A. L. STEPHENS.

LOADING HOPPER AND CHUTE.

APPLICATION FILED AUG. 21, 1919.

1,417,780.

Patented May 30, 1922.

2 SHEETS—SHEET 1.

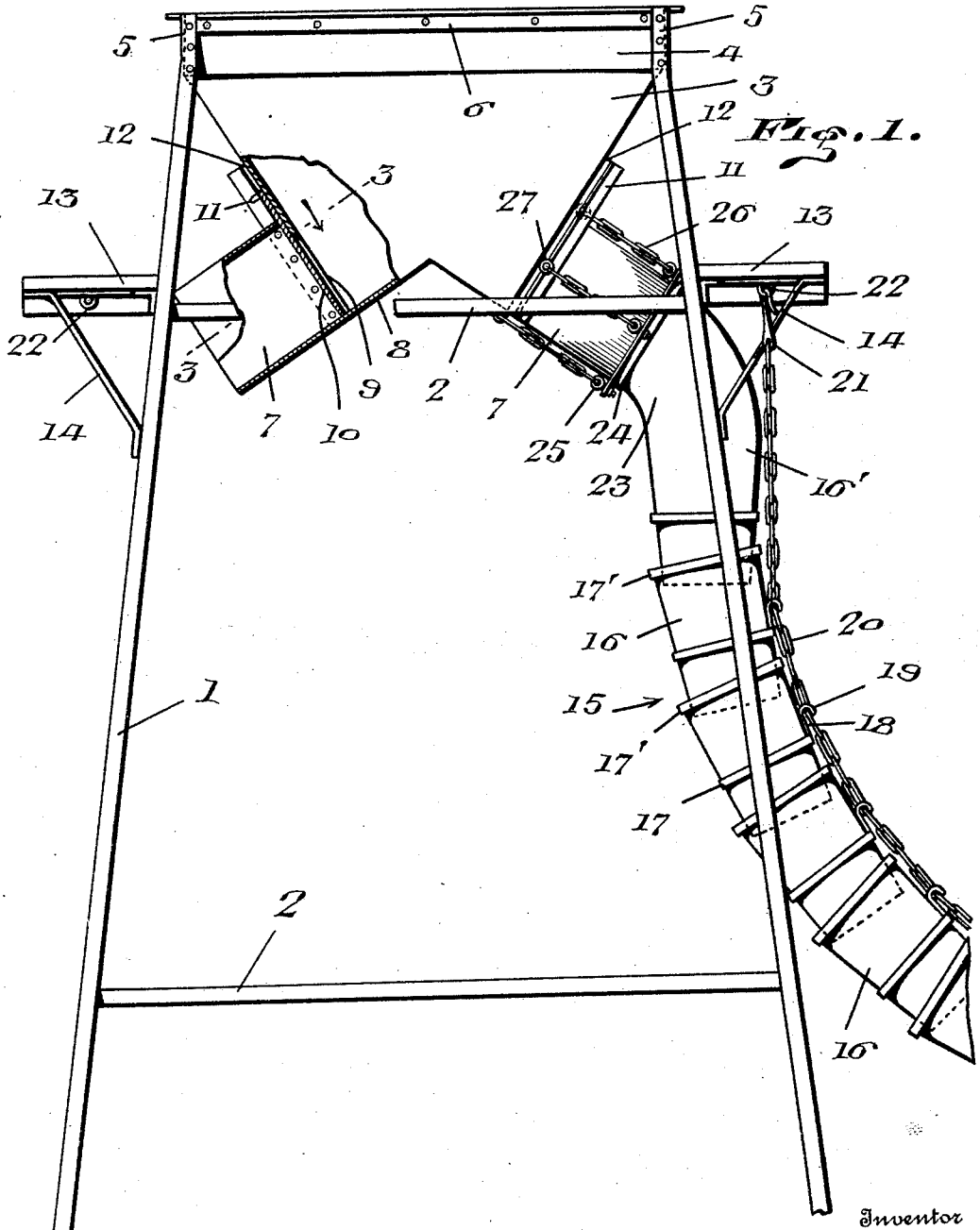


Fig. 1.

