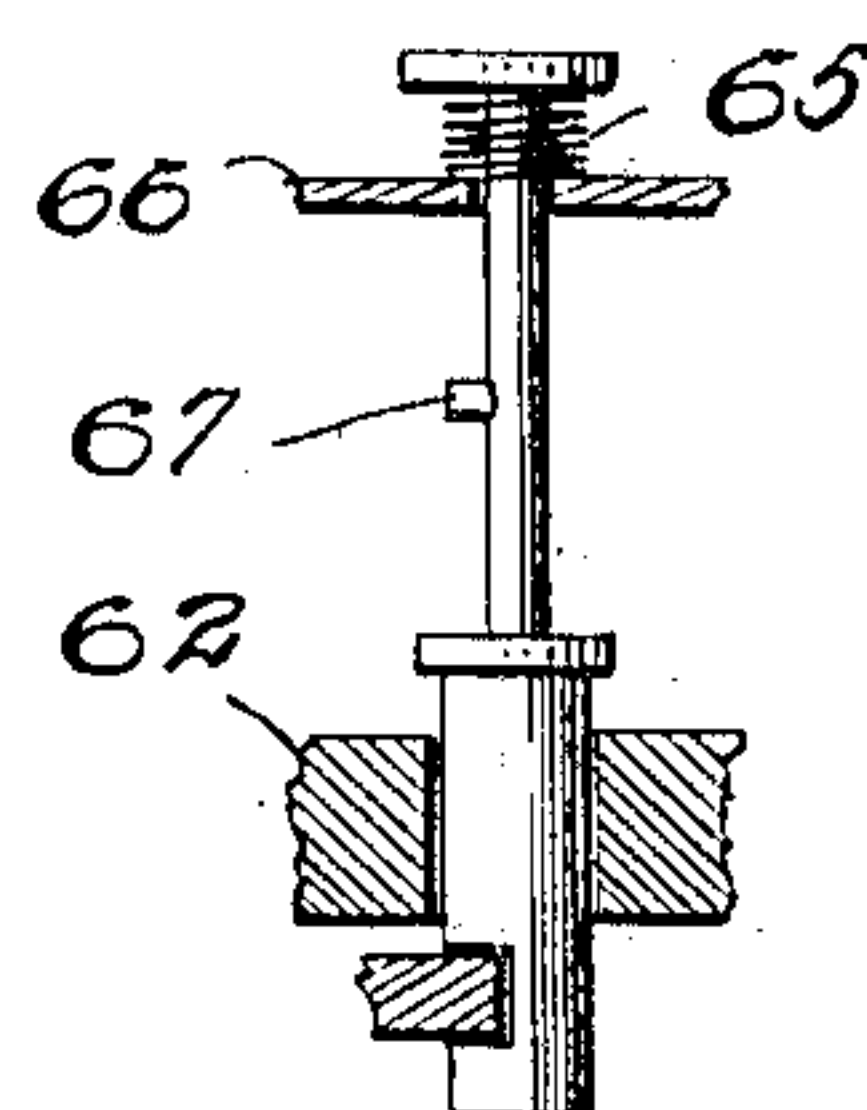


FIG. 4.

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No. 758,916.

PATENTED MAY 3, 1904.

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EXHIBITIONAL INDEX AND DISPLAY DEVICE.

APPLICATION FILED JUNE 4, 1903.

NO MODEL.

3 SHEETS—SHEET 3.

FIG. 7.

