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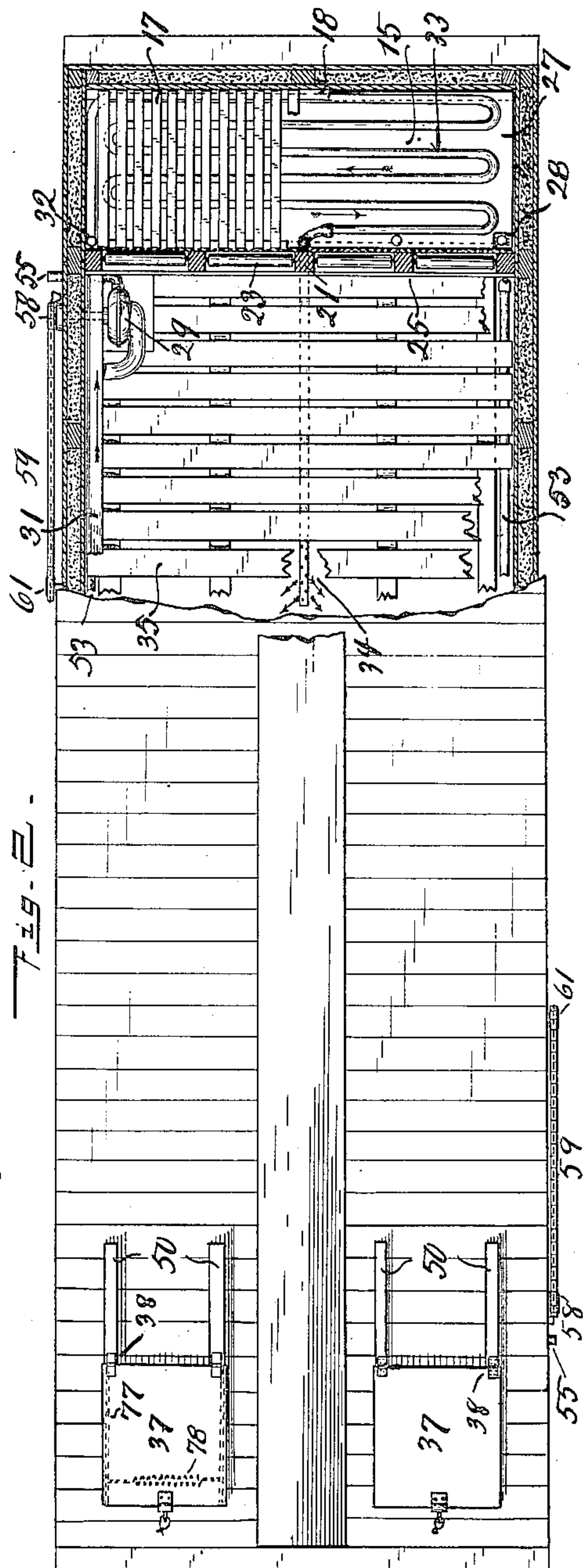
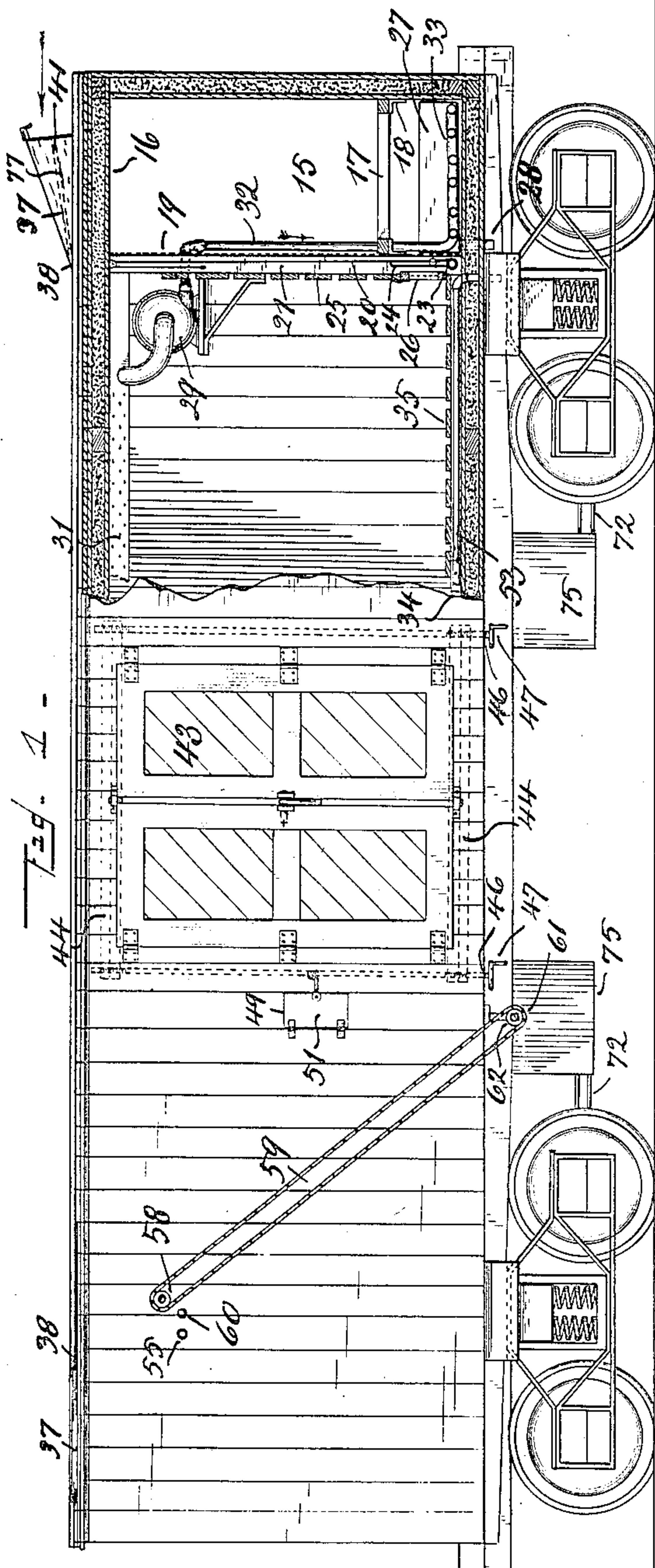
PATENTED JULY 26, 1904.

