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LIQUEFIED GAS DISTRIBUTOR'S SERVICING TRUCK

Original Filed May 26, 1928

3 Sheets-Sheet 1

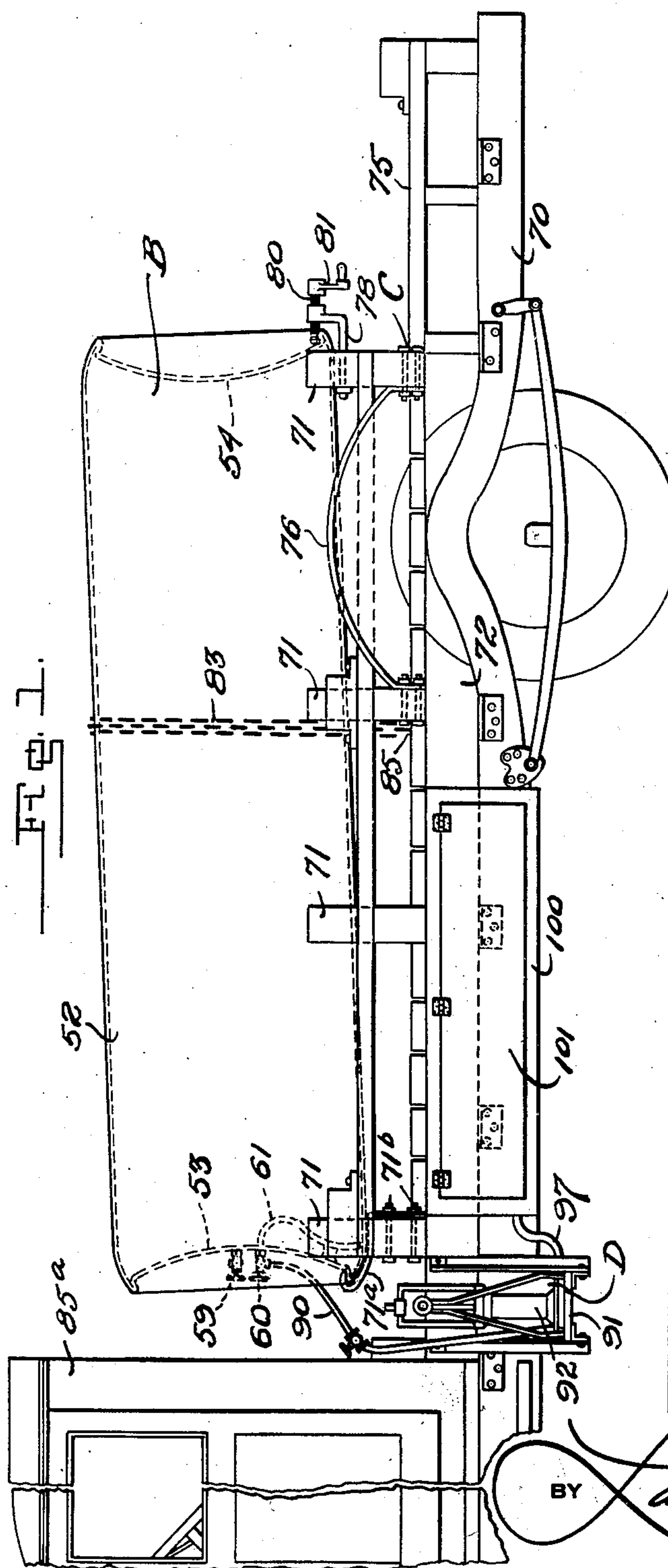
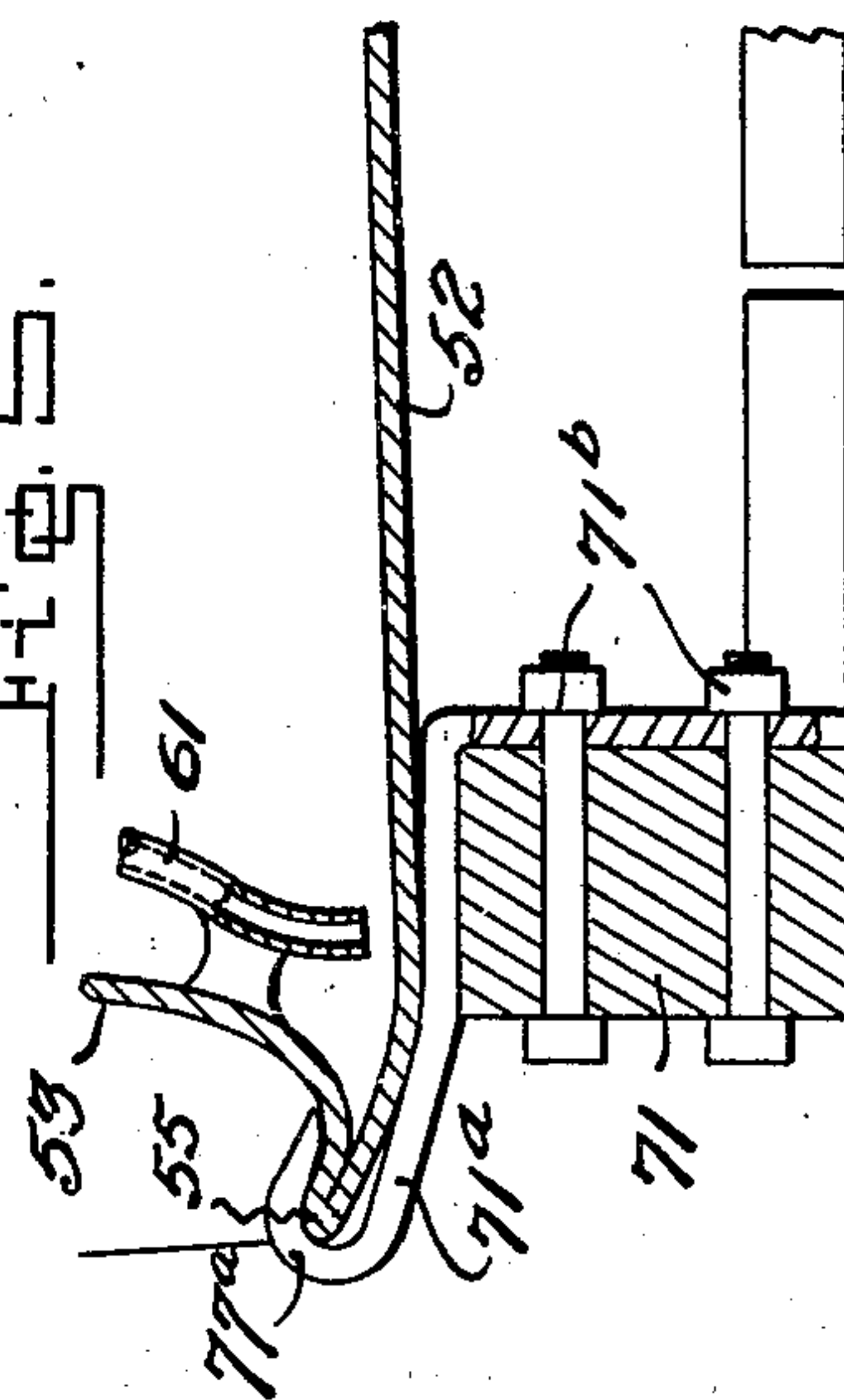
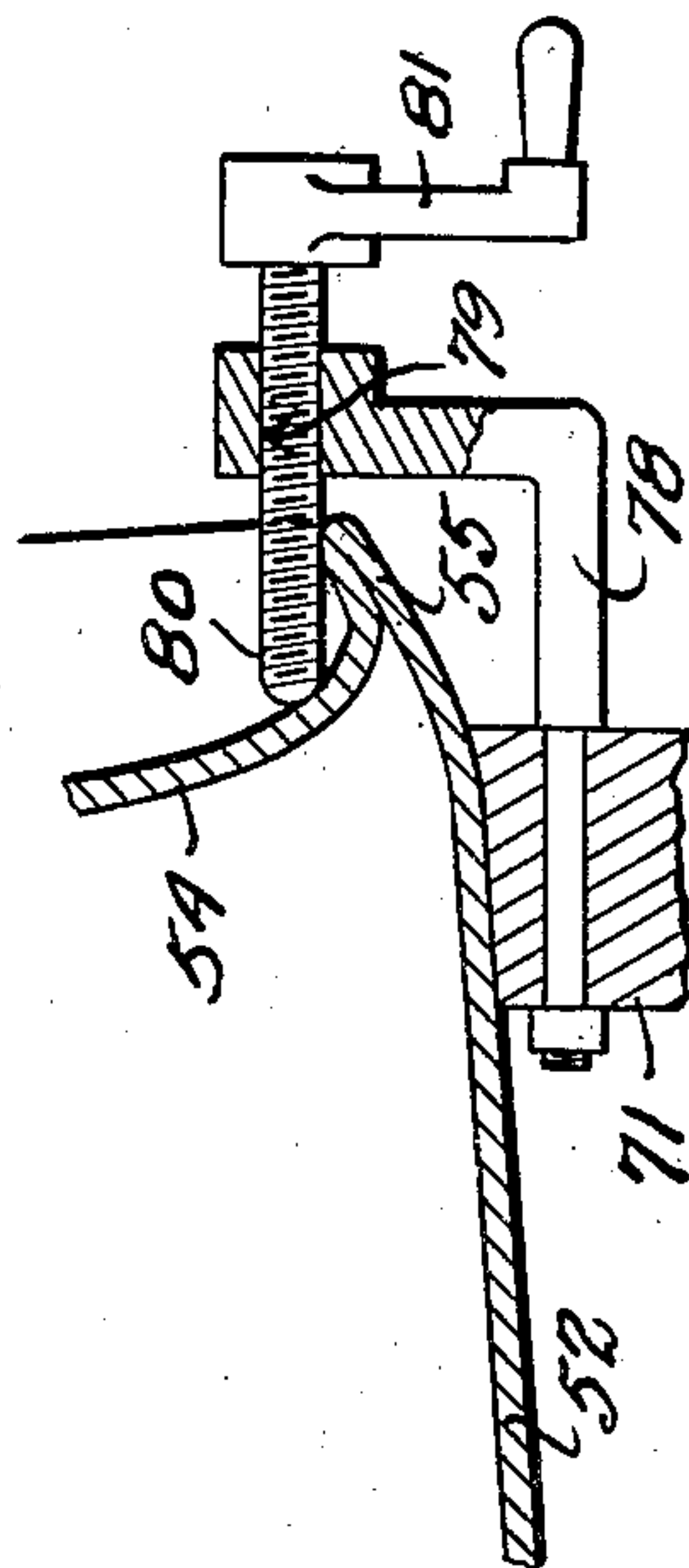


