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2,626,823

SANDING DEVICE FOR VEHICLES

Filed Aug. 11, 1948

4 Sheets-Sheet 1

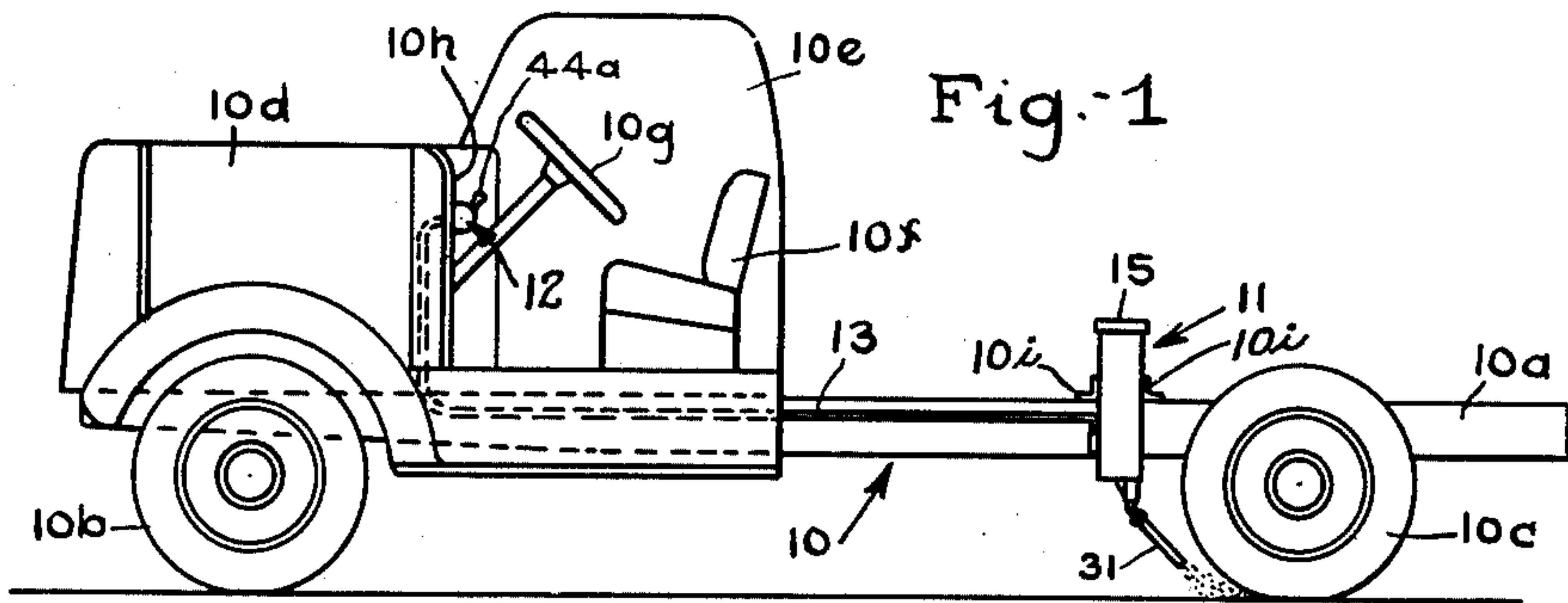


Fig. 1

