

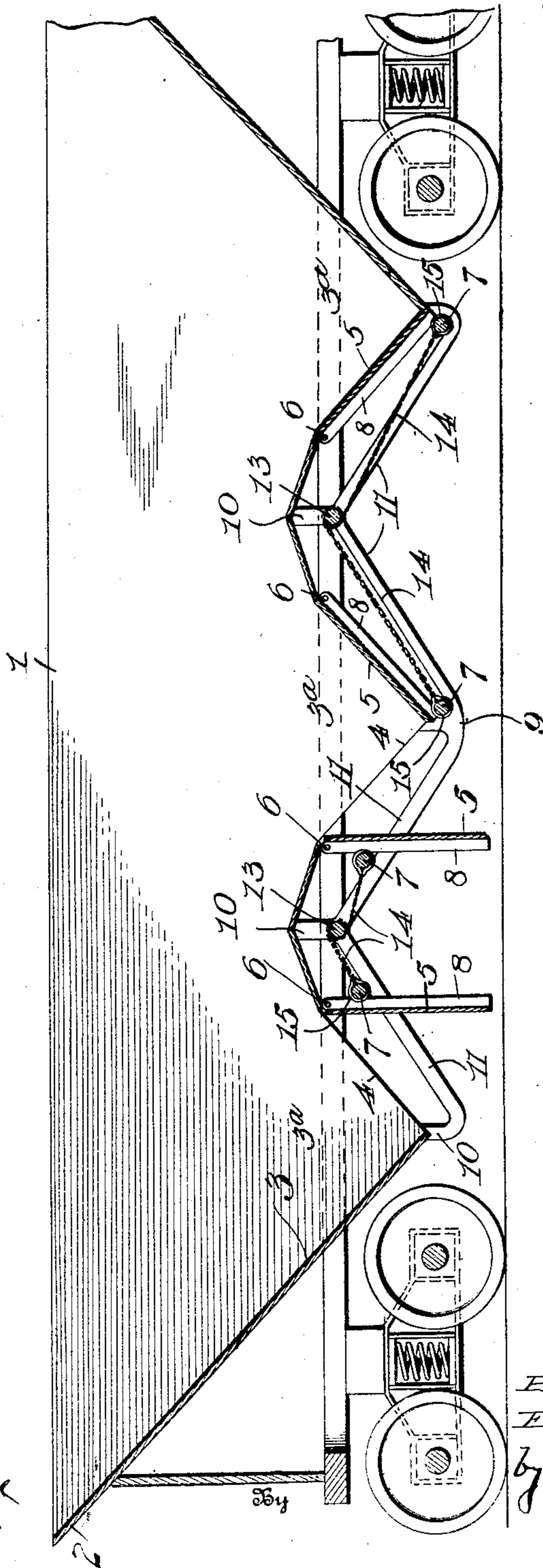
P. FURGESON & E. L. WHELAND.  
DROP DOOR FASTENING FOR CARS.  
APPLICATION FILED FEB. 4, 1909.

934,299.

Patented Sept. 14, 1909.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses  
D. L. Mochane  
S. J. Whaley.