Witness

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2 SHEETS—SHEET 2.

Fig. 3.

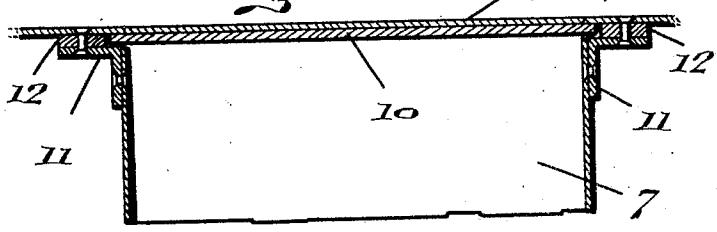


Fig. 5.

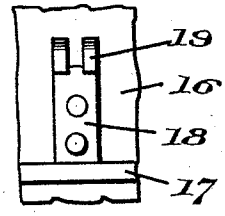


Fig. 4.

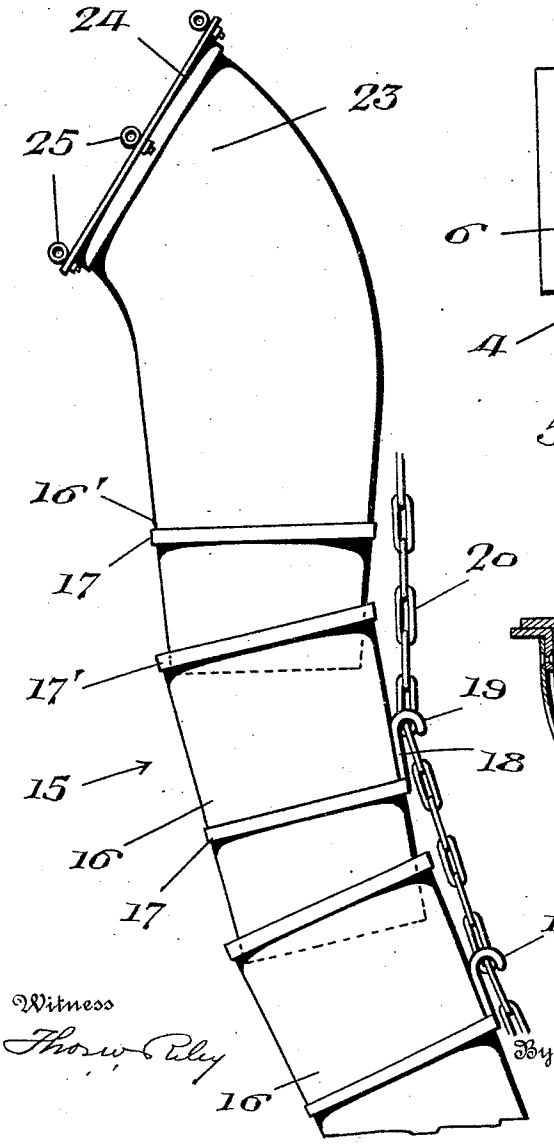


Fig. 2.

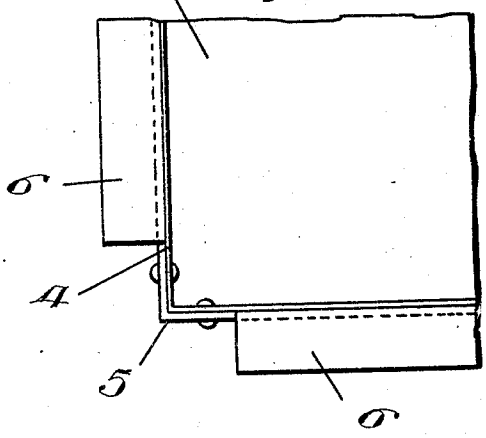
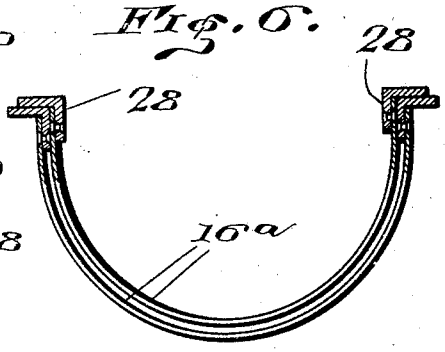


Fig. 6.