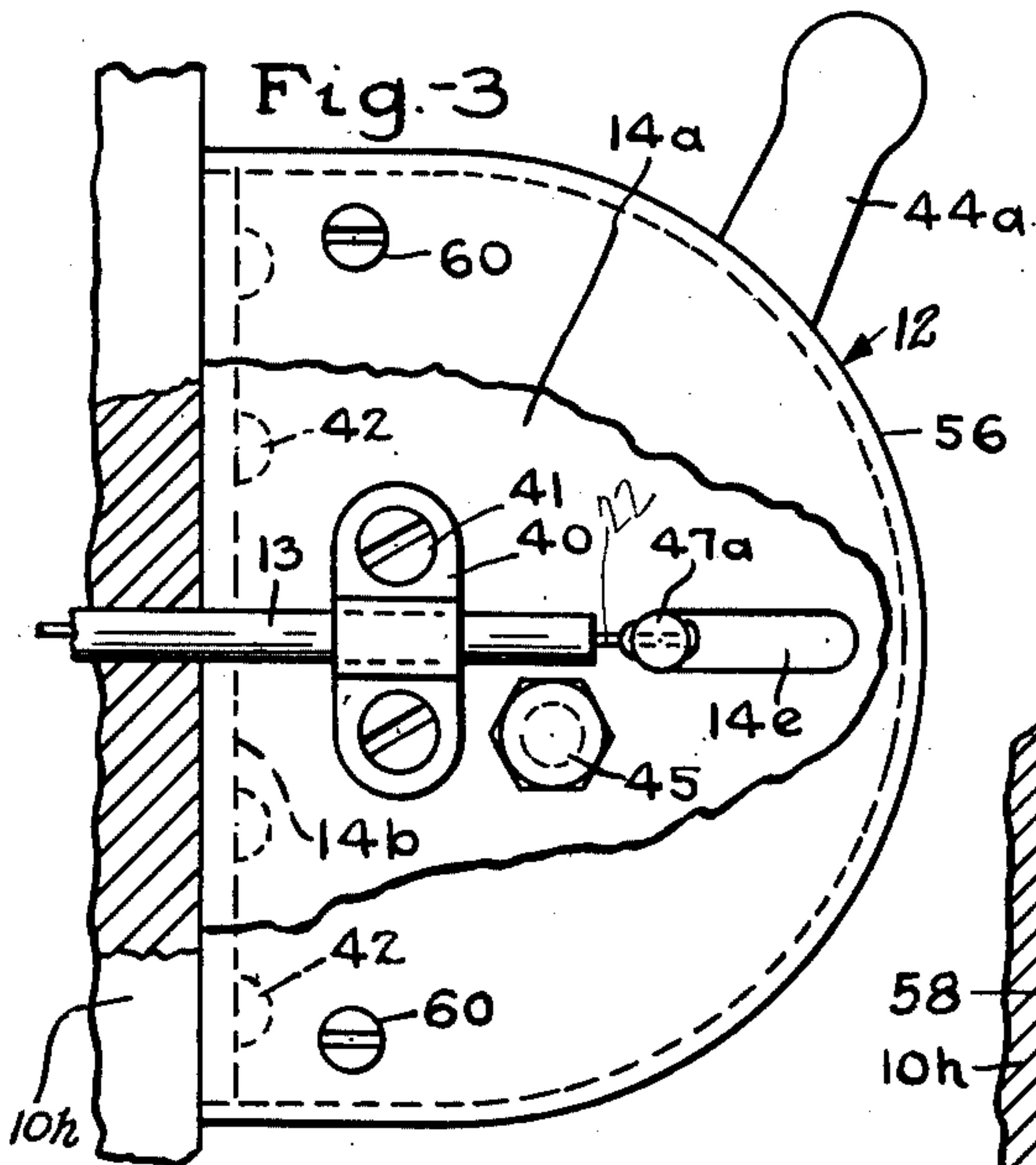


Fig. 3

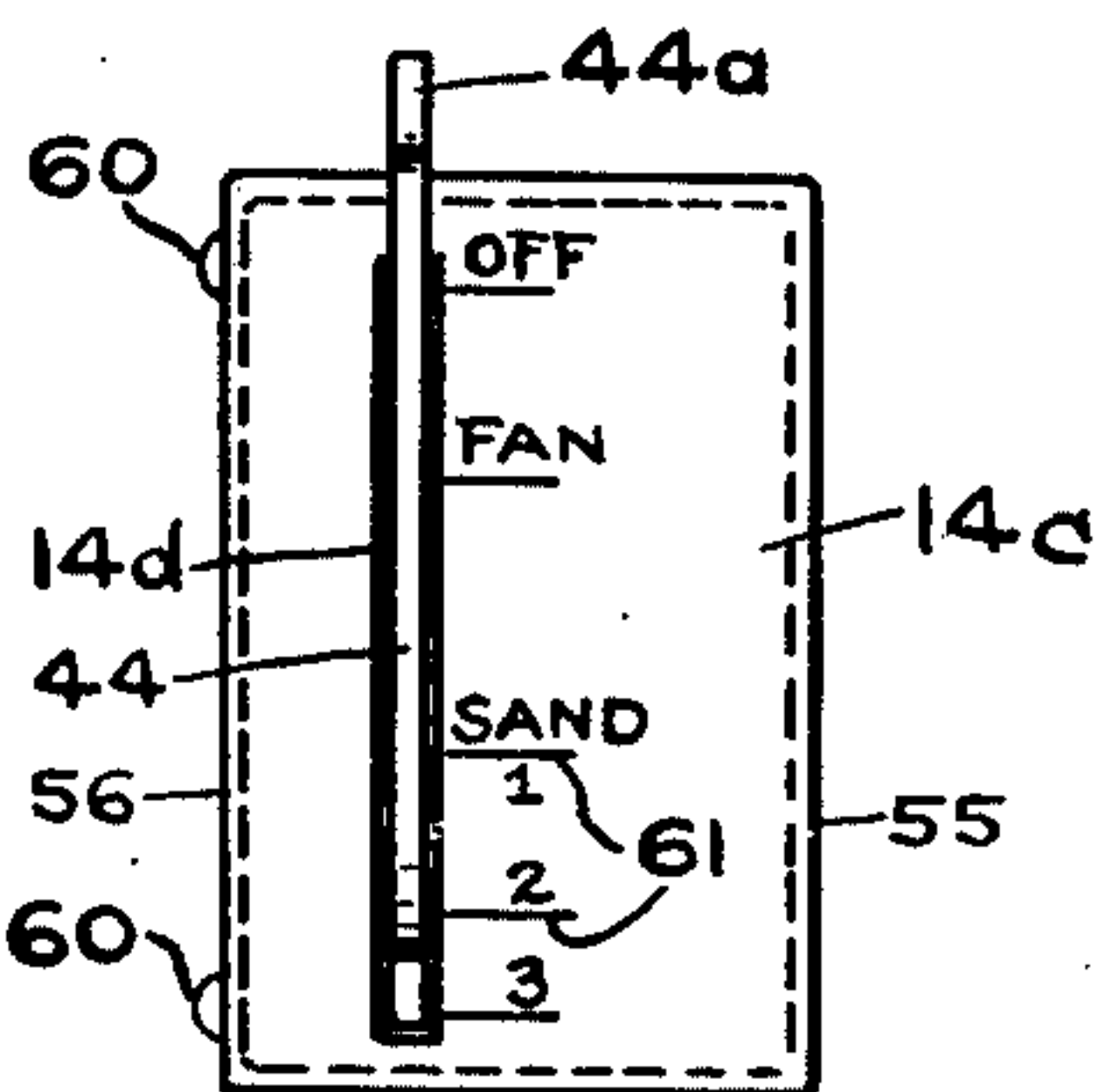


Fig. 2

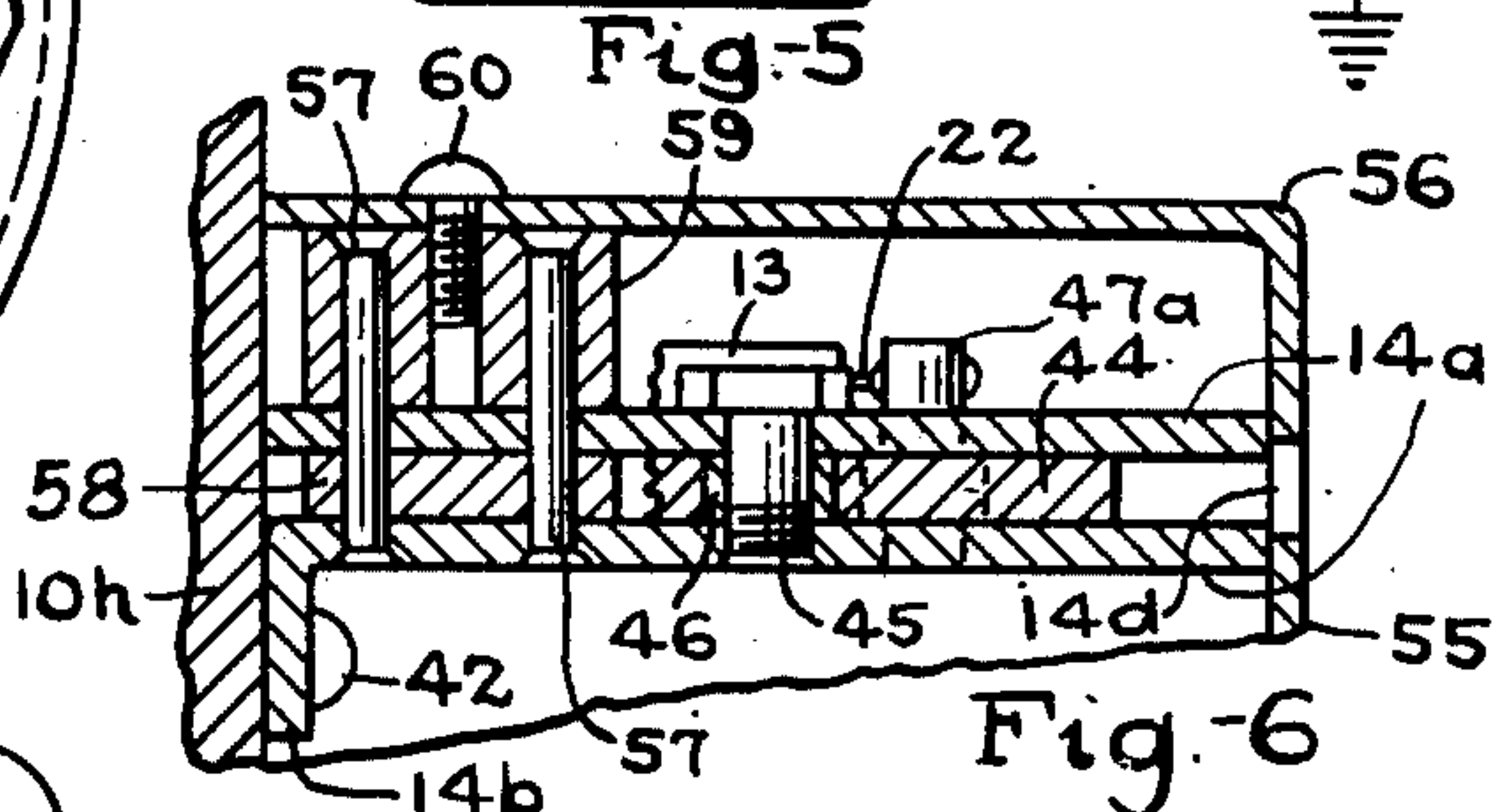


Fig. 5

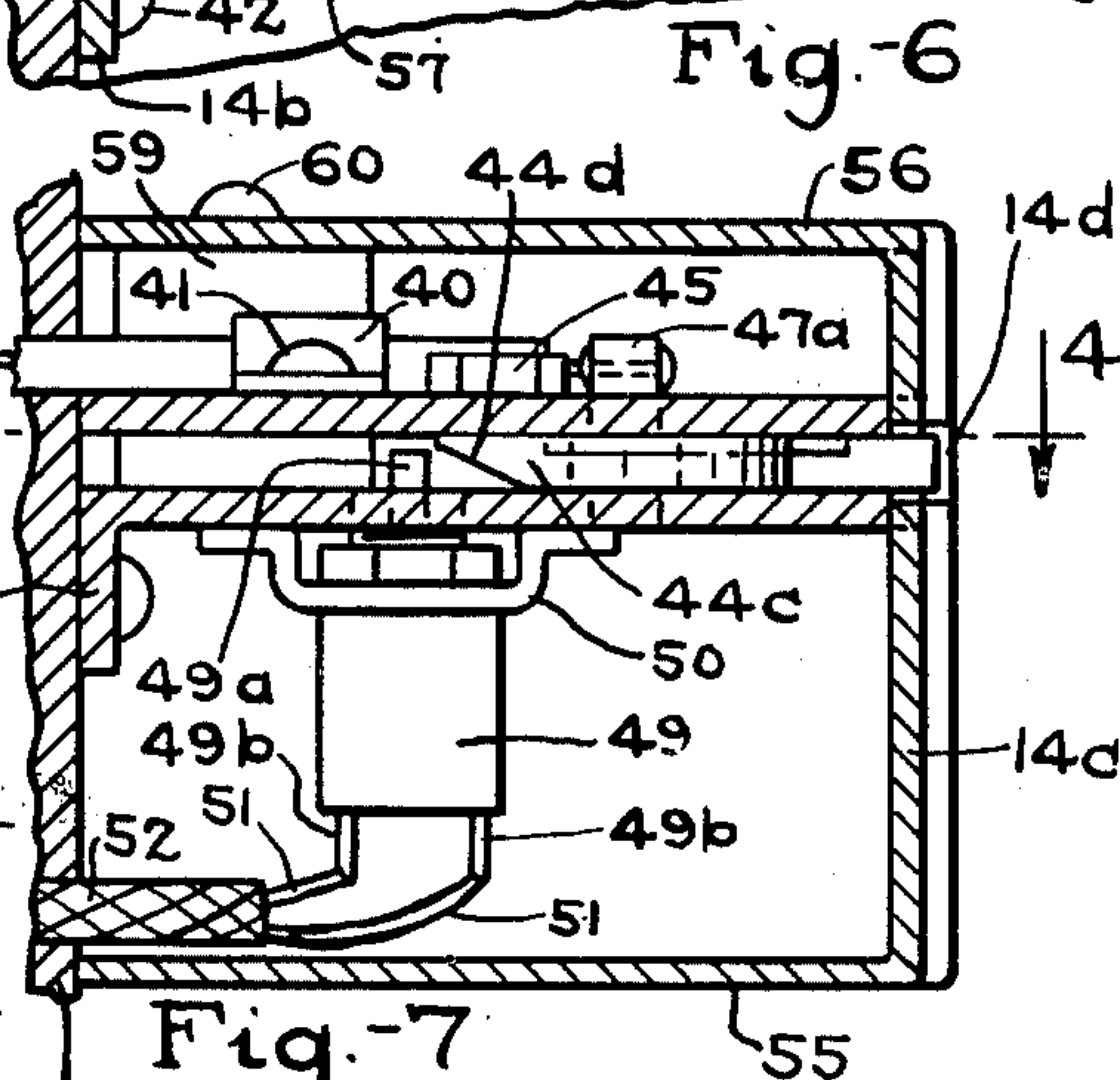


Fig. 6