Fig. 1.

Fig. 2.



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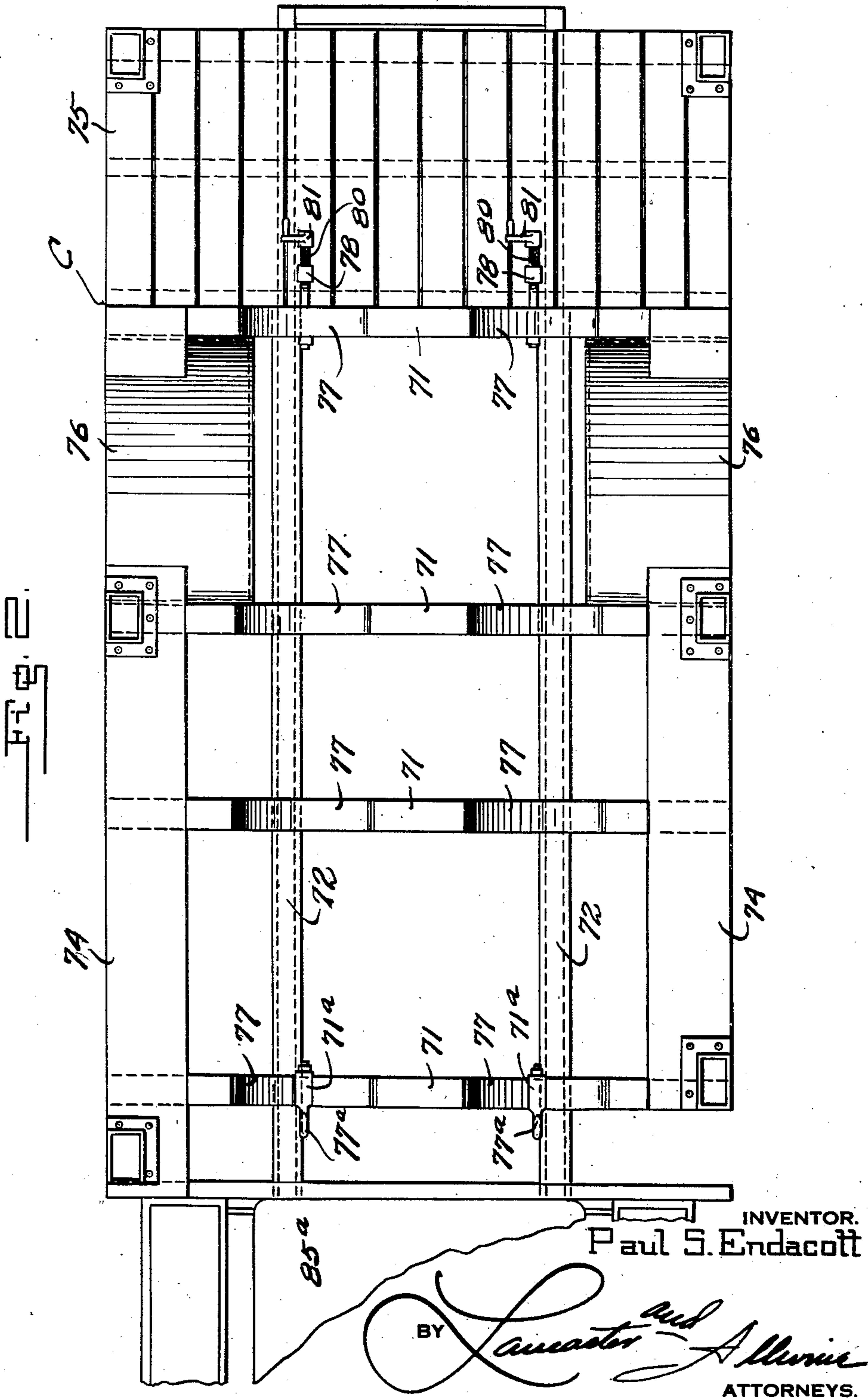
