

July 14, 1931.

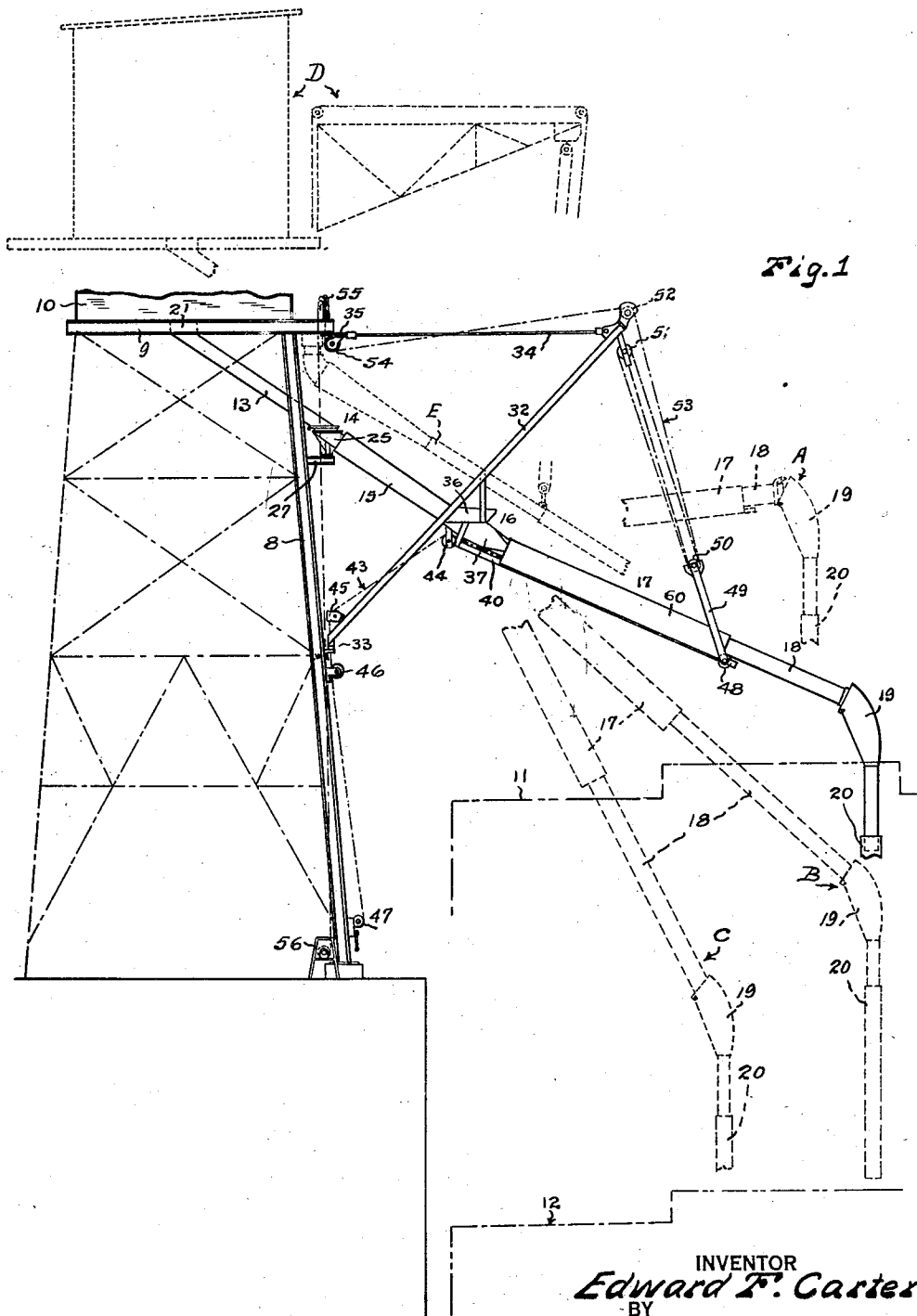
E. F. CARTER

1,814,618

DOCK SPOUT

Filed Feb. 18, 1929

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

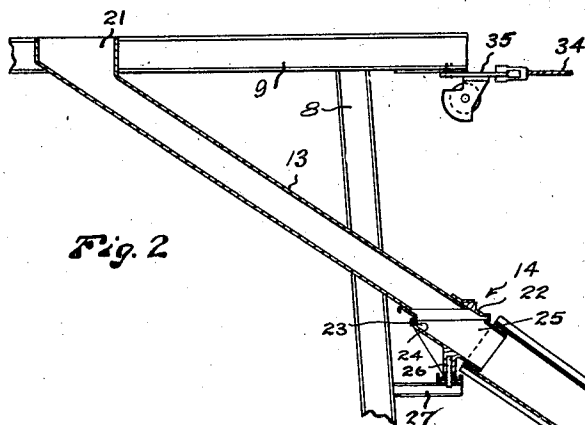


Fig. 2

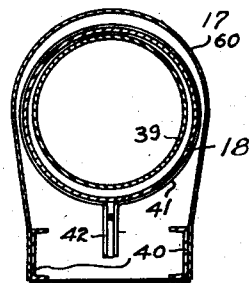


Fig. 6

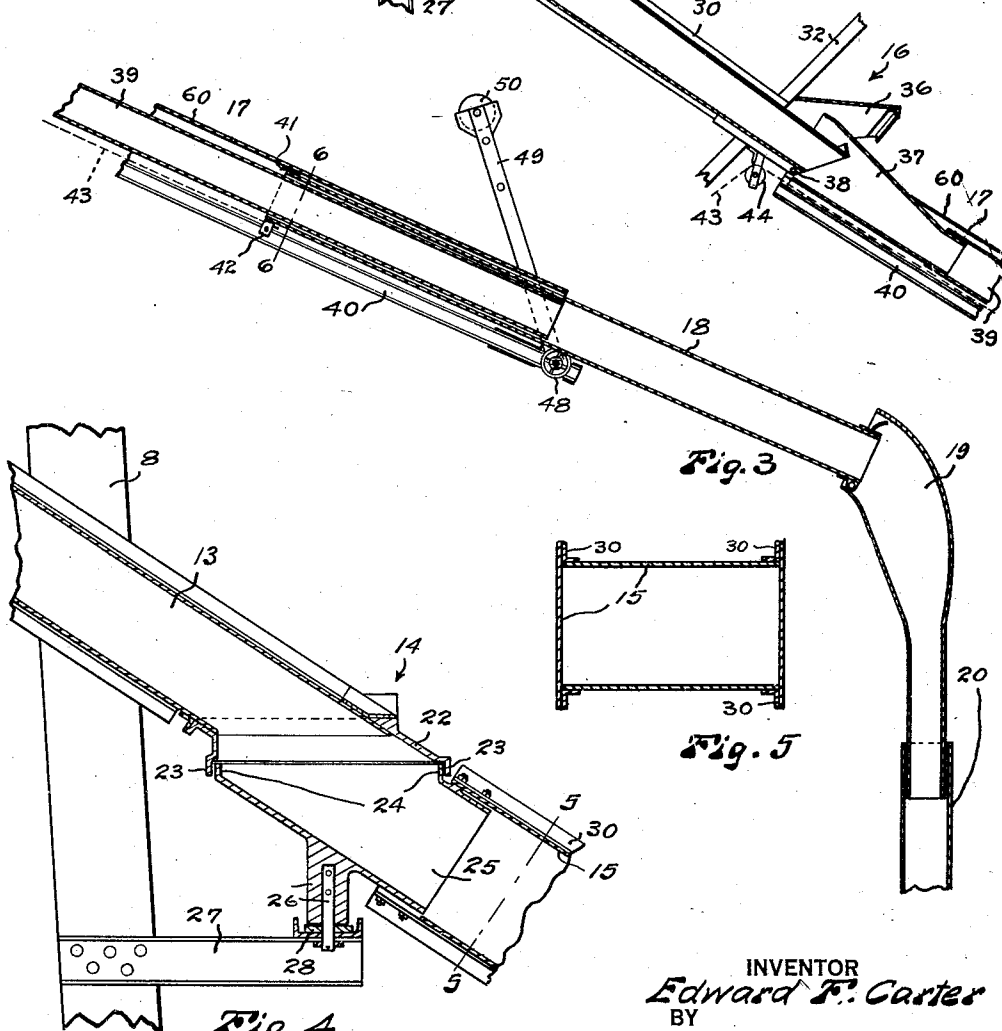


Fig. 3

Fig. 5

Fig. 4

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DOCK SPOUT

Application filed February 18, 1929. Serial No. 340,772.

My invention relates to improvements in dock-spouts and the general objects of my invention are to improve, simplify and increase the efficiency of dock-spouts of the form commonly used for spouting grain in grain elevators or from docks onto ships.

More specific objects are; to provide a dock-spout which is designed to maintain a high velocity of flow of the grain through the upper spout sections thereby permitting the decline of the lower spout sections to be decreased, and at the same time gaining an increase in the radius of action or decreasing the overall height of spout required which is advantageous for loading ships light at high tide; to provide a double hinged dock-spout which will offer the least possible resistance to the flow of grain, and in which the vertical movement is taken care of at a point on the dock-spout well down from the horizontal pivot or turnhead by means of a hinged section which offers the least possible resistance