Inventor  
Peter Furgeson &  
Edwin L. Wheland  
by W. C. Carman  
Attorney

P. FURGESON & E. L. WHELAND.

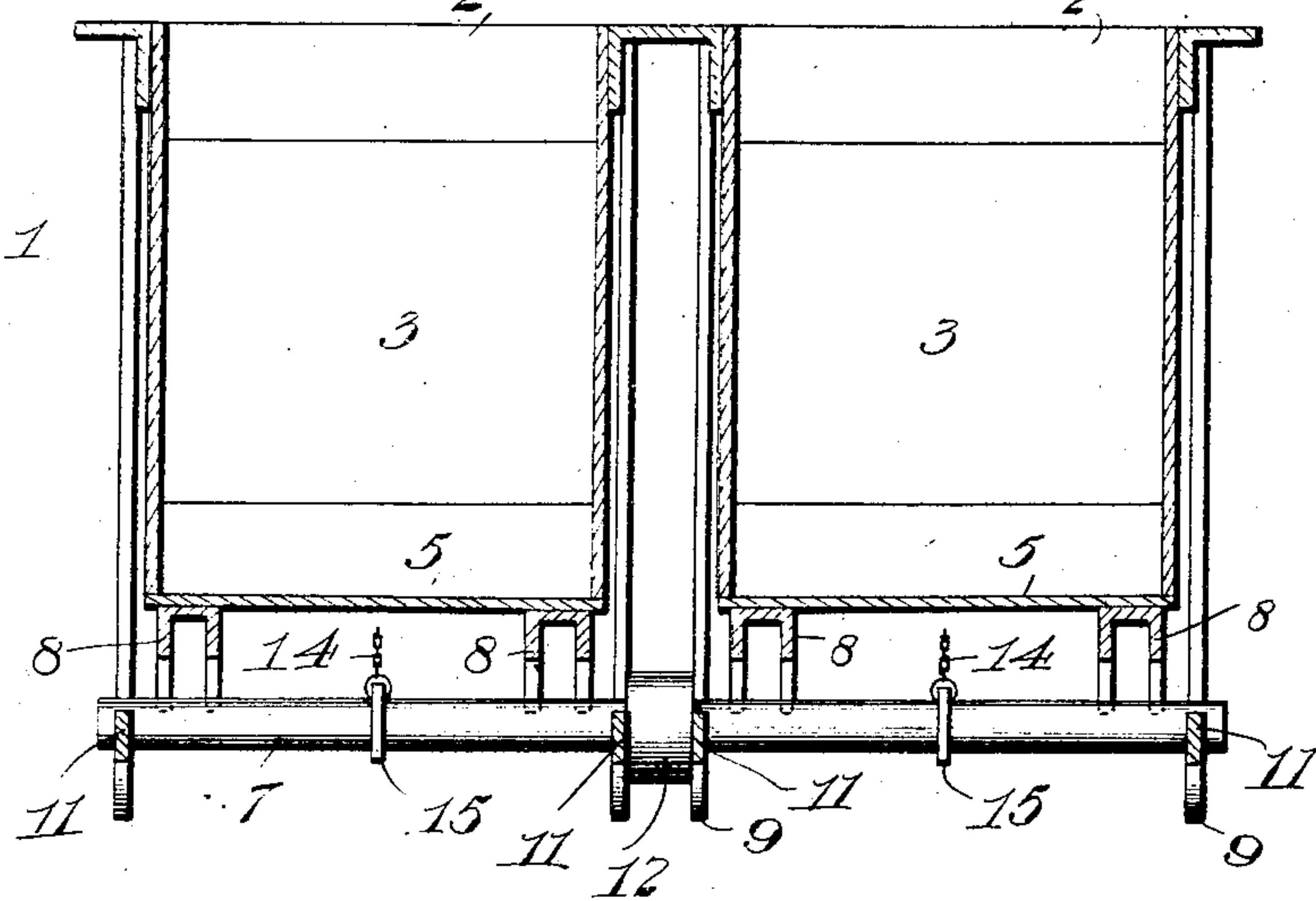
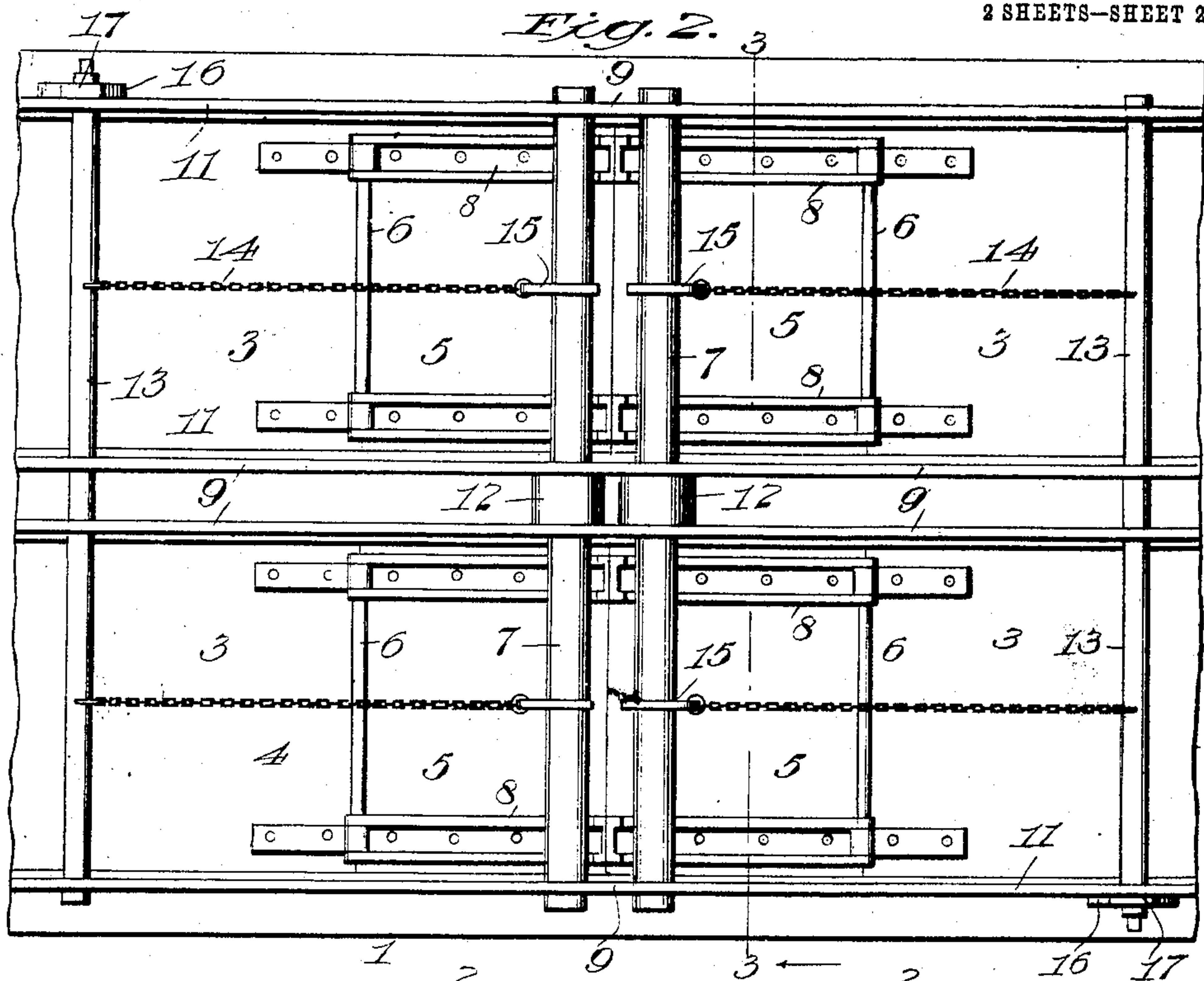
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2 SHEETS—SHEET 2.