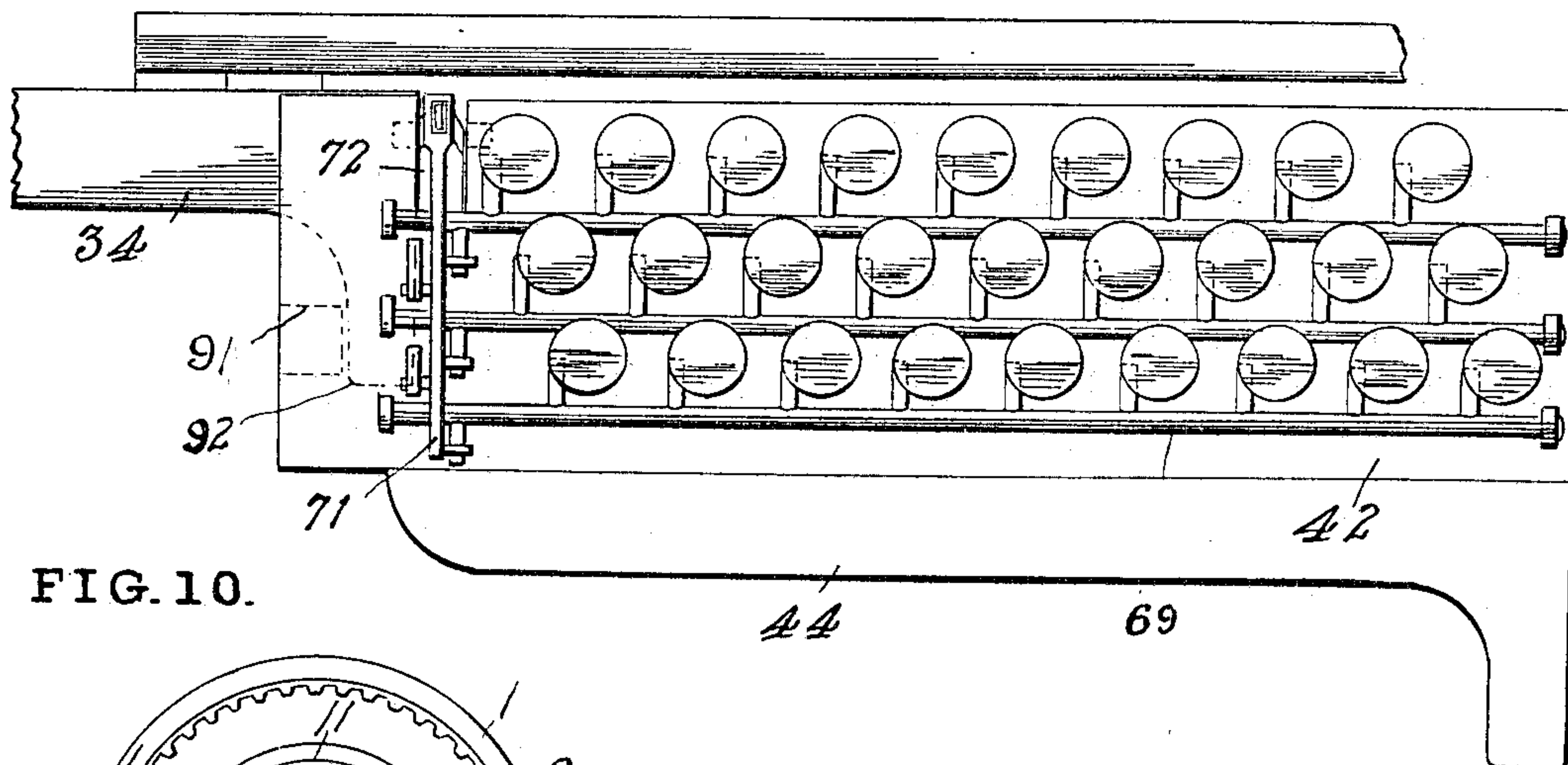


FIG. 10.