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UNITED STATES PATENT OFFICE.

ALVA L. STEPHENS, OF PORTLAND, OREGON.

LOADING HOPPER AND CHUTE.

1,417,780. Specification of Letters Patent. Patented May 30, 1922.

Application filed August 21, 1919. Serial No. 318,892.

To all whom it may concern:

Be it known that I, ALVA L. STEPHENS, a citizen of the United States, residing at Portland, in the county of Multnomah and State of Oregon, have invented certain new and useful Improvements in Loading Hoppers and Chutes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to a loading hopper and chute, and has for its primary object the provision of a novel and improved apparatus for loading coal, grain and other products aboard a vessel, car or the like.

It is the object of the invention to provide such a device including a novel elevated hopper for receiving the material, and a novel chute leading downwardly from the hopper for conveying the material by gravity into the hold or compartment of the vessel.

A further object is the provision of a novel flexible chute or conduit composed of a series of sections, having novel means for supporting the same, and enabling the chute to be bent and extended in various directions so as to discharge the material at the particular point desired.

With the foregoing and other objects in view, which will be apparent as the description proceeds, the invention resides in the construction and arrangement of parts hereinafter described and claimed, it being understood that changes can be made within the scope of what is claimed, without departing from the spirit of the invention.

The invention is illustrated in the accompanying drawings, wherein:—

Fig. 1 is a fragmentary elevation showing the hopper and chute, portions being broken away.

Fig. 2 is an enlarged front view showing one corner of the hopper.

Fig. 3 is an enlarged sectional detail taken on the line 3—3 of Fig. 1.

Fig. 4 is an enlarged elevation of the upper portion of the chute or conduit.

Fig. 5 is an elevation showing one of the chain engaging hooks of the chute sections.

Fig. 6 is a cross section of a modified form of chute.

In carrying out the invention, the apparatus is supported by a skeleton tower of structural iron or other material, which as shown, has the angle iron corner posts 1 converging upwardly and extending to the desired height, said posts 1 being connected by braces 2. The hopper 3 is supported within the upper end of this tower or frame and has a vertical rim 4. The upper terminals 5 of the posts 1 are bent at an obtuse angle into vertical position so as to fit the vertical corners of the rim 4, to which said terminals 5 are riveted or otherwise secured, thus firmly attaching the rim of the hopper to the upper end of the tower or frame. Angle iron stiffening members 6 are preferably riveted or otherwise secured to the rim 4 along the edge thereof between the posts 1. The coal, grain or other material is elevated and dumped into the hopper 3 by any well known or suitable means.

In order that the material can be discharged at either of opposite sides thereof, said opposite sides are provided with discharge pipes or spouts 7 extending outwardly and downwardly therefrom, and the bottom of the hopper has an inverted V-shaped portion or gable 8 flush with the bottoms of the two spouts 7 so as to direct the material toward either or both spouts, said gable 8 extending upwardly between the openings 9 in the walls of the hopper having the spouts and through which openings the material flows into the spouts. A slide valve or gate 10 is provided for the spout, being slidable upwardly and downwardly along the outer side of the respective wall of the hopper between the spout and said wall across the opening 9. The valve or gate is slidable past the top of the spout 7 to move upwardly away from the opening 9 and downwardly to close said opening. As a means for supporting the spout 7 and guiding the valve 10, the opposite sides of said spout are riveted or otherwise secured to angle iron members 11 extending upwardly and downwardly along the wall of the hopper, and said members 11 are secured to said wall of the hopper with shims or spacers 12 between said members and wall as seen in Fig. 3. Thus, one flange of each member 11 is secured to the spout 7 and the other flange is secured to the hopper wall and is spaced therefrom by the shim 12, said shim being spaced from the side of the spout, to provide a guide groove for the corresponding edge of the valve 10. The members 11 thus form guides for the valve to hold it for sliding movement against the wall of the

hopper, and said members also support the spout. The upper portion of the valve projects above the spout in order that it can be conveniently raised and lowered from the side of the hopper.

