

Aug. 2, 1938.

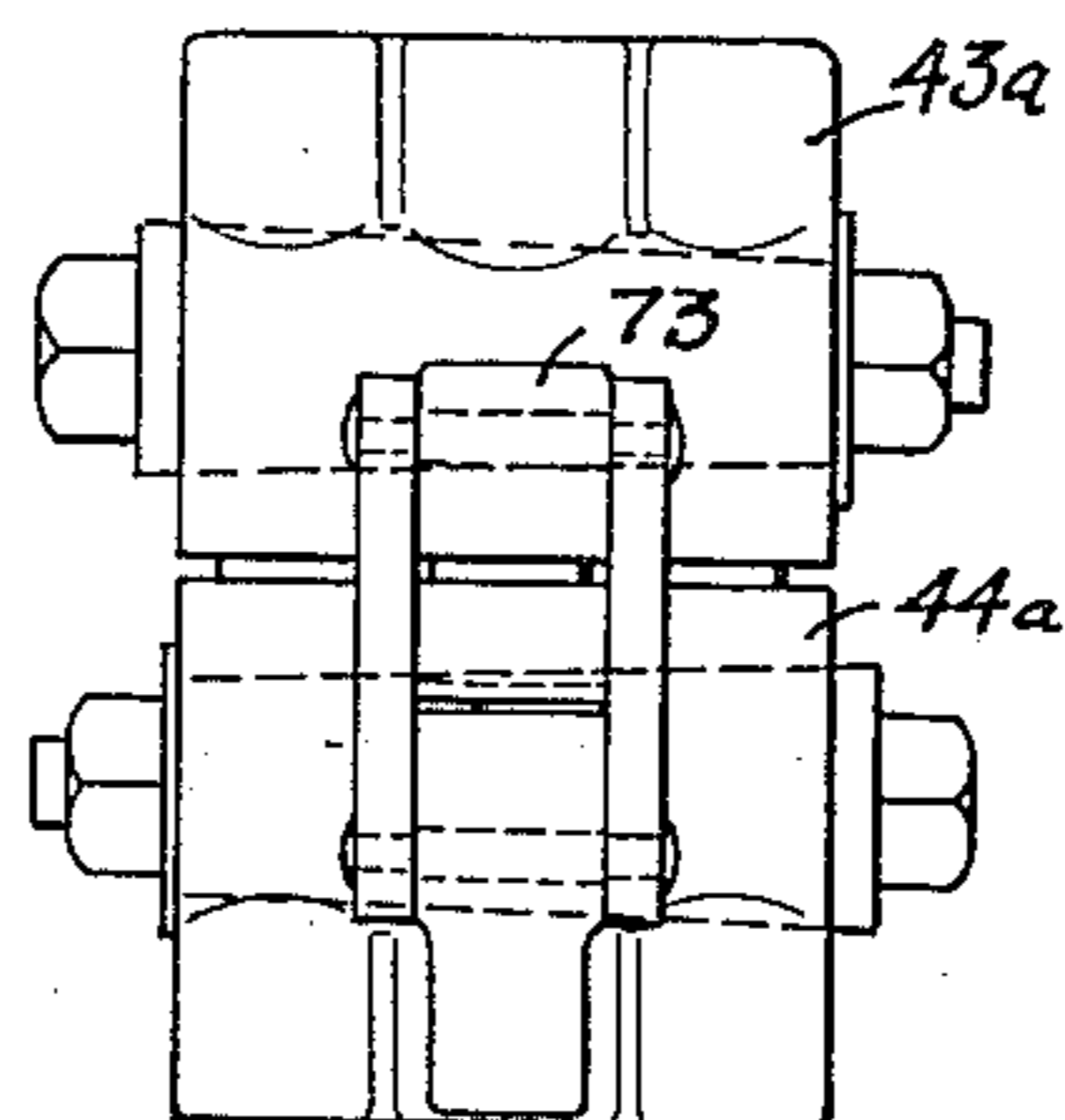
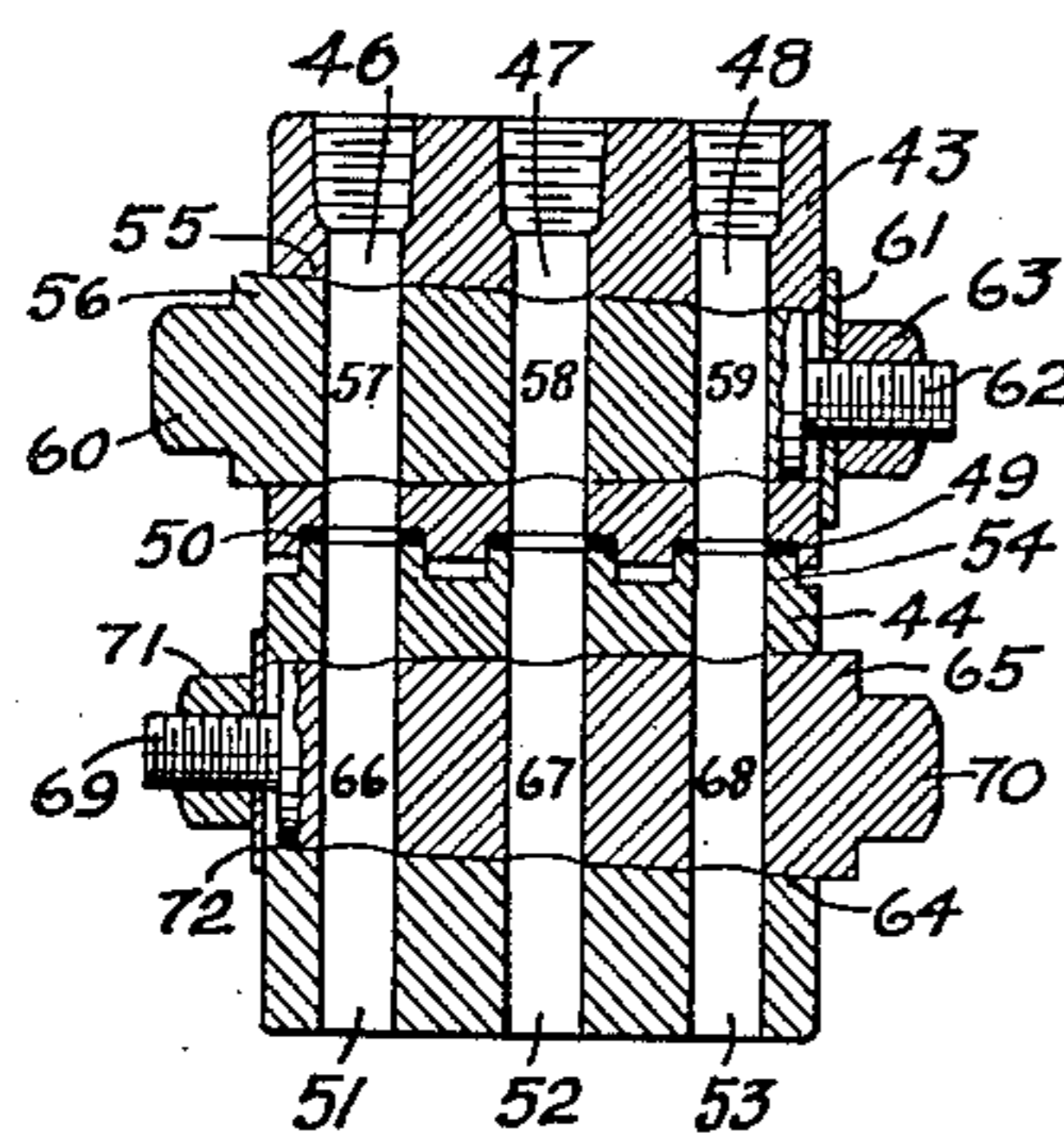