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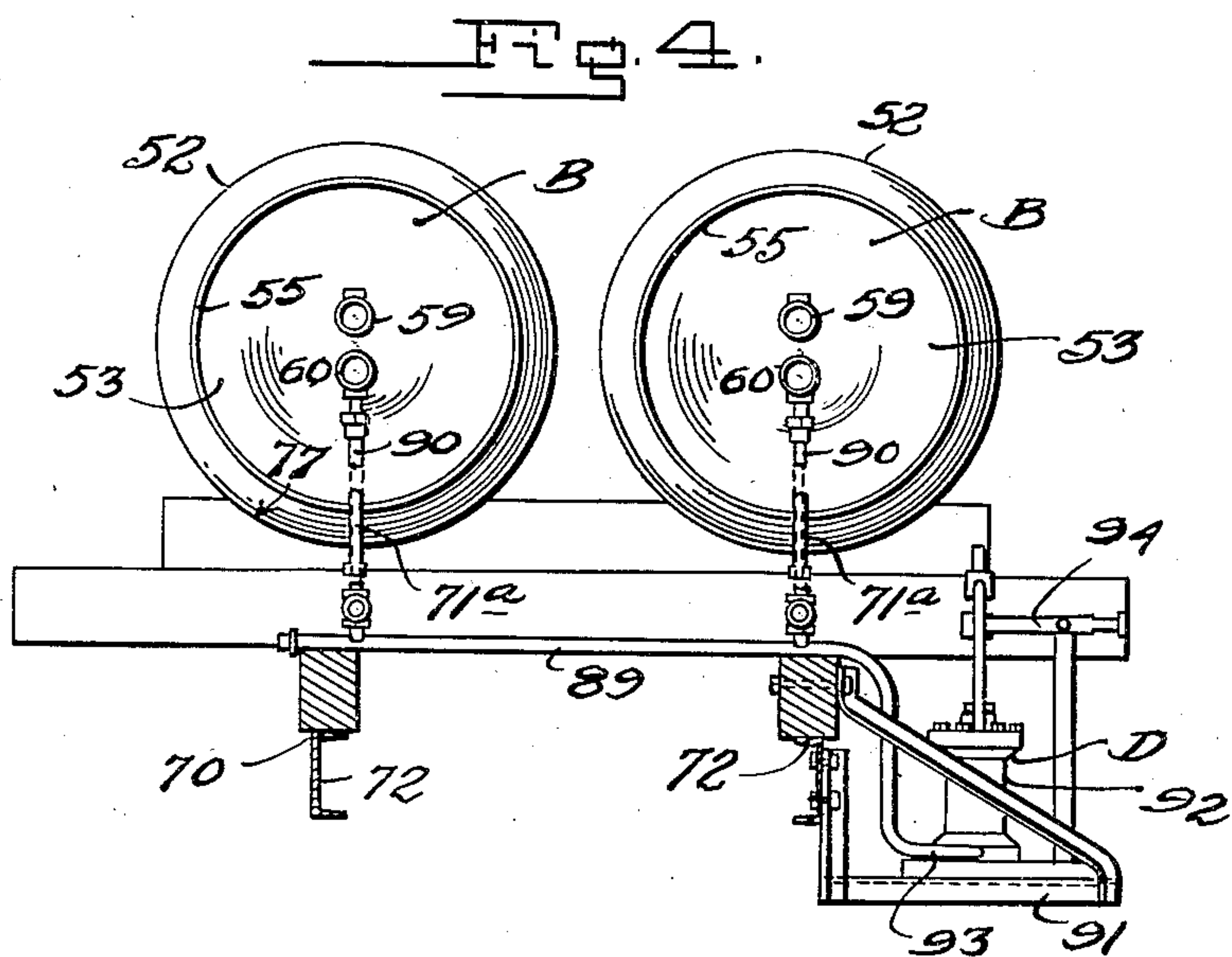
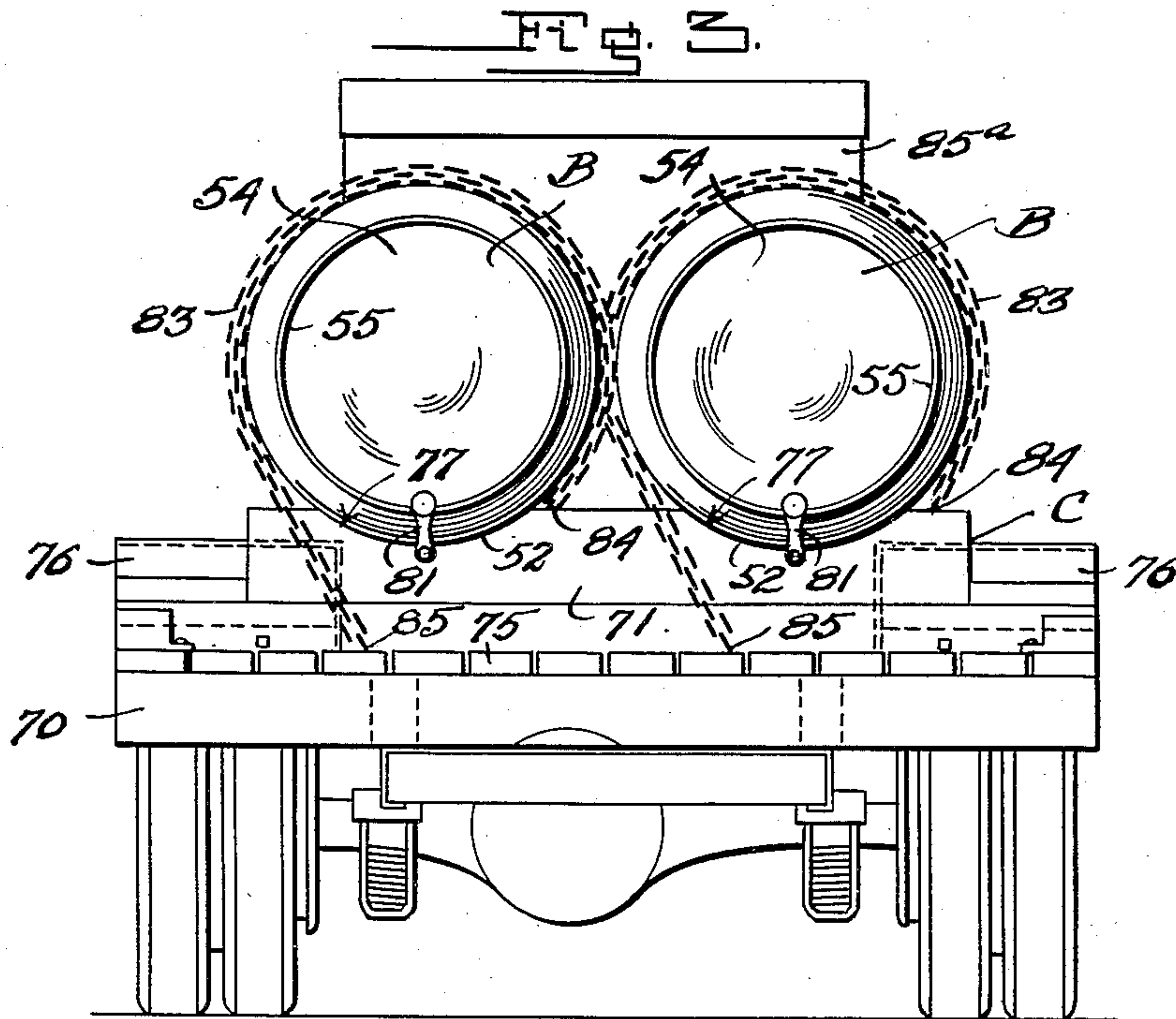
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LIQUEFIED GAS DISTRIBUTOR'S SERVICING TRUCK

