

**Feb. 24, 1953**

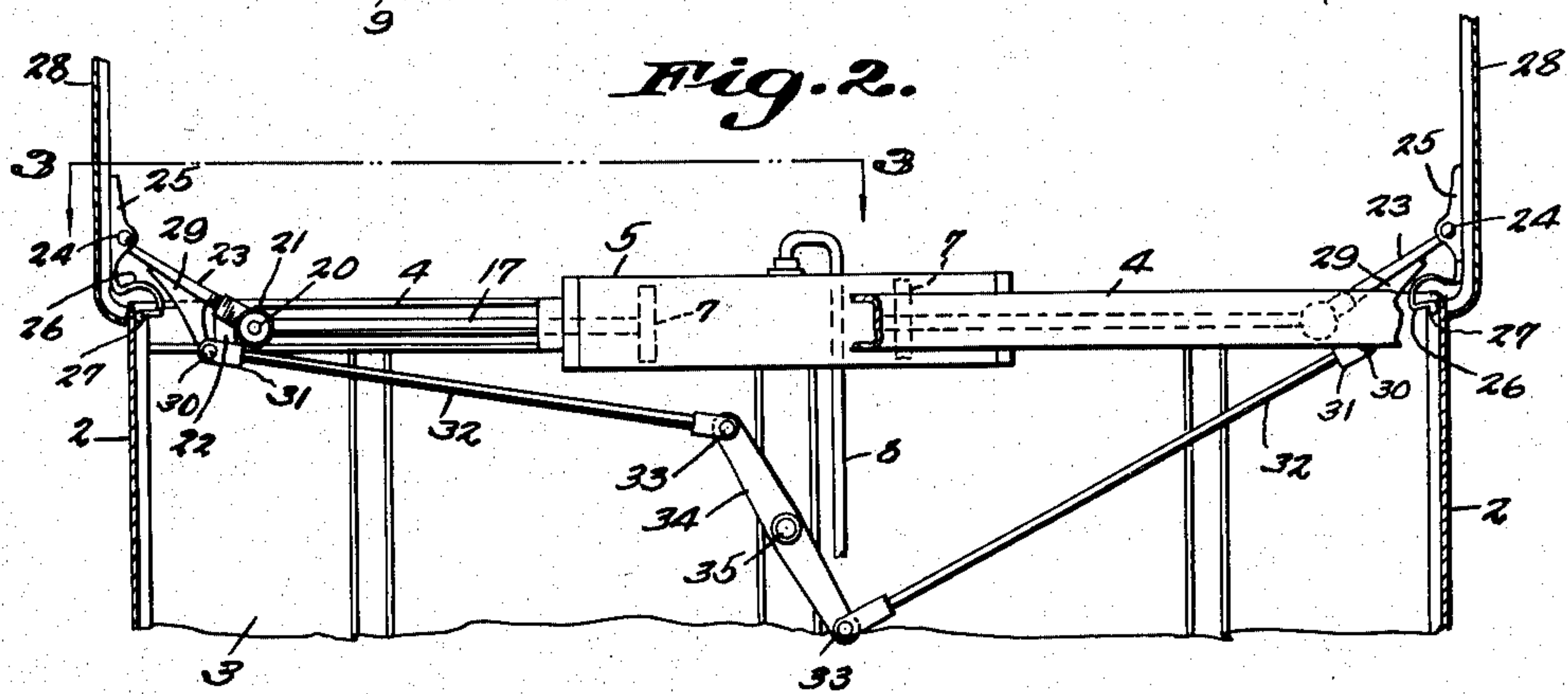
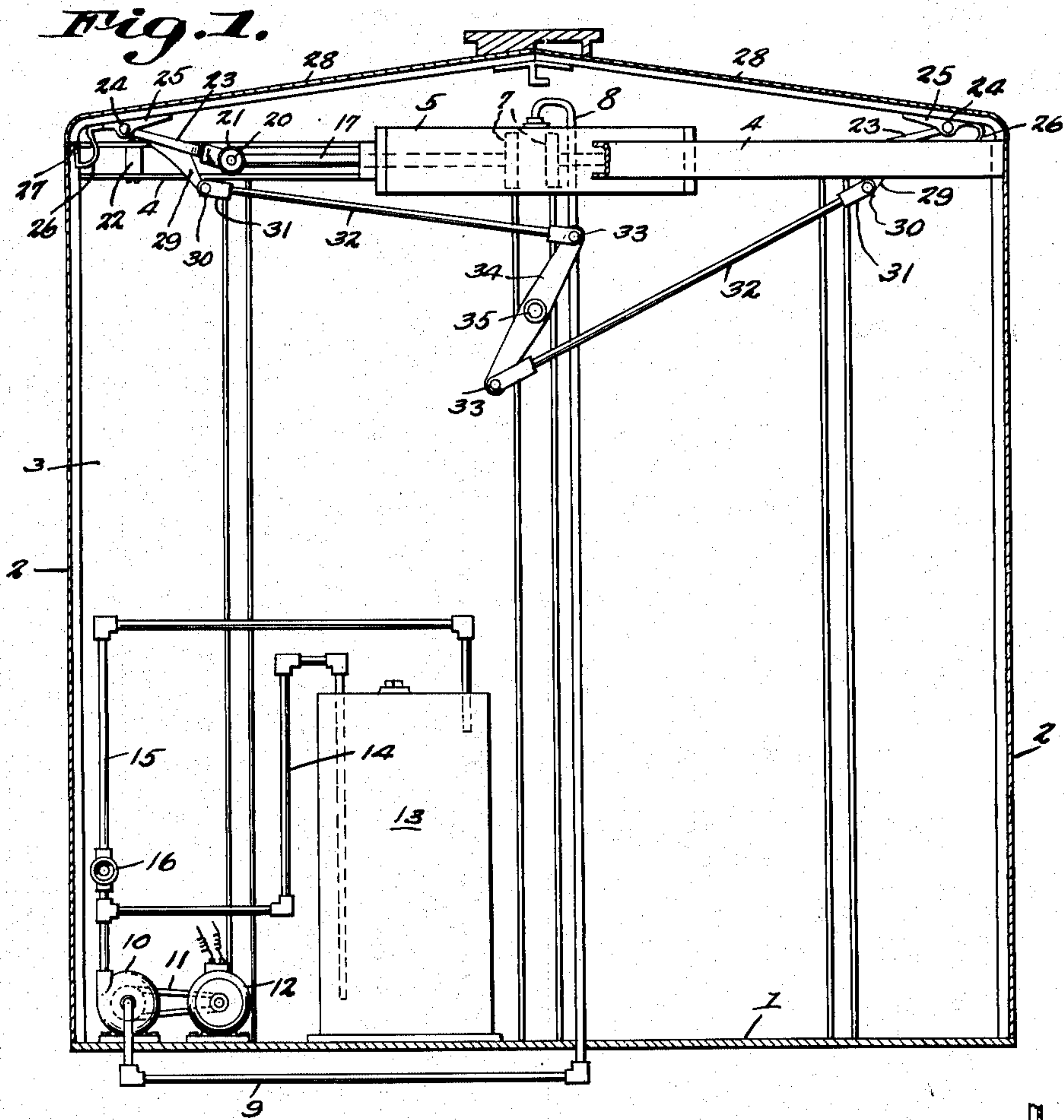
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**2,629,339**