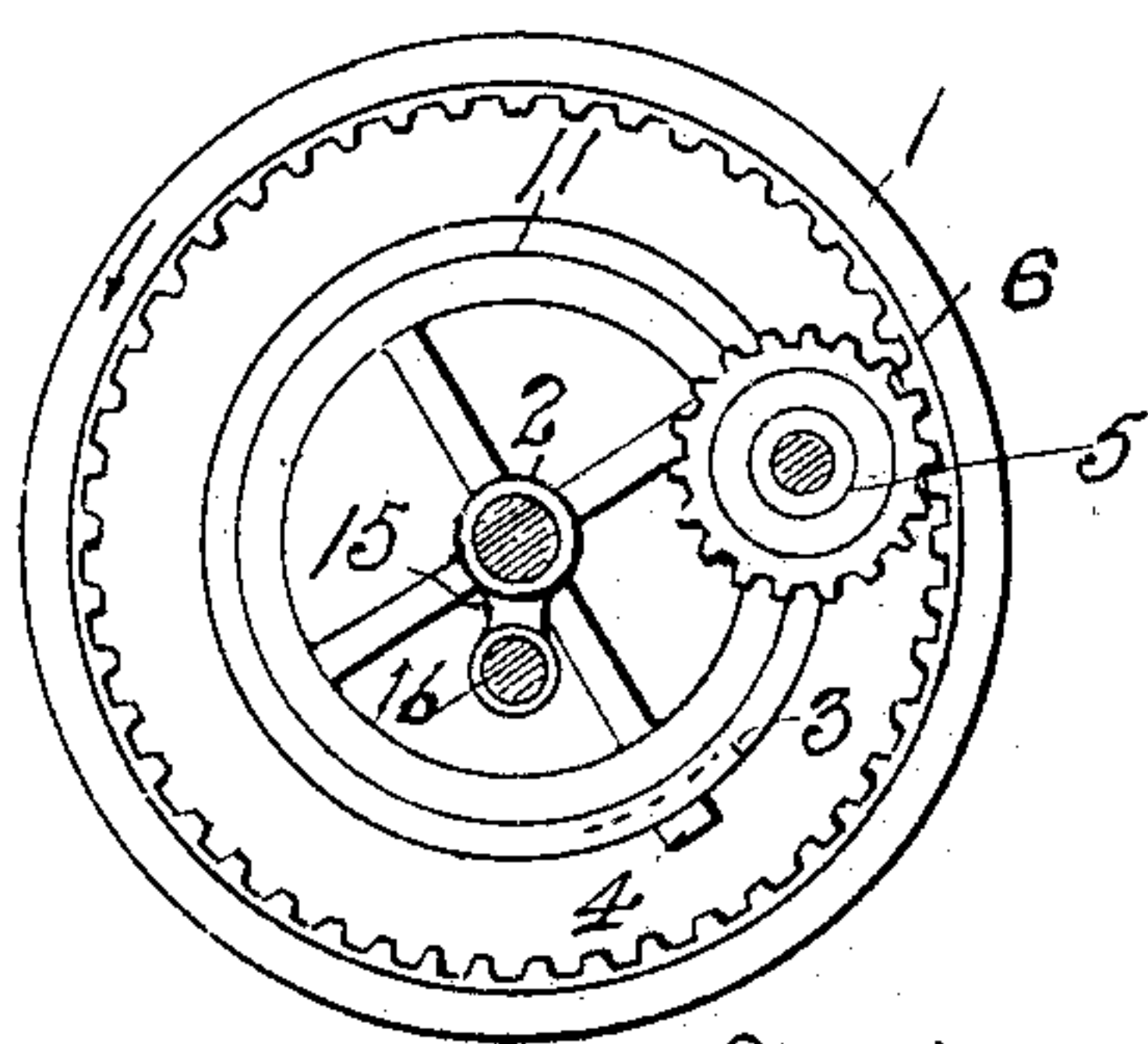


FIG. 8.

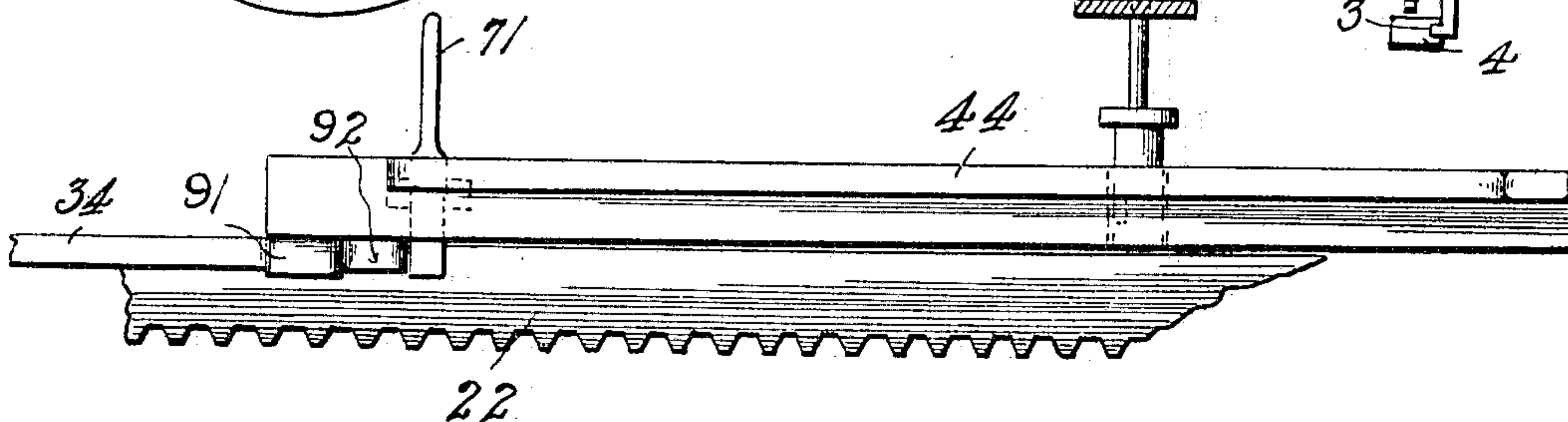


FIG. 11.

