

No. 677,554.

Patented July 2, 1901.

A. L. BACON.
SAND BOX FOR CARS.
(Application filed Oct. 27, 1900.)

(No Model.)

6 Sheets—Sheet 1.

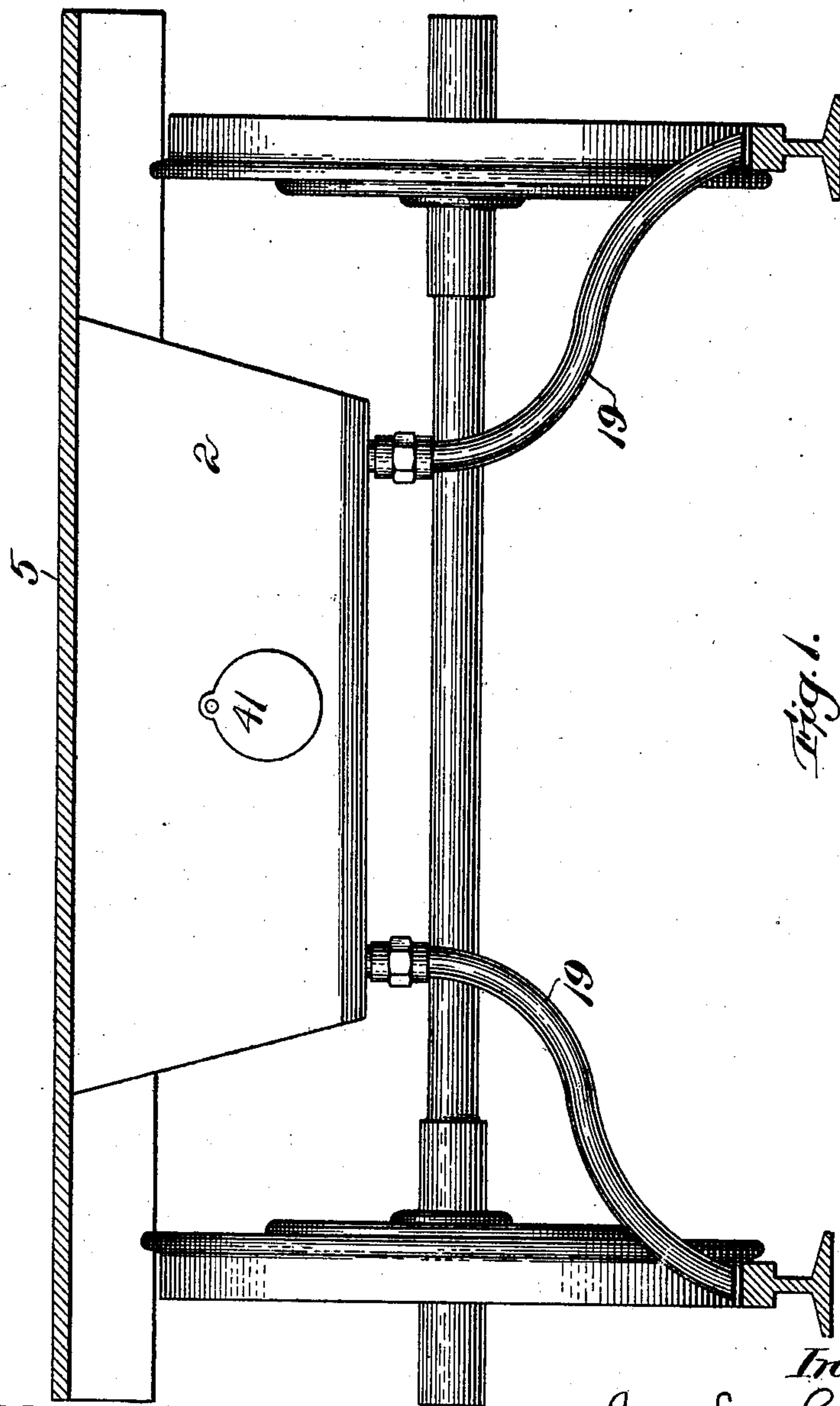


Fig. 1.