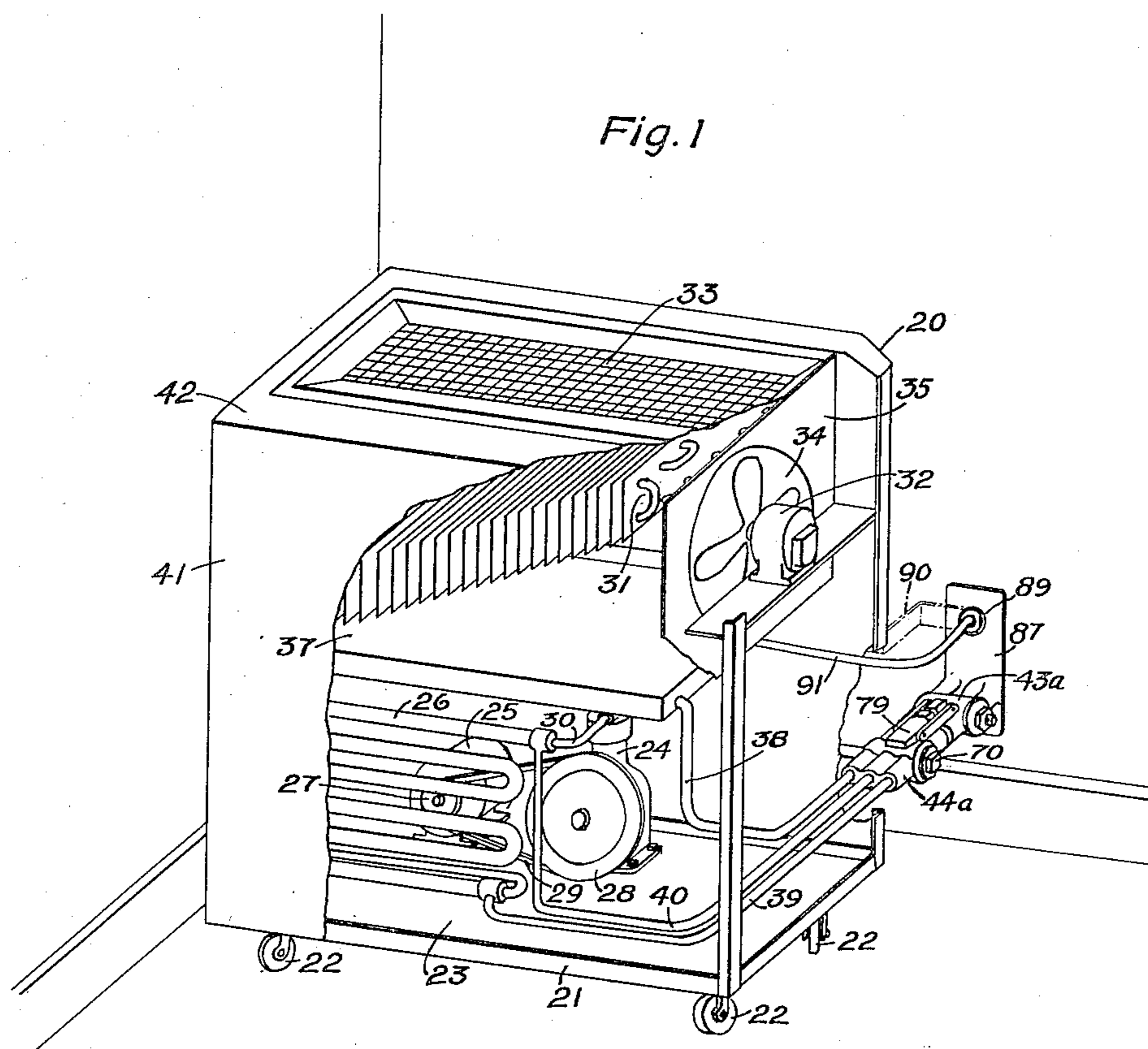
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2,125,542