# ROOF OPENING APPARATUS FOR RAILROAD FREIGHT CARS

Filed Aug. 10, 1950

2 SHEETS—SHEET 1



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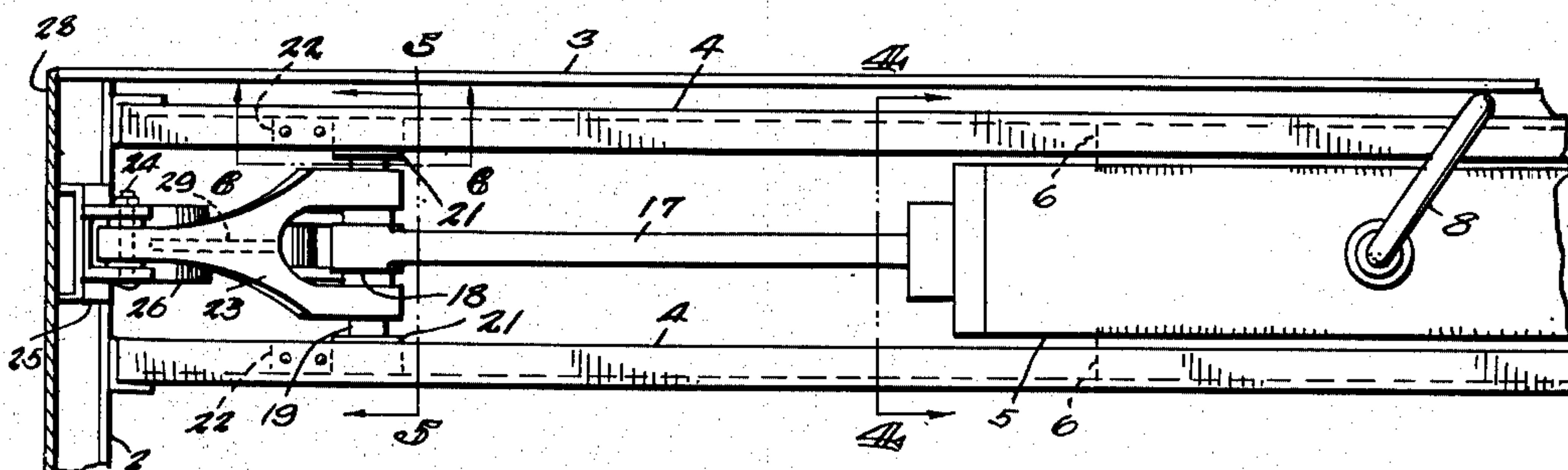