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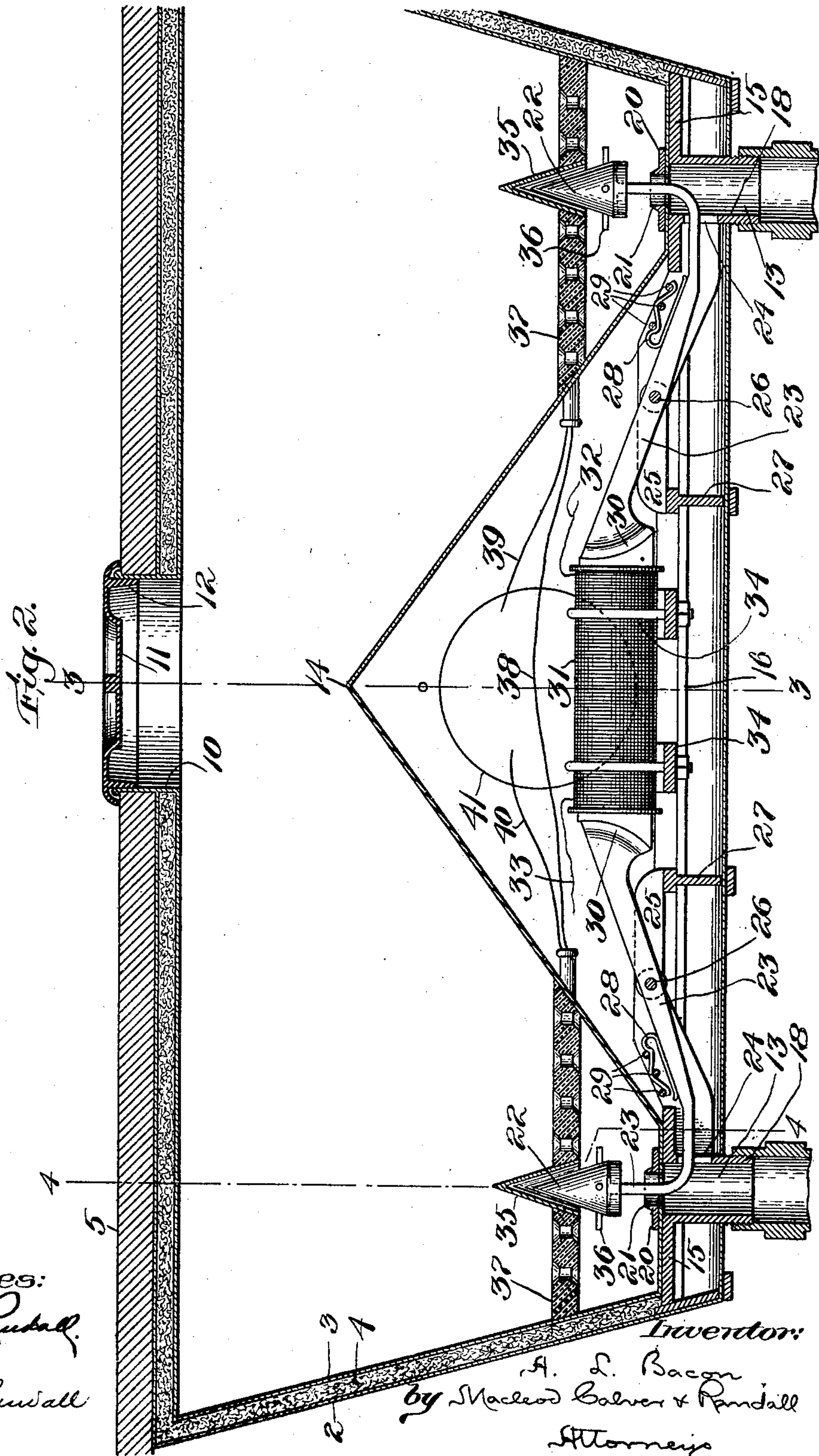
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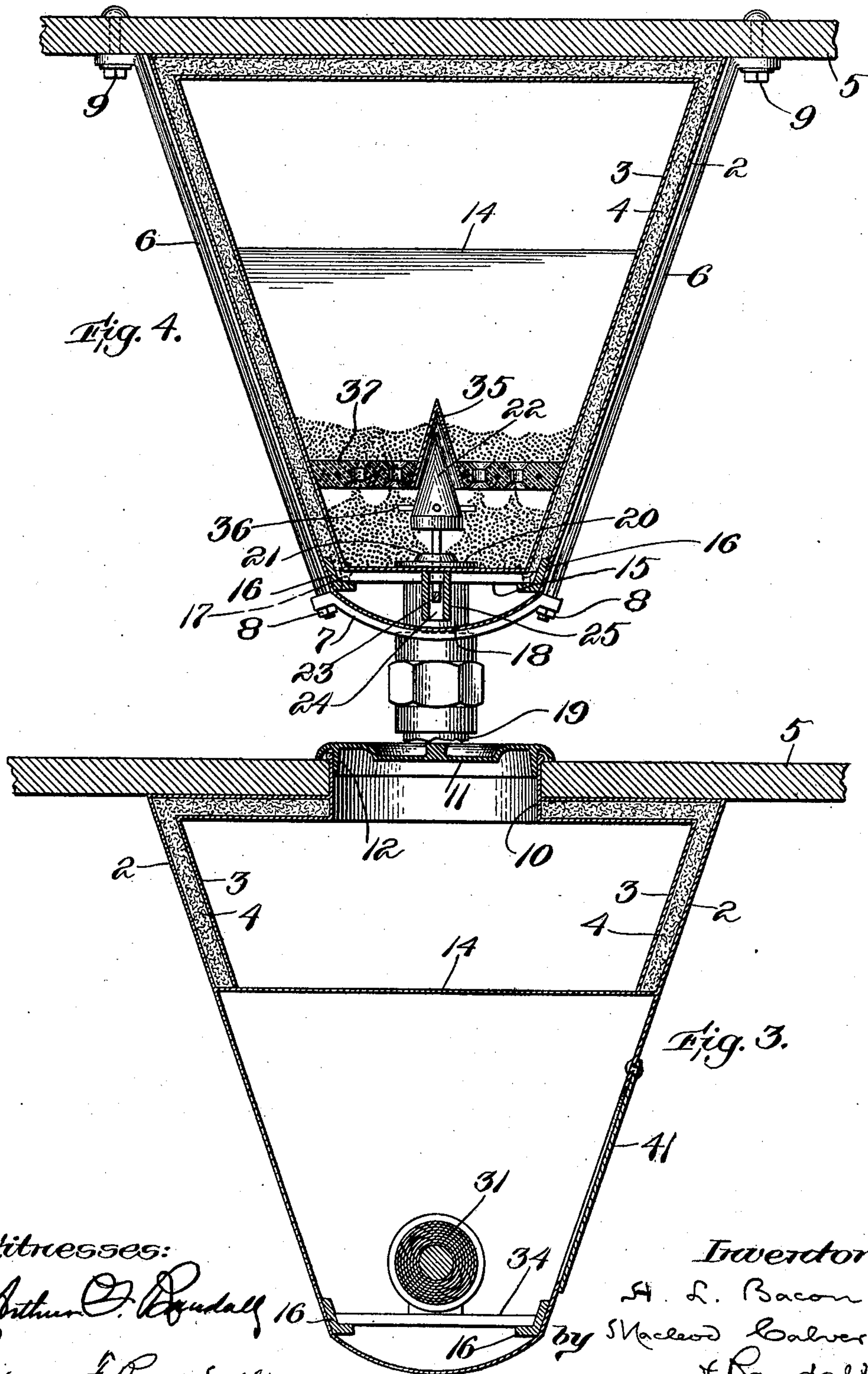
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6 Sheets—Sheet 3.



