

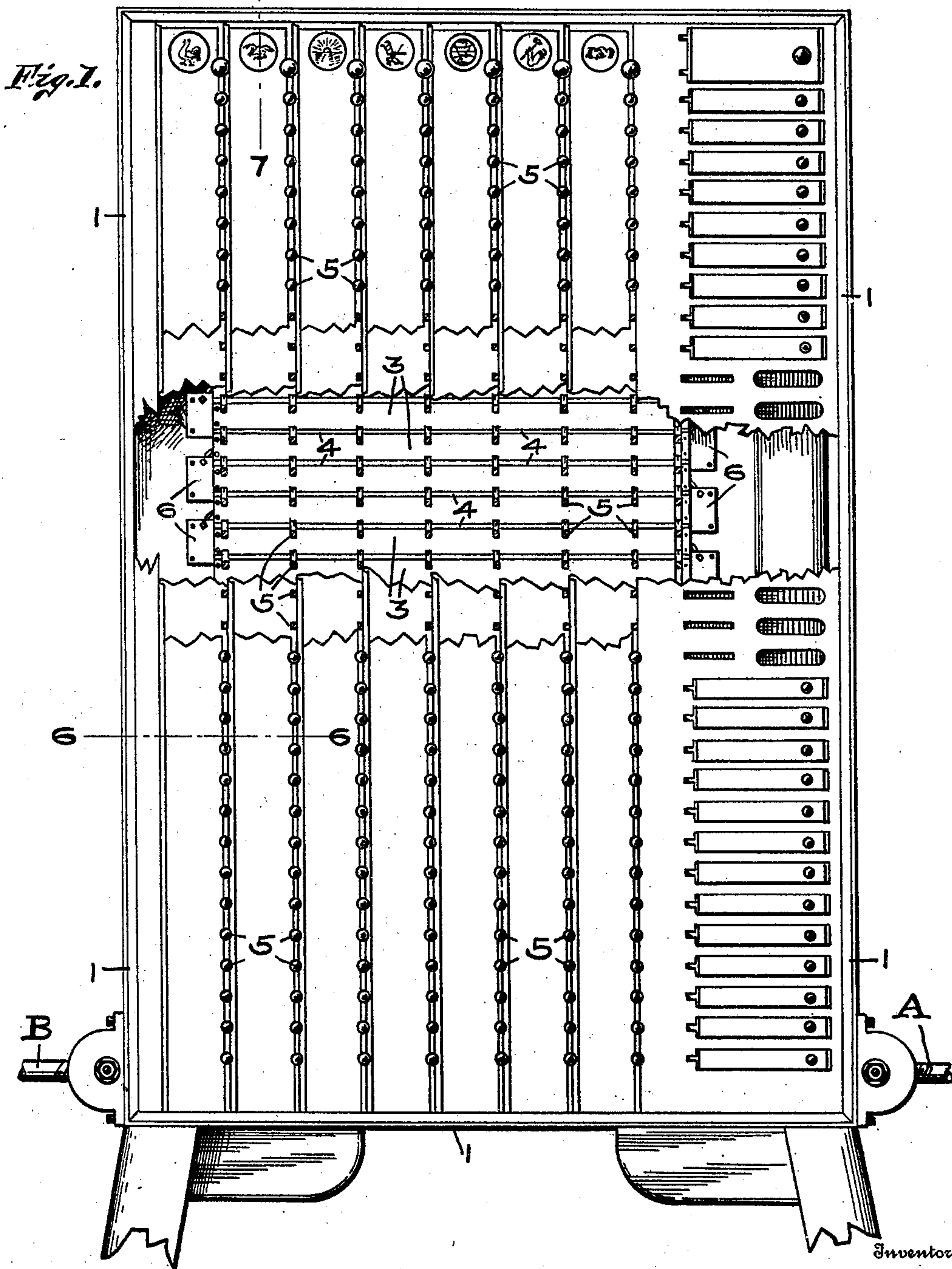
No. 819,026.

PATENTED APR. 24, 1906.

W. L. SANDAGE.  
INTERLOCK MECHANISM FOR VOTING MACHINES.

APPLICATION FILED DEC. 8, 1903.