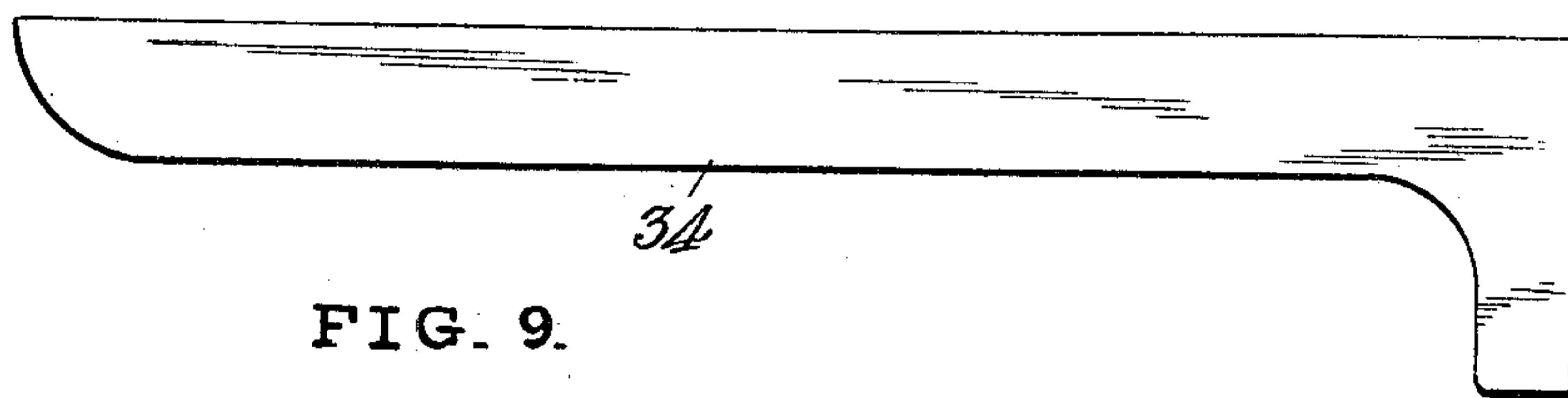
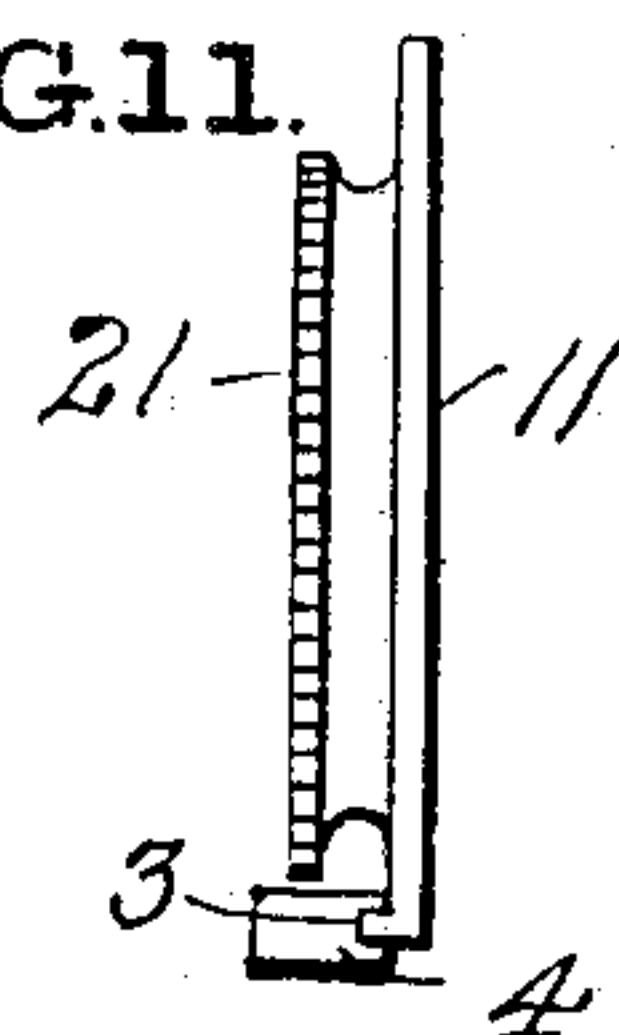


FIG. 9.