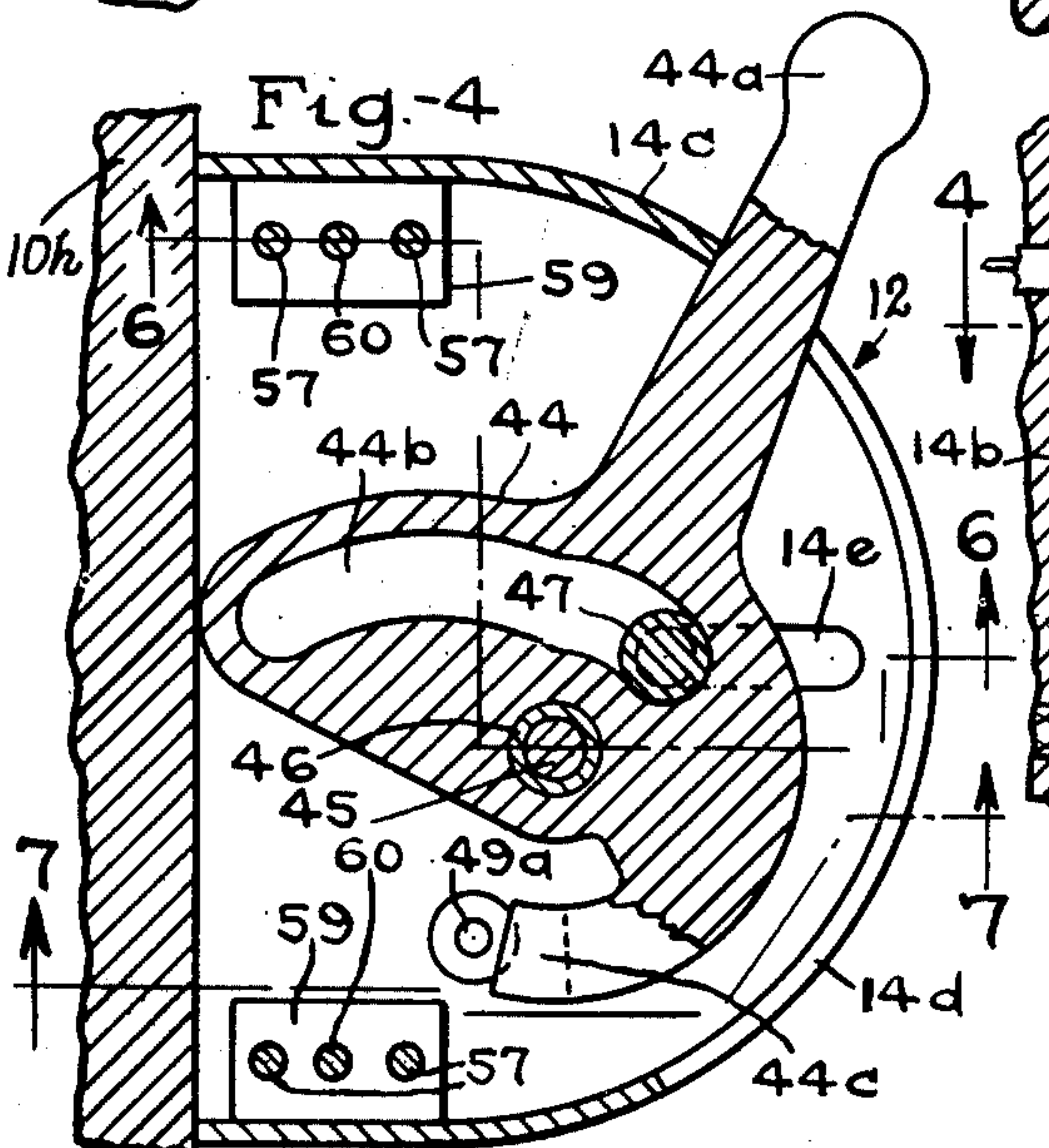


Fig. 4

Fig. 7

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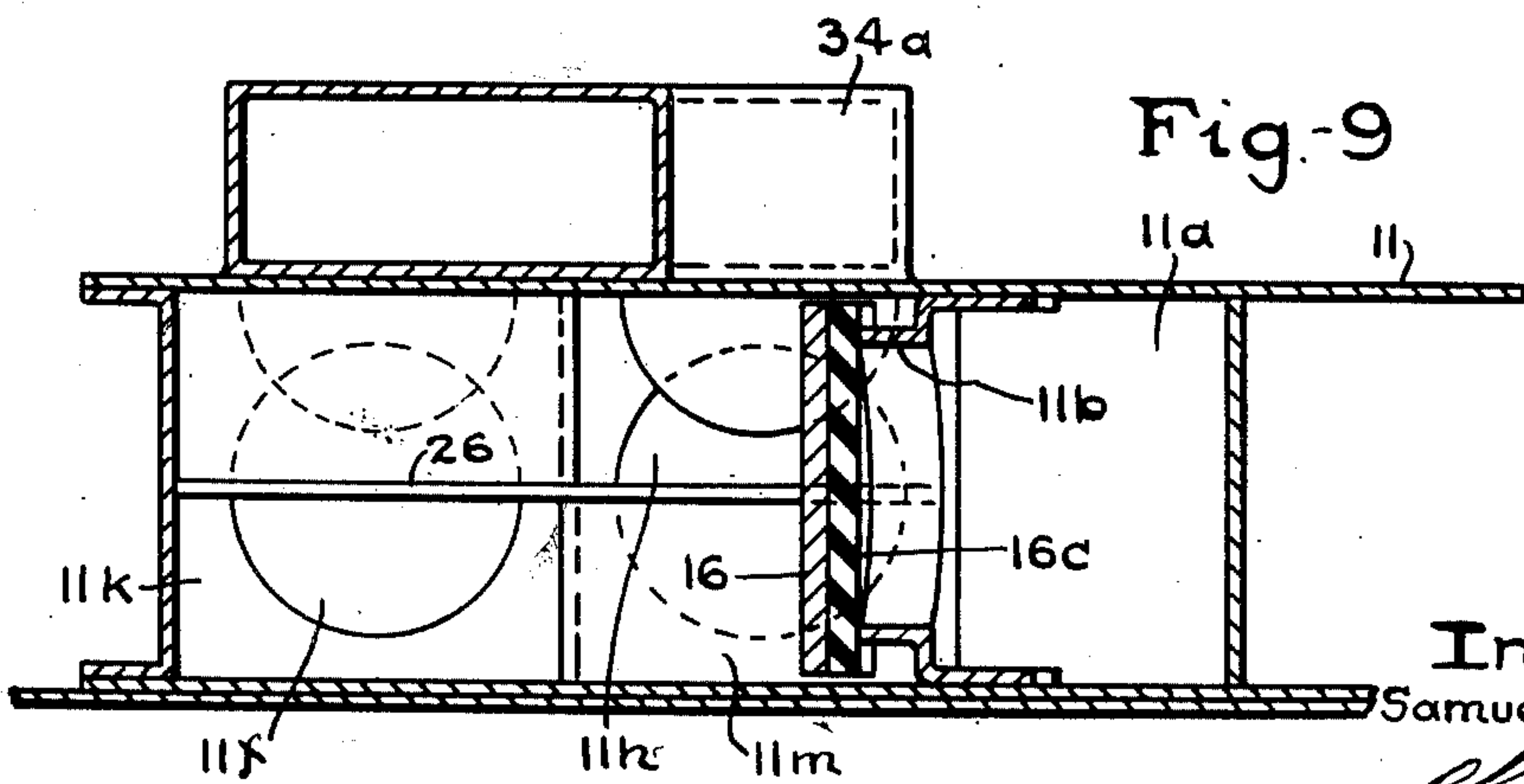
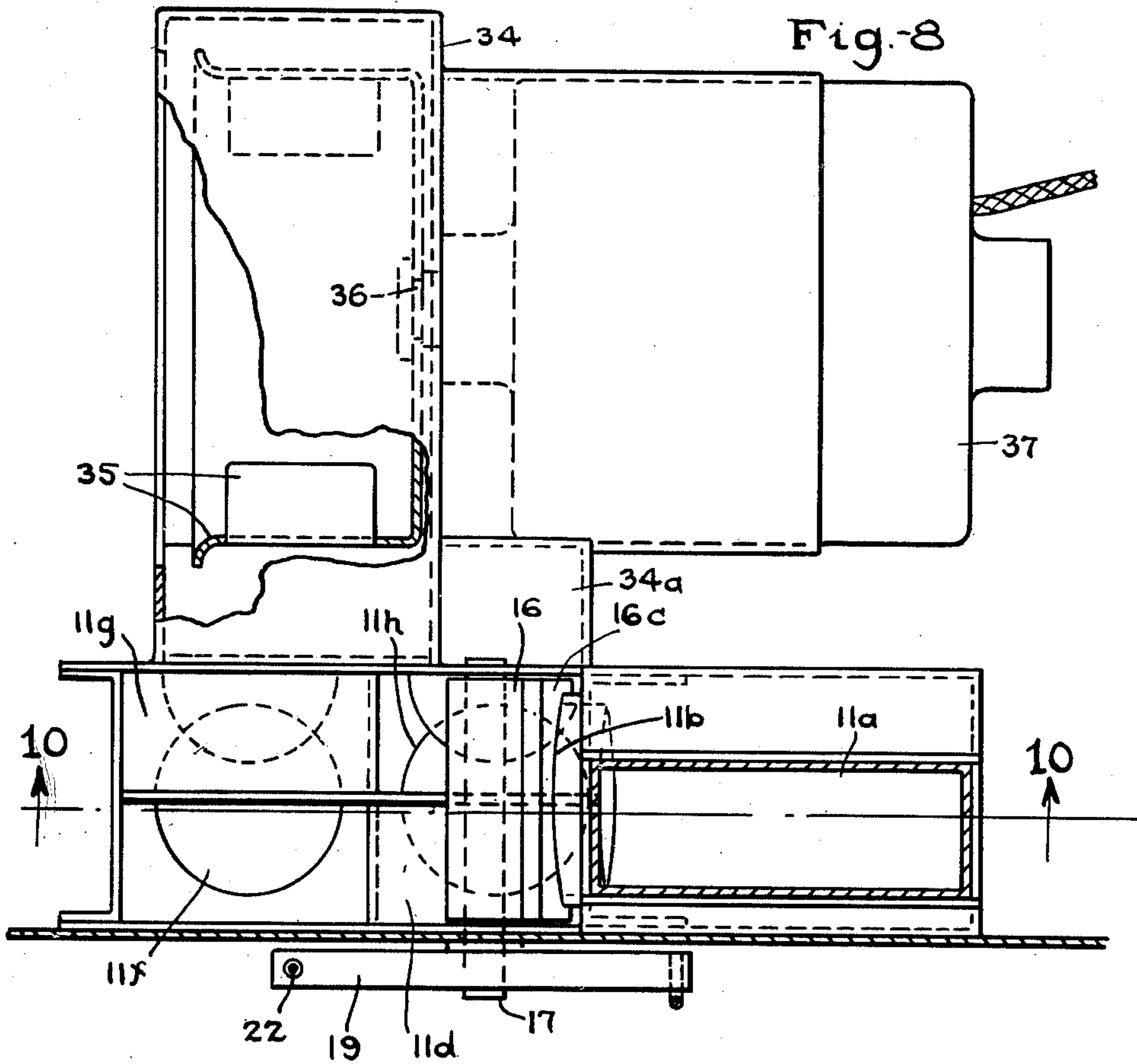