to the grain; to provide a dock-spout having an improved form of turnhead for taking care of horizontal swinging movement of the spout without interruption in the flow of the grain, thus maintaining velocity unimpaired by the change in angle; and to provide a dock-spout and supporting boom therefor which are so arranged as to act as a unit, both structurally and in operation, the upper part of the spout acting as a strut or a tie in the design of the boom.

As a result of my improvement, I attain a velocity at the boom hinge point sufficient to enable the lower portion of the spout to be operated at considerably less slope than is possible with the present type dock-spouts, thus enabling a lower shipping gallery to meet the requirements of high loading positions; I further gain an improved velocity for trimming purposes, and the whole combination makes possible the use of a very light boom, which has ample strength to handle the complete spout, fully loaded, at all stages, without recourse to the use of the ship's gear.

Other and more specific objects of the invention will be apparent from the following

description taken in connection with the accompanying drawings.

In the drawings, Figure 1 is a somewhat diagrammatic view in elevation of a dock-spout constructed in accordance with my invention showing by broken lines various positions into which the spout may be moved and showing by a finer dotted line the relative position of corresponding parts of a standard type of dock-spout.

Figs. 2 and 3 are sectional views on a larger scale of the upper and lower portions of the dock-spout.

Fig. 4 is a fragmentary sectional view on a still larger scale showing the turnhead embodied in this dock-spout.

Fig. 5 is a view in cross section on broken line 5—5, of Fig. 4.

Fig. 6 is a view in cross section on a larger scale on broken line 6—6 of Fig. 3.

Referring to the drawings, throughout which like reference numerals designate like parts, 8 designates a split trestle leg of the form commonly found on docks or elevators where grain is handled and 9 designates the bottom or floor of a gallery 10 which is supported on said trestle and is adapted to receive grain which is to be loaded into vessels, which are indicated by dot and dash lines at 11 and 12.

In accordance with my invention I provide a dock-spout embodying an upper section 13, a turnhead designated generally by 14, a second section 15, a vertical hinge joint designated generally at 16, a third spout section 17, an outer section 18 telescopic relative to the section 17 and a goose-neck 19 pivotally connected with the outer end section 18 and having an extension 20 of any desired length hanging vertically therefrom. The upper end section 13 has a hopper portion 21 at its top end which communicates with the gallery 10 for receiving the grain.