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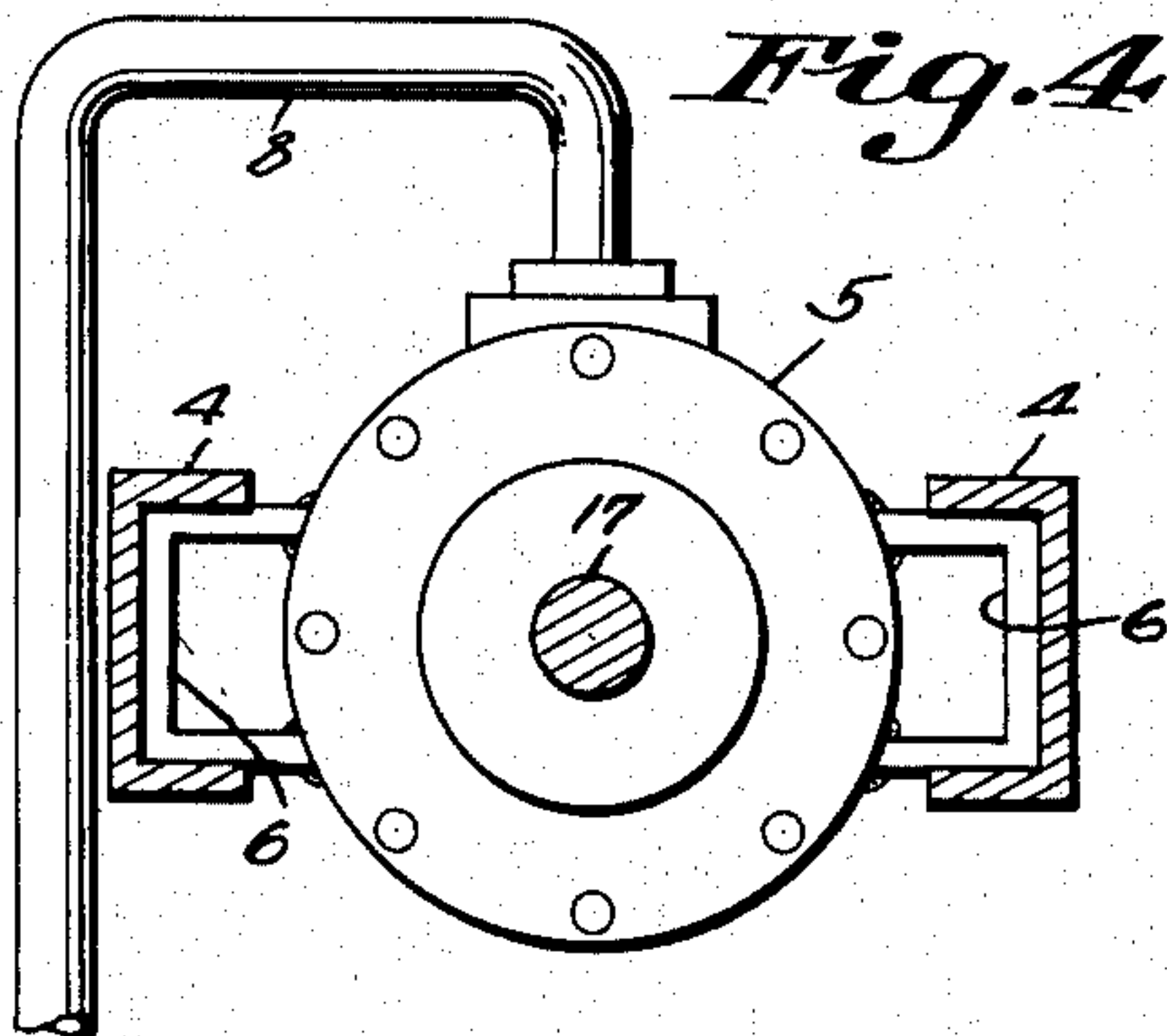
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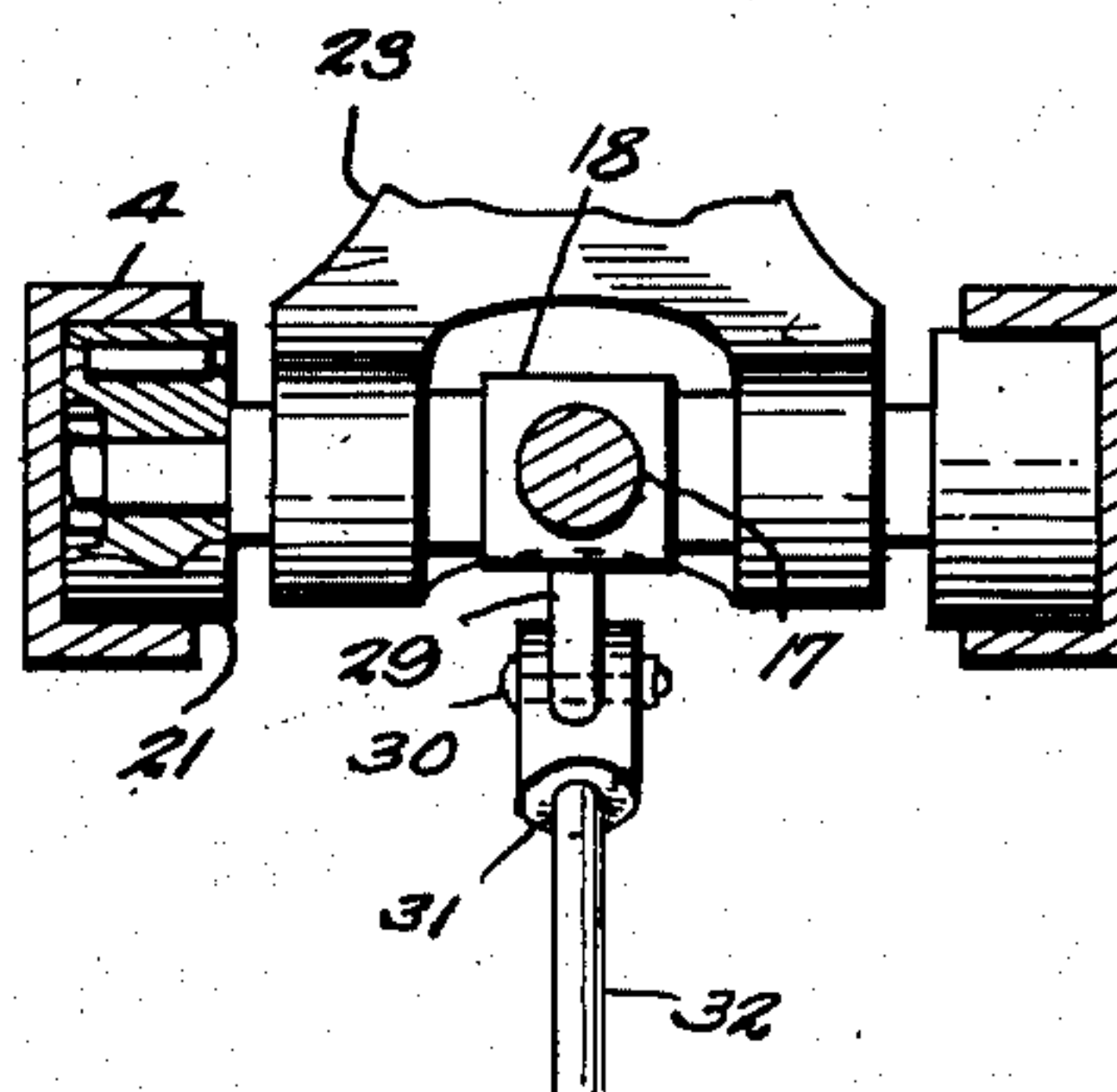
*Fig. 3.*