Fig.-9

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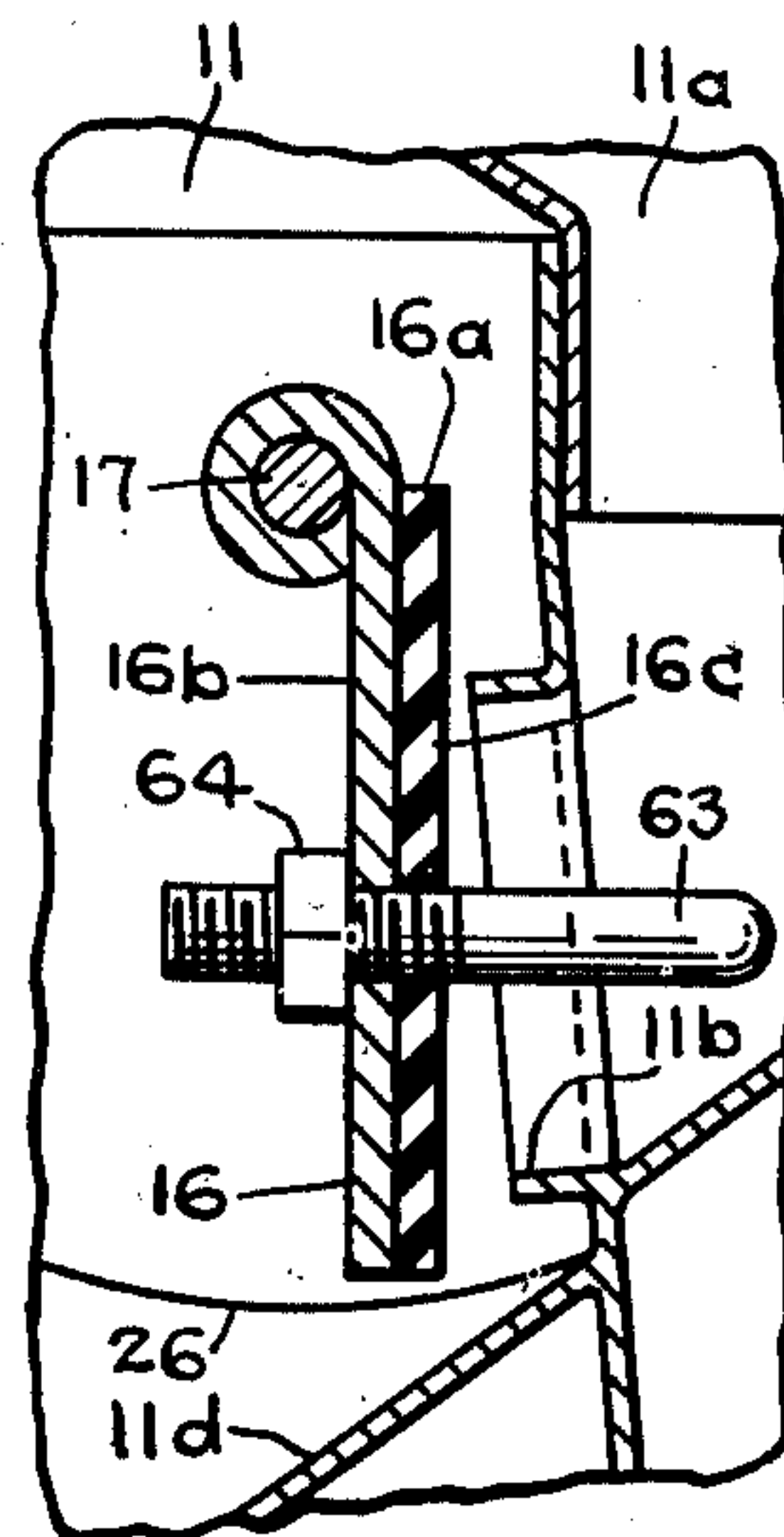
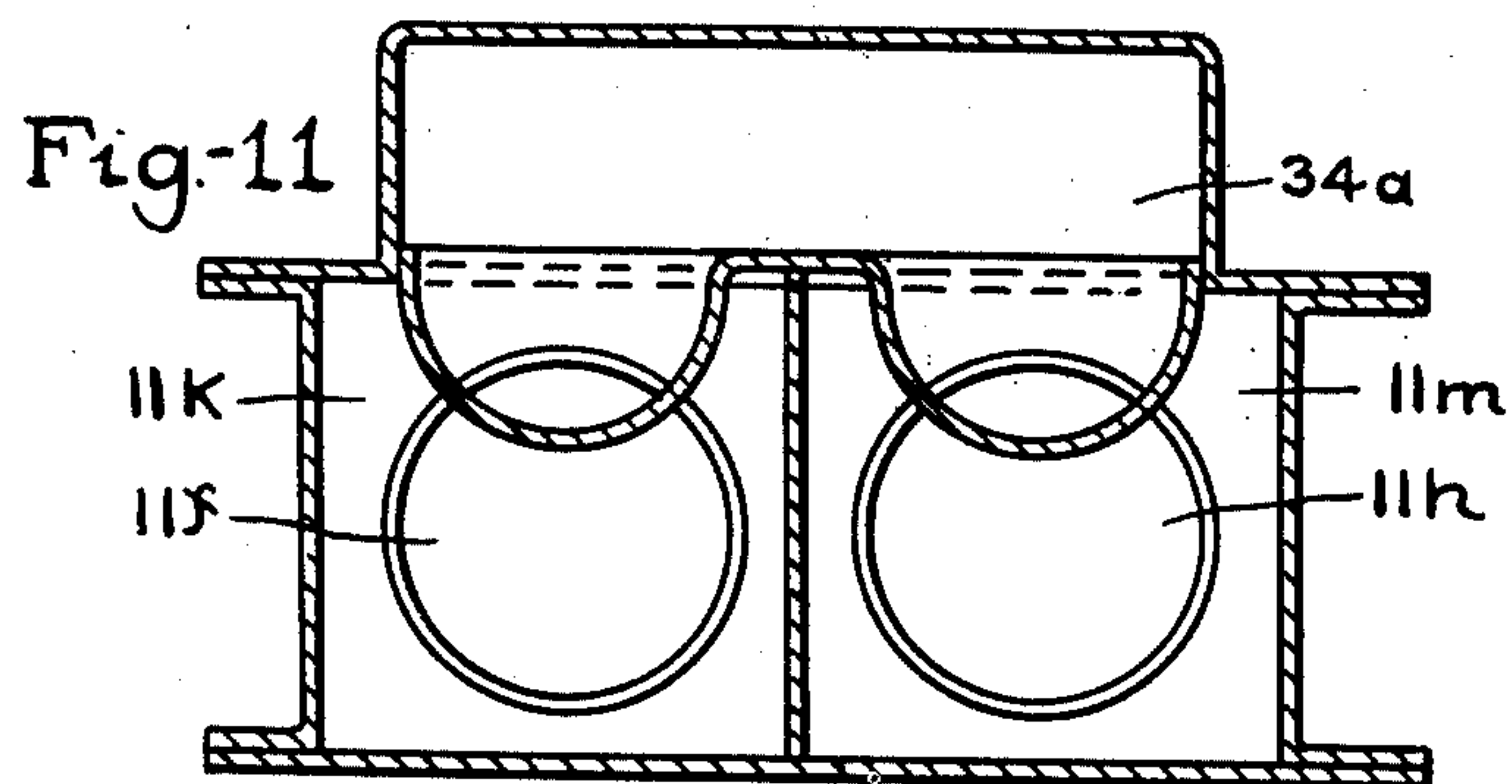
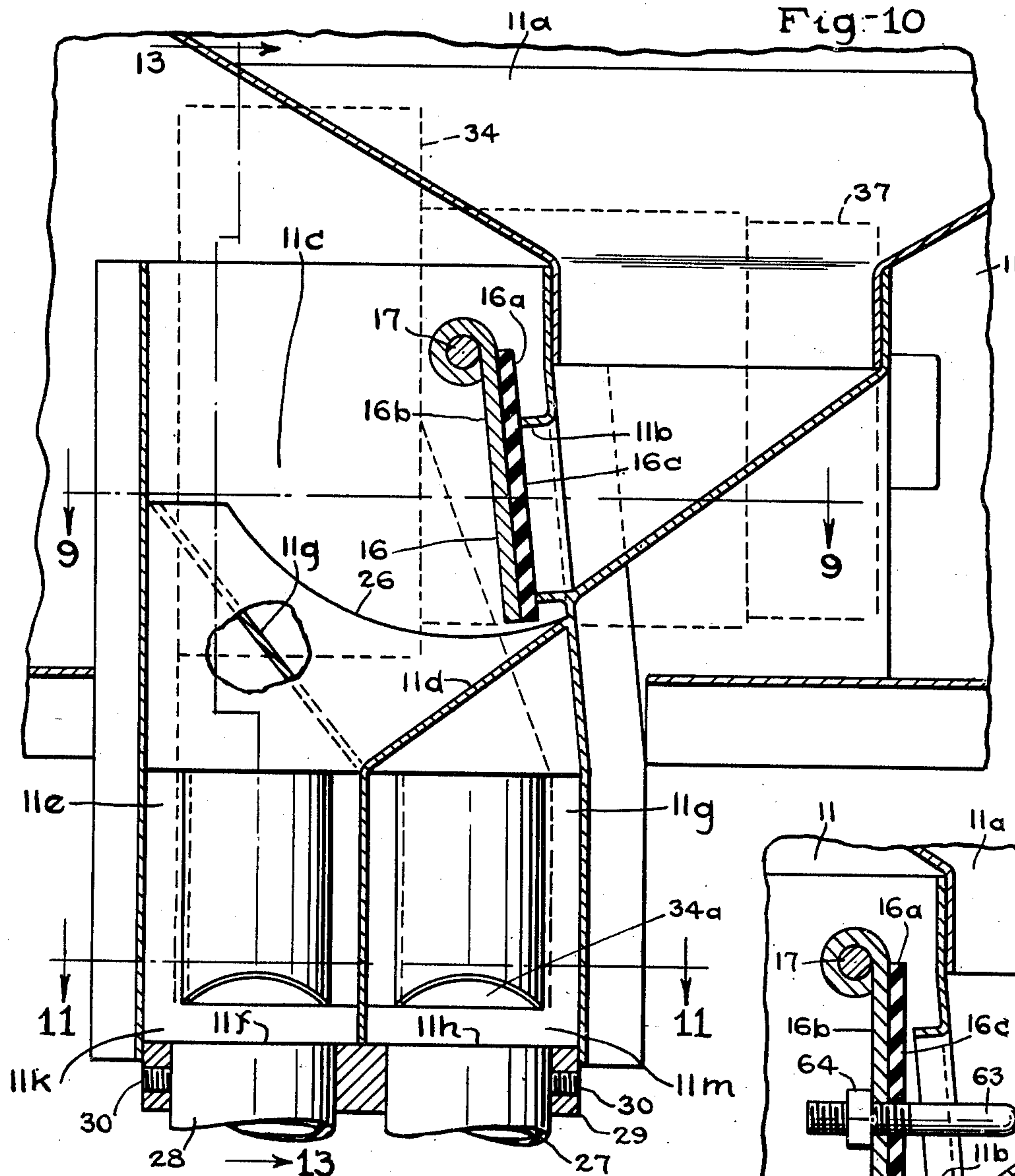