J. F. FUGAZZI.  
TEMPERABLE SHIPPING CAR.

APPLICATION FILED FEB. 9, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses  
Jacob Hilsinger  
Arthur Kline

Inventor  
John F. Fugazzi  
by C. Spengelatt



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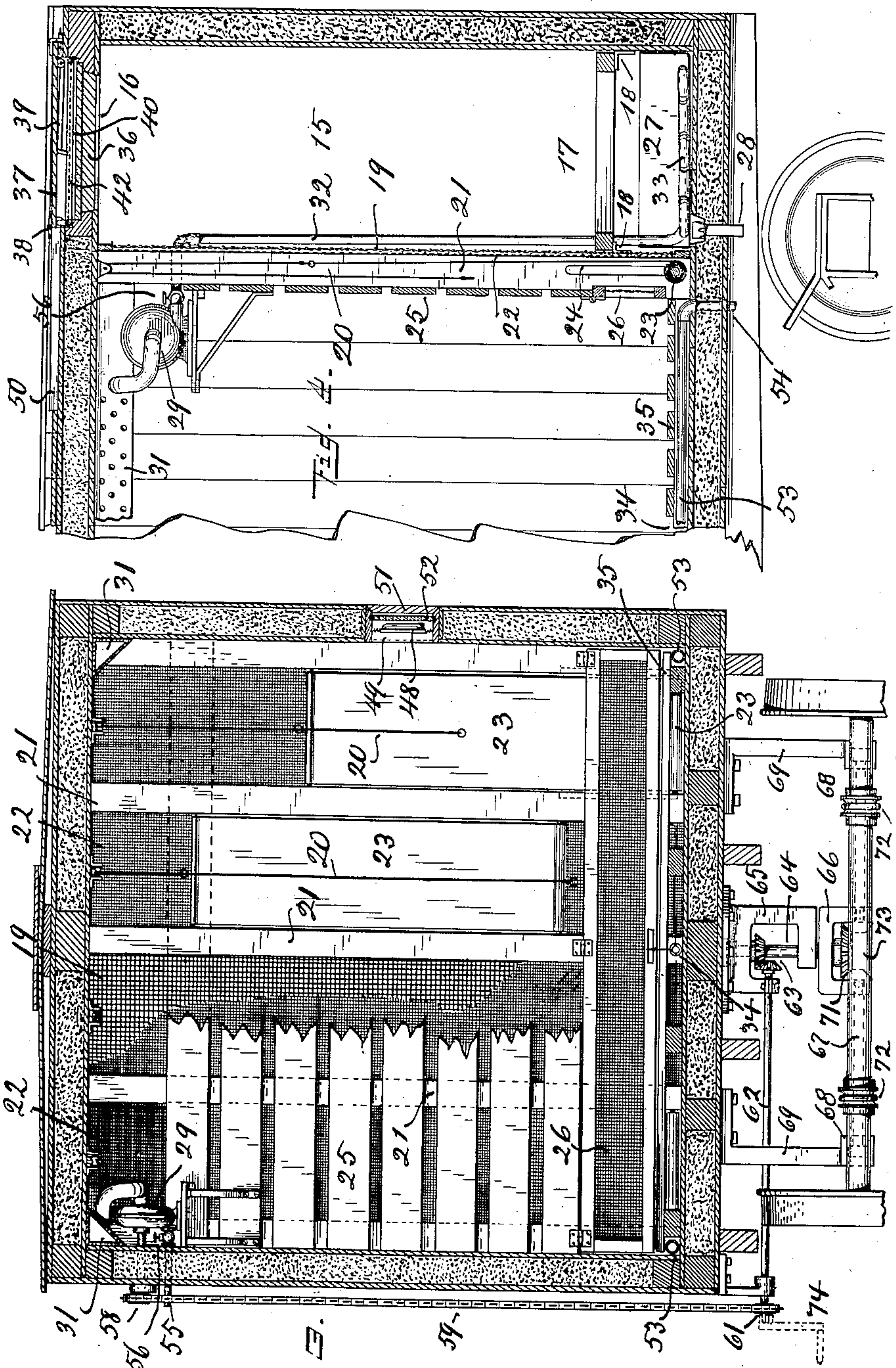
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Fig. 1.

Fig. 2.