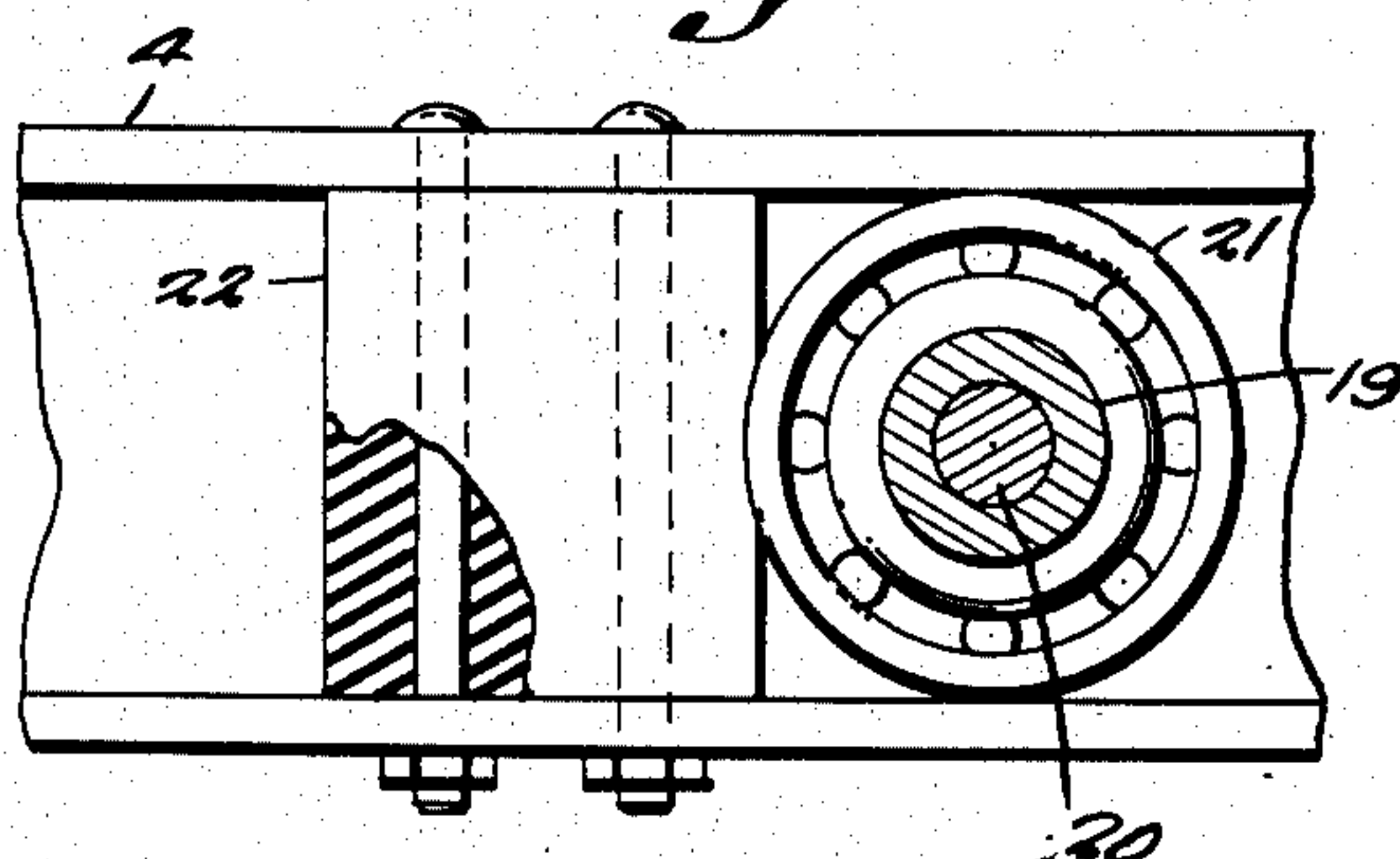
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