5 SHEETS—SHEET 1.



Witnesses

D. W. Snyder  
E. W. Spencer.

William L. Sandage,

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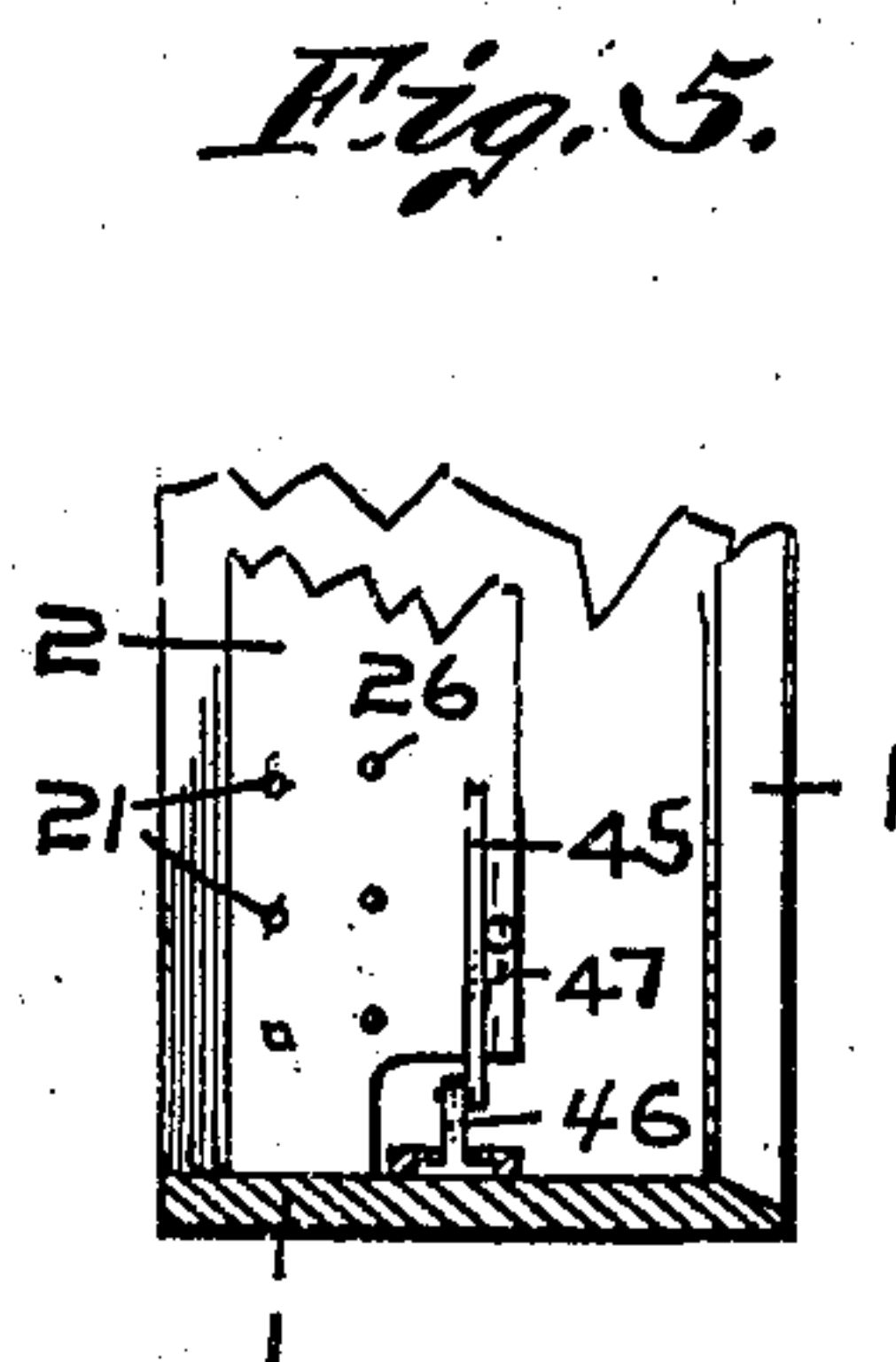