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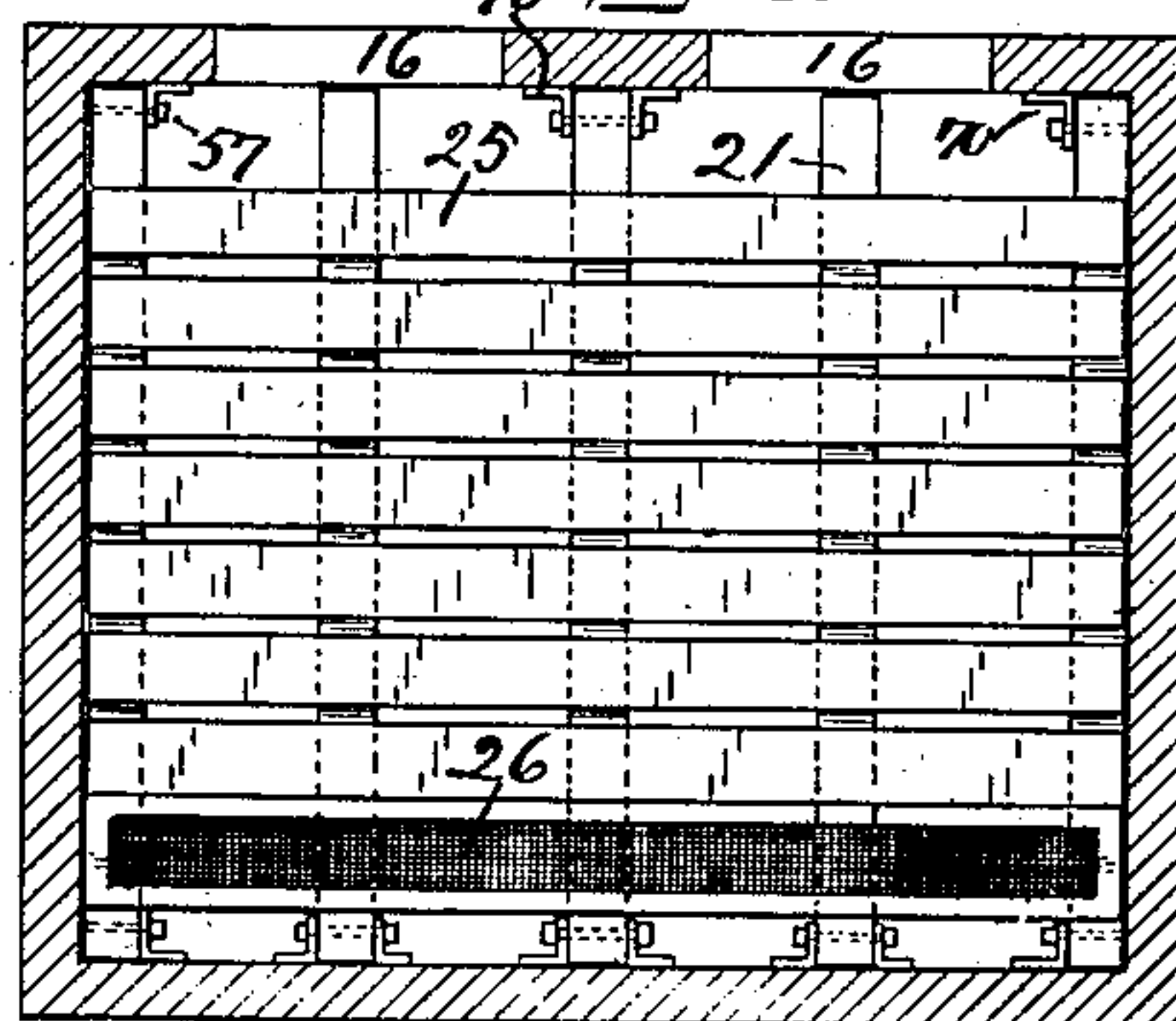
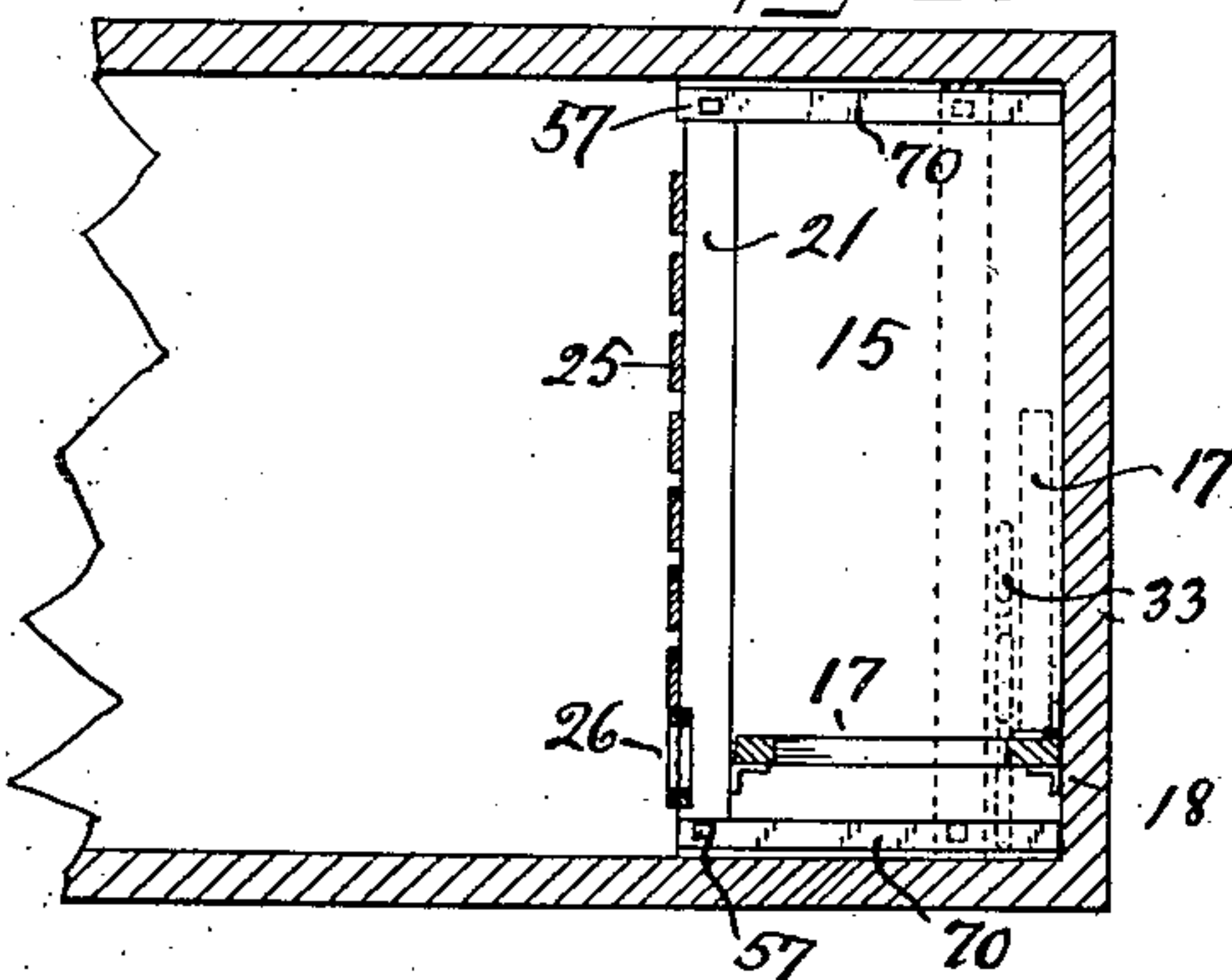