PORTABLE REFRIGERATING DEVICE, PARTICULARLY FOR AIR CONDITIONING

Filed Nov. 28, 1934

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 7

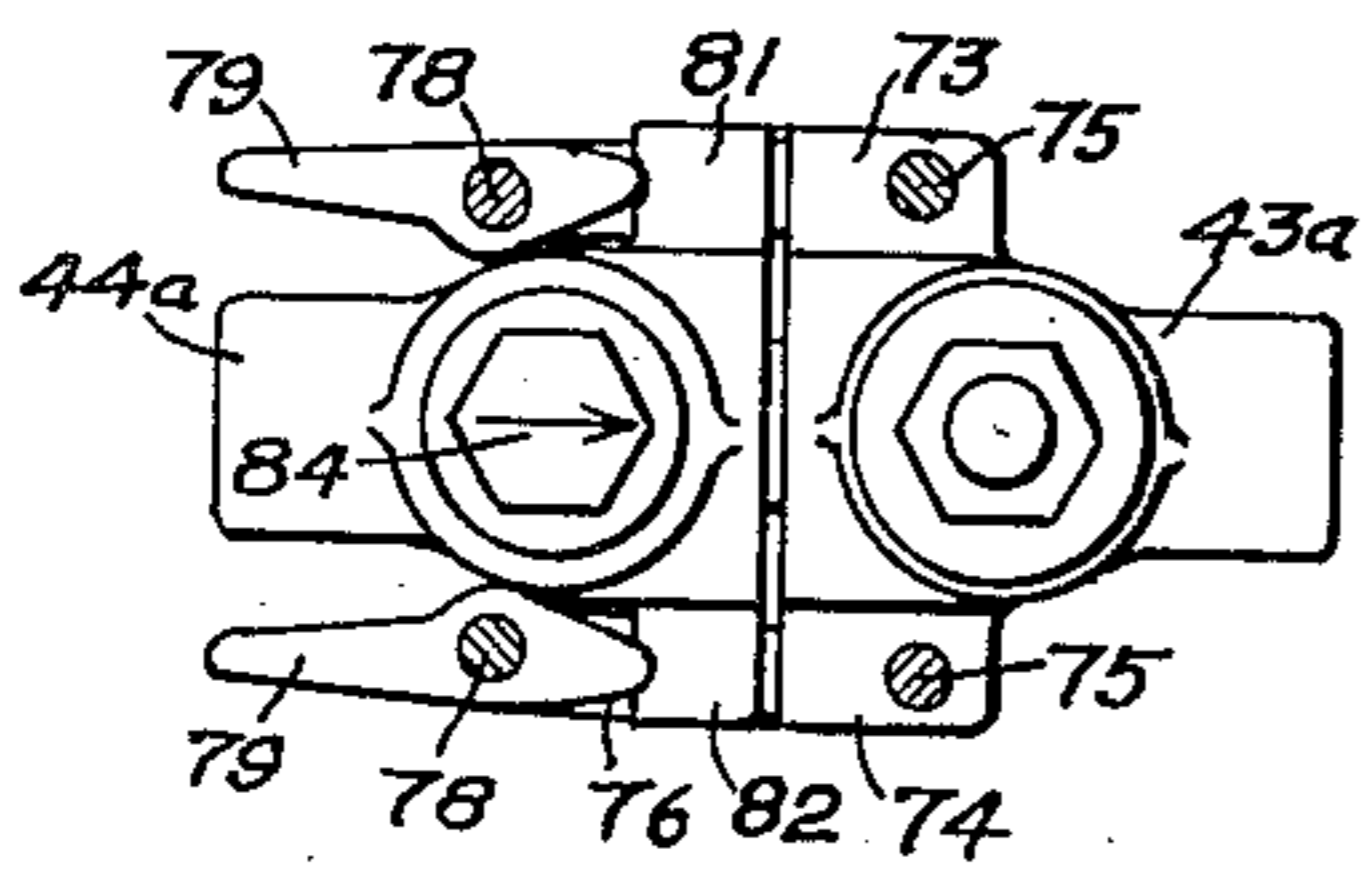


Fig. 8

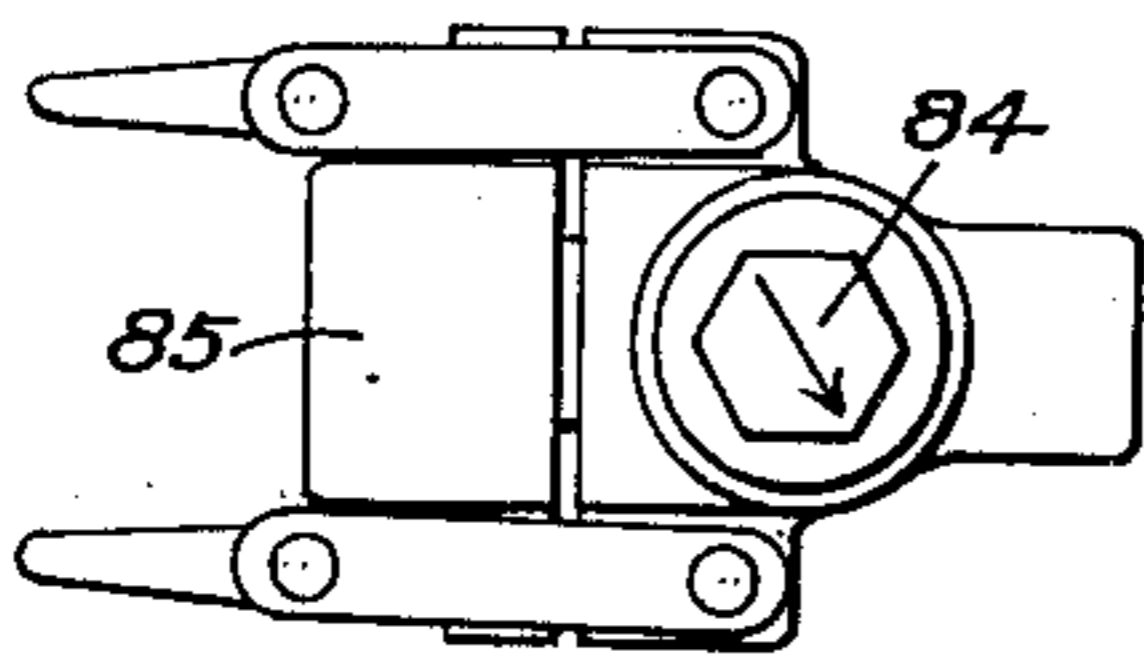
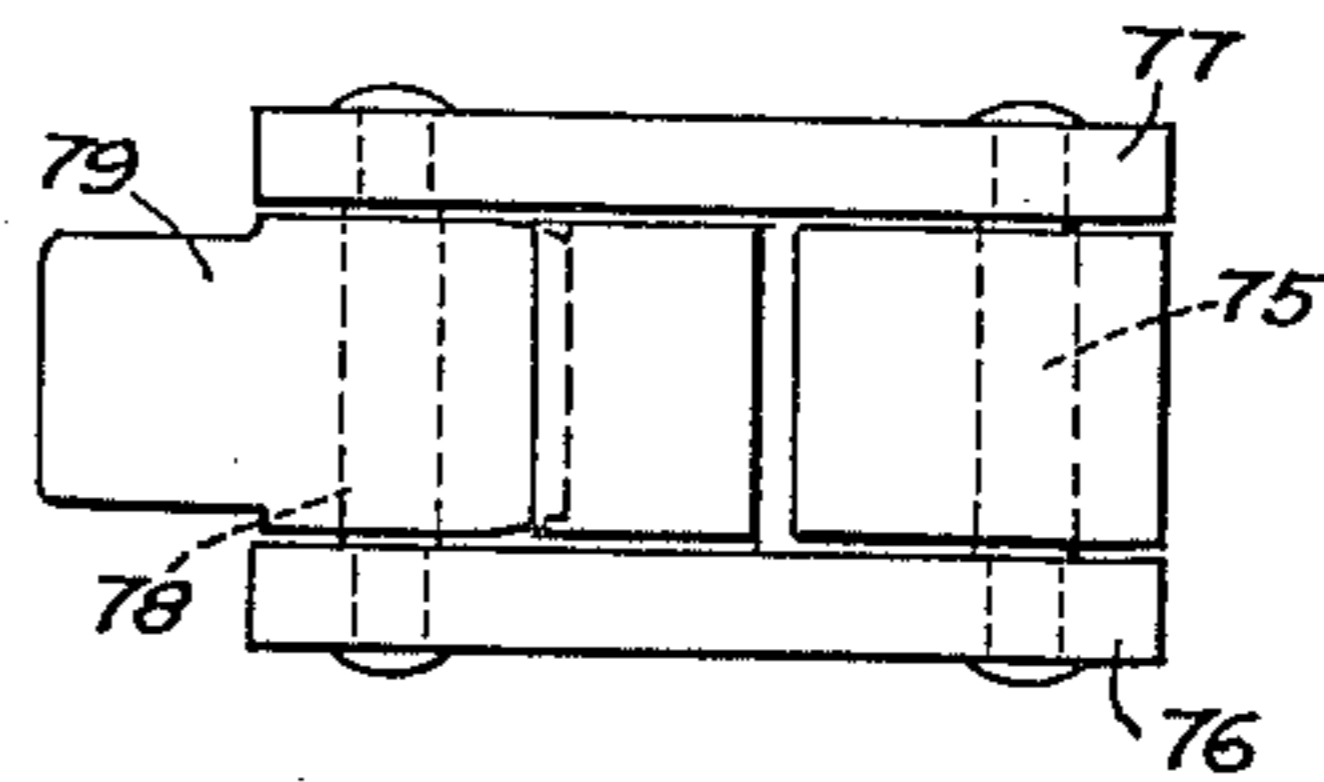