Witnesses
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Inventor
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UNITED STATES PATENT OFFICE.

CYRUS HELLER, OF WILLIAMSPORT, PENNSYLVANIA, ASSIGNOR OF TWO-THIRDS TO JAMES A. HELLER AND JOHN L. HELLER, OF WILLIAMSPORT, PENNSYLVANIA.

EXHIBITIONAL INDEX AND DISPLAY DEVICE.

SPECIFICATION forming part of Letters Patent No. 758,916, dated May 3, 1904.

Application filed June 4, 1903. Serial No. 160,057. (No model.)

To all whom it may concern:

Be it known that I, CYRUS HELLER, a citizen of the United States, residing at Williamsport, in the county of Lycoming and State of Pennsylvania, have invented certain new and useful Improvements in Exhibitional Index and Display Devices, of which the following is a specification.

This invention relates to indexes and similar exhibitional devices wherein the index-cards are moved to position to show the entries thereon under the influence of keys on a keyboard.

The object of the invention is to arrange an index of the general character of a card-index at the periphery of a cylinder or roll and to control the movement of the roll by key action. Preferably a plural keyboard is used, so that names can be arranged according to a second or third alphabet or combination of alphabets, and the necessity of looking through a large number of cards or entries to find any particular name is avoided.

The invention consists in certain constructions and combinations of mechanical elements, substantially as herein epitomized in the claims hereto annexed.

Figure 1 is an end elevation of the machine looking from the keyboard end and keyboards being omitted. Fig. 2 is a broken longitudinal section of the cylinder and operating mechanism connected thereto. Fig. 3 is a broken top plan of the cylinder, showing the keyboards. Fig. 4 is a front view of the multiple keyboard and connections. Fig. 5 is a broken plan of part of one keyboard, showing rock-shafts and gate-actuating mechanism. Fig. 6 is a detail side view of a key and partial section of connected mechanism. Fig. 7 is a plan view of a movable keyboard, partly broken away. Fig. 8 is a broken side elevation of rack-bar, showing keyboard connection. Fig. 9 is a plan of keyboard extension, which is shown broken in Fig. 7. Fig. 10 is a detail view illustrating the engagement of the teeth of a pinion with the teeth of the internal geared wheels and also the engagement

of the stop with the cylinder. Fig. 11 is an edge view of a stop, showing its relation to wheel, this view being taken from the front, near the base of the machine, and looking upward and backward.

The index, names, or the like are borne on movable and removable cards arranged round a cylinder-index carrier or supporter for the cards or other articles to be exhibited, as will be explained.

The cylinder 1 is supported on a horizontal shaft 2 and is pressed forward by suitable mechanism, so as to tend to rotate. The cylinder is prevented from rotation by a stop 3 on the cylinder engaging an abutment 4 on the frame, and a mechanism, such as a driving-pinion 5, engaging a rack-gear 6 on the cylinder, tends to rotate the cylinder constantly in one direction.

It is not specially important what mechanism is employed to drive the cylinder. A weight 7, connected by cord 8 to a pulley 9 on the same shaft with pinion 5, is shown; but clockwork mechanism, a coiled spring, or a motor of slight power may be employed. It is only necessary that the cylinder shall be so actuated as to be ready to move forward when free from abutment or detent 4. The pinion 5 engages gear 6 on the cylinder at one side of the center of the cylinder, and the slight upward or downward movement of the cylinder does not disengage the teeth of said gears. The cylinder 1 is not attached directly to shaft 2. A spider 11 at each end of the cylinder is rigid with shaft 2, and outside these spiders a ring of balls or similar bearings 12 forms a support for the end 13 of the cylinder.

The shaft 2 rests on links 15, which links 15 are supported by shaft 16. Shaft 16 has an eccentric 17 near each end and firmly attached, and this eccentric finds a bearing in or on the frame A. Thus the rocking of shaft 16 by means of its hand-lever 18 serves to lift the links 15 and the shaft 2, and shaft 2 raises or lowers its spiders and the cylinder 1 when the shaft 16 is rocked.

The cylinder 1 is guided in its lifting move-

ment by a block 20, (one at each end of shaft 2,) sliding in a suitable notch in the frame.

The lifting of cylinder 1 releases it from stop 4 and at the same time engages a pinion 21 on the cylinder with the teeth of a rack 22, which rack may move in a slideway in the frame, as will be described. The pinion 21 always comes into engagement with the rack 22 at the same place when the cylinder is lifted. When the cylinder is dropped by the rocking of shaft 16 back to normal position, the cylinder goes on and completes a revolution, thus bringing stop 3 again into contact with stop 4, and the parts normally rest in this position.