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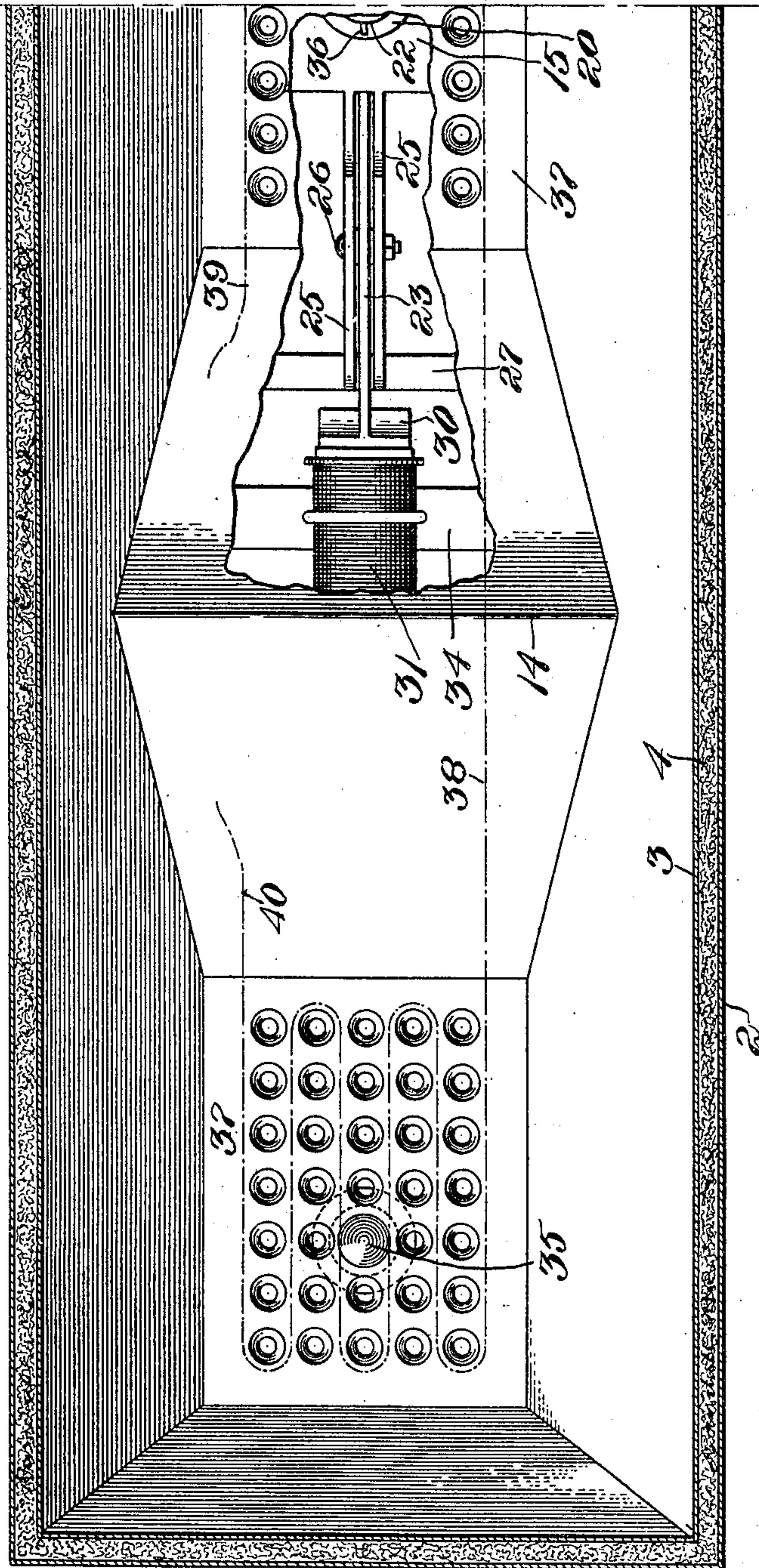
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6 Sheets—Sheet 4.

Fig. 5.