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## UNITED STATES PATENT OFFICE

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ROOF OPENING APPARATUS FOR RAILROAD  
FREIGHT CARS

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3 Claims. (Cl. 105—377)

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This invention relates to apparatus for opening and closing the roof of a railroad box car or the like.

In general, railroad box cars are loaded from the side, through doors located intermediate the opposite ends of the car. While these doors are of substantial size, they are nevertheless small in size as compared to the overall length and cubic area of the car, and in actuality open only the middle part of the car. As a result, freight handlers are required to move freight loaded through said doors toward the opposite ends of the car, so as to pack said car fully.

As will be appreciated, by reason of the present construction of box cars and the loading practices required by such construction, the loading of a single box car is a time-consuming and expensive operation, considering the number of helpers or handlers required, and considering further the limited opening into the box car through which all the freight must pass for manual packing in the ends of the car.

The present invention has as its main purpose the elimination of these objections which have heretofore existed, by the provision of an apparatus whereby, in a matter of seconds, the entire roof of the box car is adjusted either to open or closed position as desired for loading and unloading of the freight through said roof opening.

Another important object is to provide apparatus of the type stated whereby, when said roof is adjusted to fully opened position, the entire interior of the box car, from end to end and side to side thereof, is exposed completely, for deposit of freight at any location in the car.

Yet another object is to provide shipping apparatus of the character described wherein the means for opening and closing the car roof occupies a small space at one end of said car and takes up practically none of the room required for loading of the freight, and additionally, provides no bulky mechanism which will interfere with the actual movement of the freight into and out of the roof opening.

Still another important object is to provide apparatus of the type stated which can be applied to box cars already in use at relatively low expense, considering the benefits to be obtained.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts, hereinafter more fully described and pointed out in the claims, it being understood that changes

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may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

Referring to the drawings

5 Fig. 1 is a transverse section through a box car equipped with the present invention, the roof being shown in closed position.