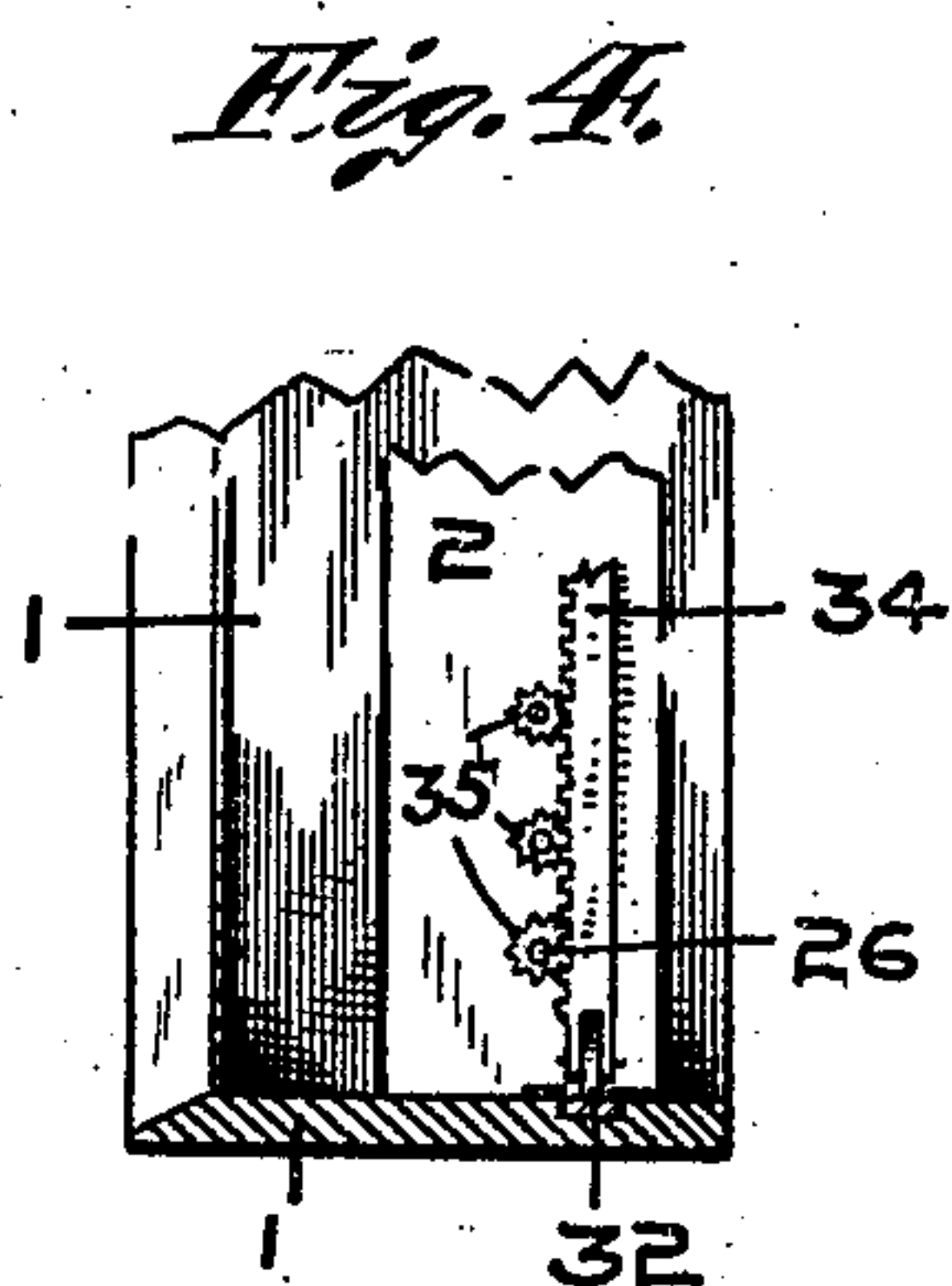
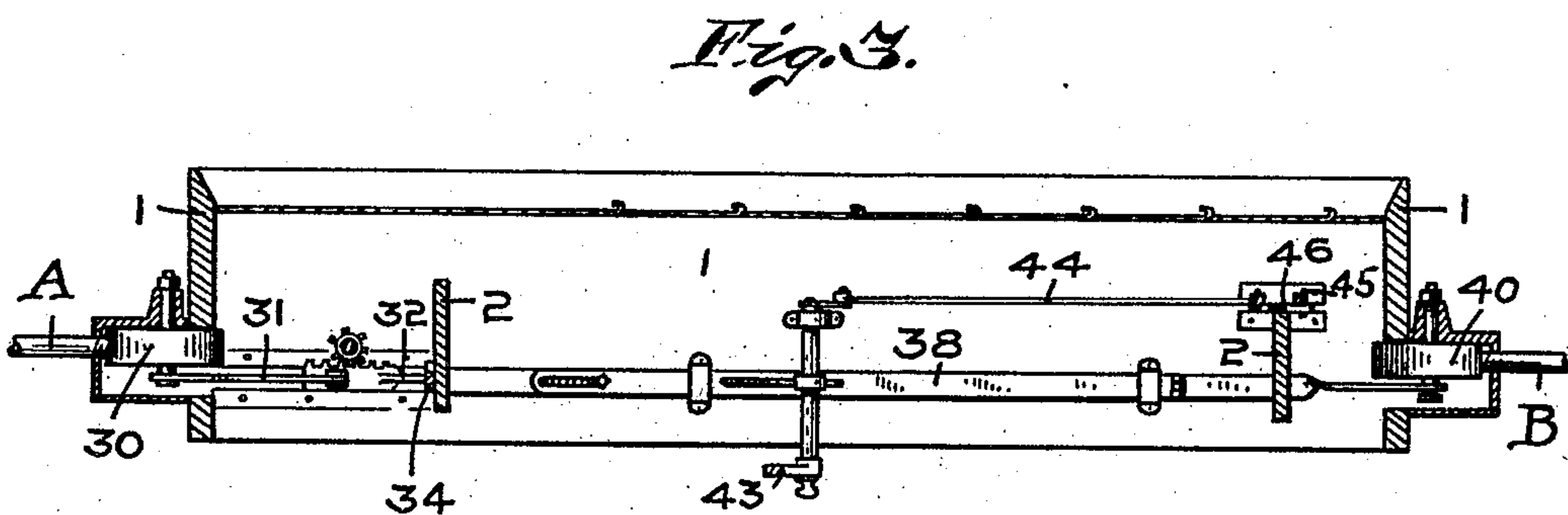
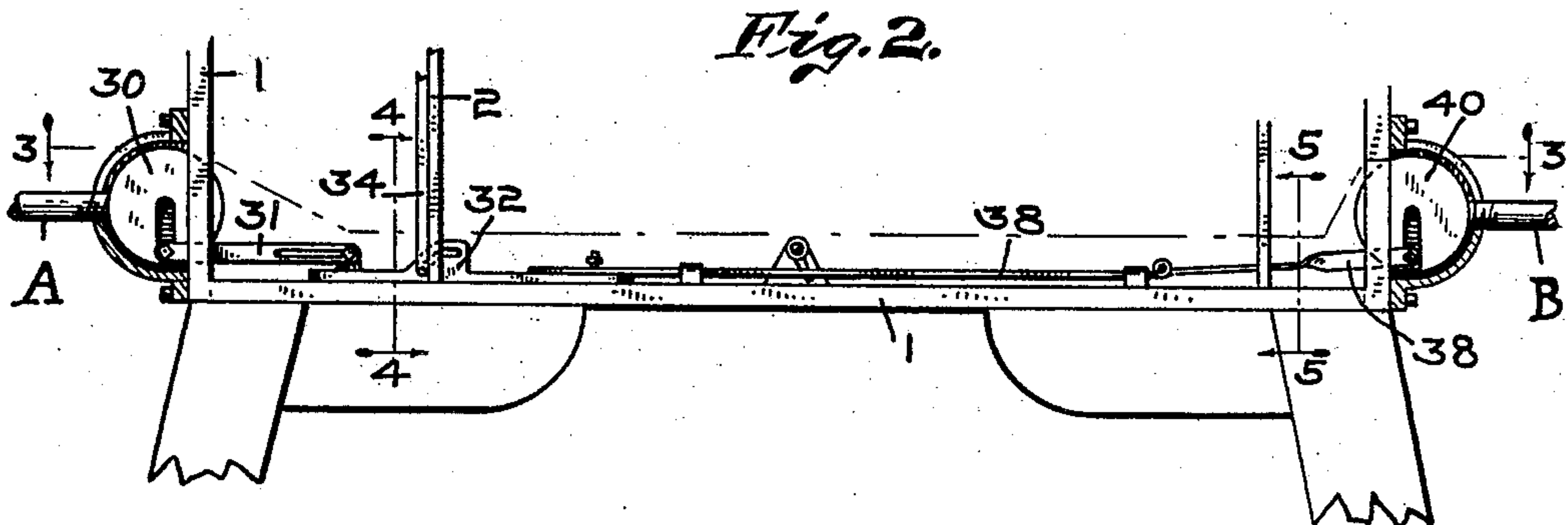
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5 SHEETS—SHEET 2.