Witnesses  
*J. L. Kockrober*  
*S. J. Holmquist*

By

Inventors  
*Peter Furgeson &*  
*Edwin L. Wheland,*  
*W. C. Carman*  
Attorney



# UNITED STATES PATENT OFFICE.

PETER FURGESON AND EDWIN L. WHELAND, OF YOUNGSTOWN, OHIO.

## DROP-DOOR FASTENING FOR CARS.

934,299.

Specification of Letters Patent. Patented Sept. 14, 1909.

Application filed February 4, 1909. Serial No. 476,040.

To all whom it may concern:

Be it known that we, PETER FURGESON and EDWIN L. WHELAND, both residing at Youngstown, in the county of Mahoning and State of Ohio, have invented certain new and useful Improvements in Drop-Door Fastenings for Cars, of which the following is a specification.

This invention relates to the subject of drop bottom cars of the type usually employed in handling coal and ore products and embodying dumping drop doors.

To this end the invention primarily has in view a simple and practical drop door fastening for cars of the drop bottom or hopper bottom type, and contemplates a fastening for this purpose which possesses the distinct advantage of being conveniently and rapidly manipulated, (that is, readily released and dropped to an operative door holding position), and also providing a most substantial and secure fastening for the doors to prevent them from accidentally or otherwise being opened except by the positive and direct release of the fastening itself.

Furthermore, the invention provides the improved fastening in connection with the drop doors so arranged that in the event of becoming loose while the car is running, the same will readily swing back and pass over obstructions on the track without causing the disastrous results which frequently happen from that cause, viz: from drop doors falling open while the car is running and striking obstructions on the track.