From the hopper 21 the upper end section 13 makes a straight run through a split trestle leg 8 to the turnhead 14 and is secured to the upper housing portion 22 of said turnhead. The upper turnhead housing part 22 has a cylindrical flange 23 on its bottom end which is adapted to interfit rotatively with the cy-

lindrical upper end 24 of a lower turnhead housing section 25, which is supported for horizontal rotary movement on a vertical pivot 26. A bracket 27, rigid with the leg of the trestle, 8, supports the turnhead and carries a suitable bearing 28, see Fig. 4, for the pivot 26. The pivot 26 is essentially coaxial with the interfitting flange portions 23 and 24 of the two parts of the turnhead and the spout sections above and below the turnhead may, if desired, be of rectangular shape, as shown in the drawings. The turnhead forms a pivotal joint in the chute which permits horizontal swinging movement of all except the first section of said chute but does not change the course of the grain vertically and offers the least possible obstruction to the flow of said grain. Said turnhead forms the subject matter of another patent application of even date herewith and will not be further specifically described.

The lower end of the turnhead housing member 25 is rigidly secured to the upper end of second chute section 15, see Figs. 4 and 5, which may be of rectangular cross section and reinforced as with angle bars 30 so that it is capable of withstanding tension or compression in a longitudinal direction. The lower end of the chute section 15 passes between and is riveted or otherwise secured to, the two side bars 32 of a boom which is pivoted for swinging movement from a bracket 33 on the leg of the trestle 8 and serves as the main support for the chute. The upper end of the boom is swingably supported by a tie rod 34 whose inner end is secured to a plate 35 which is pivoted to the support 9.

The pivot at the location of the bracket 33 is in vertical alignment with the turnhead pivot 26 and pivot in plate 35 so that the boom and spout section 15 will swing as a unit about the common axis of the pivot 26 and the pivots at 33 and 35. This makes it possible to utilize the spout section 15 as a strut or tie and supporting member for the boom thereby making it possible to carry the spout and its load on a very much lighter boom than would otherwise be possible, the spout section 15 functioning as a brace which is connected with the boom approximately mid-way between the two ends of the boom.

A rain shield 36 is provided to exclude water from the point between spout sections 15 and the upper portion 37 of the spout section 17. The upper end of the spout section 17 is the enlarged funnel chute portion 37 which fits over the end of the spout section 15 and is connected therewith by a cross pivot 38 which affords a joint permitting vertical swinging movement of the outer spout sections. The upper end of the spout section 17 is rectangular in cross section to conform to the shape of the lower end of spout 15 while the lower end is preferably cylindrical and is rigidly connected with a tubu-

lar spout member 39 which telescopes into the spout section 18. The portion designated by the numeral 60 is in the nature of a hood of inverted U shape, see Fig. 6, which fits over the portions 37 and 39 and is secured to two spaced apart channel bars 40 which extend lengthwise along the underside of the spout member 37 throughout substantially its entire length. A band 41 is secured around the upper end of the spout section 18 and has two downwardly extending lugs 42 to which a cable 43 is secured for the purpose of adjusting the spout section 18 telescopically. The cable 43 may extend over sheaves 44, 45 and 46 to a suitable winch 47.

A roller 48 is rotatably mounted between the lower ends of the channel bars 40 for the lower spout section 18 to roll on. Sling straps 49 are connected with the lower ends of the channel bars 40 at the location of the roller 48, and block and tackle means including sheaves 50, 51 and 52 and a cable 53 are provided between the sling straps 49 and the upper end of the boom 32 for supporting the outer end of the spout at different elevations. From the roller 52 the cable 53 extends toward the platform 9 where it passes over sheaves 54 and 55 and down to a winch 56.

Various adjusted positions into which the spout may be moved are shown by broken lines at A, B and C respectively in the drawings, the spout being fully telescoped and elevated into an inoperative position at "A" and said spout being lowered and extended in the operating positions "B" and "C".

The angle or pitch of the upper spout sections 13 and 15 is fixed and can not be varied and this pitch is steep enough to impart to the grain sufficient velocity so that said grain will flow at a relatively high speed through the lower spout sections when the pitch of said lower sections is substantially less than the pitch of the upper sections. This makes it possible to obtain a greater radius of operation or to lower the gallery or intake end of the spout and effect a substantial saving in the cost of construction and operation without reducing the elevation at which the spout will deliver grain at a high enough velocity for trimming purposes. The dotted lines D in Fig. 1 show the elevation of a gallery which would be required to deliver grain through a spout "E" of the type ordinarily used at the same velocity and at the same elevation as the delivery end of my improved spout.