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3 Sheets-Sheet 3



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## UNITED STATES PATENT OFFICE

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## LIQUEFIED GAS DISTRIBUTOR'S SERVICING TRUCK

Original application filed May 26, 1928, Serial No. 280,746. Divided and this application filed July 27, 1929. Serial No. 381,502.

The present invention relates to equipment for the servicing of liquefied gas to customers by the distributor, and more particularly to a truck including a suitable container or containers for the liquefied gas under superatmospheric pressure with means for controlling, advancing and delivering the gas under such pressure from said container to the customer's supply tank. The present application is a division of that filed by me May 26, 1928, Serial No. 280,746 entitled Methods and apparatus for distribution of liquefied gas.

The primary object of the present invention is to provide equipment by which liquefied gas may be safely, economically and expeditiously loaded, transported and transferred to the tanks of customers in a manner that the customer is not required to discontinue use of the gas while the supply in the individual customer's tank is being replenished and without the necessity of the customer manipulating valves or otherwise directing attention to the gas burning equipment.

In practice, as an example, the containers of the distributors' servicing equipment, capable of withstanding high internal pressure and of a capacity many times greater than the individual customer's tank may be filled with liquefied gas and transported as by railroad to the various distributing centers. There they are transferred to trucks, by suitable cranes, the trucks traveling routes so as to provide for regular and economical distribution of the liquefied gas to the customers. The trucks include means for receiving the containers as they are lowered in place and means for retaining them against movement with respect to the truck body in order that the trucks may travel at moderate speed and over inclined highways without danger of the containers being displaced. The trucks also include suitable equipment for transfer of the liquefied gas under pressure to the customers' tanks which equipment is compactly placed and conveniently located so as to minimize the weight and wheel base of the truck and make possible expeditious servicing.

