

A. W. ROBINSON.
DISCHARGE PIPE FOR HYDRAULIC DREDGES.
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1,055,417.

Patented Mar. 11, 1913.

FIG. 1.

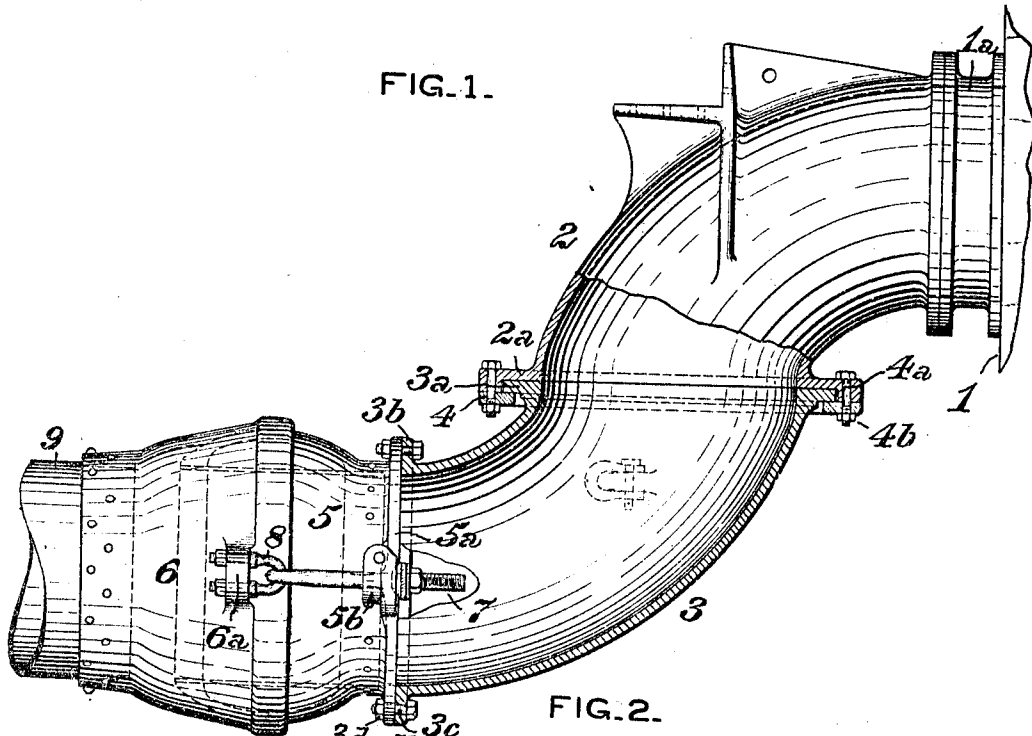


FIG. 2.

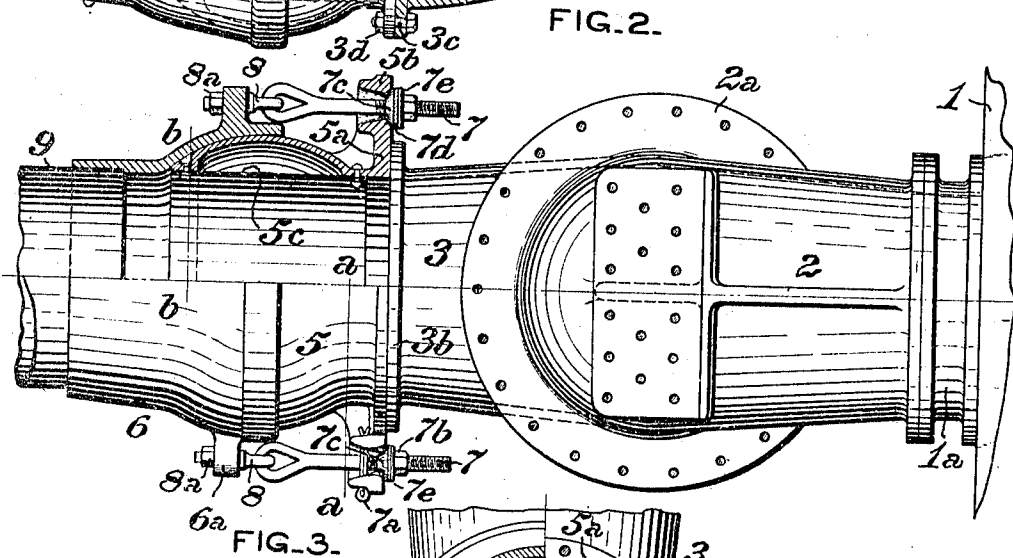
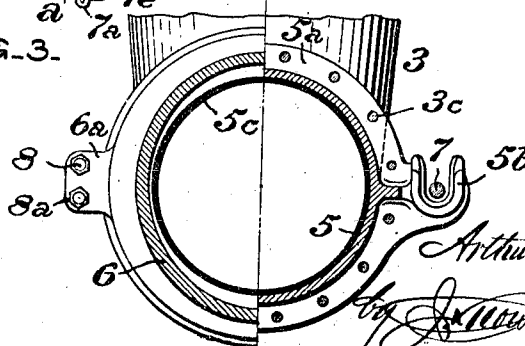


FIG. 3.



WITNESSES

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DISCHARGE-PIPE FOR HYDRAULIC DREDGES.