With these and many other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

The essential feature of the invention involved in the novel mounting of the bodily shiftable and gravitating holding rollers, in combination with the doors, is necessarily susceptible to structural modification without departing from the scope of the invention, but a practical embodiment of the latter is suggested in the accompanying drawings, in which:

Figure 1 is a longitudinal sectional view of a drop bottom car having a plurality of drop doors and equipped with the improved drop door fastenings contemplated by the

present invention, the view also illustrating certain of the doors closed and other doors opened in order to more clearly show the action of the shiftable holding rollers in both locking and releasing positions. Fig. 2 is a bottom plan view of the central part of the car illustrated in Fig. 1, and showing the opposite sets of doors closed and held in such positions by the holding rollers. Fig. 3 is a vertical transverse sectional view on the line 3-3 of Fig. 2.

Like references designate corresponding parts in the several figures of the drawings.

In carrying the invention into effect, the improved drop door fastening claimed herein may be utilized in connection with any of the common and well known forms of drop bottom cars, either of the regular freight or ore car varieties, and which embody in their organization dumping drop doors, so for illustrative purposes, there is shown in the drawings an ordinary type of drop bottom car designated in its entirety by the numeral 1. The drop bottom or dump car 1 shown in the drawings includes in its construction the usual car body 2 carried by the wheel trucks and provided with the inclined end portions 3 and a plurality of hoppers or pockets 3<sup>a</sup> from which the contents are discharged through the bottom dump openings 4, which latter are adapted to be covered and uncovered by the drop doors 5. In this connection it will of course be understood that the invention may be associated with car bodies having any number of discharging hoppers or pockets, or only a single one of such hoppers or pockets, without affecting the functions performed by the improved fastening. It is only essential, for the purposes of the present invention, that the car bottom embody in its organization one or more of the discharging hoppers or pockets 3<sup>a</sup>, the drop doors 5 for such hoppers or pockets being locked and released through the action of the improved fastening means claimed herein. In explanation of the arrangement of pockets and drop doors shown in Fig. 1 of the drawings, it will be noted that the end or terminal pockets 3<sup>a</sup> are closed at one side by the inclined end portions 3 of the car body, and each of said terminal pockets is provided with a single dump opening 4 covered and uncovered by a single drop door 5, whereas the central pocket or hopper 3<sup>a</sup> of the car body is open at both



sides and is adapted to be closed in by a pair of the doors 5 arranged in opposite and matching relation, as clearly shown in the drawings.

Referring further to the exemplification of the invention suggested in the drawings, it will be observed that for the terminal and central pockets the car bottom may be equipped with doors arranged respectively at opposite sides of the vertical longitudinal center of the car bottom, as may be best seen from Figs. 2 and 3 of the drawings. However, irrespective of the particular arrangement of the drop doors according to the number and position of the pockets or hoppers 3<sup>a</sup>, the separate drop doors are hinged at their upper edges, as at 6, to suitable points of support, and the dump openings 4 are arranged at an inclination so that the doors when closed lie obliquely and preserve the hopper formation of the bottom.

According to the present invention, the transversely arranged, and vertically swinging, drop doors 5 are designed to be fastened in their closed position, and released from the latter, through the medium of bodily shiftable holding rollers 7. Each holding roller 7 is arranged to operate entirely beneath the doors with which it is associated, and usually consists of a stout cylindrical rod extending transversely of the car bottom from side to side thereof, and of sufficient strength to not only operate as a fastening for the doors to hold them closed, but also as a continuous and rigid support therefor to firmly brace the same against the downward pressure of the load contained within the car.

Each of the bodily shiftable holding rollers 7 is designed to have a bearing and rolling contact with bearing ribs or irons 8 secured upon the outer sides of the drop doors, said bearing ribs or irons being disposed edgewise and preferably formed by channel irons arranged at or near opposite edges of the doors and extending from the hinged to the free edge portions thereof. In conjunction with the bearing and rolling contact which each holding roller 7 has with the doors with which it is associated, said roller is supported and guided in its movement by means of stationary supporting guides 9 secured to the frame work of the car bottom, and arranged wholly below the latter. The said supporting guides are preferably arranged in the manner shown in the drawings, that is, respectively at opposite sides of the car body and also at a point intermediate of the latter. All of the supporting guides 9 are disposed longitudinally of the car bottom, and are of duplicate formation to provide similar supporting and guiding means for all of the holding rollers 7. In connection with the said support and guiding of the rollers 7, it will be observed that