**Witnesses**

Witnesses  
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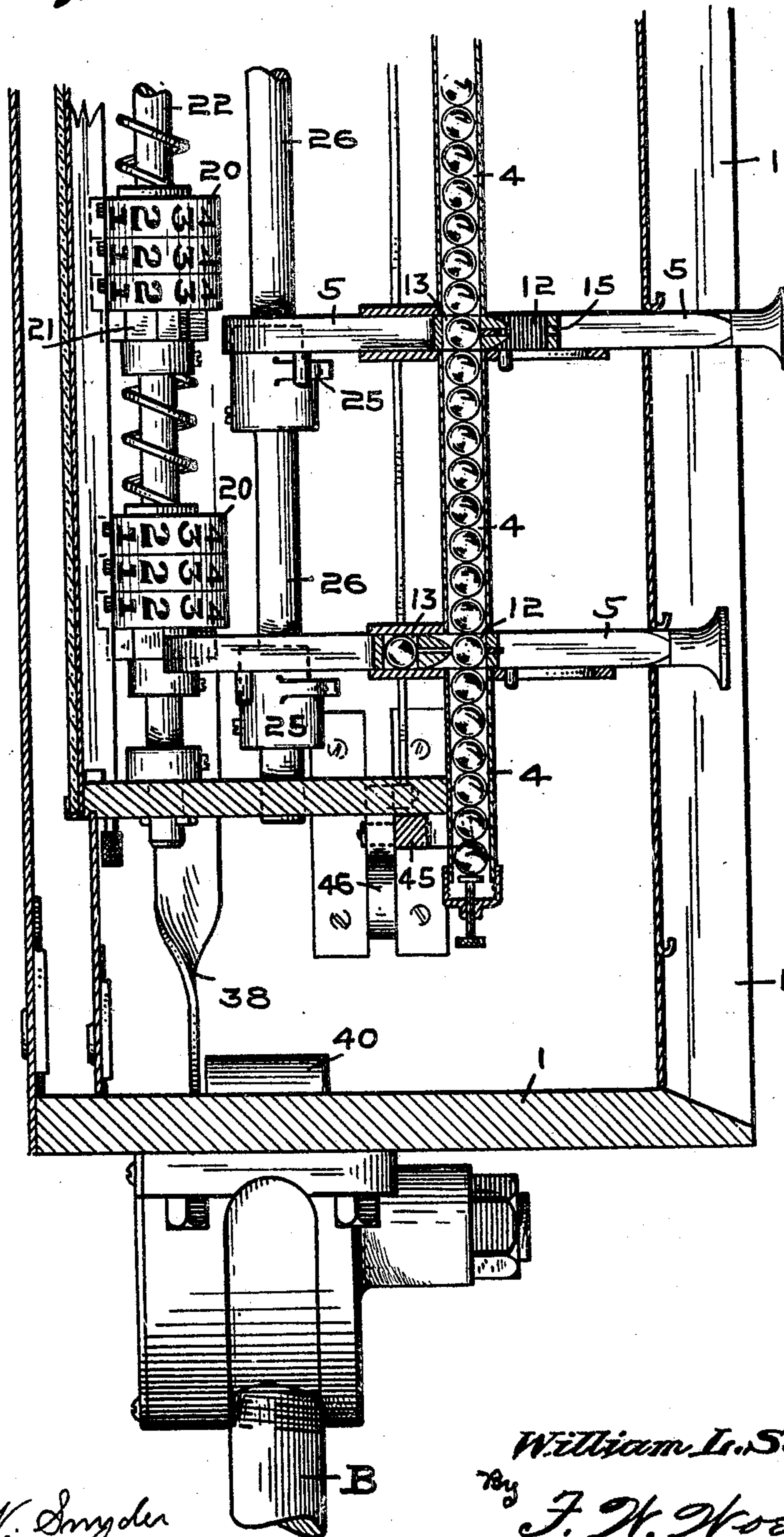
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5 SHEETS—SHEET 3.