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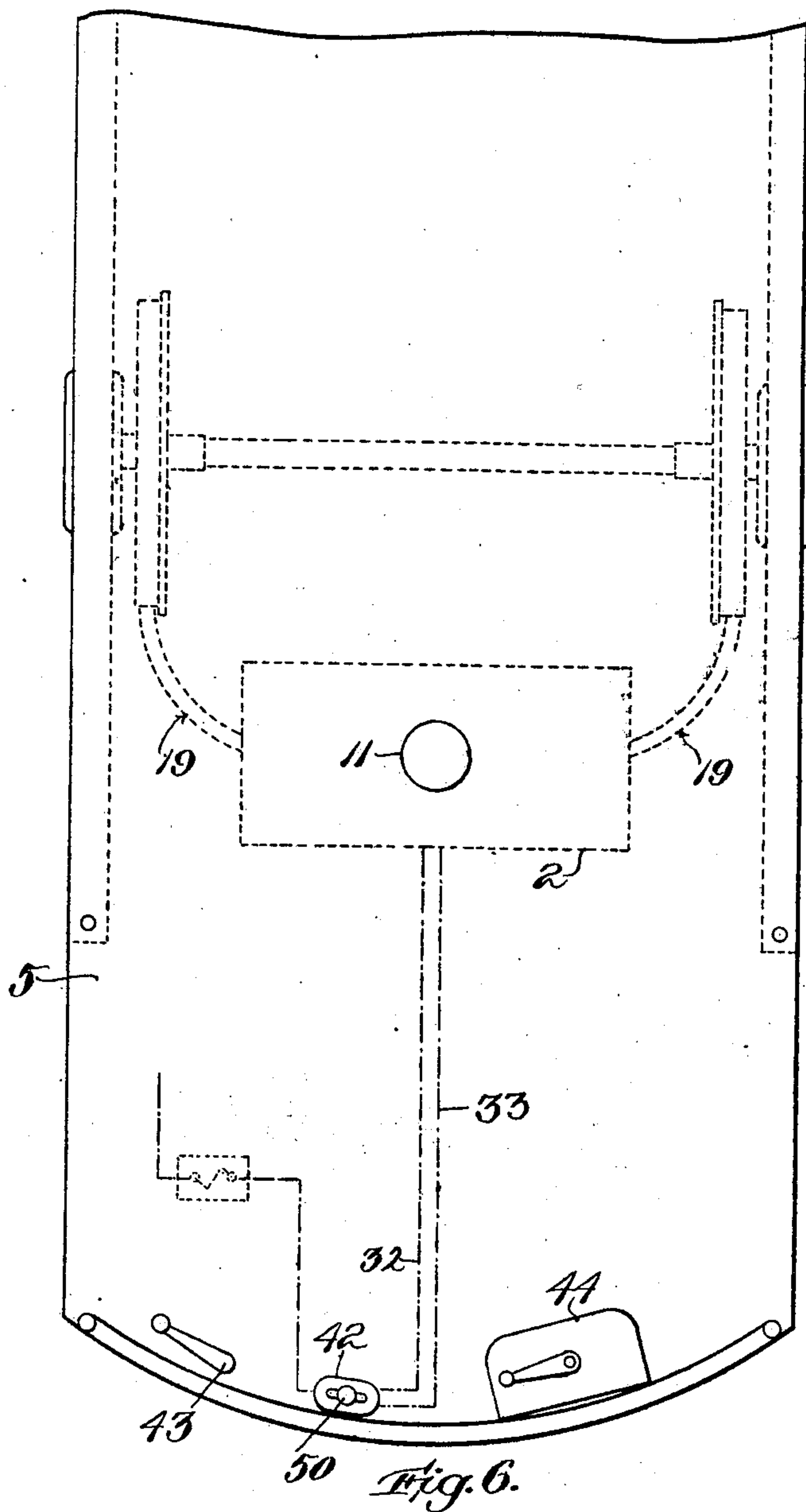
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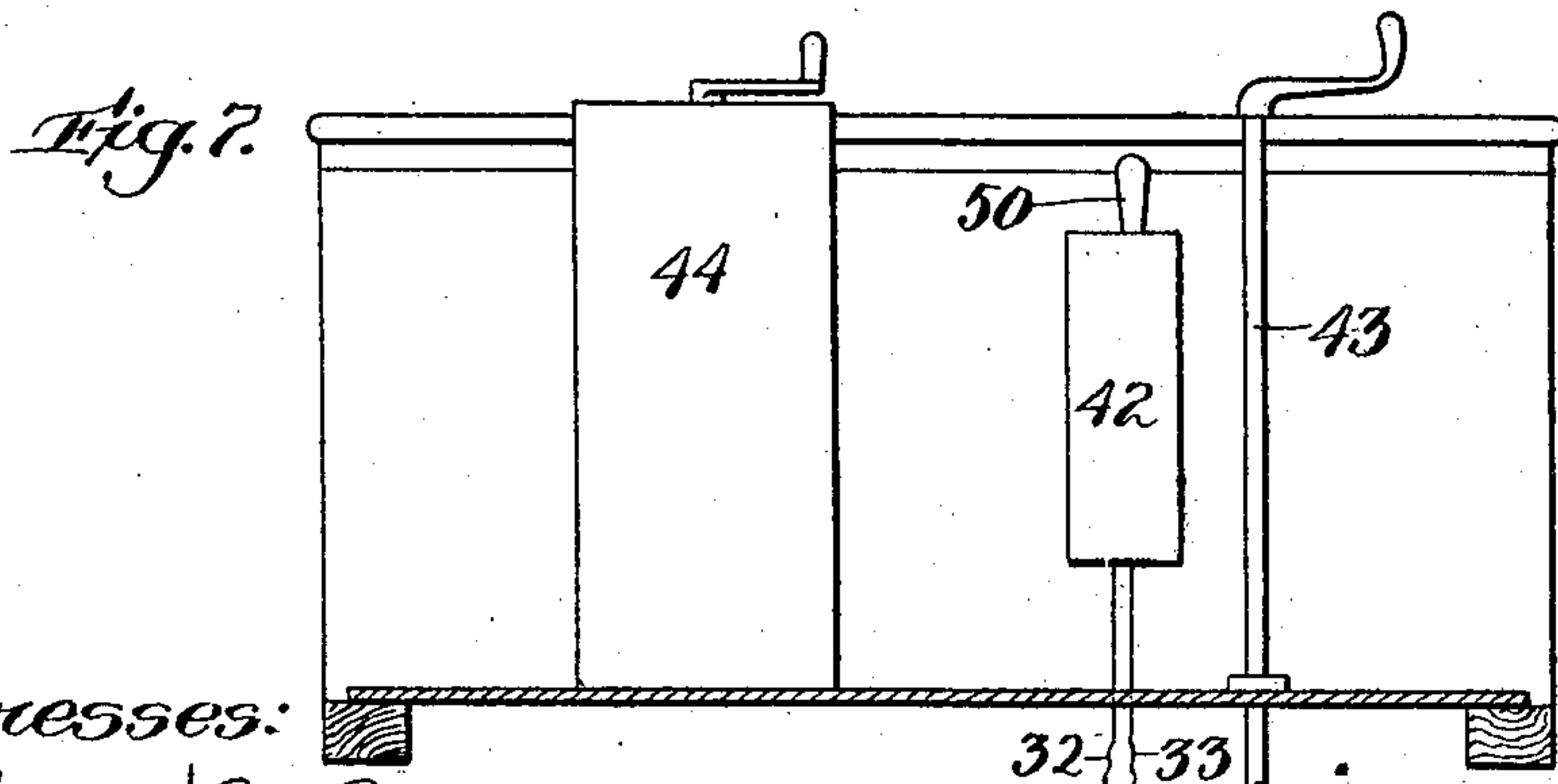