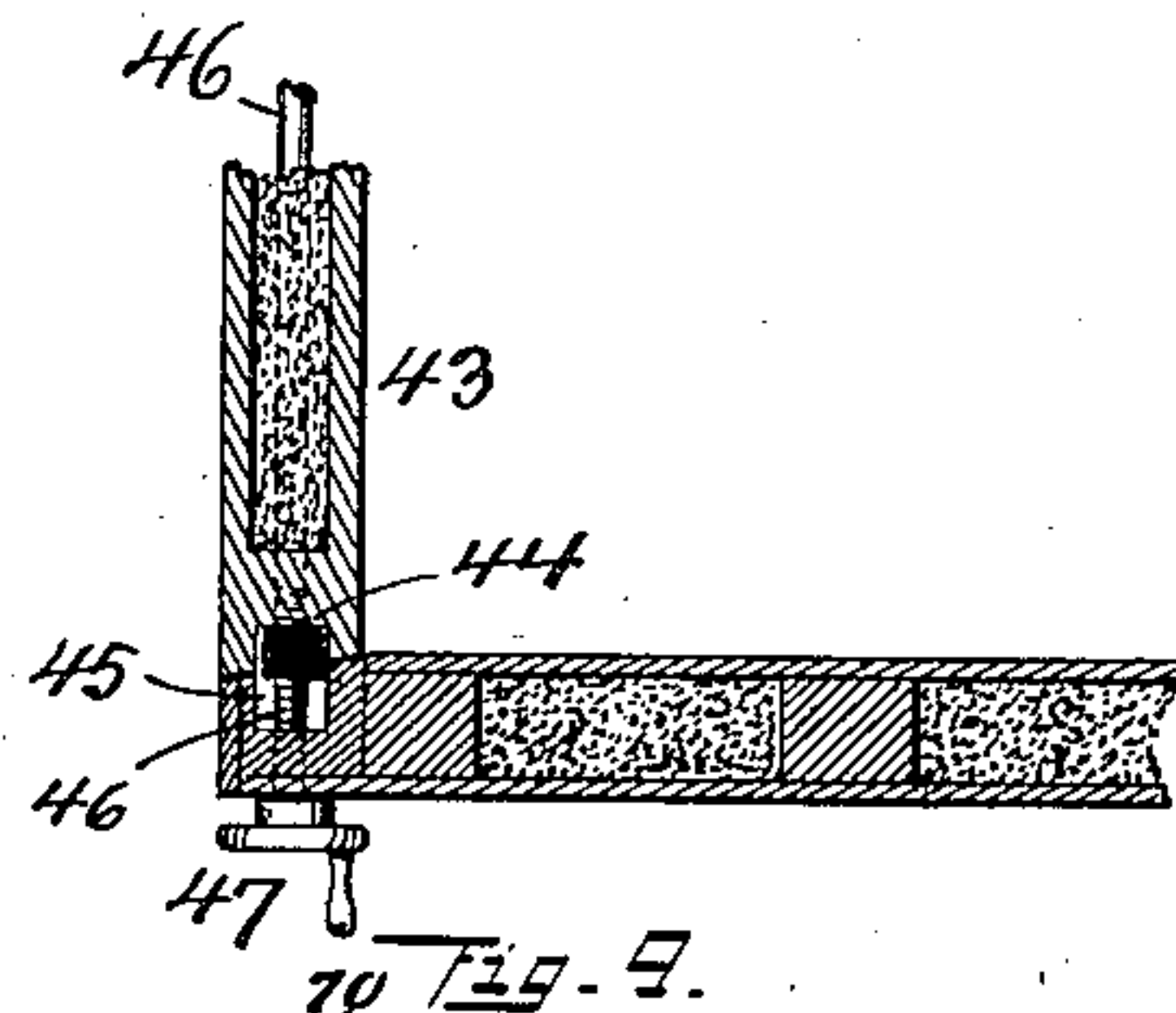
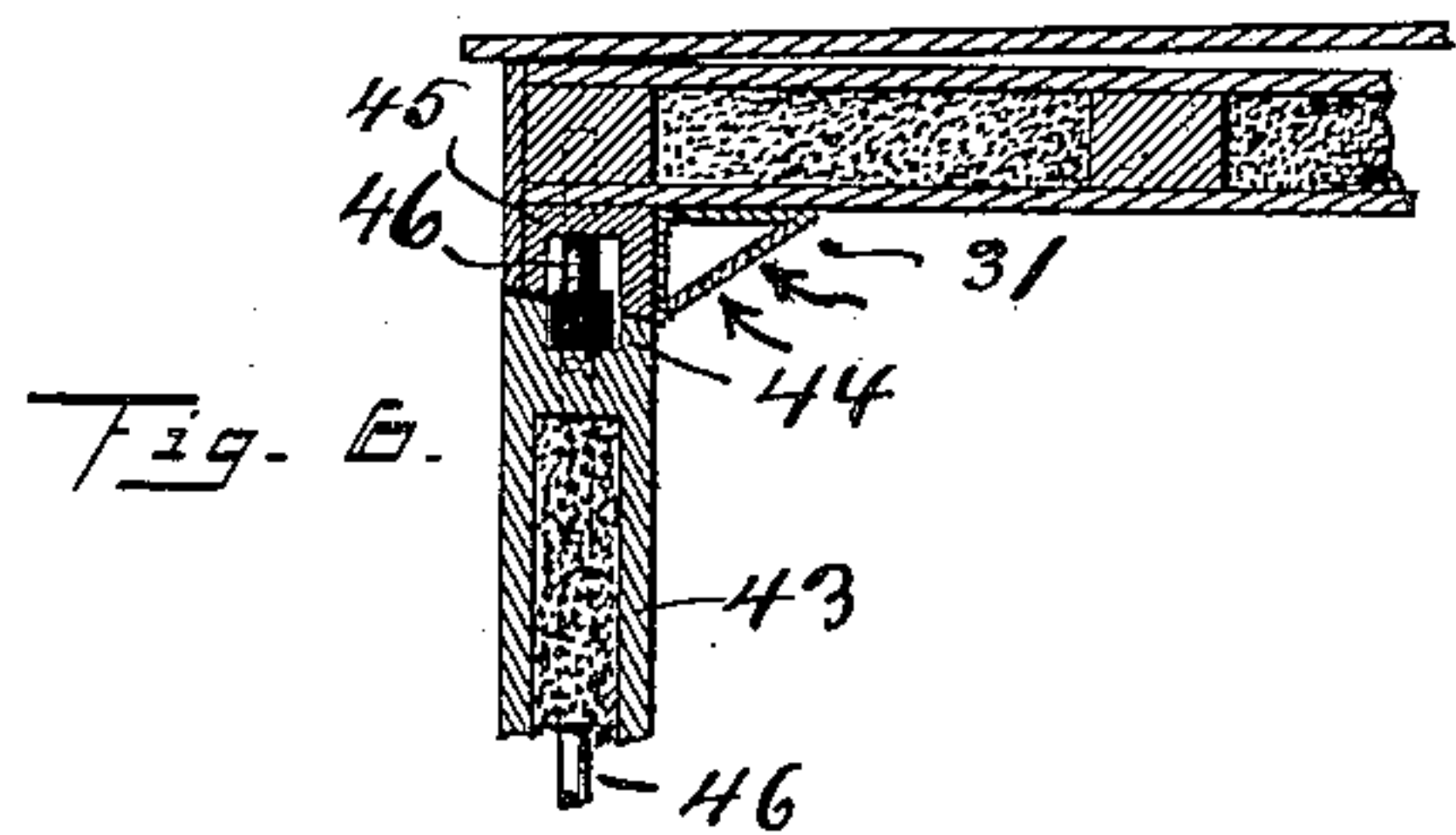
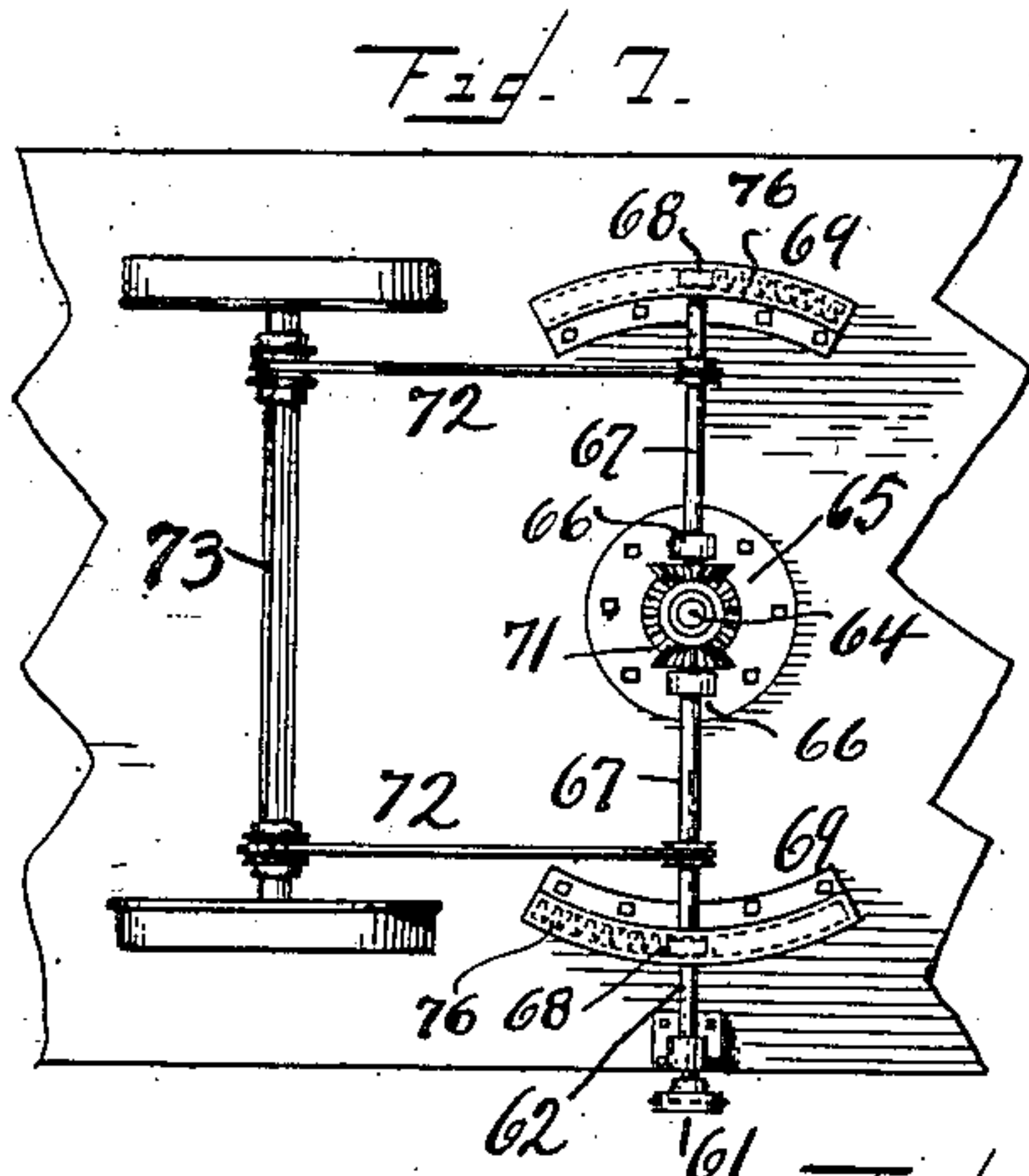
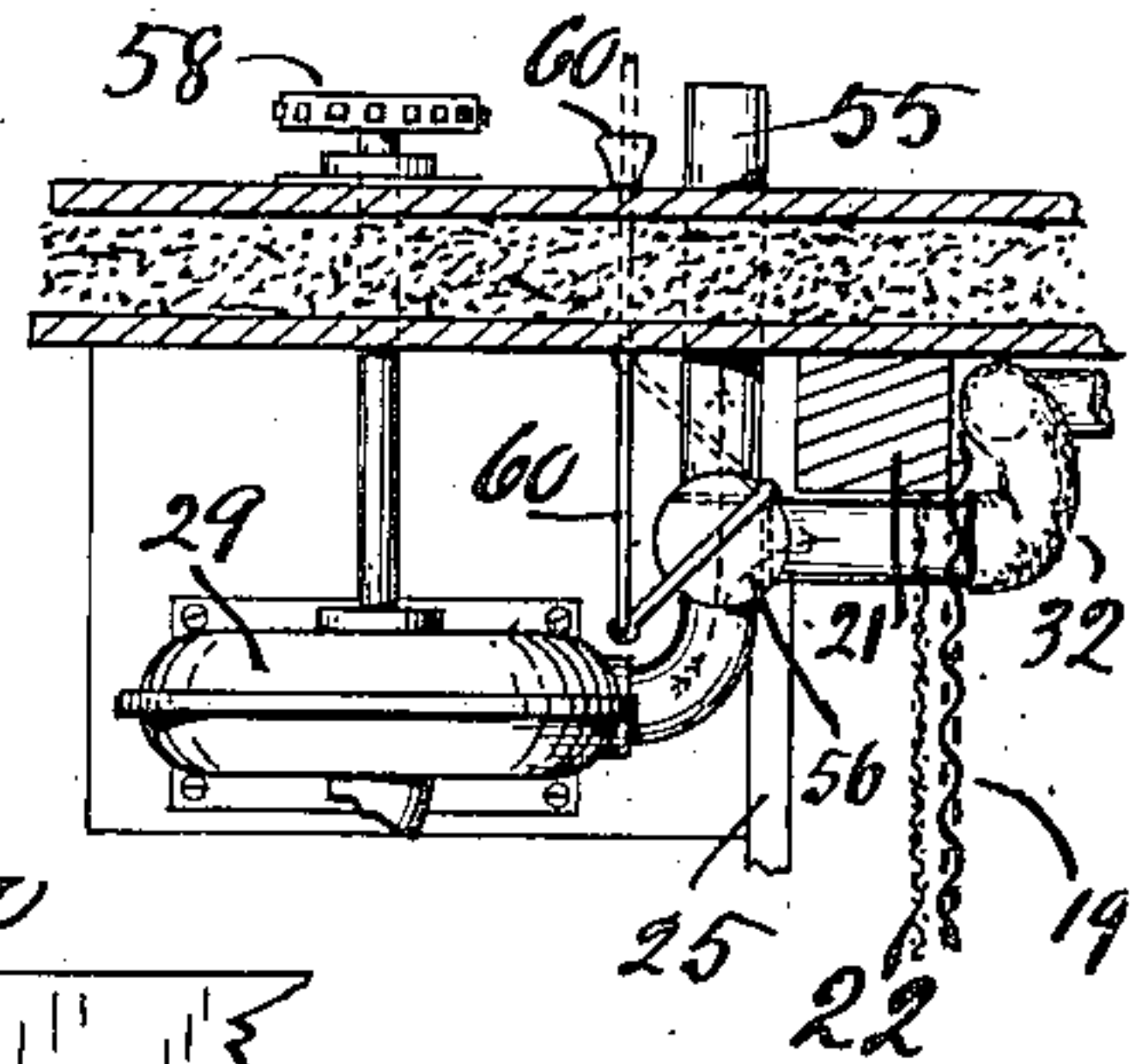