*Fig. 6.*



Witnesses

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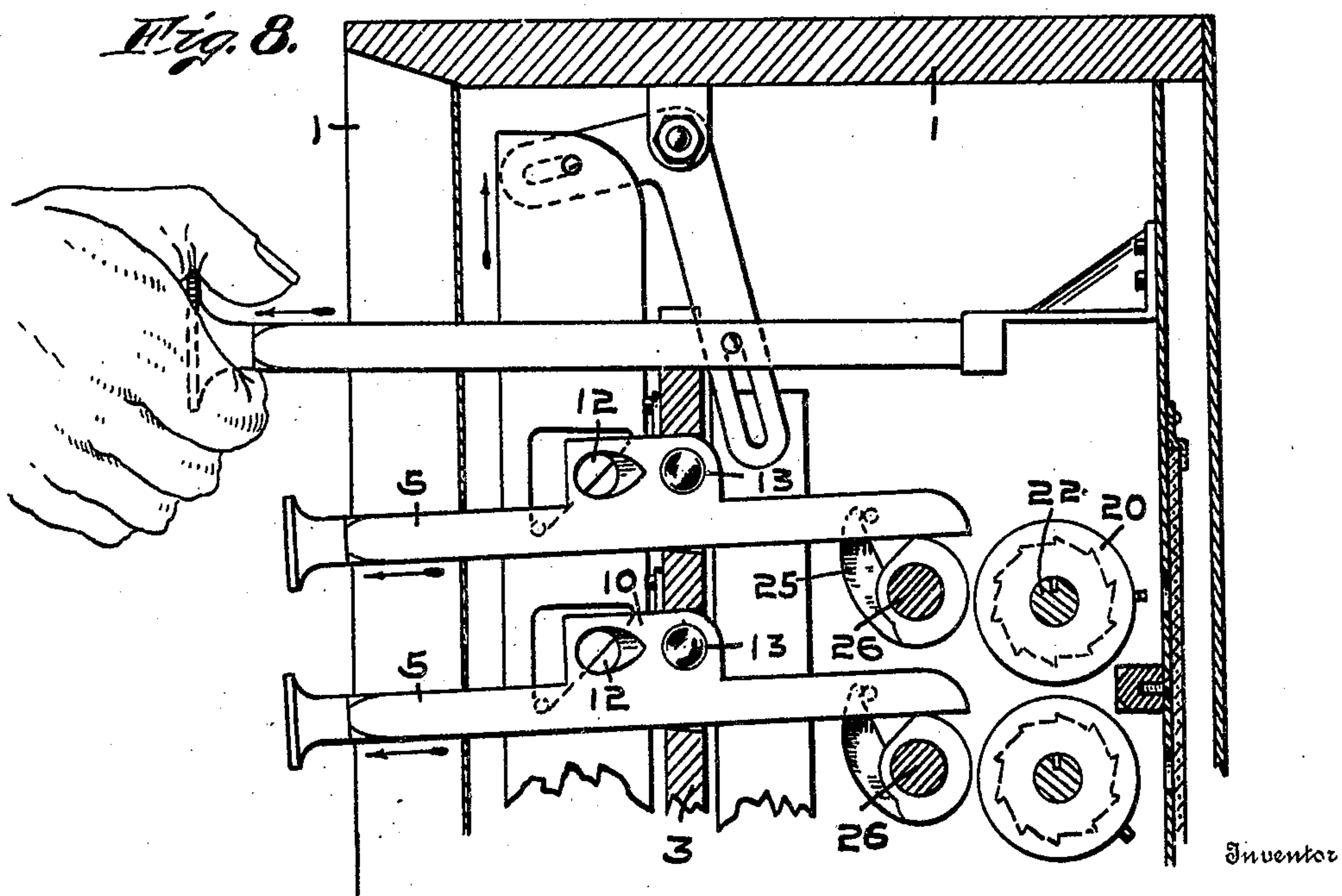
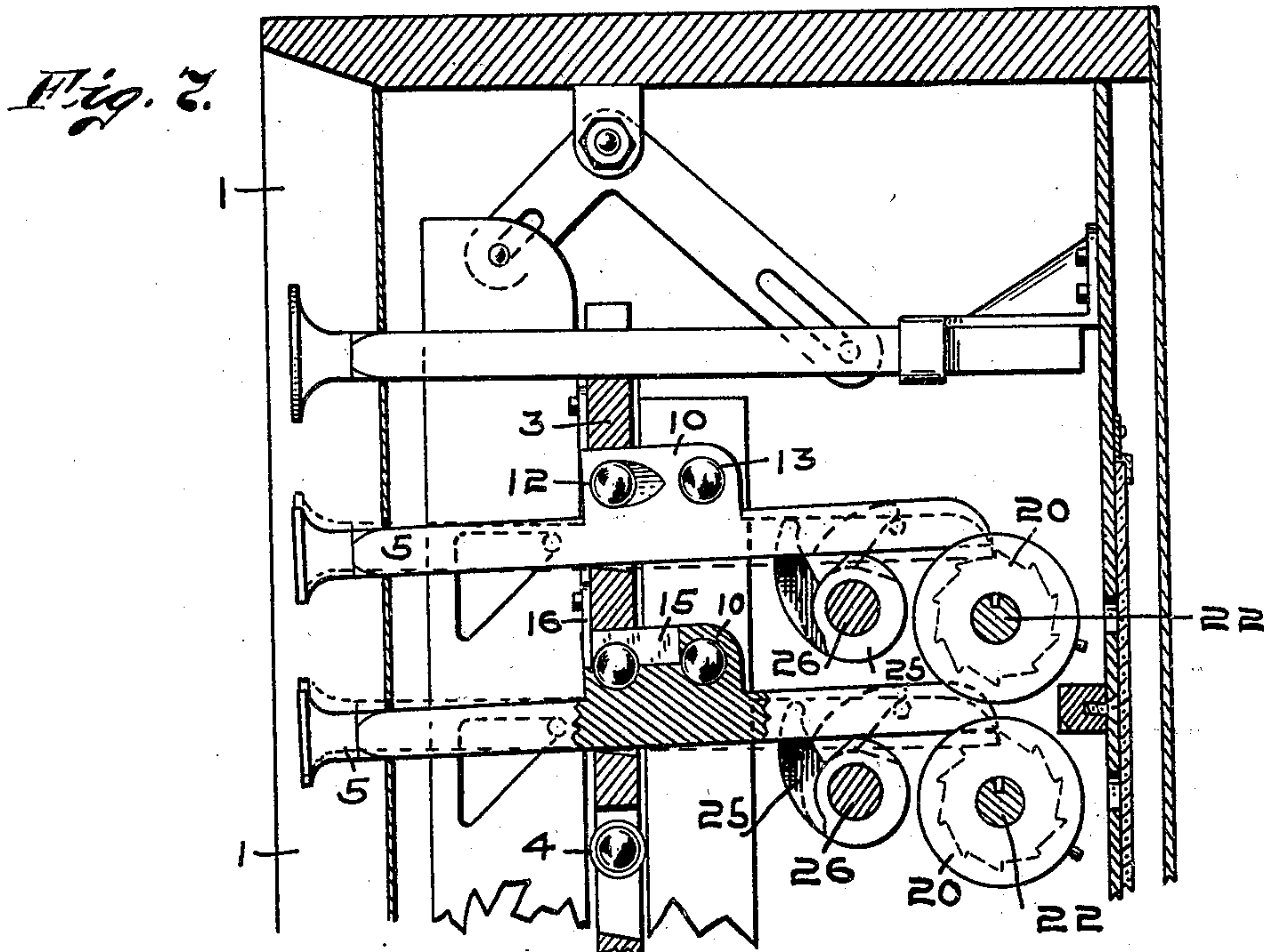
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5 SHEETS—SHEET 4.