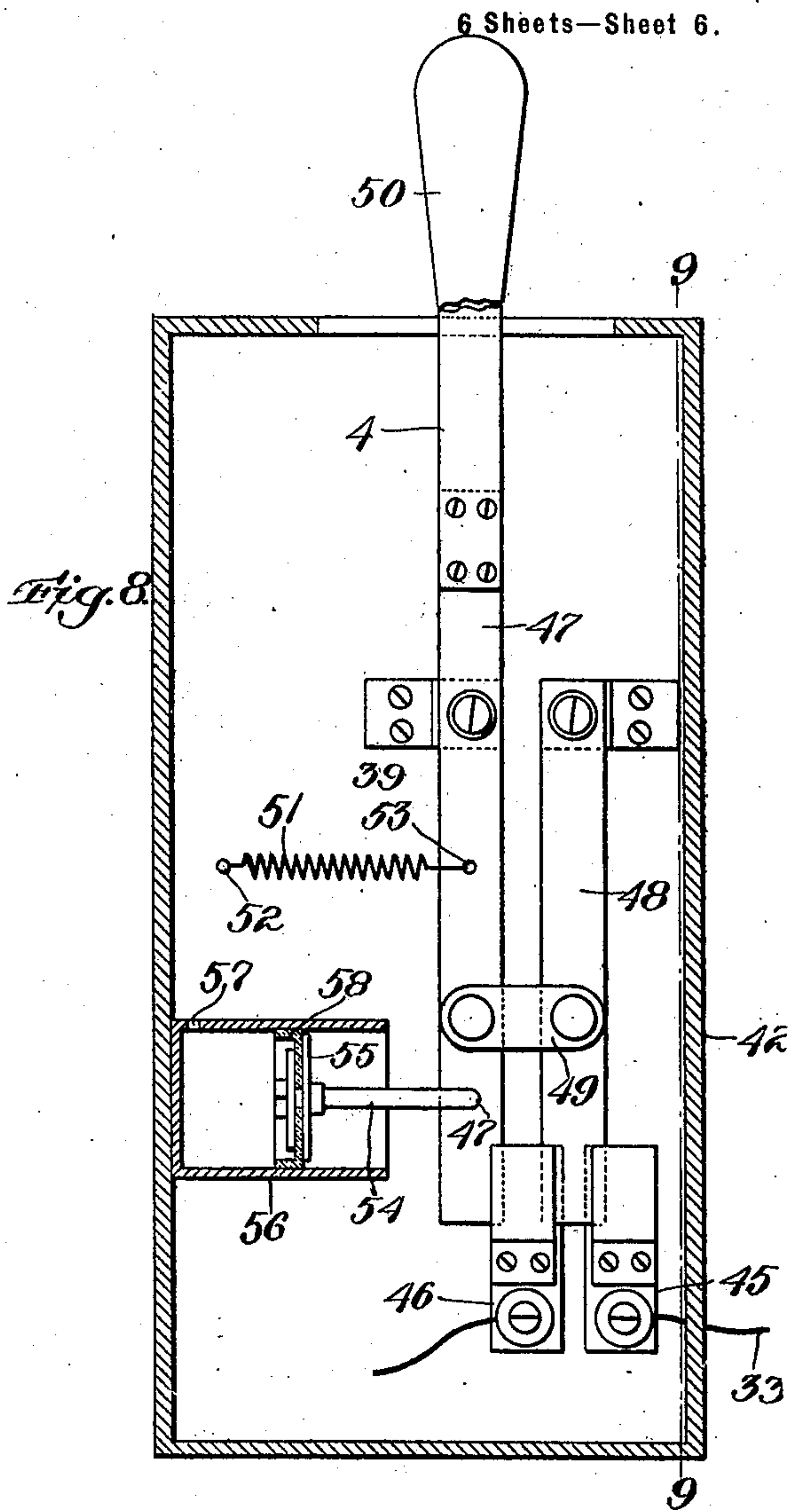
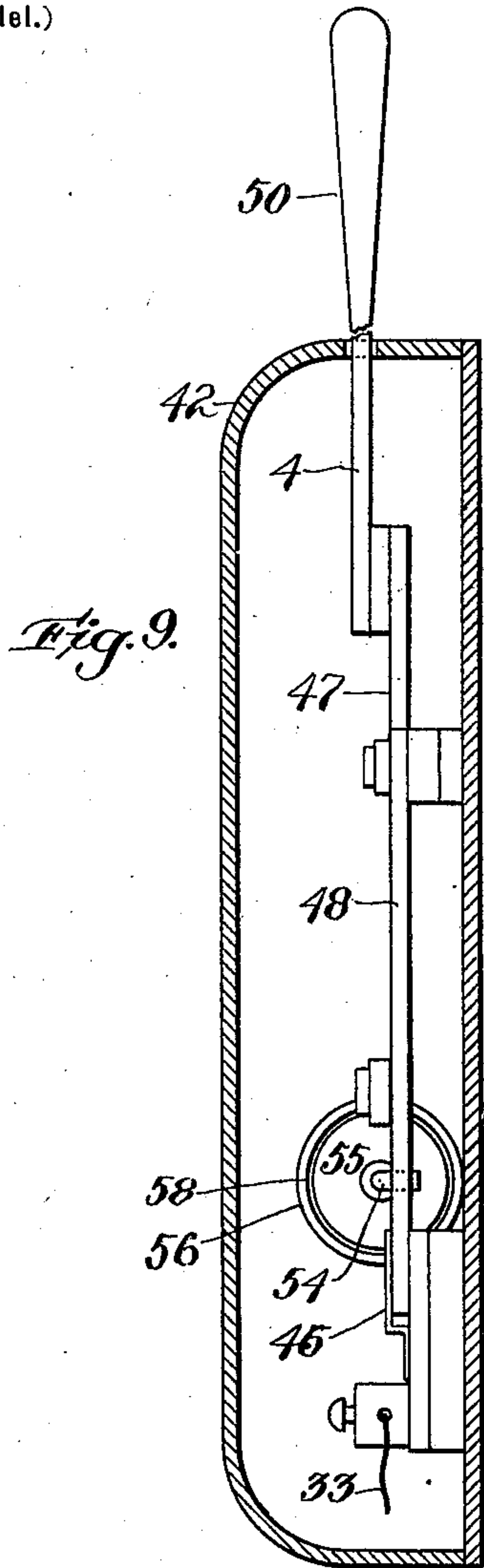
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UNITED STATES PATENT OFFICE.