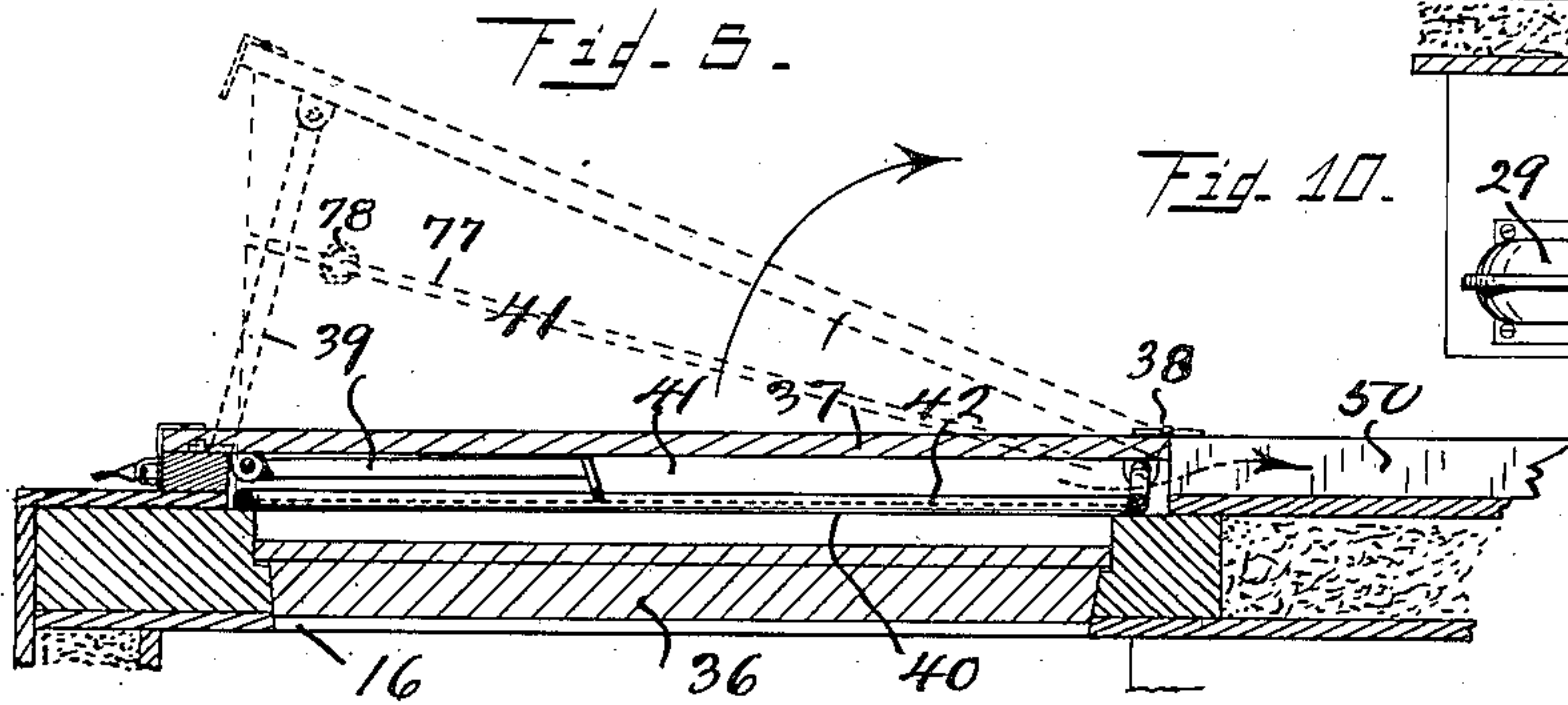
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3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