10 Fig. 2 is a fragmentary transverse section through the car, parts being broken away, the roof being shown in opened position.

Fig. 3 is an enlarged section taken substantially on line 3—3 of Fig. 2.

Fig. 4 is a section, still further enlarged, taken on line 4—4 of Fig. 3.

15 Fig. 5 is an enlarged section taken substantially on line 5—5 of Fig. 3.

Fig. 6 is an enlarged section taken substantially on line 6—6 of Fig. 3.

20 Referring to the drawings in detail, illustrated in Figs. 1 and 2 is a conventional box car construction including the floor 1, side walls 2, and end wall 3.

At opposite ends of said box car, I extend transversely across the car, close to the roof thereof, the pairs of parallel channel members 4 which, as readily seen from Fig. 4, are faced inwardly toward each other to define rails or tracks for a rollable portion of the apparatus, in a manner to be made apparent hereinafter.

30 The opposite ends of said pairs of horizontally extending tracks 4 are rigidly secured in any suitable manner to the opposite side walls 2.

35 Since the construction at opposite ends of the railroad car is identical, the description hereinafter will be confined to the construction at one end only of said car. It will nevertheless be understood that the description applies to the other end as well, both ends of the roof opening means being operated from a common source for simultaneous operation.

40 Accordingly, considering the rails or tracks 4 at one end of said railroad car, intermediate the opposite ends of the trackway defined by said rails there is rigidly mounted between the rails a horizontally disposed hydraulic cylinder 5 of the double ended type in which is slidably mounted the spreadable pistons 7. As will be understood, when liquid is forced under pressure into the center of the cylinder 5, said pistons 7 are spread and forced to opposite ends of the cylinder. Conversely, upon removal of said hydraulic force, the pistons 7 are permitted to return toward the center portion of said cylinder.

55 For the purpose of actuating the respective



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pistons 7, I extend into communication with the center portion of the cylinder 5 one end of an elongated feed line 8 extending downwardly along the end wall 3 through the floor 1, said feed line being extended laterally as at 9, below said floor 1 and being in communication at its opposite end with a hydraulic pump 10 driven by belt 11 powered from motor 12. A manual pump can be used quite effectively in place of the illustrated power means 12, if desired.

A supply tank 13 for hydraulic liquid is mounted upon the floor 1 at the end of the car adjacent said pump 10, and extending from said tank 13 is the supply line 14 to the pump 10, a return line 15 extending from the pump to the supply tank and being provided with a regulating valve 16 of the needle or any other suitable type.

Rigid with the respective pistons 7 and extending from the opposite ends of the cylinder 5 are the rods 17 having at their outer ends the sleeves 18 extending around and rotatable relative to the tubular bushings 19 in which are rotatable the axles 20 carrying at opposite ends the roller bearing wheels 21 that roll in the tracks 4.

Pivotally mounted upon the tubular bushings 19 are the yokes 23 the other ends of which are connected by pivot pins 24 to brackets U-shaped in cross section, these being designated 25 and being a part of the hinges 26 connected by the hinge pins 27 to the upper ends of the side walls 2. Brackets 25 are rigid with the doors 28, each door 28 extending the full length of the box car and half the width thereof.

It is desired that means be provided for equalizing the movement of the respective doors 28 to open or closed position. To this end, the yokes 23 are rigid with the depending tongues 29 pivotally connected at 30 to the bifurcated ends 31 of elongated equalizer rods 32, pivotally connected at 33 at their opposite ends to the opposite ends of a lever 34 pivotally mounted at its center as at 35 against the end wall 3.

I believe the manner of operation of the apparatus is now more or less obvious from the drawings and description provided. Summarizing said operation briefly, however, it may be noted that when the pump is placed in operation and forces liquid under pressure into the cylinder 5, the respective pistons 7 of the cylinder are spread, so as to force the rods 17 outwardly toward the opposite sides of the car, thus to cause the roof sections 28 to swing upwardly upon their hinges to the position shown in Fig. 2. It may be noted from Fig. 2 that in their fully opened positions the roof sections 28 are substantially vertical, thus to expose the entire inner area of the box car for loading of freight at any location longitudinally thereof, with the exception of course of the small end areas taken up by the apparatus itself. These end areas, however, occupied by the roof opening means are no more than a foot, more or less, in width.