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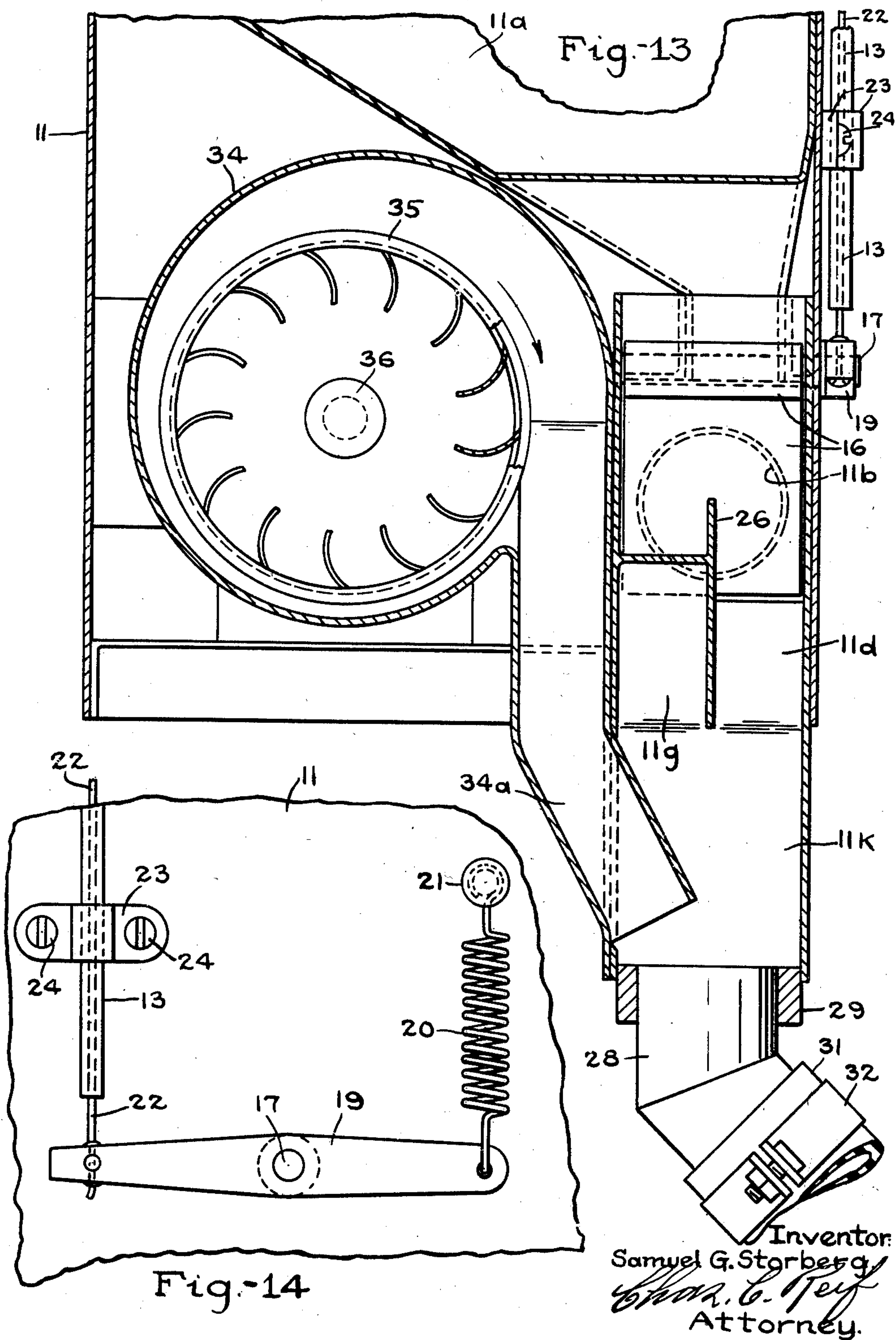
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SANDING DEVICE FOR VEHICLES