JOHN F. FUGAZZI, OF CINCINNATI, OHIO.

## TEMPERABLE SHIPPING-CAR.

SPECIFICATION forming part of Letters Patent No. 765,772, dated July 26, 1904.

Application filed February 9, 1903. Serial No. 142,851. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN F. FUGAZZI, a citizen of the United States, residing in the city of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Temperable Shipping-Cars; and I do declare the following to be a clear, full, and exact description thereof, attention being called to the accompanying three sheets of drawings, with the reference-numerals marked thereon, which form also a part of this specification.

This invention relates to improvements in temperable shipping-cars used for shipping perishable merchandise where the condition of such latter is influenced by extreme temperatures, either hot or cold.

The object of the invention is to construct such a car in a manner which permits maintenance of a certain equable temperature therein best suited for the contents of the car at the time and in view of simultaneously existing weather conditions outside, and which construction therefore involves means to lower as well as to raise the temperature inside, so that in hot weather the car may be cooled and in extreme cold weather its temperature may be sufficiently raised to prevent freezing of the contents, so that such cars may be used in all seasons.

Another object is to equalize within the car any particular temperature, so as to have it the same in all parts of the car, particularly near top and bottom, irrespective of any particular temperature.

The invention consists of particular means and their construction, as hereinafter described and claimed and as illustrated in the accompanying three sheets of drawings, in which—

Figure 1 is a side view of my improved shipping-car with parts broken away and shown in section. Fig. 2 is a similar view of the top thereof. Fig. 3 is a cross-section, and Fig. 4 part of a longitudinal section, taken near one end of the car, both sections shown at enlarged scale. Fig. 5 is an enlarged detail view and shows in section one of the ventilator-openings in the top of the car and the

means for closing the same. Fig. 6 is an enlarged vertical detail section showing means for packing tightly the car-door after the same has been closed. Fig. 7 in an under side view of the car shows the mechanism whereby the ventilating-fan is operated. Figs. 8 and 9 in views similar to Figs. 3 and 4, but shown at reduced scale of Figs. 1 and 2, illustrate certain possibilities of shifting and adjusting parts comprising the refrigerator-compartment. Fig. 10 is an enlarged top view of the suction-fan and its adjacent parts.