Witnesses

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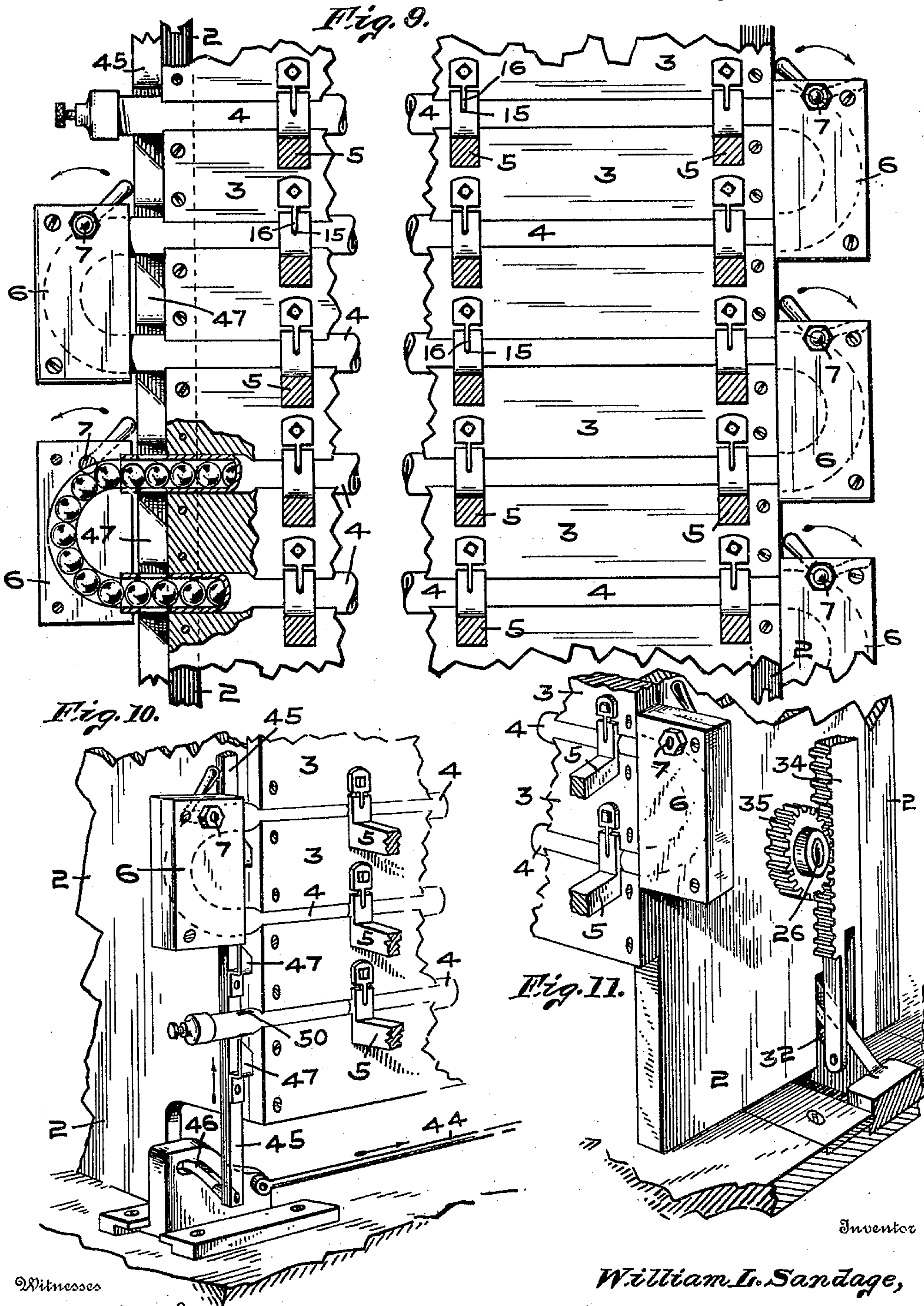
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APPLICATION FILED DEC. 8, 1903.

5 SHEETS—SHEET 5.



Witnesses

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# UNITED STATES PATENT OFFICE.

WILLIAM L. SANDAGE, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO THE  
NATIONAL VOTING MACHINE COMPANY, OF INDIANAPOLIS, INDIANA,  
A CORPORATION OF INDIANA.

## INTERLOCK MECHANISM FOR VOTING-MACHINES.

No. 819,026.

Specification of Letters Patent.

Patented April 24, 1906.

Original application filed April 10, 1903, Serial No. 152,005. Divided and this application filed December 8, 1903. Serial No. 184,280.

*To all whom it may concern:*

Be it known that I, WILLIAM L. SANDAGE, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Interlock Mechanism for Voting-Machines, of which the following is a specification.

This invention relates to voting-machines, being a division of my application, filed April 10, 1903, Serial No. 152,005, and relates more particularly to the interlock or key-arrester mechanism comprising a plurality of tube-sections the ends of which are suitably united, so that communication may be established or destroyed between them when desired, portions of the tube-sections being fixed and other portions being movably mounted and terminating in keys, the keys being provided with pluralities of apertures which may be moved into or out of alinement with the fixed sections of the tubes, series of key-arrester devices within the fixed sections, and similar devices carried in the movable sections, so that the latter devices may be moved into or out of alinement with those in the fixed sections, thereby regulating the number of movable sections that may be operated.

There are other features consisting in the construction and arrangement of parts of such a device whereby the advantages sought are attained, and a device embodying my said invention will now be fully described, and the novel features thereof pointed out in the claims.