The tower or frame carries supporting boards or ledges 13 at the opposite sides of the hopper near the spouts 7, said ledges 13 being supported by brackets 14 secured to the posts 1 and enabling the workmen to stand on said ledges, from which the valves 10 can be readily reached for opening and closing them, and, furthermore, the workmen will have access into the hopper during the loading of the material.

Coming to the flexible chute or conduit 15, the same includes a series of sections 16, including an upper attaching section 16′ and these sections are tubular or hollow and taper from their upper to their lower ends. The lower smaller end of each section is fitted loosely within the larger upper end of the next lower section, permitting the sections to swing relatively to one another, so as to render the chute flexible. A band or hoop 17 is secured on each section between the ends thereof to strengthen same, and a similar band or hoop 17′ is also secured around the upper end thereof. In order to support the sections of the chute to enable the chute to be flexed and to also permit the sections to be readily assembled and detached, a plate 18 is riveted or otherwise secured to one side of the section immediately above the hoop or band 17, and the upper end of said plate has a bifurcated hook 19 to engage the links of a suspending chain 20. These hooks can be readily engaged with the links of the chain, to flexibly support the sections, and to permit them to be readily assembled with the chain and with one another, as well as enabling the sections to be quickly removed. As many sections can be added as necessary to extend the chute to the desired length, and the sections of the chute will hang from the chains, as seen in Fig. 1, permitting the chute to be readily extended or bent in various directions. The chain 20 can be supported in any suitable manner, such as from the corresponding ledge 13. Thus, the upper end of the chain has a hook 21 to engage an eyelet 22 depending from the ledge 13. The upper section 16′ of the chute has its upper end curved toward one side so as to meet and fit over either spout 7, and an angle iron band or ring 24 is secured around the upper end of said section 16′ and has eyelets 25 for the engagement of short chains 26 or other flexible elements which can be connected to eyelets 27 or similar devices on the wall of the hopper for holding the upper end of the chute on said spout.

The present apparatus thus affords a practical and efficient means for loading coal, grain and other materials on vessels, cars, and the like, inasmuch as the material can be conveniently dumped into the hopper from which it will gravitate down through the chute or conduit into the vessel, it being noted that the chute can be readily extended in various directions to discharge the material to the exact point wanted. The sections of the chute can also be readily added to and removed from the suspending chain 20, and will be hung therefrom in such a way as to render the chute freely flexible.

In some cases a chute as shown in Fig. 6 can be used, comprising the channel-shaped sections 16^a, which can be fitted one within the other. These sections 16^a have angle iron stiffening members 28 secured to the edges thereof, and the sections can be nested one within the other and can be slid apart.

Having thus described the invention, what is claimed as new is:—

1. A loading apparatus embodying a hopper having an inclined wall with an opening therein, a pair of shims secured to said wall at opposite sides of said opening, angle members secured to the shims, an inclined spout secured at its upper end to said members in communication with said opening, a valve slidable along said wall between said wall and said members and spout and having its edges guided by said members, and a chute connected to and leading downwardly from said spout.

2. A loading chute comprising a series of sections fitting loosely one within the other, a suspension chain extending along and past all of said sections, and bifurcated hooks carried by said sections at one side thereof to fit over some of the links of said chain and downwardly over other links for suspending said sections from the chain.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALVA L. STEPHENS.

Witnesses:
G. F. Faber,
J. P. Winter.