The keyboard mechanism is best shown in Figs. 3 and 4 and will now be explained. Three keyboards, with banks of keys, are shown, but more or less might be used. The cylinder is divided circumferentially into as many spaces as there are keys on all the keyboards. In the example illustrated seventy-eight spaces should surround the cylinder, each space having mechanism for the attachment of cards C. The cylinder should be long enough to contain about twenty-six cards when an alphabetical index is employed. In an arrangement by numbers or other basic foundation to the index of course the arrangement would correspondingly differ.

The rack 22 slides in a way 23 in the frame or a slideway thereon. The rack is drawn up in the slideway when released from the pinion 21 by a weight 24, attached to a cord 25, which cord is also attached to the rack and runs over pulley 26. The power which drives cylinder 1 is sufficient to overcome weight 24 and lift the same when the cylinder engages the rack-bar 22; but when disengaged the weight draws up the rack-bar and the movable keyboards.

The rack 22 is attached to a bar 30, which bar has a bracket 33, with its edges extending under the edges of the guides or pieces which form the slideway 23. Rolls or other anti-friction devices 28 may be used to render the movement easy in the slideway. The shelf 34, which is rigid with rack-bar 22, extends under the keyboard 42 of the third alphabet.

Keyboard 42 has a bracket 43, extending into a guideway 42' in the frame parallel with the guideway 23, and this keyboard 42 has a shelf 44 exactly corresponding to the shelf 34 of the rack-bar and extending under the next adjacent keyboard.

The two inner keyboards 42 and 52 are duplicates, and board 52 moves in slideway 53, but to a less distance than does the keyboard 42—that is, the rack-bar may slide in its way the length of the three keyboards, the keyboard next the rack may slide the length of two keyboards, the middle keyboard may slide its own length, and the outer keyboard 62 is fixed. A downward projection 91 from

each succeeding keyboard is engaged by the shelf of the keyboard next toward the rack-bar. The movable keyboards are moved upward by the engagement of the shelf with this projection, and the projection on the fixed keyboard serves as a stop to prevent the other keyboards from moving too far under the influence of the weight.

The mechanism to ease friction in the sliding movement of the keyboards may be the same in each instance or any usual antifriction mechanism. For convenience in construction the bars D, which constitute the covers of the slideways, are made removable and held in place by screws 36.

The outer keyboard 62 is firmly secured to the frame at the side of the slideways by any suitable holding means. For convenience of adjustment the outer keyboard should, however, be removable.

In Fig. 3 the keys and rock-shafts are shown on the keyboard on a small scale. In Fig. 4 only the left-hand keyboard is shown with rock-shafts and springs, parts being omitted from the other keyboards for convenience of illustration. Each key is a plunger, arranged so that its lower end may pass entirely through a hole in the keyboard and project below said board. The keys are normally held up by springs 65, resting on key-guides 66, attached to the keyboard. Each key has a pin 67 projecting at one side thereof and in position to engage a lever 68 on the rock-shaft 69 whenever the key is depressed.

Rock-shafts 69 are held in suitable bearings and extend alongside a range of keys. A lever 70 on the rock-shaft engages with a slide 71 near the end of the keyboard. Slide 71 is supported in suitable guideways and engages with a gate 72, which gate is pivoted to a bracket 73 on the keyboard. Normally each gate 72 projects below the end of its keyboard, as in Fig. 4. Thus gate 72 on the fixed keyboard 62 projects below said board, as shown in Fig. 4, and prevents keyboard 52 from moving down in its slideway; but when any key on board 62 is depressed the act of depressing it rocks one of the shafts 69 and swings the gate 72, so that its lower end moves away from the front of shelf 54 and lets the keyboard 52 slide down in its guideway. The force of the cylinder, rack, and keyboard connections impel this movement, as explained, and overcome the resistance of weight 24. The key, which thus serves to release the gate holding the neighboring keyboard, itself projects below its own keyboard and becomes a stop for its neighboring keyboard. Fig. 6 shows in detail how the bracket on a keyboard may engage a notch in the key of a neighboring keyboard and hold the key depressed after it is once depressed until it is released by the depression of cylinder 1 to set all the mechanism back to starting position.

In the illustration I have endeavored to simplify constructions, and I have not expected to show working dimensions of parts, but only to indicate the general principles of constructions. Mechanical skill can make many changes without departing from the general principles above outlined.