Fig. 10

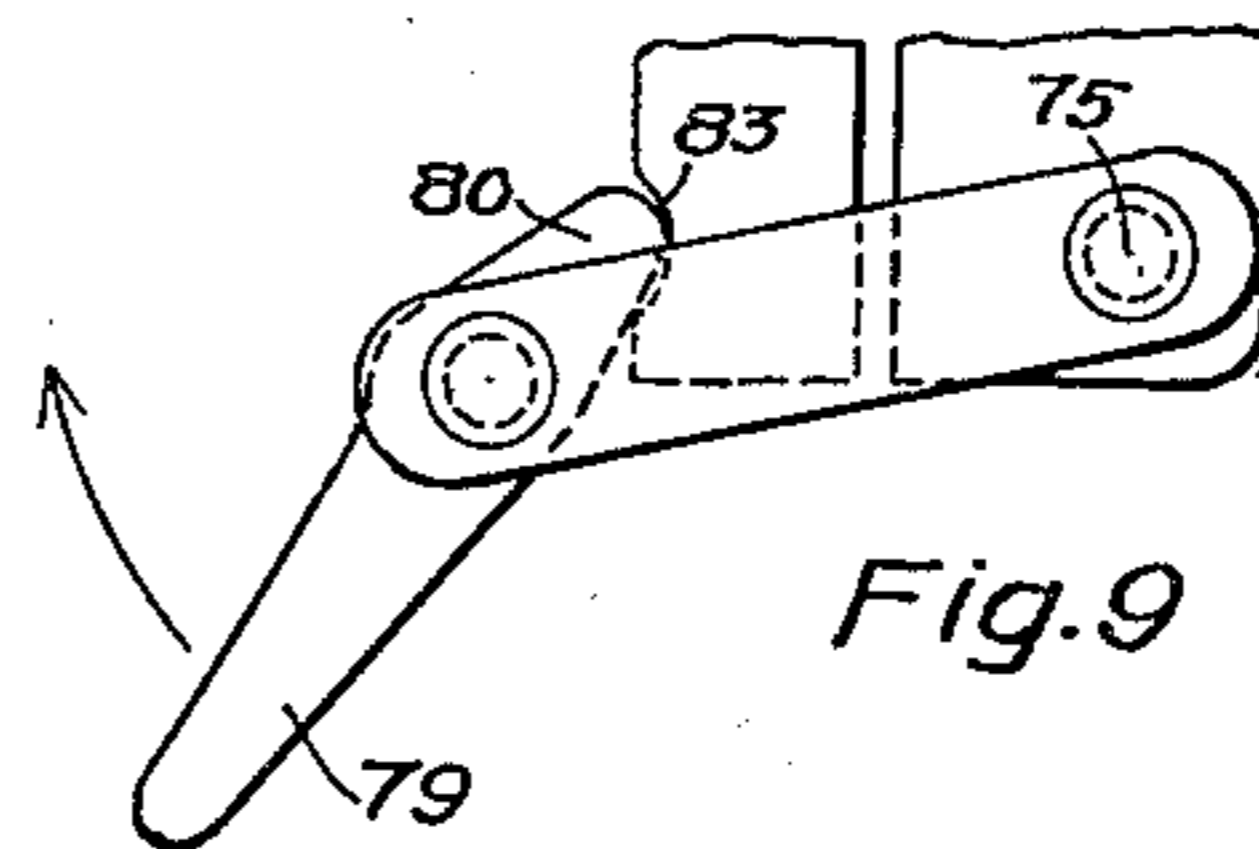


Fig. 9

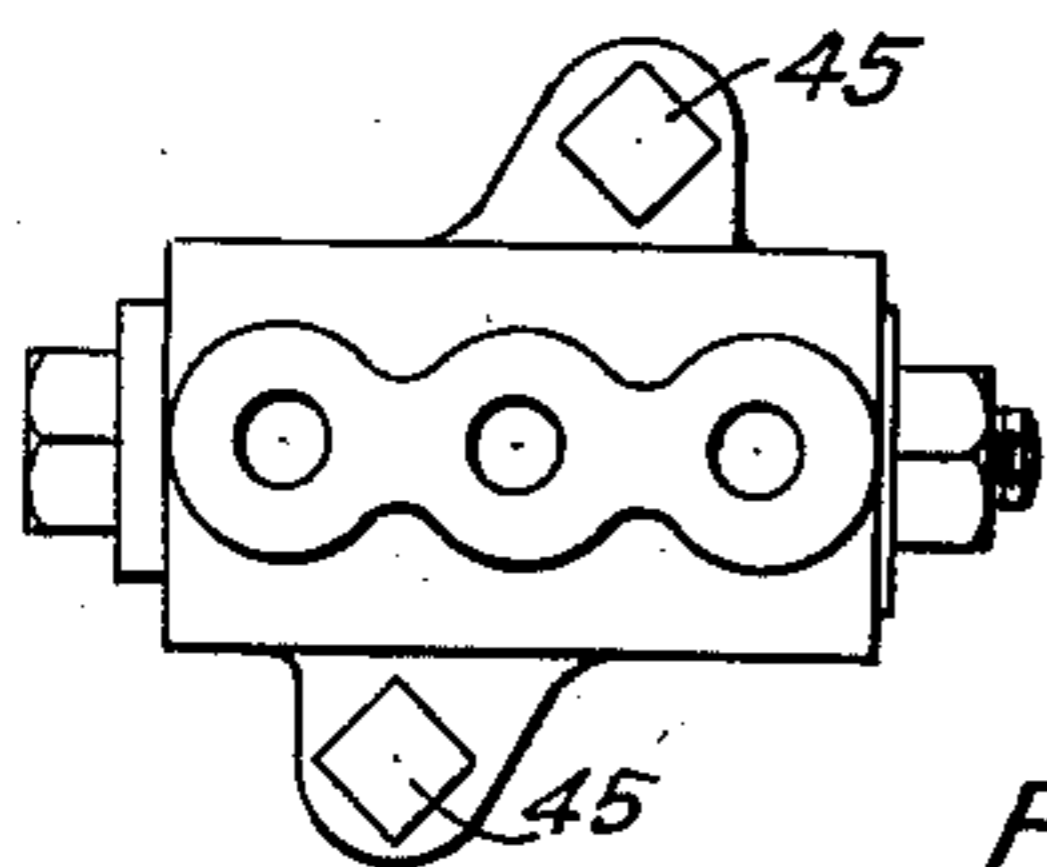


Fig. 5

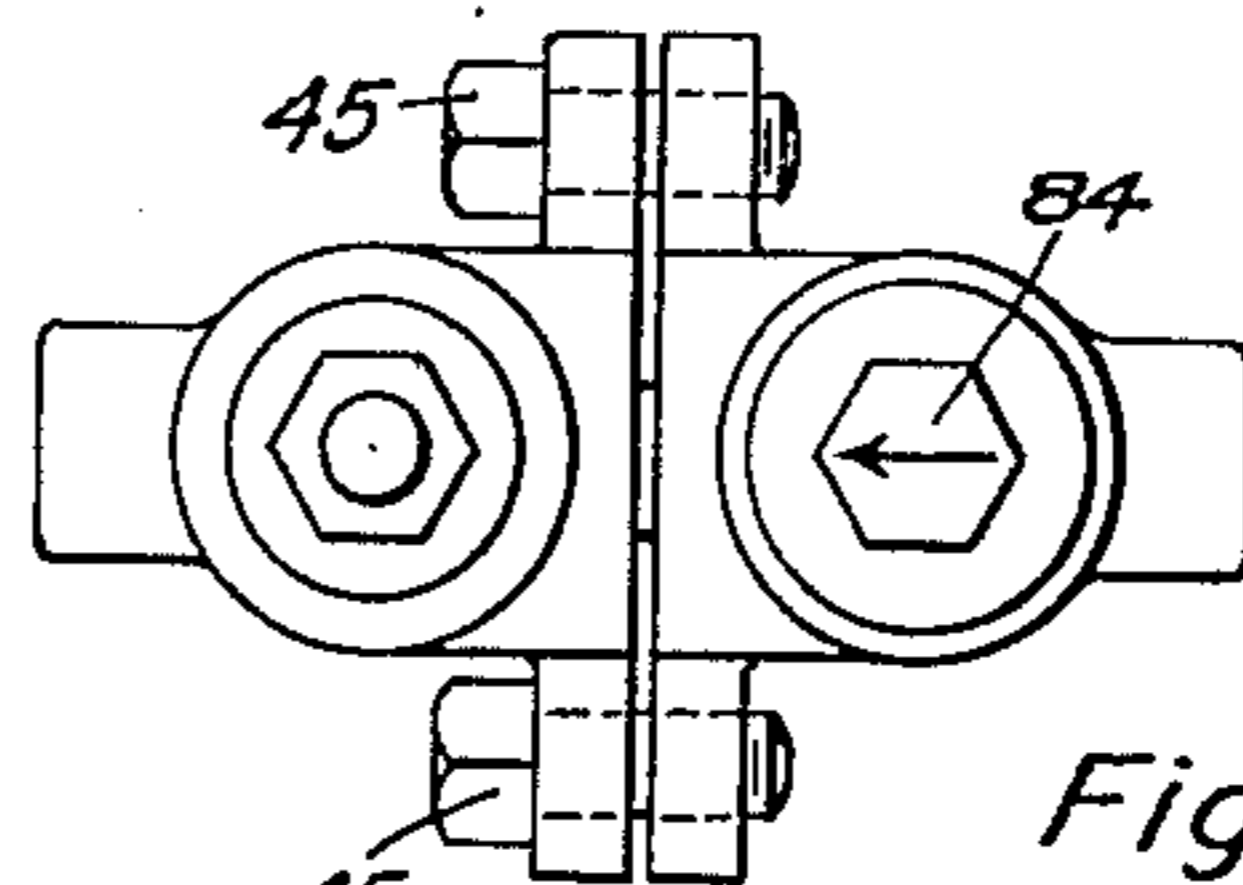


Fig. 4

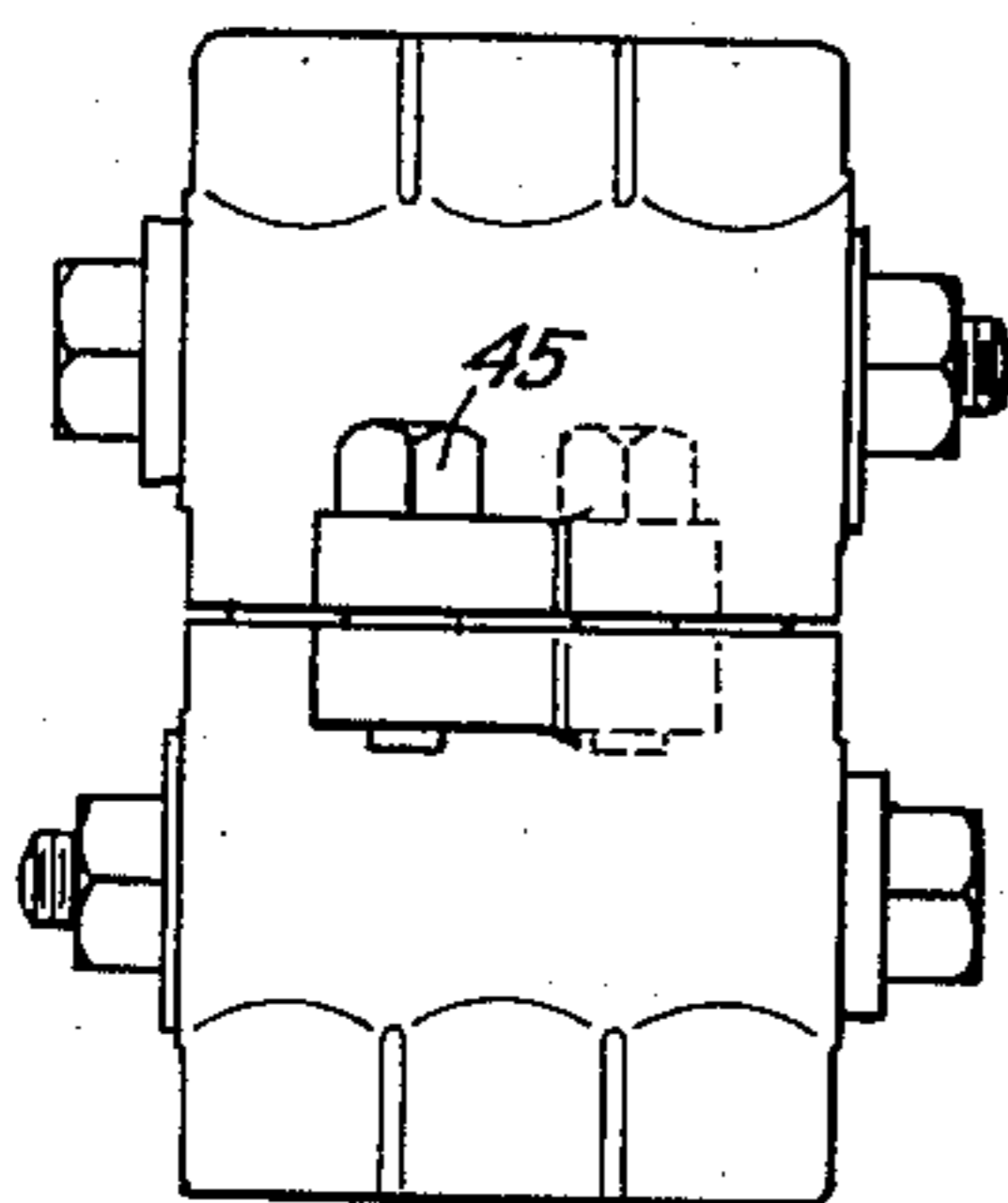


Fig. 3

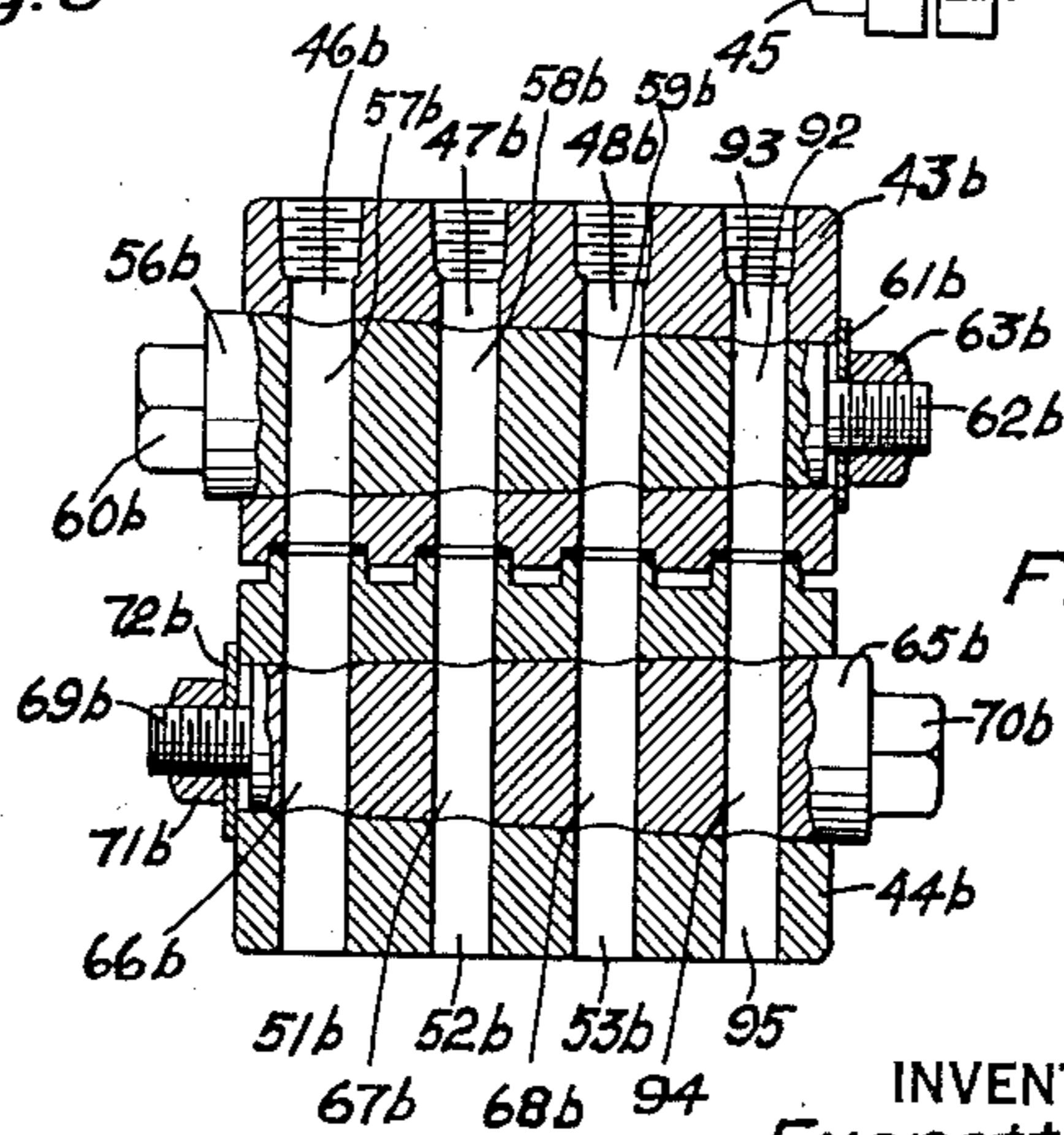


Fig. 11

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PORTABLE REFRIGERATING DEVICE, PARTICULARLY FOR AIR CONDITIONING

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Application November 28, 1934, Serial No. 755,114

4 Claims. (Cl. 62—129)

This invention relates to improvements in portable refrigerating devices, particularly for air conditioning, and has for an object the provision of a portable refrigerating system which may be water cooled and readily moved from one portion of a building to another.

Another object of the invention is the provision in a portable refrigerating device of means for preventing the cooling water from leaving the condenser when the device is disconnected from the supply of cooling water for the purpose of moving it to another location.

Another object of the invention is the provision of a separable coupling comprised of two members each including a multiple valve. One member is secured to the refrigerating device and includes a passage through which the entering cooling water may pass, a second passage through which the used condensing water may flow and the third passage through which condensate from the cooling device may pass.

The other member matches the first member and is adapted to be secured in or to the wall of a room. One of the passages is connected to the water mains and the other two are connected to pipes leading to the sewer.