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4 Sheets-Sheet 4



UNITED STATES PATENT OFFICE

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SANDING DEVICE FOR VEHICLES

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Application August 11, 1948, Serial No. 43,740

15 Claims. (Cl. 291—3)

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This invention relates to a sanding device and particularly to a sanding device adapted to be carried by a vehicle and to discharge sand adjacent the wheels of said vehicle. It is desirable to have such a sanding device for automotive vehicles, particularly trucks, when the traction surface is covered with ice or snow, or otherwise in slippery condition. Such devices are also used on busses.

It is an object of this invention to provide a sanding device having a very simple and compact structure, together with a simple and efficient control means for said sanding device.

It is a further object of the invention to provide a sanding device comprising a member adapted to contain a supply of sand, a chute leading from said member and having a delivery end, a valve for closing and opening said end, and means for dividing the sand delivered through said end into two substantially equal streams in all positions of said valve.

It is also an object of the invention to provide such a structure as set forth in the preceding paragraph, said chute having a delivery end disposed at one plane and said valve having a flat surface adapted to engage said end, said valve being mounted to swing about an axis at one side of said end.

It is another object of the invention to provide a sanding device comprising a member adapted to contain a supply of sand, a delivery chute leading from said member, a valve for controlling the sand delivered from said chute and movable to different positions to control the amount of sand delivered, a motor, a fan driven by said motor for directing air to discharge sand from said device, and a control device disposed adjacent the driver's position in said vehicle, movable successively from a position with said valve closed and said motor and fan idle respectively to positions to operate said motor and fan and to open said valve different amounts.

It is still further an object of the invention to provide a sanding device for a vehicle comprising a casing mounted adjacent the rear wheels of said vehicle, and comprising a sand supply means, a delivery means for said sand, a motor, a fan driven by said motor, and a novel control device mounted adjacent the driver's position on said vehicle for starting and stopping said motor and fan and for determining the amount of said to be delivered.

These and other objects and advantages of the invention will be fully set forth in the following description made in accordance with the accompanying drawings and in which like reference characters refer to similar parts throughout the different views and in which:

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Fig. 1 is a view in side elevation of a vehicle showing the device of the invention applied thereto;

Fig. 2 is a wiring diagram for a motor used;

Fig. 3 is a view in side elevation of a control device used, some parts being broken away;

Fig. 4 is a vertical section of said control device taken substantially on line 4—4 of Fig. 7 as indicated by the arrows;

Fig. 5 is a substantially top plan view of a portion of the control device shown in Fig. 3;

Fig. 6 is a horizontal section taken substantially on line 6—6 of Fig. 4 as indicated by the arrows;

Fig. 7 is a horizontal section of said control device taken substantially on line 7—7 of Fig. 4 as indicated by the arrows;

Fig. 8 is a view partly in top plan and partly in horizontal section of a casing used and parts carried thereby;

Fig. 9 is a horizontal section taken substantially on line 9—9 of Fig. 10 as indicated by the arrows;

Fig. 10 is a vertical section taken substantially on line 10—10 of Fig. 8 as indicated by the arrows;

Fig. 11 is a horizontal section taken substantially on line 11—11 of Fig. 10, as indicated by the arrows;

Fig. 12 is a partial vertical section taken substantially on line 12—12 of Fig. 10 as indicated by the arrows; showing a modification;

Fig. 13 is a vertical section taken substantially on line 13—13 of Fig. 10 as indicated by the arrows, and

Fig. 14 is a partial view in side elevation as seen from the right of Fig. 13.