I do not here attempt to describe mechanism for holding the index-cards to the face of the cylinder. Such means are common in this art.

By preference I attach a hand-rest 80 to the frame in front of the cylinder and cover the rear part of the cylinder with a shield or casing 81. The face of the cylinder is arranged to support the index-cards in well-known manner, and the entries may be made on the cards either before or after their attachment to the cylinder and on either or both sides thereof. The position of the cards on the cylinder causes them to hang suspended from the lower side of the cylinder and to incline either rearward or forward on the upper side of the cylinder, the line where the cards drop over being the line for inspection, as is usual.

The operation of the machine is as follows: Assuming that the operator desires to inspect a particular name properly arranged among the cards on the cylinder—for instance, the name "Heller." He first lifts the cylinder to starting position by means of lever 18 and connections. Then the operator will depress the key H in the fixed keyboard. Immediately the gate at the end of the keyboard 62 is lifted, and the cylinder 1 begins to rotate, drawing the rack-bar 22, and by this means drawing down both of the inner keyboards until keyboard 52 is stopped by its bracket 54 engaging the depressed key H, when the mechanism comes to a stop. The operator then depresses a key E on the keyboard 52. This releases the gate holding the keyboard 42 and permits this keyboard to move down until it is stopped by the key, when the machine comes to rest. The operator then depresses the key L in board 42, and the sliding rack is in like manner released, and the machine moves to its final position, which brings the cards in the peripheral space which contains all names beginning with the letters "HEL" to position for inspection at the front of the machine. The fourth letter in the name being "L" he now directs his attention to cards bunched under that letter in the alphabet running lengthwise of the cylinder where all names having the first four letters "HELL" should be found. When the inspection has been made, the hand-lever 18 is rocked back, lowering cylinder 1 and releasing it from rack 22. The cylinder then rotates under the influence of its driving mechanism until its stop 3 engages the abutment 4 on the frame, when the cylinder comes to rest. Simultaneously the

weight 24 draws back the bar 22 and the keyboards connected thereto, the depressed keys are lifted by their springs, and the gates which hold the keyboards from sliding down their guideways fall to their holding position.

Suitable buffers may be provided to take up the jar of stopping, such as are common in the general mechanism of the character described. The same is true of the stops to limit the movement of keyboards in the slideway.

The general principle on which the machine with three keyboards operates may be stated as follows: I take a certain space and divide it into twenty-six equal spaces, the number corresponding to the number of letters in the alphabet. Beginning at one end I take the alphabet and designate the first space by "A," the second by "b," following with the balance of the letters in the regular order they occupy in the alphabet. Thus "h" designates the eighth, "e" the fifth, and "l" the twelfth space, &c., starting from the front or "a" space. Now by triplicating this arrangement and letting "a" of the second rest against "z" or last space of the first and "a" of the third rest against "z" of the second we have seventy-eight spaces from the first, inclusive, covered by three alphabets. Now by depressing key "h" I bring the first space or "a" in the second alphabet to the eighth space from the beginning of the first alphabet. By depressing "e" of the second alphabet I bring "a" of the third alphabet to the fifth space of the second or the thirteenth of the first. Depressing next the "l" key in the third alphabet, I bring the rack to the twelfth space of the third alphabet or to the twenty-fifth ($8+5+12=25$) space from the first space of the combined alphabets. This has moved the cylinder around to within twenty-five of its peripheral spaces from its starting-point or a distance of fifty-two of its peripheral spaces. By a similar operation the keys H A L would move it to the twenty-first space from its starting-point, ($8+1+12=21$.) Now the only difference between "H A L" and "H E L" is the middle letters "A" and "E," and their relative positions to "A" or first letter of the alphabet produce the difference in the results twenty-five and twenty-one. Thus a combination of spaces marked by the letters of the three alphabets and manipulated by keys standing at the entrance of each one of the spaces serves to distribute the names among the seventy-eight alphabets running lengthwise of the cylinder. In other words, each circumferential space on the cylinder does not correspond to a letter in the alphabet, but to a combination of three letters of the alphabet, and yet there are seventy-eight spaces, because there are seventy-eight possible combinations.

What I claim is—

1. In an exhibitional device, a cylinder car-

rying the articles to be displayed, means tending to rotate said cylinder continuously in one direction, a stop by which said cylinder is held, means for releasing said cylinder from the stop, a sliding piece engaging the cylinder and controlling its rotation, and a weight operating to move said sliding piece when permitted to do so.