ABBOTT L. BACON, OF FRANKLIN, MASSACHUSETTS.

SAND-BOX FOR CARS.

SPECIFICATION forming part of Letters Patent No. 677,554, dated July 2, 1901.

Application filed October 27, 1900. Serial No. 34,609. (No model.)

To all whom it may concern:

Be it known that I, ABBOTT L. BACON, a citizen of the United States, residing at Franklin, in the county of Norfolk, State of Massachusetts, have invented a certain new and useful Improvement in Sand-Boxes for Cars, of which the following is a specification, reference being had therein to the accompanying drawings.

10 The invention relates to apparatus particularly designed for attachment to an electric car and adapted to be operated by the motorman when it is desired to distribute sand upon the track.

15 The object, in the main, is to produce a mechanism which shall act with certainty and rapidity and which shall be under the complete control of the motorman. Furthermore, the device is automatic to a certain degree, 20 obviating the necessity of the motorman taking his attention from the brake and power in order to secure an efficient action thereof.

The improvement will first be described in connection with the accompanying drawings, 25 which illustrate the best embodiment of the invention which has yet been devised, the essential characteristics of the same being afterward more particularly pointed out and distinctly defined in the claims at the close of 30 this specification.

In the drawings, Figure 1 is a front elevation of portions of a car equipped with the device. Fig. 2 is a middle vertical transverse section of the device. Fig. 3 is a section on 35 the line 3 3 of Fig. 2. Fig. 4 is a section on the line 4 4 of Fig. 2. Fig. 5 is a view in horizontal section. Fig. 6 is a plan view of the forward end of a car, showing the various relations of the parts of my device. Fig. 7 is a 40 rear elevation of the front dasher of the car. Fig. 8 is an elevation of the interior of the switch-box. Fig. 9 is a section on the line 9 9 of Fig. 8.

45 The sand-box is composed of an outer shell 2 and inner shell 3, with a layer 4 of asbestos between them. The top of the box is flat, so that it may be brought into close contact with the under surface of the flooring 5 of the car. The sides and ends of the box slope inward 50 toward the bottom. The bottom of the outer shell is rounded, as shown in Figs. 3 and 4. The box is hung from the car-flooring and

clamped thereto by means of rods 6 and curved straps 7, as shown in Fig. 4. The straps pass under the rounded bottom of the 55 outer shell and have outturned ends with holes therein. The lower extremities of the rods pass through these holes and are screw-threaded for the reception of nuts 8. The upper ends of the rods are bent outward and 60 have holes through which pass bolts 9 for affixing the rods to the car-flooring. By tightening the nuts 8 the box is drawn up and clamped solidly against the flooring.