A substantial saving in the cost of construction is accomplished by utilizing the spout section 15 as a strut or tie for the boom 32 and the efficiency of the dock-spout is greatly increased by locating the vertical pivot at the lower end of the section 15 instead of at the upper end of the same and by avoiding acute angles in the path of flow of the grain.

The foregoing description and accompanying drawings clearly disclose a preferred embodiment of my invention but it will be understood that this disclosure is merely illustrative and that such changes may be made as are fairly within the scope and spirit of the following claims.

What I claim is:

1. A dock-spout embodying two upper spout sections mounted in substantially the same inclined plane, a turnhead connecting said upper spout sections and affording a passageway through which material may flow without change of incline or loss of velocity, and lower spout sections pivotally connected for vertical adjustment with said upper spout sections at a point below and separate from said turnhead.

2. A dock-spout embodying a relatively fixed upper spout section, a second spout section disposed in substantially the same inclined plane as said upper spout section, a turnhead connecting said two spout sections and permitting horizontal swinging movement of said second spout section, and lower spout sections pivotally connected with the lower end of said second spout section and adjustable vertically relative to the same.

3. In a spout of the class described, a plurality of upper spout sections articulated for horizontal swinging movement and having a predetermined vertical pitch designed to impart a relatively high velocity to grain and lower spout sections articulated for vertical swinging movement with the lower end of said upper spout sections and capable of operating at less vertical pitch than said upper sections.

4. A dock-spout embodying two upper sections inclined downwardly at the same angle and disposed in substantially the same inclined plane and non-adjustable vertically, turnhead means pivotally connecting said two upper spout sections to allow horizontal swinging movement of the second upper spout section, boom means supporting the outer end of said second upper spout section at a constant and fixed angle and lower spout sections connected by pivotal means below the boom to obtain vertical movement with the outer end of said second upper spout section.

5. A dock-spout embodying a plurality of downwardly inclined pivotally connected spout sections, and an upwardly inclined boom extending beyond and above said spout sections and connected with the outer end of one of said spout sections for supporting said dock spout, the spout section to which the boom is secured serving as a strut for the boom.

6. The apparatus as claimed in claim 5 in which the spout section which serves as a strut or tie is connected by pivot means with a fixed support.

7. A dock-spout embodying a fixed sup-

port, an upper spout section non-adjustably carried by said support, a second spout section having its upper end secured by a pivot to said support and arranged to receive material from said upper spout section, a boom having its lower end pivoted on said support in axial alignment with the pivot of the upper end of said second spout section, said boom extending upwardly and outwardly to a point above and beyond said spout sections and being secured to the outer end of said second spout section whereby said second spout section forms a strut or tie for said boom, outer spout sections connected for vertical adjustment with the outer end of said second spout section, and means for supporting the outer end of said outer spout sections from the upper end of said boom.

8. The apparatus as claimed in claim 7 in which the connection between the upper spout section and the second spout section is a turnhead permitting horizontal swinging movement of the second section without changing the path of a stream of grain in vertical directions.

9. A dock-spout embodying a fixed support having an elevated platform to which grain may be delivered, an upper fixed spout section carried by said support and having a grain intake at the location of said platform, a second spout section, a turnhead uniting the ends of said two spout sections and affording a pivot connecting the upper end of said second spout section with said support, an inclined boom pivoted below said turnhead and in axial alignment with said turnhead pivot, the outer end of said second spout section being secured to said boom whereby said spout section will form a strut for said boom, lower spout sections pivotally connected with the outer end of said second spout section for vertical adjustment and tackle means for supporting said outer end sections from the upper end of said boom.

In testimony whereof I affix my signature.
EDWARD F. CARTER.