2. In an exhibitional device, a cylinder carrying the articles to be displayed, a horizontal shaft supporting said cylinder, an abutment on the frame and a stop on the cylinder in position to engage said abutment, and means for lifting the shaft and cylinder so that the stop may ride over the abutment, all combined.

3. In an exhibitional device, the combination of a cylinder, supporting-shaft, means for rotating the cylinder, a stop for preventing such rotation, means for releasing said stop, a movable keyboard, and means for actuating said keyboard by the cylinder when the stop is released.

4. In an exhibitional device, the combination of a rotating cylinder, a shaft within the same having spiders on which the cylinder turns, a rock-shaft parallel with the first shaft, links connecting the two shafts, and eccentrics on the rock-shaft engaging the frame to lift the first shaft and cylinder.

5. In an exhibitional device, the combination of the main cylinder, its supporting-shaft having bearing-blocks thereon, the notched frame in which said blocks rest, and a rock-shaft having eccentrics supported on the frame, and links from the rock-shaft supporting the main shaft.

6. In an exhibitional device, the combination of a cylinder, a pinion thereon, a sliding rack which may engage with or disengage from said pinion, and a movable keyboard actuated by said rack.

7. In a machine as described, a cylinder and driving means tending to rotate the cylinder continuously in one direction, a stop by which the rotation of the cylinder is prevented, means for disengaging the cylinder from the stop, and a plurality of keyboards, each keyboard having keys by which the stopping position of the cylinder may be controlled, one of said keyboards being movable and controlled in its position by keys on the other keyboard.

8. In an exhibitional device, the combination of a cylinder and means for rotating it, of a fixed keyboard, a movable keyboard controlled by the keys of the fixed keyboard, and means by which the keys of the movable keyboard control the position of said cylinder.

9. In an index mechanism, the combination with the exhibit-supporter, of a plurality of keyboards, one keyboard controlling the position of another, and all controlling the exhibitional position of the supporter.

10. In an index mechanism, the combination

of the index-carrier with a fixed keyboard and a sliding keyboard, the fixed keyboard controlling the position of the sliding keyboard, and this in turn controlling the position of the index-carrier.

11. In an index device, the combination of a cylinder having circumferential spaces equal in number to the keys on a plurality of keyboards, a plurality of keyboards, and connecting mechanism from the keyboards to the cylinder, whereby the position of the cylinder is controlled by the joint action of the keys on the separate keyboards.

12. In an index device, the combination of a rotating cylinder and means for driving it, a keyboard-slideway, a plurality of keyboards sliding in said way, means for holding the keyboards by the key action, and operating connections from the keyboards to the said cylinder.

13. In an index device, the combination of a cylinder, a keyboard-slideway, a fixed and movable keyboard on said slideway, key mechanism on the fixed keyboard by which the position of the movable keyboard is controlled, and key mechanism on the movable keyboard by which the position of the said cylinder is controlled.

14. In an index device, a fixed keyboard having a gate and a series of keys each acting to lift said gate, a sliding keyboard held in its slideway either by the gate or by a key of the fixed keyboard, an exhibitional cylinder, and connections from the movable keyboard to said cylinder to determine its rotative position.

15. In an index device, a rotating cylinder, a movable rack connecting to said cylinder as described, a slideway for said rack, a keyboard connected to said rack and sliding in the slideway, key mechanism controlling the position of said keyboard, and means for moving the keyboard automatically in the slideway.

16. The combination with the inclined slideway having guide-passages for the keyboards, of movable keyboards sliding in said way, antifriction devices in the guide-passages, and automatic means for moving the keyboards in one direction.

17. The combination with the inclined slideway, of a fixed and a movable keyboard thereon, a rack connected to the movable keyboard and of a length equal to that of the movable and fixed keyboard, and the exhibiting cylinder adjustably connected to said rack.

18. The combination with the inclined slideway, of a fixed keyboard, a movable keyboard having a shelf underlapping said fixed keyboard, keys on the fixed keyboard in position to engage said shelf, a movable rack underlapping the movable keyboard, and keys on said movable keyboard acting as stops for the rack.

19. The combination with a rotatable wheel carrying a sequence of exhibitional devices,

arranged according to a series, of means tend-
ing to rotate said cylinder continuously in one
direction, a stop for the cylinder, means in-
dependent of the keyboard for releasing the
5 cylinder from said stop, and a keyboard hav-
ing keys connected to and controlling the
stopping position of said cylinder.

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

CYRUS HELLER.

Witnesses:

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B. BERNDT.