When the device is rolled into a room and the two parts or members are secured together, the passage in the wall member associated with the water supply members up with the passage in the machine member leading the cooling water to the condenser. After the machine has been operating and it is desired to move it to another location, the valves in the two members are closed thereby preventing the leakage of any substantial amount of water when the machine is disconnected from the plumbing or wall fixture.

With the new and improved connection valve only a few drops of water are spilled.

Still another object of the invention is the provision in an air conditioning system of a valved coupling device comprised of two members, one of which is an integral part of the machine and the other of which is a permanent fixture of the building, of hand operated means for quickly associating or disassociating the members without the necessity of using any tools whatever.

Other objects will be apparent to those skilled in the art upon a perusal of the specification and the appended claims.

Referring to the drawings:

Figure 1 is a prospective view of a portable air conditioning device, according to the invention, partly broken away, showing the cooling water supply and discharge pipes, the condensate drain

pipe and the electrical connections associated with the corner of a room of which one member of the valved coupling device forms an integral and permanent part;

Figure 2 is a sectional elevation of one form of the new and improved coupling and valve;

Figure 3 is a side elevation of the valved coupling shown in Figure 2;

Figure 4 is an end view of the coupling;

Figure 5 is a top view showing the arrangement of bolts for securing the two members together;

Figure 6 is an elevation similar to that shown in Figure 3 with the exception that instead of bolting the members together they are secured together with cammed clamping levers;

Figure 7 is a side elevation, partly in section, showing the position of the clamping levers when the members of the coupling are secured together;

Figures 8 and 9 are enlarged views of the cammed clamping levers showing details thereof;

Figure 10 is a view of a single valved coupling member provided with a suitable closure cap; and

Figure 11 is a sectional view of a coupling member similar to that shown in Figure 2 with the provision of an extra passage which may be adapted to gas-fired refrigerating machines.

The portable air conditioner, designated generally by the numeral 20, consists of a frame 21 mounted on swivel rollers 22 forming a "dolly". The frame 21 may be provided with a suitable boss plate 23 forming a support for a compressor 24, a motor 25 and a condenser 26. The motor pulley 27 is attached to the compressor flywheel 28 preferably with the usual V-belt 29.

The compressed refrigerant is discharged into the condenser via the pipe 30 and the lower coil or coils of the condenser may form a receiver for liquid refrigerant.

Liquid refrigerant is delivered to an evaporator or cooling coil 31 via a suitable expansion valve (not shown) and the evaporator is connected by return pipe (not shown) to the suction side of the compressor.

The evaporator, or cooling coil, is preferably inclined, as shown, and a suitable fan 32 is provided for forcing air through and over the evaporator 31. This air becomes cooled and passes out into the room through the grilled opening 33. The blades of the fan 32 are positioned in an opening 34 formed in the plate 35. A suitable connector cord 36 is provided for leading current to the motor 25 and the fan 32. A drip pan 37 is positioned beneath the evaporator 31 to catch condensed moisture which may drip from the evap-

orator. A suitable drain pipe 38 is connected to the drip pan 37 preferably near a corner thereof and the drip pan is inclined so that all condensate will drain into the pipe 38. A pipe 39
5 connected at the lower part of the condenser 26 is provided for delivering cooling water to the condenser. A pipe 40 connected to the upper part of the condenser is provided for leading cooling water away from the condenser 26.

10 The frame 21 is provided with suitable cover plates 41 and 42 thereby enclosing the mechanism.

Heretofore it has been customary to connect portable refrigerating devices of this character to
15 water and drain connections by means of lengths of hose. One length of hose was connected between the water supply pipes and the condenser and the other between the condenser drain pipe and pipes leading to the sewer. When it was
20 desired to remove the device to another room or portion of the building it was customary to place a large tub or bucket beneath the hose connections after which the hose was disconnected and all of the water in the condenser had to be drained into
25 the bucket or tub before the device could be moved. If the bucket or tub was too small the floor or carpet was usually wet or puddled and the whole procedure was "messy."

These disagreeable features are overcome in the
30 present invention by the provision of a coupling device, one member of which is a permanent fixture in the room and the other a permanent part of the refrigerating device. These members are arranged in the wall of the room and in the de-
35 vice respectively so that when the device is rolled into position the member in the device will match up with the member in the wall of the room.

These members are provided with passages therethrough through which liquid may pass and
40 each member is provided with a valve adapted to close these passages. The coupling is shown in section in Figure 2 and consists of a member 43 and a cooperating member 44. These members are secured together in cooperative relation by
45 means of bolts 45 shown in Figures 3, 4 and 5.

The member 43 is provided with passages 46, 47 and 48 passing therethrough. The member 43 is also provided with countersunk portions 49 at adjacent ends of the passages 46, concentric therewith, and adapted to contain suitable gas-
50 kets 50.

The member 44 is provided with a plurality of passages 51, 52 and 53, which, when the members are in cooperative relation, are in line with the
55 passages 46, 47 and 48 respectively. The member 44 is provided with bosses 54, on one phase thereof, concentric with the passages 51, 52 and 53. These bosses are of such diameter that they fit into the countersunk portions 49 of the mem-
60 ber 43 and when the members 43 and 44 are secured together the gaskets 50 form a sealed joint therebetween.

The member 43 is provided with a tapered hole
65 55 preferably at right angles to and communicating with the passages 46, 47 and 48. A tapered plug 56 fits the tapered hole 55 and is provided with cross holes 57, 58 and 59 in line with the passages 46, 47 and 48, thereby forming a valve. The tapered plug is provided with a hexagonal
70 head 60. The opposite end of the tapered plug forms a boss 62 which is threaded to accommodate a nut 63. A suitable washer 61 is provided between the face of the member 43 and the nut 63.

When the tapered plug is rotated by means of
75 a suitable tool engaging the hexagonal head 60,

the cross holes 57, 58 and 59 are moved out of engagement with the passages 46, 47 and 48 and solid portions of the plug 56 close the passages. In other words, the tapered plug is adapted to simultaneously shut off all three of the passages. 5

The member 44 is also provided with a tapered hole 64 fitted with a tapered plug 65 similar to 56 and provided with cross holes 66, 67 and 68 which are adapted to member up with the pas-
sages 51, 52 and 53 respectively. The plug 65 is
10 provided at its large end with a hexagonal head 70 and at its small end with a boss 69. The boss 69 is threaded and provided with a nut 71. A suitable washer 72 is provided between the nut 71 and the face of the member 44. The tapered plug 65
15 forms a valve and operates in the same manner as that described for 56.