Referring to the drawings, a device is shown adapted to be connected to a vehicle and, while various vehicles might be used, in the embodiment of the invention illustrated a device is shown attached to a truck 10 having a longitudinal frame member 10a supported upon front wheels 10b and rear wheels 10c. The hood 10d of the vehicle is shown as portion of the cab 10e in which is disposed the driver's seat 10f in front of which is the steering wheel 10g. A dash or instrument board 10h is also shown. The device of the invention comprises a casing designated generally as 11, which will be mounted upon the frame 10a adjacent the rear wheels 10c and preferably in front of the same. Casing 11 can be secured in place by brackets 10i shown as in the form of angle iron. A guide tube 13 extends from casing 11 to the instrument board 10h and to a control device 12 comprising a housing 14. The casing 11 is provided with a cover 15 beneath which is a chamber 11a which

forms a supply chamber or hopper adapted to contain a supply of sand. Chamber 11a has sides converging toward their lower ends and these form a chute which has a delivery end 11b. The periphery of the delivery end of portion 11b is disposed in one plane and, while portion 11b could be variously formed, in the embodiment of the invention illustrated it is shown as cylindrical. A valve member 16 has a flat surface 16a which fits against the end of portion 11b to close said portion. Valve 16 comprises a plate 16b to which is secured a plate or ring 16c of some yielding materials such as rubber or rubber composition. Plate 16 is formed as a hub at its upper end and is swingable with the shaft 17 which extends substantially horizontal and transversely of portion 11b above the latter and is journaled adjacent its ends and the sides of the casing 11 as shown in Fig. 13. Shaft 17 projects at one side of said casing and has secured to said projecting end a lever 19, which lever extends at opposite sides of said shaft. A tensile coil spring 20 is secured to one end of lever 19 and is secured at its other end to the side of casing 11 by a screw or bolt 21. A flexible member 22, such as a wire or cable, is secured to the opposite end of lever 19 and extends into the guide tube 13, one end of which is shown in Fig. 14 and which is held on casing 11 by a bracket 23 secured by screws 24. Casing 11 contains a chamber 11c into which the sand is delivered from the chute end 11b and a plate 26 is disposed at the bottom of chamber 11c, the same being in a substantially vertical plane and extending toward the end 11b, said plane being substantially in a vertical diameter of the end 11b. Plate 26 has a concavely curved upper edge, one end of which extends to one side of chamber 11c and beneath the end 11b and valve 16, said edge extending away from end 11b and upwardly to a point a short distance above the center of end 11b. One part of the bottom of chamber 11c, namely 11d, slopes downwardly to a vertical passage 11f which communicates with a chamber 11k having a circular outlet 11f. The other part of the bottom of chamber 11c, namely part 11g, slopes downwardly to the end of portion 11d and directs the sand into a passage 11h and into a chamber 11m having a circular outlet 11j. Conduits 27 and 28 extend downwardly from the chambers to which passages 11e and 11h deliver, said conduits being held in a frame 29 secured to casing 11. Each conduit 27 and 28 is held respectively by a set screw 30. The bottom 11d extends downwardly and vertically between the chambers 11k and 11m from which conduits 27 and 28 lead. Flexible members 31 will be secured to the ends of conduits 27 and 28 by suitable clamps 32 and will direct the sand toward the bottoms of the rear wheels 10c of the vehicle. A fan housing 34 is disposed within one side of casing 11, the same having discharge passages 34a which are directed into the chambers 11k and 11m, as shown in Fig. 13. A fan 35 is disposed in housing 34 and carried on a shaft 36, to one end of which is connected a motor 37 also extending into fan housing 34.

As stated, the tubular housing 13 extends to a control device 12 mounted on an instrument board 10h. This control device comprises a casing 14a having parallel sides and a substantially semi-cylindrical periphery. A tubular housing 13 is connected to one side of casing 14a by a bracket 40 which is secured to said casing by a pair of screws 41. Casing 14a has a laterally

extending flange 14b which is secured to the instrument panel by screws or rivets 42. A cam member 44 is disposed between the parallel sides of casing 14a, the same having a handle portion 44a extending through a slot 14d in the semi-cylindrical end of casing 14c. Member 44 is swingable about a pivot member 45 threaded into one side of casing 14a, the same extending through a bushing 46 in member 44. Member 44 has a cam slot 44b therein, a small portion of which is concentric with member 45 and the major portion of which is eccentric to member 45. A cam follower 47 is disposed in slot 44b, the same having reduced portions 47a projecting through slots 14e on each side of casing 14a. One end of cable 22 is secured in a suitable manner to projecting portion 47a. Member 44 has a lower projecting end portion 44c, the end of which is beveled as shown as 44d in Fig. 7. A switch member 49 is supported upon one side of casing 14a by means of a bracket 50 secured to the side of casing 14a in any suitable manner. Switch member 49 has a movable portion having a pin 49a projecting into the space between the sides of casing 14a and adjacent the cam portion 44d. Conductors 51 are secured to electrodes or binding posts 49b of switch 49 and are housed in a covering or cord 52 which extends to binding posts on motor 37. Switch 49 is adapted to open and close the motor circuit as illustrated in Fig. 2. A suitable source of power, such as a battery 54 of the vehicle, will furnish current for the motor 37. The motor and battery 54 will, as usual, be grounded by being connected to the frame of the vehicle. Cover portions 55 and 56 of casing 14c are secured to casing 14a at respective sides thereof and house the switch 49 and connected parts and the upper housing 13 and bracket 40 and portion 47a. Rivets 57 secure the sides of casing 14a to a spacing block 58 and also extend through a spacing block 59 for the cover member 56. The latter is held in place by a screw 60. The casing 14c will have graduations or lines 61 at one side of the slot 14d and the one of the same at the top is designated "off," the next adjacent one is designated "fan," the next adjacent one is designated "sand 1," and the two at the bottom are designated "sand 2" and "sand 3" respectively.

In operation sand will be placed in the chamber or hopper 11a and the lid or cover 15 will be placed on the casing 11. When the device is in inoperative position and it is desired to apply some sand to the roadway, the driver will take hold of handle 44a and move the same toward him or downwardly. A slight movement of handle 44a will move the projection 44c and bring the beveled portion 44d into engagement with the end of pin 49a. Pin 49a will be moved downwardly as shown in Fig. 7 and this will close switch 49. Motor 37 will now be started and fan 35 will be driven. Air will now be blown into the chambers 11k and 11m and will pass downwardly through conduits 27 and 28 and into the conduits 31. A further movement of handle 44a will bring cam follower 47 into the eccentric portion of cam slot 44b and this will move portion 47a and exert a pull upon cable 22. This in turn will pull upon lever 19 against the tension of spring 20 and will swing shaft 17, and valve 16 will be swung away from the end 11b of the sand delivery chute. Sand will now be delivered by gravity through portion 11b and this sand will be divided into substantially equal streams by the plate 26 and will pass down into the chambers

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11k and 11m. Should more sand be required, the driver will move handle 44a so that a marking thereon will register with the line 61, mark 2 on 3, and this will open valve 16 still further. Plate 26 will always divide the sand into substantially equal streams no matter to what degree the valve 16 is opened. The sand will drop down into chambers 11k and 11m and will be forcibly directed through the conduits 27 and 28 and the conduits 31 toward the rear wheels 10c and the traction surface. Reverse movements of the handle 44a will decrease the amount of sand through action of spring 20 and when it is desired to render the device inoperative, the handle will be moved to its upper or "off" position. The circuit of motor 37 will then be broken and the fan 35 will not be driven. Spring 20 and the corresponding end of lever 19 may be omitted if desired. The push of member 22 and gravity would then operate valve 16.

In Fig. 12 a modification is shown in which a member or pin 63 is secured in valve 16 substantially central of the end 11b. Pin 63 is threaded and has a locking nut 64 thereon which engages one side of valve 16. The pin 63 will enter the end 11b and will act to keep the sand free and in flowing condition.