Referring to the accompanying drawings, which are made a part hereof, and on which similar characters of reference indicate similar parts, Figure 1 is a front elevation of a voting-machine, showing the position occupied by the tube-sections which contain the key-arrester devices. Fig. 2 is a rear and internal view of the lower portion of the voting-machine in which the mechanism for automatically operating the movable sections of the tubes is disclosed. Fig. 3 is a plan view of the construction as seen from the dotted line 3 3 in Fig. 2. Fig. 4 is a fragmentary detail view as seen from the dotted line 4 4 in Fig. 2. Fig. 5 is a fragmentary detail view as seen from the dotted line 5 5 in Fig. 2. Fig. 6 is a fragmentary horizontal sectional detail view, on an enlarged scale, through one end of a tube-section as seen from the dotted line 6 6 in Fig. 1. Fig. 7 is a detail

view, in vertical section, of the upper end of the machine and shows the relationship of the movable and fixed sections of the tube as seen from the dotted line 7 7 in Fig. 1. Fig. 8 is a view similar to Fig. 7, except that it shows the various parts operated. Fig. 9 is a fragmentary detail view in elevation of both ends of the tube-sections which contain the key-arrester devices and in which the intermediate portion of the structure is broken away. This figure also shows the means for establishing or destroying communication between the various tube-sections. Fig. 10 is a fragmentary detail perspective view of the mechanism for regulating the number of keys that may be operated. Fig. 11 is a fragmentary detail perspective view of the mechanism for automatically restoring the movable tube-sections or keys to normal position.

In the drawings, 1 is the casing for the machine.

2 constitutes the division-walls that extend vertically within and are secured to the frame 1. A series of bars 3, provided with grooved edges, are secured to the inner division-walls 2 in any suitable manner. Lying within the grooved edges of the bars 3 are the tube-sections 4. These sections extend from one end of the bars 3 to the other and form the races for the balls. Each of the tube-sections 4 is cut at intervals by the movable and transversely-mounted sections that help to form the sections 4. These movable sections terminate in keys 5, so that they may be operated. The repeated cutting of the tube-sections for admitting the transverse keys 5 virtually reduces the tube-sections 4 into lesser sections, which, however, will hereinafter be known as the "sections" 4. The tube-sections 4 are connected with one another at the ends by means of the plates 6, which are provided with semicircular races that register with the ends of the sections 4, so that communication is established between them. The communication between the tube-sections 4, however, may be destroyed at will by means of the revolving pins 7, that pass transversely through the plates 6 and pierce the races therein. The pins 7 are provided with the notches 8, which correspond with the curvature of the races, so that when the notches are turned to register with the races uninterrupted communication is established between the tube-sections 4 and withal creating a tube unit comprising



said tube-sections, and turning the pins in the opposite direction removes the notches from the races and destroys both the tube unit and the communication between the tube-sections 4. The two positions assumed by the pins 7 are shown in Fig. 9 of the drawings. The object for establishing and destroying the communication between the tube-sections 4 will be hereinafter described.

The keys 5 are of peculiar construction, being provided with the shoulders 10, which shoulders are provided with a plurality of apertures in which the front apertures, hereinafter known as the "primary" apertures 12, stand in alinement with the fixed sections of the tubes when the keys 5 are in normal position, and the rear apertures, hereinafter known as the "secondary" apertures 13, are moved into alinement with the tube-sections 4 when the keys are operated. The apertures 13 form parts of the ball-races and carry balls which are moved into alinement with the tube-sections 4 when the keys are operated.

As before stated, the various tube-sections 4 may be united at their ends in order to form a complete unit, or they may each and every one be made independent from the other. The mechanism employed for establishing or destroying communication between the various tube-sections 4 has heretofore been described.

When the tube-sections 4 are independent from one another, each section is filled with balls. A single ball is removed from each section, which creates a single interstice or space equivalent to the diameter of a ball in each section. In a tube-section in which a key is operated a ball is inserted into said section. This ball fills the interstice in section, and, with the balls in the section, a solid bar is created which prohibits both the subsequent insertion of other balls or the operation of other keys. Further voting in this particular section therefore is prevented.

This is the desired result when voting for a given number of candidates for a given office. When, however, several candidates are to be elected for similar offices—for instance, county representatives, justices of the peace, &c.—it becomes necessary to provide means that will enable the voter to cast his ballot for two or more of the candidates for the same offices. I accomplish this class of voting in establishing communication between the same number of tube-sections 4 as there are offices. For an example, where there are seven representatives to be elected communication is established between seven of the tube-sections 4, which jointly would create a tube unit having seven interstices therein. This tube unit would include a sufficient number of keys to enable all the candidates to be represented, and the voter would be able to vote for any seven, it being immate-

rial how the names of the chosen candidates were arranged. Each key voted inserts a ball into the tube unit, which correspondingly reduces the space therein until the seven keys have been voted, when the space entirely disappears and further voting is prevented. As the voter leaves the voting-booth he operates suitable mechanism which registers his ballot and withal returns the voted keys to normal position. During the return movement of the keys each key carries a ball out of the tube unit, when the heretofore-mentioned interstice is recreated, and the machine is ready for the next voter. It may also be noted that I can form the tube unit that will comprise all or part of the tube-sections 4.

Examining Fig. 7 of the drawings, it will be seen that when the apertures 12 in the keys 5 are in alinement with the tube-sections 4 they permit free movement of the balls through the keys. This figure also shows the extra balls carried in the secondary apertures 13 and which are moved into alinement with the balls in the tube-sections 4 when the keys 5 are operated. Fig. 8 plainly shows the keys 5 voted and in which the apertures 12 are empty. The apertures 13 in this figure are in alinement with the tube-sections 4. The first impulse imparted to the keys 5 discharges the balls from the apertures 12 into the tube-sections 4. The course pursued by the discharged balls is in the direction of the existing interstices within the tube-sections 4. The balls from some of the keys therefore may be discharged toward the right and from others toward the left. The discharge of the balls from the apertures 12 is accomplished by means of the grooves 15 in the keys 5 and the fingers 16. The grooves 15 bisect the apertures 12 in the keys 5. (See Figs. 6, 7, and 10.) A series of fingers 16, secured to the bars 3, (see Figs. 7 and 9,) engage with the grooves 15 in the keys 5. The instant the keys 5 are operated the balls lying in the primary apertures 12 come into contact with the fingers 16 and are discharged into the tube-sections 4.