The inclosure of this car may be constructed on any of the approved styles customary in the building of structures where it is desirable to insulate against the influence of the outside temperature and to maintain an equable temperature inside. For such purpose the surrounding sides, top, and bottom usually consist of a double wall with an insulating-space between them. For cooling the inside of the car during the hot season there are ice-chambers 15, one preferably at each end, the ice being supplied through hatchways 16 in the top of the car above such ice-chambers and rests on an ice-rack 17, suitably supported at 18. This rack extends throughout the entire length and width of the ice-chamber, part of it being omitted, however, in Fig. 2 in order to show parts below. The front of the ice-chamber toward the car is closed first by a heavy wire screen 19 of sufficient strength to retain the ice, such screen being reinforced and held in position between its ends by posts 21. In front of this heavier screen there is a lighter one, 22, of closer mesh, its object being to prevent dust and impurities from passing into the pack-space of the car. In the panels between posts 21 and in front of this outer screen there are adjustable curtains 23, which permit, if necessary, a partial or entire closure of said panel, effecting thereby to a corresponding degree the communication and circulation of air between the ice-chambers and the car-space between them. These curtains may be of any suitable material, fabric, or sheet metal and their adjustment is by rolling or unrolling them, the ends of the rollers being mounted in slots 24, in which



they may be raised or lowered, thus allowing for various forms of adjustment from the top or bottom, or both, &c., aided by a pull-cord 20. On the outside of these curtains and secured across posts 21, by which it is supported, there is a lattice-work, consisting of slats or boards 25, forming a retaining-wall against which the contents are packed and whereby they are kept away from the curtains and screens. They have a space between them to prevent interference with the circulation of air, and in order to have as little interference as possible at the bottom, where most of the cold air passes out, the lattice-work is omitted thereat and its place taken by an additional screen 26. This screen is hingedly connected to permit of it being raised to give access to the curtains for purposes of their manipulation and to parts behind.

The drip-water from the melting ice is received by a pan 27 and guided to the outside by a drip-pipe 28. The upper end of this latter may be provided with the customary air-trap to prevent free passage of air, as best shown in Fig. 4.

The cold air, as before stated, passes into the packing-room through the spaces between slats 25 and also through screen 26, said room for well-known reasons being coldest near the bottom, while the warmer air rises to the top. To have, however, as near as possible an even temperature inside of the car, and more particularly to remove the warmer air accumulating in the upper part of it, I provide means whereby these differences in temperature are equalized, such means operating substantially by circulating the air inside of the car and whereby the warmer air in the upper part of it is removed, cooled, and set free again in the lower part of the car. For such purpose I use one or more suction-fans 29 connected to suction-ducts 31 in the upper horizontal corners of the car, and which ducts in the side toward the interior of the car have perforations through which the warm air is drawn in as soon as these fans are set in operation. There may be one fan only or one for each longitudinal duct on each side. The warm air so drawn in by a fan is forced downwardly through a pipe 32 and into and through a coil 33. This latter occupies a position in the lowest part of the ice-chamber, and more particularly in the drip-pan 27 thereat, where more or less of it is constantly covered by the cold water from the melting ice. In this manner the coil is kept cool and the air while passing through it is also cooled. After cooled the air is forced out through the perforations in an outlet-pipe 34, which pipe is placed on the floor of the car and preferably in the center thereof. In order to protect this pipe, I provide a special open floor or grating 35, upon which the goods to be packed rest and whereby also a space is provided under these latter, through which the

air may laterally spread below these goods instead of passing directly upwardly.

After the ice is charged into the ice-chambers the hatchways are closed up, first with a lid or plug 36 so constructed as to provide soft or yielding edges, which by fitting snugly into the hatchways close the same air-tight. Above each hatchway there is another lid, 37, having one edge hingedly connected at 38, while the other edge may be held in a raised position by a collapsible prop 39, so that plug 36 having been removed hatchway 16 may be used as a ventilating-opening at times when the car is not used as a refrigerator-car, the raised lid 37 forcing the air into the car and serving as a hood for it to keep out the weather. The triangular sides 41 are closed by a suitable material like a fabric which permits folding. A screen 42 serves to keep out cinders and also to prevent access to the interior of the car. The entire hood, being lid 37 and collapsible sides 41, the lower edges of which are secured to a frame 40, which supports also screen 42, swinging on the hinges at 38, may be thrown clear back onto the top of the car, so as to entirely clear the hatchways, it resting at that time on strips 50. The upright edges between doors 43 of the car and their opening are usually constructed in a manner by means of a yielding packing or cushion whereby they are rendered air-tight. There is no such provision, however, for the horizontal edges, for which reason I provide horizontal packing-strips 44, (see Fig. 6,) which after the door is closed are moved against the upper and lower edges of the same or into recesses in these edges. Before opening the door these strips are moved back into recess 45, where they remain while the door is open, so as not to form an obstruction. It is preferable to move these strips simultaneously, for which purpose I provide screw-rods 46, one at each upright side of the door and engaging threaded holes in the ends of these packing-strips. The threads in one strip run in opposite direction to those in the other, so that when these rods are rotated by means of a handle 47 these strips are caused to move simultaneously against the edges of the closed door above and below.

A thermometer 48 to indicate the temperature is provided within an opening 49 in the side of the car and may be consulted by opening a door 51. It is protected against interfering influences of outside temperature by a window 52.

For heating the car in winter-time I provide pipes 53 to convey the heating agent, which may be preferably steam to be taken from any suitable source—as from the engine, for instance—connection to be made at 54, as shown in Fig. 4.

The circulating means for equalizing the temperature at top and bottom of the car, which means comprise suction-ducts 31 at the



top, suction-fan 29, and outlet-pipe 34 at the bottom, may always be used whether the car is heated or cooled.

Bad or damp air may be entirely removed, if desirable, by passing the same out to the open air through a pipe 55, (see Figs. 3 and 10,) a switch-valve 56, having been closed first, which prevents it from passing down and through pipes 32 and 34 back into the car. As shown in Fig. 10, the valve may be operated by a pull-rod 60 from the outside. When used as a heated car, curtains 23 may be opened out to close the open front of the ice-chamber, so as to confine the heat to the pack-room.

When used as a ventilated car, the curtains are closed up, the hatch-plugs 36 removed, and lids 37 raised, so as to admit air and to form hoods. Any dust which has entered at such time the empty ice-chambers is kept out of the pack-room by dust-screen 22 of the front wall of the ice-chamber.