Apertures are made in line with each other 65 in the middle of the top of the inner and outer shells of the box and in the car-flooring, and a tube or collar 10, forming a feed-hole for the introduction of sand into the box, is set therein. A cover 11 for the feed-hole is pro- 70 vided, having a depending flange 12, fitting loosely inside the collar 10 and preventing displacement of the cover.

The outlets are shown at 13 13. They are placed one at each side of the box, in the bot- 75 tom thereof, their construction being described in detail hereinafter. Between the outlets the bottom of the inner shell of the box runs up from each side to a point, or, more precisely speaking, to a ridge, as at 14. This 80 ridge separates the box into two sand-compartments, each one having an outlet and each discharging sand upon one rail of the track. The feed-hole admits a supply of sand to both of the compartments. 85

At each side beneath the bottom of the inner shell 3 are base-plates 15, supported upon angle-irons 16. The latter are fixed to the inner faces of the outer shell 2 at the point 90 where the straight sides and rounded bottom thereof run into each other. Thereby the inner shell is supported.

The pipes forming the outlets for the two sand-compartments are cast integral with the respective bed-plates and are designated 18. 95 They extend downward through holes in the bottom of the outer shell, and at a point below the latter they are coupled to pipes 19, which curve outward and downward and terminate just above the rails of the track and 100 in front of the car-wheels. Annular disks 20, with raised inner lips 21, are riveted upon the inner face of the bottom of the inner shell in line with the outlet-pipes 18, forming mouth-

pieces for the pipes. The said shell, as will of course be understood, is cut through at the said outlets, so as to allow a free passage for the sand from the sand-box to the track.

5 Coöperating with the outlets are valves 22, which are suitably held above the outlets and are adapted to be moved vertically toward and from the same. The valves are of conical form and preferably are furnished with
10 depending rims, which when said valves are in their lowermost position shut down around the lips 21. The rims do not, however, either necessarily or preferably make contact with the said lips or with the main flat portion of the
15 disks 20. It is found that when said rims are employed after the valves have descended to a certain point the escape of sand through the outlets is arrested even though some considerable space is preserved between the
20 valves and the disks. In some instances the lips 21 are dispensed with; but the action of the device is rendered more certain when they are employed, especially in view of the constant jarring of the car.

25 The valves are carried on the bent-up outer ends of levers 23, working through slots 24 in the sides of the pipes 18. The main portion of each lever is contained in the space below the sloping portion of the bottom of the inner
30 shell. An inward extension is cast on each base-plate in the form of parallel vertical webs 25, having a space between them sufficient to accommodate the corresponding lever 23. A pivot-pin 26 is carried by the webs
35 and passes through a hole in the lever. The inward ends of each pair of webs are attached to a corresponding cross-beam 27, whose ends are supported by the angle-irons 16. Leaf-springs 28 are supported upon pins 29, riv-
40 eted to the webs 25, and bear against the levers, so as to tend to close the valves 22 down over the outlets. On the inner or proximate ends of the levers are armatures 30. Between the armatures is interposed a straight elec-
45 tromagnet 31, the poles of which are located at its opposite ends, the wires being indicated at 32 and 33. The magnet may be supported in a frame 34, carried by the angle-irons 16.

50 In order to partly protect the valves from the pressure of sand, and thereby facilitate the raising thereof, shields 35 are supported, as hereinafter described, within the sand-compartments above the valves, the shields preferably being formed as hollow cones cor-
55 responding with the valves, so as to receive the valves when they are raised. As the valves are raised they become wholly or substantially wholly relieved from the pressure of sand. As they again descend their descent
60 is increasingly assisted by the said pressure, and a proper closing of the outlets is therefore insured by the action of the sand itself against the valves.

As a precaution against the caking of sand
65 adjacent the outlets projecting pins 36 are set into the outer faces of the valves. These op-

erate to loosen the sand as the valves are raised and lowered.

The lower portion of each sand-compartment is divided off from the upper portion 70 thereof by horizontal division-plates 37 37. The said division-plates are in the form of perforated porcelain plates with wires embedded in them constituting rheostats. The said plates constitute gratings by means of 75 which hard lumps, gravel, and the like, which would be liable to interfere with the proper working of the valves, are prevented from reaching the latter. They are set at as low a point as convenient in order that the heat 80 thereof may serve to keep at a proper temperature that portion of the sand which immediately surrounds the outlet. The sand is compelled to pass down through the perforations of the rheostats as fast as it is used, 85 and thereby is both heated and separated into particles, the jarring of the car assisting in this action. The rheostats may be connected in series, as by the wire 38, 39 and 40 being the circuit-wires therefor. 90

In the construction herein shown the shields 35 are fixed in central apertures in the rheostats and project above the latter. Thereby the valves 22 are permitted to reciprocate in very close proximity to the rheostats, and the 95 sand that presses upon the valves is freshly heated and sifted or separated into particles, and therefore such sand offers a relatively slight resistance to the movement of the valves. 100

A hand-hole in the front of the casing having a cover 41 affords access to the magnet and other mechanism in the sand-box beneath the partition formed by the reëntrant portion of the inner shell 3. 105