the stationary supporting guides 9 essentially consist of guide frames having attaching arms or equivalent members 10 fastened to suitable points of support on the car body, and also include in their construction the main inclined supporting and guiding members 11 for the rollers. The said members 11 for each holding roller 7 are arranged at an upward inclination from a point below the free edges of the drop doors so as to afford means for positively guiding the roller upward and backward from the doors when the latter are to be released, and downward and forward toward the free edges of the doors when the latter are to be secured in their closed positions. To facilitate the positive guiding of each roller 7 in these movements, and also to retain the same against longitudinal displacement, each of said rollers is preferably provided at a point between its ends with a retaining collar 12 guided and held between a pair of supporting guides or guide frames 9 which are located at a point intermediate the opposite sides of the car body, as plainly shown in Fig. 4 of the drawings.

To provide for withdrawing the individual rollers 7 upward and away from their holding positions beneath the free edge portions of the drop doors, and thereby releasing the doors, there is utilized a release mechanism, combined with each roller and consisting of a release shaft 13 journaled in suitable bearings provided in or on the guide frames 9, and suitably arranged pull cables 14 winding and unwinding at one end on the shaft, and at their other ends having clevis or equivalent loose connections 15 with the rollers 7. Each release shaft 13 is also provided with a locking device preferably consisting of a ratchet disk 16 thereon, and a locking pawl or dog 17 engaging the teeth of the ratchet disk and serving to lock the release shaft against movement after the winding up of the cables or chains 14 until it is desired to permit the roller to gravitate down the inclined guiding members 11 and thereby automatically lift and secure the drop doors. In the embodiment of the invention suggested in Fig. 1 of the drawings, it is preferable, as shown, to utilize one release shaft 13 in connection with holding rollers 7 for oppositely located doors of different pockets 3<sup>a</sup> and to arrange the separate pull cables 14 for the separate opposite rollers 7 in such a manner that the said rollers will have the same movement in both the releasing and locking operations. Of course, it will be understood that any other preferred and practical disposition and arrangement of the releasing mechanism with relation to the holding rollers may be resorted to without affecting the invention.

It will be obvious from the construction described that each holding roller 7 pro-



vides a continuous rest or support throughout the length of each door secured in place thereby, while at the same time being capable of freely and readily being drawn backward and upward from its fastening position. Furthermore, each roller is intended to be sufficiently heavy so as to freely gravitate down the inclined guiding members and thereby automatically close and fasten the doors when the hopper has been dumped of its contents.

We claim:

1. In a drop door fastening for cars, the combination with transversely hinged drop doors, of a bodily shiftable holding roller arranged to gravitate to a fastening position beneath the free edges of the doors.
2. In a drop door fastening for cars, the combination with transversely hinged drop doors, of a bodily shiftable holding roller supported to gravitate to a fastening position beneath the free edges of the doors, and means for withdrawing the roller upward and backward from said fastening position.
3. In a drop door fastening for cars, the combination with transversely hinged drop doors, of stationary inclined supporting and guiding members, and a bodily shiftable holding roller arranged to gravitate, on said members, to a fastening position beneath the free edges of the doors.
4. In a drop door fastening for cars, the combination with transversely hinged drop doors, of inclined supporting and guiding members, a bodily shiftable holding roller arranged for support on said members and having a gravitating movement thereon to a fastening position beneath the free edges of the doors, and means for withdrawing the

roller upward and backward from said fastening position.

5. In a drop door fastening for cars, the combination with transversely hinged drop doors, of stationary inclined supporting and guiding members, and a bodily shiftable holding roller arranged to provide a continuous support throughout the length of the doors, said roller extending transversely of the car bottom and having a gravitating movement on said members to a fastening position beneath the free edges of the door.

6. In a drop door fastening for cars, the combination with the hinged drop doors, of a plurality of guide frames having stationary inclined supporting and guiding members, and a bodily shiftable holding roller arranged on said members and provided with an intermediate retaining collar working between a pair of said members.

7. In a drop door fastening for cars, the combination with the hinged drop doors, of separately inclined supporting and guiding members, a bodily shiftable holding roller carried by said members and operating beneath the doors, and a release mechanism comprising a release shaft having a locking device and pull cable winding and unwinding on said shaft and having loose connections with the holding roller.

In testimony whereof we hereunto affix our signatures in the presence of two witnesses.

PETER FURGESON.  
EDWIN L. WHELAND.

Witnesses:

ROBT. O. KIELING,  
A. J. CLARK