From the above description it will be seen that I have provided a very simple, compact and efficient sanding device including a compact and efficient controlling means. The device can be easily, quickly and conveniently attached to the standard truck, bus or other automotive vehicle and will operate efficiently to deliver sand to the roadway to secure more traction. The casing 11 is made largely from sheet metal and can be easily produced and assembled. The device has been demonstrated in actual practice, found to be very successful and efficient and is being commercially made.

It will of course be understood that various changes may be made in the form, details, arrangement and proportions of the parts, without departing from the scope of applicant's invention, which generally stated, consists in a device capable of carrying out the objects above set forth, in the parts and combinations of parts disclosed and defined in the appended claims.

What is claimed is:

1. A sanding device for a vehicle having in combination, a casing having a chamber therein adapted to contain a supply of sand, a chute leading from said chamber through which sand flows and having a discharge end in a plane substantially at right angles to the central axis of said chute, said chute having a delivery end, a plate-like valve hinged above said chute and swingable to engage and close and to open said end, passages below said valve to which sand is delivered from said chute and a plate below said valve disposed in a vertical plane for dividing the sand delivered by said chute into equal parts and means for directing said parts into said passages in all open positions of said valve.

2. The structure set forth in claim 1, said plate being disposed in a plane passing through a substantially median line of the end of said chute and having its upper end disposed in an arc closely adjacent the arc described by the lower end of said valve in its movement.

3. A sand device for a vehicle having in combination, a casing having a chamber therein adapted to contain a supply of sand, a chute leading from said chamber through which sand flows,

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said chute having a delivery end the periphery of which is disposed in one plane substantially at right angles to the central axis of said chute, a plate valve swingable about an axis at the upper side of said chute and having a surface adapted to engage said end to close said chute and to be moved away from said end to different positions to open said valve different amounts, and a plate adjacent said end disposed in a vertical plane forming substantially a median plane of said end to divide the sand delivered through said chute into substantially equal streams in all positions of said valve, a pair of substantially parallel downwardly extending chutes and plates for directing said streams into said last mentioned chutes respectively.

4. The structure set forth in claim 3 and a member projecting from said valve adjacent said chute and adapted to move into and out of said end in the swinging movement of said valve.

5. A sanding device for a vehicle having in combination a casing having a chamber therein adapted to contain a supply of sand, a cylindrical chute leading from said chamber through which sand flows, said chute having a delivery end the periphery of which is disposed in one plane perpendicular to the central axis of said chute, a plate valve swingable about a substantially horizontal axis at the upper side of said chute, having a surface adapted to engage said end to close said end, a plate adjacent said end disposed in a substantially vertical plane, which plane forms substantially a vertical diameter of said end, passages leading downwardly from each side of said plate and a pair of substantially parallel chutes below said passages whereby sand delivered by said chute is divided into two substantially equal streams and directed into said last mentioned chutes by said passages in all open positions of said valve.

6. A sanding device for a vehicle having in combination, a casing having a chamber adapted to contain a supply of sand, a substantially cylindrical chute leading from said chamber, said chute having a delivery end disposed substantially in one substantially vertical plane, a plate-like valve having a surface adapted to engage said end and hinged about an axis disposed above said end, a plate having a concavely curved upper edge extending from a point below and closely adjacent said end and extending away from said end and upwardly to above the center of said end, said plate being disposed in a substantially vertical plane forming substantially a median plane of said end, the upper edge of said plate being adjacent and substantially parallel to the arc described by the bottom of said valve in its swinging movement, a pair of downwardly extending substantially parallel chutes and channels leading downwardly from each side of said plate and leading to said chutes, whereby sand delivered from said end is divided into substantially equal streams and delivered by said channels to said last mentioned chutes respectively.

7. A sanding device for a vehicle having in combination, a casing having a chamber for containing a supply of sand, a chute leading from said chamber and having a discharge end, a valve for closing said end and swingable with a shaft disposed at one side of said valve, a lever secured to said shaft, a spring connected to one end of said lever, a cable secured at one end to the other end of said lever, a member to which the other end of said cable is secured, a control member swingable about a fixed axis and having a handle,

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said control member comprising a cam slot eccentric to said axis, said first mentioned member having a part disposed in said cam slot whereby said first mentioned member is moved to different positions by swinging said handle to pull upon said cable and open said valve different amounts.

8. A sanding device for a vehicle having in combination, a casing mounted adjacent the rear wheels of said vehicle and comprising a chamber adapted to contain a supply of sand, a chute leading from said chamber and having a delivery end, a plate-like valve for engaging and closing said end and movable to different positions to permit discharge of different amounts of sand, and a control member pivotally mounted for oscillating movement adjacent the driver's position on said vehicle and having a handle movable to different positions, a cable connecting said member and valve movable by said member for opening said valve different amounts.

9. The structure set forth in claim 10, a fan for discharging sand, a motor for driving said fan, a switch for controlling said motor adjacent said control member and means movable by said control member for closing said switch before said valve is opened.

10. A sanding device for a vehicle having in combination, a casing having a chamber therein adapted to contain a supply of sand, a chute leading from said chamber and having a discharge end, a valve for closing and opening said end, a control cam member comprising a cam having a cam slot, a member connected to said valve disposed in said slot, and a switch, said cam member having a portion adapted to close said switch.

11. A sanding device for a vehicle having in combination, a casing having a chamber adapted to contain a supply of sand, a chute leading from said chamber, a valve for closing and opening said chute, a control member adapted to be mounted adjacent the driver's position on said vehicle comprising parallel plates, a pivot extending between said plates, a cam member movable between said plates and having a handle thereon, said cam member being swingable about said pivot, a switch at one side of one of said plates, having a pin projecting through said plate, said cam member having a beveled end adapted to engage and move said pin to close said switch, said cam member having a cam slot therein, a cam follower disposed in said slot, the other of said plates have a slot through which said follower projects and in which it is movable, and a member secured to said follower and to said valve for opening said valve different amounts in the movement of said cam member.

12. A sanding device for a vehicle having in combination, a casing, a fan, a fan housing carried by said casing, a supply hopper for sand at the upper end of said casing, a chute leading from said hopper and having a delivery end disposed in one plane, a swinging valve having a flat surface movable against and away from said delivery end, a plate in front of said valve disposed substantially in a median plane of said end, passages leading from the sides of said plate respectively and a pair of discharge chutes, said passages leading from said fan housing to said discharge chutes respectively.

13. A sanding device for a vehicle having in

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combination, a casing having a chamber therein adapted to contain a supply of sand, a chute leading from said chamber and having a discharge end, a movable valve for closing and opening said end, a control member swingable about a fixed axis and having a cam slot therein, said slot having a portion concentric to said axis and another portion eccentric to said axis, a follower in said slot, a member connecting said follower connected to said valve for moving the latter when said follower is moved, a fan, a motor for driving said fan, a switch for said motor adjacent said control device, means on said cam for closing said switch during movement of said concentric portion of said slot relative to said follower, further movement of said cam causing said eccentric portion of said cam to move said follower and open said valve.

14. A sanding device for a vehicle having in combination, a casing having a chamber adapted to contain a supply of sand, a chute leading from said chamber, said chute having a delivery end disposed substantially in one plane, a plate-like valve having a surface adapted to engage said end, a lever connected to said valve for swinging the same, a spring at one end of said lever for moving said valve to closed position, a cable connected to the other end of said lever, a movable manually operated control member adjacent the position of the driver of said vehicle having a handle adapted to be grasped by said driver, said cable being connected to said control member whereby said valve may be opened more or less by movement of said control member to permit delivery of more or less sand, means for directing an air blast for moving said delivered sand and a switch for controlling said last mentioned means.

15. A sanding device for a vehicle having in combination, a casing having a chamber adapted to contain a supply of sand, a chute leading from said chamber, said chute having a delivery end disposed substantially in one substantially vertical plane, a plate-like valve having a surface adapted to engage said end and hinged about an axis disposed above said end, a spring adapted to move said valve to closed position, and means adjacent the position of the driver of said vehicle adapted to be manually moved by said driver, other means connected to said first mentioned means and valve whereby said valve will be opened by movement of said first mentioned means, an electrically operated means for directing an air blast for moving said delivered sand and a switch adjacent the driver's position for controlling said last mentioned means.

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