Referring more particularly to Figs. 6, 7, 8, and 9, 42 is a switch-box supported on the dasher of the car between the brake and power, which are respectively designated 43 and 44. Within the switch-box are the ter- 110 minals 45 and 46 of the circuit, including the magnet in the sand-box. The movable portion of the switch is formed of two pivoted bars 47 and 48, connected by a link 49. The bar 47 is extended to the top of the switch- 115 box and is provided with a detachable handle 50, by means of which the motorman may actuate the switch. It will be understood that in the usual form of electric car a switch for the sanding device will be located on each 120 platform, and a single handle will be utilized for both switches, it being thereby insured that the switch on the platform not in use by the motorman for the time being cannot be accidentally or maliciously moved. 125

One feature of invention is the combination, with other elements of the sanding device, of means whereby when the switch has been thrown in by motion of the switch-handle and the magnet in the sand-box has there- 130 by been energized, and in consequence the valves covering the outlets in the box have

been raised, it will be possible for the motor-man instantly to relinquish his grasp on the switch-handle and return his hand to the power or brake, as the case may be, without the sand-box circuit being immediately broken and the caps immediately allowed to descend. The present object, on the contrary, is to secure an automatic momentary continuance of the discharge of sand upon the track. The object is accomplished by automatically retarding the opening of the switch after it has been closed by the motorman. Thus in the present form of the device a spring 51 is provided within the switch-box, one end of the spring being affixed, as at 52, to the switch-box and the other end, as at 53, to the switch. This spring tends to open the switch; but it will of course be understood that the motorman may retain his hand upon the switch-handle as long as desired, and thereby continue at will the period of discharge of sand upon the track. Connected with the switch is a piston-rod 54, carrying a piston 55, provided with packing 58 and working in an open-ended cylinder 56, affixed to the switch-box. A small air-outlet 57 is provided in the cylinder. In effect the mechanism just described constitutes a dash-pot whereby the free and rapid closing of the switch by the motorman is not interfered with, while the subsequent opening under the tension of this spring 51 is retarded. Thereby the motorman is permitted to return his attention immediately to the power or brake after throwing over the switch-handle.

Fig. 8 shows the switch closed, the bar 48 being in contact with both terminals 45 46. The action of spring 51 tends to swing the bars 47 48 transversely, so as to carry bar 48 out of contact with terminal 45, and thereby open the switch—i. e., break the electric circuit. The movement of the two bars under the action of the spring and consequent opening of the switch is retarded by the dash-pot arrangement.

What I claim is—

1. In a sanding device for railways, the combination of a sand-box, an outlet therefrom having a raised rim extending upward around the opening of the outlet, a valve having a depending rim adapted to inclose the raised rim of the outlet, and means to raise and lower the valve and thereby open and close the outlet.

2. In a sanding device for railways, the combination of a sand-box, an outlet therefrom having a raised rim extending upward around the opening of the outlet, a conical valve having a depending rim adapted to inclose the raised rim of the outlet, and means to raise and lower the valve and thereby open and close the outlet.

3. In a sanding device for railways, the combination of a sand-box, an outlet therefrom, a conical valve adapted to close the outlet, a lever below said valve for raising and lower-

ing the latter, and a shield above the valve and into which the latter enters when raised, whereby in being raised from the outlet to open the latter the valve is progressively relieved from the pressure of sand, and in being lowered again upon the outlet to close the same the valve is progressively subjected to greater sand-pressure.

4. In a sanding device for railways, the combination of a sand-box, an outlet therefrom, means to open and close the outlet, a perforated grating above the outlet to arrest gravel and the like, and separate the particles of sand, and electrical means to heat the plate.

5. In a sanding device for railways, the combination of, a sand-box, an outlet therefrom, means to open and close the outlet, and a perforated plate constituting a rheostat above the outlet, whereby to heat the sand, prevent the passage of gravel, and separate the particles of sand.

6. In a sanding device for railways, the combination of a sand-box, an outlet therefrom, a movable valve covering the outlet, a perforated plate above the outlet, means to heat the plate, and a hollow shield extending upward from the plate to receive the valve and relieve it from pressure of sand.

7. In a sanding device for electric-railway cars, the combination of a sand-box, a valve for the outlet thereof, an electromagnet in electrical communication with the trolley a lever having a connected armature coöperating with said magnet and also connected with said valve, and means for manually controlling the operation of said electromagnet.

8. In a sanding device for railways, the combination of a sand-box having two compartments, outlets in the said compartments, means to open and close the outlets, levers connected with such means at their outer ends and provided with armatures at their proximate ends, and a magnet interposed between the armatures.

9. In a sanding device for railways, the combination of a sand-box having two outlets, valves for the outlets, levers connected with such valves and provided with armatures, and a magnet coöperating with the armatures.

10. In a sanding device for railways, the combination of a sand-box, a partition within the same dividing off its middle lower portion and separating the remaining space into two sand-compartments, outlets for the said compartments, valves for the outlets, levers pivoted beneath the partition, connected with such valves and provided with armatures at their proximate ends, and a magnet interposed between the armatures.

11. In a sanding device for railways, the combination of a sand-box, mechanism to control the discharge of sand therefrom, actuating means to set the said mechanism in operation, and retarding devices for auto-

matically continuing said mechanism in operation for a predetermined period after said actuating means has ceased to act.

12. In a sanding device for railways, the
5 combination of, a sand-box, electrically-operated mechanism to control the discharge of sand therefrom, a switch in the electric circuit, a spring to open the switch, and means

to momentarily retard the action of the spring. 10

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

ABBOTT L. BACON.

Witnesses:

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