Other objects and advantages of the present invention will appear in the following detailed description, taken in connection with the accompanying drawings, forming a part of this specification, and in which drawings:

Figure 1 is a fragmentary side elevation of a truck, showing a special body for receiving distributors' tanks, by means of which the liquid gas may be economically distributed along a route.

Figure 2 is a fragmentary plan view of the special truck body used to carry the distributors' supply containers.

Figure 3 is a rear end elevation of the truck showing the containers thereon.

Figure 4 is a front elevation of the truck body adjacent the front ends of the supply containers, showing apparatus for forcing the liquid gas into a customer's tank.

Figures 5 and 6 are fragmentary sectional views taken through parts of the distributor's tank.

In the drawings, wherein for the purposes of illustration are shown only preferred details of one embodiment of equipment which may be successfully used in the delivering of liquefied gas; the letter B designates a distributor's tank, (in the example shown there being two of such tanks); C a truck upon which the tanks B are mounted; and D means for dispensing the liquid gas from either tank B to the customer's tank, not shown in the drawings but an example of which may be found in said copending application Serial No. 280,746 and more particularly shown, described and claimed in co-pending application filed by me, May 26, 1928, Serial No. 280,745.

The tanks B in which the distributor carries the liquid gas under pressure, to the customer's equipment, are capable of withstanding high internal pressures and comprise an elongated cylindrical body having inwardly bulged front and rear end walls and 54 respectively, with tapered flange connections 55 between these walls and the respective ends of the body, which are important in connection with the mounting of the containers on the truck body C, as will sub-



sequently appear. The container B may be of any approved volumetric capacity, and the front end wall 53 thereof is provided with inlet and outlet valves 59 and 60, respectively, the latter having communication with a downwardly extending pipe 61 open to the lowermost portion of tank B when the latter is in substantially a horizontal position as shown in Figure 5.

Referring to the truck C, the truck chassis 70 is provided with a plurality of transverse supports 71, in parallel relation, which at their ends extend beyond the side rails 72 of the chassis 70, as shown in Figure 2, and support side platforms 74; a rear platform 75; and rear wheel fenders 76. The supports 71 are provided with recesses 77 inwardly from the top surfaces thereof, which align longitudinally of the truck body, to provide seats for the containers B. These recesses 77 are successively deeper from the rearmost transom of truck body to the foremost transom of the truck body, so that the tanks B will have a forward downward inclination, to insure a complete drainage of liquid to the front ends of the containers B, from whence said liquid is dispensed. It is preferred that a pair of the containers B be mounted upon the truck body C at one time, although this arrangement may be departed from if desired, and the body structure may be of different nature than that described, for transporting the liquid gas to the customer's equipment.

To seat the containers B in proper position upon the truck body, it is proposed to provide a front bracket 71<sup>a</sup>, attached as at 71<sup>b</sup> to the front transom 71, in a detachable relation, provided with a hook end 77<sup>a</sup> to receive the forward flange 55 at the lower part of the container, as shown in Figures 1 and 5 of the drawings. This prevents an upward jump of the front end of the container. A detachable bracket 78 is placed on the rearmost transom 71, having a threaded opening 79 for adjustably receiving a clamping screw 80, which has a crank handle 81 thereon by means of which the screw 80 may be clamped against the rear wall 54 of the container B, immediately above the lower part of the flange connection 55, and this holds the rear end of the container B against upward jumping. To prevent lateral rolling or shift of the container B, clamping chains or cables 83 are provided, secured at 84 to an end of each, on one of the intermediate transoms 71, and which chains are adapted to be wrapped about the containers B and secured at their opposite ends 85 at some convenient location on the transom 71 or the body, in a detachable relation, and this of course prevents the lateral rolling of the containers B and holds the same in position. Other means than such clamping means may be provided if desired.