It will be further understood that a single pump 10 mounted in one box car would feed hydraulic cylinders 5 at both ends of said car simultaneously.

It is an important characteristic of the present invention that a railroad box car already in use is capable of being easily converted at relatively low expense to include elevatable roof sections 28 as illustrated in the drawings and equipped with the roof opening means constituting the present invention. The roof of the conventional box car might itself comprise the ma-

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terial capable of being divided into a pair of longitudinally extending roof sections 28 each extending half way across the car to the middle of the car and each hingedly connected to a side wall of the car. Balancing the expense of such conversion is the appreciable benefit to be derived from use of the invention. In a few seconds the entire interior area of the box car can be exposed, and a single crane operator, having one or two helpers, is enabled to load the entire car through the roof thereof in a very short time, thus to keep the car in profitable service almost constantly. Or, the freight can be loaded through chutes provided for the purpose or dropped from overhead structures. In any event, it is possible to load the entire car simultaneously from end to end thereof, as distinguished from present day practice in which the freight must be loaded in relatively small amounts through the center door and thence moved toward the opposite ends of the car.

What is claimed is:

1. In a railway car of the type having a bottom platform, vertically extending side and end walls, and doors hingedly carried by the side walls adjacent the upper edges thereof for movement in vertical arcuate paths from a substantially horizontal position in which they wholly cover the bottom platform to a substantially vertical position in which the platform is wholly exposed, means for so moving the doors which includes tubular bushings mounted adjacent the upper edge of an end wall of the car to move in a horizontal path which extends transversely of said car, yokes pivotally carried by the bushings to move in vertical arcuate paths, means pivotally coupling the yokes to the doors, and means mounted within the car adjacent the aforesaid end wall of the car and connected to the bushings to move said bushings in the horizontal path.

2. In a railway car of the type having a bottom platform, vertically extending side and end walls, and doors hingedly carried by the side walls adjacent the upper edges thereof for movement in vertical arcuate paths from a substantially horizontal position in which they wholly cover the bottom platform to a substantially vertical position in which the platform is wholly exposed, means for so moving the doors which includes tubular bushings mounted adjacent the upper edge of an end wall of the car to move in a horizontal path which extends transversely of said car, yokes pivotally carried by the bushings to move in vertical arcuate paths, means pivotally coupling the yokes to the doors, means mounted within the car adjacent the aforesaid end wall of the car and connected to the bushings to move said bushings in the horizontal path, an elongated lever pivotally mounted intermediate its ends to move in a vertical arcuate path adjacent the aforesaid end wall, and equalizer rods pivotally connected to the lever adjacent opposite ends thereof and to the yokes for preserving uniform the movement of the yokes.

3. In a railway car of the type having a bottom platform, vertically extending side and end walls, and doors hingedly carried by the side walls adjacent the upper edges thereof for movement in vertical arcuate paths from a substantially horizontal position in which they wholly cover the bottom platform to a substantially vertical position in which the platform is wholly exposed, means for so moving the doors which includes tubular bushings mounted adjacent the upper edge of an end wall of the car to move in



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a horizontal path which extends transversely of said car, yokes pivotally carried by the bushings to move in vertical arcuate paths, means pivotally coupling the yokes to the doors, a cylinder mounted within the car adjacent the aforesaid end wall, pistons mounted within the cylinder for movement therein, piston rods connected to the pistons and to the bushings for moving said bushings with the pistons, means connected to the cylinder between the pistons for admitting fluid under pressure to said cylinder and moving the pistons, and means carried adjacent the aforesaid end wall and connected to the yokes for equalizing the movements of the pistons.

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