If the use of a car in such manner—that is, as a heated car—or as one where maintenance of a certain temperature is of no importance is to extend over a greater length of time, it may be to advantage to remove the front walls of the ice-chambers to gain additional packing and shipping space. For such purpose ice-rack 17, coil 33, and other parts in the lower part of the ice-chamber are tipped up and moved against the end wall of the car, as shown in Fig. 8, the connection of coil 33 to pipe 32 and to the outlet-pipe 34 being a detachable one by means of a suitable coupling. The front wall of the ice-chamber is next moved bodily back against the uptilted parts, for which purpose posts 21 of it are detachably held in guides 70 by suitable fastening devices or fittings 57, which after being removed permit the wall to be moved back in said guides, all as shown in Fig. 8. The fan is operated from the outside by having a pulley or sprocket-wheel 58 on its shaft, which is rotated by means operated from the running-gear or truck of the car. In this case it is rotated by a sprocket-chain 59 and sprocket 61. This latter is on a shaft 62, which runs inwardly toward the center and is rotated by means of a set of bevel-wheels 63 from an upright shaft 64, as shown in Figs. 3 and 7. This latter is mounted in a bracket 65 and at its lower end supports another bracket, 66, containing two alined shaft-bearings which support the inner ends of two alined shafts 67. The outer ends of these shafts are supported in bearings 68, which have a sliding adjustment in brackets 69. These shafts are operatively connected by means of bevel-wheels 71 to upright shaft 64, and each is driven by a belt or chain connection 72 from one of the axles 73. Brackets 66 with the inner shaft-bearings being free to rotate, it is clear that shafts 67 are free to adjust themselves to any variation in the posi-

tion of the axle or truck with reference to the car-body. Springs 76 acting against bearings 68 aid this adjustment. This machinery is preferably inclosed by a casing 75 to protect it against dust. Instead of having a more or less constant operation of the temperature-equalizing means while the car is moving, such may be had at intervals only by manual operation and with the car standing still, for which purpose a detachable crank 74 may be used and to be applied to the lower sprocket 61. (See Fig. 3.) This permits also operation of the fan at times while the car is not traveling, the key holding said sprocket to shaft 62 for rotation having been removed.

Instead of having the heating and air-outlet pipes on the bottom of the car below a grated floor gutters might be provided in said floor to receive them. Before the circulated air is discharged again into the car certain properties—as, for instance, disinfecting, drying, and moisture-absorbing—might be imparted to it by having it on its passage through suction-ducts 31 come in contact with certain chemicals, which would be placed in said ducts or special receptacles provided for them within the circuit of the air.

By embodying one or more stiffening-rods 77 in the triangular pieces of pliable material forming the sides of the hood and as shown in dotted lines in Figs. 1, 2, and 5, and, further, by connecting said rods by a spring 78, as shown in dotted lines in Fig. 2, said pliable sides when the hood is lowered will be drawn inside under the lid 37, being thereby protected and prevented from flopping around on the outside.

In conclusion it may be stated that the salient points of advantage resulting from my improved construction are as follows: My system is such that it may be applied to any refrigerating-car of general type—that is, one having insulated walls—without requiring extensive alterations in such cars. The construction is, further, such as to avoid any internal projections—as, for instance, an uneven floor—which greatly interferes with the compact loading of a car, which is so desirable. The smaller space which my arrangement requires increases also as against other cars the loading capacity. As to the circulating arrangement, by drawing the air in through ducts in the upper longitudinal corners of the car and by discharging the same again through pipes in the lower longitudinal corners a more direct and concentrated action is attained as to parts remote from the ice-chamber and with a certain given suction or air-moving power. This power comes from suction-fans which require frequent attention for oiling and repairing, and they should therefore be located so as to be readily accessible. In my case they are therefore located outside of the ice-compartments and near the ceiling of the car where they can be reached, since these cars



are never loaded to the top. This leaves this space of the ice-compartment otherwise so occupied free to receive a correspondingly-larger ice charge, increasing in equal degree the refrigerating capacity of the car.

Having described my invention, I claim as new—

1. In a shipping-car, the means for cooling and adjusting the temperature within, consisting of ice-compartments, one at each end, upright partitions separating these compartments from the pack-room of the car, they consisting of open-work to permit the cool air to pass out into the pack-room and adjustable curtains in front of these partitions to regulate their open area through which the cool air passes.

2. In a shipping-car, the means for cooling the interior, consisting of ice-compartments, one at each end, upright partitions which separate them from the pack-room of the car, and consist of posts, a wire screen to hold the ice back, an additional wire screen of closer mesh to exclude dust and open lattice-work against which the contents of the shipping-space are packed.

3. In a shipping-car, the means for cooling and for adjusting the temperature inside, the means for cooling consisting of an ice-compartment at each end, upright partitions which separate these compartments from the pack-room of the car between them, posts forming parts of this partition, screens on one side of them and toward the ice-compartment serving to retain the ice, open lattice-work on the other side toward the pack-room, adjustable curtains between the two and a hinged screen across the lower part of each partition to permit access to the lower part of the ice-chamber.

4. In a temperable refrigerating-car, the means for removing accumulated warm air from the upper part of it, for cooling the same for discharging it again into the car at the floor of the same and for keeping the same air in circulation within the car in the manner indicated, said means consisting of an ice-compartment at each end of the car, partitions extending across this latter whereby each ice-compartment is separated from the cen-

tral pack-room or loading-space, perforated suction-ducts, one in each of the upper longitudinal corners of the pack-room and between the partitions mentioned, a suction-fan for each duct supported below one end of the same in one of the upper corners of the pack-room and outside of the ice-compartment, a perforated discharge-pipe extending from the center of the ice-compartment into the lower part of the pack-room, cooling-pipes in the ice-compartment, pipes connecting them with the suction-fan and also with the perforated discharge-pipes mentioned and an open, false floor above these latter, to protect them and to present an even, unbroken surface to serve as a floor for the pack-room.

5. In a temperable and ventilated refrigerating-car, the particular means for removing the warm air from the upper part of the car and for ejecting the same to the outside, or for returning it again into the car after cooled, said means consisting of an ice-compartment at each end of the car, partitions extending across this latter whereby each ice-compartment is separated from the pack-room of the car, perforated suction-ducts, one in each of the upper longitudinal corners of the pack-room and between the partitions mentioned, perforated discharge-pipes in the lower part of the car extending from the ice-compartments into the pack-room, a fan connected to one of the ends of each suction-duct and supported below such end in the upper corners of the pack-room, cooling-pipes in the ice-compartments in open communication with the perforated discharge-pipes mentioned, pipes connecting each suction-fan with these cooling-pipes, pipes leading from each fan to the outside of the car and a valve whereby the air drawn in by the fans from the suction-ducts may either be ejected to the outside or directed through the cooling-pipes and returned into the car through the perforated discharge-pipes.

In testimony whereof I hereunto set my signature in the presence of two witnesses.

JOHN F. FUGAZZI.

Witnesses:

C. SPENGEL,

ARTHUR KLINE.