Each key 5 is provided with a counter 20, that records the number of votes cast on the key corresponding thereto. These counters are mounted on suitable counter-shafts 21, arranged in the frame 1 and in the rear of the tube-sections 4. The counters are provided with suitable ratchet-wheels 22, which are contacted and operated by the keys. A series of cams 25 are mounted on the shafts 26, which are suitably arranged in the frame 1 and between the counter 20 and the tube-sections 4. The cams 25 carry the rear ends of the keys 5 and provide the means for returning the keys to normal position. The mechanism for actuating the cams 25 will now be described.

The machine is provided with the levers A



and B, which the voter operates in entering and leaving the voting-booth. The voter in entering the booth raises the lever A, which is carried by the drum 30, rotatably mounted in a suitable bearing secured to the frame 1. A link 31 extends from the drum 30 to a sliding cam 32, suitably mounted in a way in the frame 1. A vertical rack-bar 34 engages with and is operated by the cam 32. A series of pinions 35 engage with the rack-bar 34 and are secured to the shafts 26, that carry the cams 25 heretofore described. The movement of the inlet-lever A operates the cams 25, which disconnect the rear ends of the keys 5 and of the ratchet-wheels 22 on the counters 20. (See dotted and full line positions in Fig. 7.) This movement for disengaging the keys from the ratchet-wheels 22 allows unrestricted manipulation of the keys 5 without disturbing the totals on the counters 20. The voter within the booth may operate the keys 5 as often as desired in perfecting his ballot without disturbing the other mechanism. Having arranged his ballot, the voter leaves the booth on the side opposite the one through which he enters and raises the lever B. This latter and final movement of the lever B, which signifies the closing act of a voter casting his ballot, reverses the movement of the sliding cam 32 through a suitable link 38, that leads from said cam to the drum 40, that supports the lever B. This movement causes an upward movement of the rack-bar 34, which operates the cams 25 and returns the keys 5 to normal. During this movement of the cams 25 the keys 5 immediately drop and engage the ratchet-wheels 22 and operate the counters 20.

Provision is also made to permit the casting of ballots by restricted voters, which class includes women who are permitted to vote for a limited number of candidates in some of the States. The mechanism employed for restricting or limiting the number of candidates for this class of voters is shown in Fig. 10 of the drawings, in which a movable bar 45 extends alongside the tube-sections 4. This bar engages with and is operated by a sliding cam 46, which is mounted in a way in the frame 1 of the machine. The cam 46 may be operated by means of the lever 43 and link 44 (see Fig. 3) or similar mechanism by the restricted voter before entering the voting-booth. When the restricted voter operates the limiting device, he then enters the booth in the same manner as the general voter by raising the lever A. The sliding or movable bar 45 is provided with a series of fingers 47, which pass when the bar 45 is operated through the slots 50, formed in the tube-sections 4. The fingers 47 are placed on the movable bar 45, so as to engage those tube-sections 4 that contain the keys designating the candidates for whom the voter is prohib-

ited to vote. The fingers 47 are of the same width as the diameter of one of the balls in the sections 4, and thus fill the interstices in the sections into which they enter. This, as will be readily understood from the previous description, will prevent the operation of any key or keys in the section or sections 4 with which the fingers 47 engage.

Having thus fully described my said invention, what I desire to secure by Letters Patent is—

1. In a voting-machine, a race unit having laterally-movable sections.

2. In a voting-machine, a race unit composed of a series of both fixed and laterally-movable sections.

3. In a voting-machine, a race unit composed of both fixed and laterally-movable sections, the latter carrying a plurality of race-apertures which can be alternately moved into or out of alinement with the former.

4. In a voting-machine, a race unit composed of both fixed and laterally-movable sections, the latter provided with a plurality of race-apertures, balls within said sections, and means engaging with the movable sections for displacing balls into the fixed sections.

5. In a voting-machine, a race unit composed of both fixed and laterally-movable sections, the latter provided with a plurality of race-apertures, slots bisecting the apertures, and means engaging with the slots for displacing the balls.

6. In a voting-machine, a race unit composed of both fixed and laterally-movable sections, the movable sections provided with primary and secondary race-apertures the former having the walls formed on inclinations to accelerate the displacement of the balls.

7. In a voting-machine, a race unit comprising a series of both fixed and movable race-sections, and means for connecting the fixed sections of the race unit.

8. In a voting-machine, a race unit comprising a series of both fixed and movable race-sections, and curved race-sections connecting the fixed sections of the race unit.

9. In a voting-machine, a race unit comprising a series of both fixed and laterally-movable race-sections, and means for connecting the fixed sections of the race unit.

10. In a voting-machine, a race unit comprising a series of both fixed and laterally-movable race-sections, and curved race-sections connecting the fixed sections of the race unit.

11. In a voting-machine, a race unit comprising a series of both fixed and laterally-movable race-sections, and limiting means within the race unit to limit the movement of the movable sections of the race.

12. In a voting-machine, a race unit com-



prising a series of both fixed and laterally-movable race-sections, limiting means within the race unit to limit the movement of the movable sections of the race unit, and means  
5 in the movable race-sections to carry the limiting means into and out of the race unit.

13. In a voting-machine, a race unit comprising a series of both fixed and movable race-sections, limiting means within the race  
10 unit to limit the movement of the movable sections of the race, means in the movable sections of the race unit to carry the limiting means into and out of the race unit, and means for connecting the fixed sections of the  
15 race unit.

14. In a voting-machine, a race unit com-

prising a series of both fixed and movable race-sections, limiting means within the race unit to limit the movement of the movable sections of the race unit, means in the movable sections of the race unit to carry the  
20 limiting means into and out of the race unit, and curved race-sections connecting the fixed sections of the race unit.

In witness whereof I have hereunto set my  
25 hand and seal, at Indianapolis, Indiana, this 4th day of December, A. D. 1903.

WILLIAM L. SANDAGE. [L. s.]

Witnesses:

JOHN M. MCGEE,  
F. W. WOERNER.