The containers B are so mounted on the body that the front ends thereof may be conveniently spaced from the cab 85<sup>a</sup>.

Bearing in mind that the liquid gas is under superatmospheric pressure in the containers B, and that so long as any liquid gas is in the customer's tank, the same is also under superatmospheric pressure, and if the temperatures of both the distributors' and the customers' tanks are about the same, the superatmospheric pressure therein will be about equal, it will be seen that some means will be necessary to force the liquid gas into the customer's tank, although if found convenient it may be placed therein by gravity flow. As a preferred example of the means of connecting the tanks to each other and for forcing the liquid gas into the customer's tank, I prefer to connect the outlet valves 60 to a horizontal manifold 89, by suitable connections 90, shown more particularly in Figure 4 of the drawings. The truck body is provided with a platform 91, supported at a level below the chassis rails 72, at the front end of the truck, just rearwardly of the cab, which is adapted to support a pump 92, such as of the hand operated type. This pump has a connection 93, with the manifold 89, and a suitable pumping lever 94, provided for drawing the liquid gas from the container into the pump, and then discharging it into an outlet tubing 97, shown in Figure 1, which enters an end of a special compartment 100 placed at a side of the truck body. This compartment 100 is elongated and has a lid 101 opening laterally of the truck body, and it is adapted to house a long length of metal hose or tubing 97 of the means D.

The natural gas may be compressed and liquefied at locations convenient to the producing well and pumped directly into the large containers or tanks B. In practice, these tanks are suitably racked and placed on a railway car and therein delivered to the desired destination. At present there is a special construction of railway car for supporting thirty of the cylinders B at the distributing center. The entire cylinder cargo of the car may be removed and racked or stored and as needed, placed upon the trucks C. The recesses 77 in the supports or transoms 71 aid in disposing the tanks B in proper relation on the truck body, that is, with the longitudinal axis of the tank longitudinally of the truck chassis. As may be noted by reference to Figure 2 the recesses 77 in the transom 71 nearest cab 85<sup>a</sup> are the largest of the recesses accommodating the tanks B and the recesses 77 in the other transoms 77 as they become remote from the cab 85<sup>a</sup> diminish in size so that the tanks are inclined forwardly and downwardly as shown in Figure 1 so that the delivery end is lowermost and the tanks have a tendency to settle against the brackets 71<sup>a</sup> which, together with



the brackets 78 also tend to keep the tanks from lateral as well as endwise movement on the transoms 71. The manifold 89 may receive liquefied gas from either or both the tanks B and in practice it is desirable to draw from both tanks in a manner to substantially equalize the load in the tanks. The platform 91 and pump mounted thereon are conveniently and compactly located between the cab 85<sup>a</sup> and the foremost transom 71. The compartment 100 likewise is compactly located beneath one of the platforms 74 where access may be readily gained to the flexible tubing 97.

It is apparent from the foregoing description that novel equipment has been provided for safely, economically and expeditiously delivering liquefied gas from the local distributing center to the customers and that while, in the example shown the truck supports two tanks B, this is merely by way of example since the capacity of the truck may be such as to accommodate but one or a plurality of tanks B and that various changes in shape, size, and arrangements of parts may be made to the disclosure without departing from the spirit of the invention or the scope of the appended claims:

I claim:

1. In apparatus of the class described the combination of a truck including a chassis, a detachable tank for the chassis, a hook fixedly connected with the chassis at the front end thereof for engaging the front of the tank at the lower portion thereof, and a longitudinally extending clamping screw at the rear end of the chassis having a threaded connection with the chassis for movement longitudinally thereof into engagement with the rear end of the tank near the lower portion thereof.

2. In a truck for transporting and distributing liquid materials and the like, the combination of a chassis, a tank horizontally supported on the chassis having outwardly extending end flanges, a hook mounted fixedly upon the chassis and engaging the flange of the tank detachably at one end of the tank, and tank clamping means mounted on the chassis in screw threaded connection therewith at the other end of the tank including a shank engageable with the flange of the tank at that end of the tank to clamp the tank upon the chassis in cooperation with the hook first mentioned.

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