The construction of the valved coupling mem-
bers, shown in Figures 1, 6 and 7, is exactly like described for Figures 2, 3, 4 and 5 with the ex-
20 ception that the members themselves are secured together by other means than the bolts 45. The passages through the members and the valves are identical with those shown in Figure 2. The member 43a is provided with bosses 73 and 74.
25 These bosses are each provided with cross holes in which shouldered pins 75 are pivotally supported. A link 76 is riveted or otherwise secured to one end of the pin 75 and a link 77 is riveted or otherwise secured to the other end of the
30 pin 75.

The shouldered pin 78 is riveted or otherwise secured to the free ends of the links 76 and 77 forming a pivotal support for the lever 79. The lever 79 is provided with cams 80 adapted to en-
35 gage cooperative bosses 81 or 82. The bosses 81 and 82 are made integral the member 44a and are provided with concave depressions 83 to be engaged by the cams 80.

Referring to Figure 9, when the link lever as-
40 sembly is swung into position for clamping action and the lever 79 is moved in the direction of the arrow the cam 80 engages the concave depressions and as the lever 79 is moved therethrough the members 43a and 44a are tightly clamped
45 together. When in this condition, the links 76 and 77 member up against the sides of the member 44a and as the pin 78, when the links are in such a position, fall inside the center lines of the pin 75, the lever tends to stay in the lock
50 position.

One of the members may be made a permanent fixture in the wall of a room and its cooperating member a permanent part of the refrigerating machine. 55

It has been found preferable to make the mem-
ber 43a a permanent fixture in the wall of a room and to associate the member 44a with the ma-
chine. However, the device will operate equally well if this were reversed. 60

The member 43a may have a plate 87 formed integral therewith. The plate 87 may be provided with a connector socket 88 and a connector plug 89 may be supported on the unit 20 in any suit-
able manner; for instance, by means of a bracket
65 90. A suitable connector cord 91 connects the motor 25 to the plug 89 so that when the unit is rolled into the room and the members are lined up and connected, the motor is at the same time connected to a source of current in the building. 70

A suitable switch (not shown) may be included in the motor circuit for controlling the motor independently of automatic controls.

A business building or hotel could have each room equipped with coupling member 43a and 75

when it is desired to refrigerate the room or office a complete conditioner unit, 20, may be rolled into the room and positioned so that its coupling member 44a members up with the fixed coupling member 43a after which the levers 79 may be moved to connect the supply, discharge and drain pipes of the refrigerating machine with those in the building associated with the water supply and sewer connections. After the levers 79 are moved associating the members, the valves 60 and 70 are rotated allowing the passages 46, 47 and 48 to communicate with the passages 51, 52 and 53 via the cross holes 57, 66; 58, 67; 59, 68 respectively. The valves 60 and 70 may be provided with arrows or other suitable indicators 84.

The coupling member 43a, permanently associated with the wall of the room, when not in use, may be provided with a suitable cap 85 for closing and sealing the passages, and keeping them clean and free from dust.

The device shown in Figure 11 consists of a coupling member 43b similar to the member 43 with the exception that it is provided with four passages instead of three and the member 44b, which is similar to the member 44 in the same manner. The member 43b is provided with a tapered hole 55b, and a tapered plug 56b fitting therein and having cross holes 57b, 58b, 59b and 92 formed therein.

A suitable nut head 60b is provided so that the plug 56b may be engaged by a tool and rotated. The plug 56b is held into the member 43b by means of a nut 63b engaging the threaded portion 62b. A suitable washer 61b is provided between the nut 63b and the member 43b.

The member 43b has passages 46b, 47b, 48b and 93 formed therein adapted to be controlled by the movement of the plug 56b.

The member 44b is provided with a tapered plug 65b having a nut head 70b formed thereon and having a reduced threaded portion 69b at the other end thereof. A nut 71b screwed on to the threaded portion 69b secures the plug 65b in the member 44b, and a suitable washer 72b is provided between the nut and the body of the member 44b. The tapered plug 65b is provided with a plurality of cross holes 66b, 67b, 68b and 94. The body 44b has a plurality of passages 51b, 52b, 53b and 95 controlled by the movement of the tapered plug 65b in the same manner as described for Figure 2.

In this embodiment, the extra passage 93 in the member 43b may be secured to the gas main and the member 44b may form an integral part of a gas-fired refrigerating device; in which case the passage 95 would be connected to the gas burner in such a machine.

When the members 43b and 44b are placed into cooperative relation and secured together connections are made between the gas burner of the device and the gas main, between the condenser and the water supply, between the condenser and the sewer and between the drip pan and the sewer.

Many changes may be made in the device disclosed without departing from the spirit of the invention as defined in the following claims.

What is claimed is:

1. In a cooling device for portable refrigerating mechanisms, a coupling comprising two oppositely

disposed members each having a plurality of fluid passages formed therein, one of said members being mounted in fixed relation to the plumbing of a building and having one of its passages connected to a source of fluid and another of its passages connected to a drain pipe, and the other of said members being secured to said portable device adapted to utilize said fluid, means for detachably securing said members in cooperative relation, and a multiple valve in each member for simultaneously closing the passages therein to prevent the egress of fluid from any of said passages when said members are disassociated.

2. In a cooling device for portable refrigerating mechanisms, a coupling comprising two oppositely disposed members each having a plurality of fluid passages formed therein, one of said members being mounted in fixed relation to the plumbing of a building and having one of its passages connected to a source of fluid and the other of said members being secured to said portable device adapted to utilize said fluid, means for detachably securing said members in cooperative relation, and a multiple valve in each member for simultaneously closing the passages therein to prevent the egress of fluid from any of said passages when said members are disassociated.

3. In a cooling system for portable refrigerators employing water cooled condensers, a coupling comprising two oppositely disposed members each having a plurality of fluid passages formed therein, one of said members being secured to said portable refrigerator and having its passages connected to said condenser, the other of said members having one of its passages permanently connected to a source of cooling water and the other of its passages permanently secured to a drain pipe for said water, means for detachably securing said members in cooperative relation, and a multiple valve in each of said members adapted to close off simultaneously all of the passages in its member thereby preventing water from any of said passages from spilling when said members are disassociated prior to the removal of said refrigerator to another location.

4. In a cooling system for portable refrigerators including water cooled condensers, a coupling member having a plurality of fluid passages formed therein and connected to said condenser, a plurality of cooperative members each in a fixed location and having passages formed therein matching the passages in said first member, connections between one passage in each of said last members and a source of cooling water, connections between another passage in each of said last members and a drain pipe for said water, means for detachably securing the member carried by said portable refrigerator to any one of said second members, a multiple valve in said first member, and a multiple valve in each of said second members, each of said valves being adapted to close off simultaneously all of the passages in its member, thereby preventing water from any of said passages from spilling when the detachably secured members are disassociated prior to the removal of said refrigerator to associate its member with another of said second members.

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