3,055,417.

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To all whom it may concern:

Be it known that I, ARTHUR W. ROBINSON, of Montreal, in the Province of Quebec and Dominion of Canada, have invented a certain new and useful Improvement in Discharge-Pipes for Hydraulic Dredges, of which improvement the following is a specification.

My present invention specially relates to means for connecting a floating pipe with the hull of a dredge, in such manner as to permit universal freedom of movement, and its object is to provide, under a simplified construction, means for so connecting the pipe line with the dredge as to admit of the free movement of the pipe line through a large horizontal arc, and thereby of its radiation in any direction from the dredge; to admit of the free rising and falling of the pipe line relatively to the dredge, as in wave action; and to enable the entire floating pipe line to be readily connected to, and disconnected from the dredge, as desired.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings: Figure 1 is a view, partly in side elevation and partly in section, of a portion of the discharge pipe of a hydraulic dredge, illustrating an application of my invention; Fig. 2, a plan view, partly in section; and, Fig. 3, a transverse section, the right hand half being taken on the line *a a* of Fig. 2, and the left hand half on the line *b b* of the same figure.

In the practice of my invention, I provide a swivel elbow composed of an upper fixed section, 2, and a lower relatively movable section, 3, the upper section being rigidly attached to the hull, 1, of a dredge, in any suitable manner, as by an interposed flanged ring, 1^a, and the upper and lower sections being so connected as that the latter can traverse horizontally through as great an arc as may be permitted by the hull of the dredge. This is, as shown, preferably effected by fitting a truly faced peripheral flange, 2^a, on the top of the lower section, in a similarly faced recess in a peripheral flange, 2^a, on the bottom of the upper section, and securing the upper and lower sections together by means of a steel ring, 4, which fits against the bottom of the flange, 2^a, of the upper section, and is divided diametrically into two sections, and connected to the flange, 2^a, by a plurality of bolts, 4^a, and nuts, 4^b. The lower section is thus free

to swing about a vertical axis, relatively to the fixed upper section, while being held in connection therewith in any and all positions that it may assume.

The lower end of the lower elbow section, 3, is provided with a peripheral flange, 3^b, which is secured by a plurality of bolts, 3^c, and nuts, 3^d, to a peripheral flange, 5^a, on the ball member, 5, of a ball and socket joint, the construction of which, as now to be described, is such that the ball and socket members are so connected that no appreciable amount of horizontal movement of the socket member, relatively to the ball member, is permitted, while on the other hand, any horizontal movement of the socket member, or of the pipe line to which it is connected, will effect a corresponding movement of the ball member, and will consequently swing the lower elbow section, 3, about the axis of its connection with the upper section, 2. To this end, two lugs, 5^b, are formed, diametrically opposite each other in a horizontal plane on the flange, 5^a, of the ball member, and an eye bolt, 7, is passed through each of said lugs, said eye bolts being coupled, by U shaped bolts, 8, having nuts, 8^a, on their ends, to lugs, 6^a, on the periphery of the socket member, 6, of the ball and socket joints. The bolts, 7 and 8, are thus attached one to the other by a chain link construction, permitting freedom of movement, and they are so disposed that the rolling axis of the eye on the bolt, 7, substantially coincides with the axis of the ball, as seen in Fig. 2. By this means, displacement of the parts, or bending of the bolts during vertical movement of the socket member on the ball member, is prevented. The lugs, 5^b, are, as shown, preferably made open at their tops, the eye bolts being prevented from being accidentally displaced, by split pins, 7^a, passing through the lugs, in order to admit of the ready and rapid uncoupling of the ball and socket members to allow the pipe line to float away from the dredge when desired. The eye bolts, 7, are held in position longitudinally by nuts, 7^b, engaging threads on their ends adjacent to the lugs, 5^b, and are provided with spherical faced washers, 7^c, fitting corresponding recesses in the lugs, 5^b, and in order to facilitate the adjustment of the eye bolts, and provide a limited amount of elasticity in their connection to the lugs, washers, 7^d, of rubber or other elastic mate-

rial, for which, if desired, equivalent helical springs may be substituted, are interposed between the washers, 7^c, and ordinary flat washers, 7^e, against which the nuts, 7^b, are drawn to a proper bearing. By means of this construction, the socket member can be drawn firmly up against the ball member, with any desired degree of pressure, while at the same time, the elasticity provided permits freedom of movement of the socket member upon the ball member.

The inner surface of the socket member is so formed that its bore from its transverse axial plane to its end adjacent to the ball member is substantially cylindrical, thereby making what may be termed a parallel fit on the ball member, while from said axial plane to the discharge end of the ball member, its bore is spherical and the ball member is correspondingly spherically finished on its exterior, whereby any tension on the bolts, 7, will draw the socket member firmly against the ball member. Any slight leakage that may occur between the surfaces will, however, be self packing, owing to the solid matter (sand or mud) in the discharge, lodging or packing in the tapering space between the spherical surface of the ball member and the cylindrical portion of the bore of the socket member. A cylindrical liner, 5^c, is fitted in the ball member, in order to prevent the entrance of the water passing through the discharge into the enlargement formed by the spherical wall of the ball member.

The floating pipe line, one section, 9, of which is secured to the socket member, may be of any preferred construction and does not form part of my invention. Under the construction above described, it may rise and fall to any reasonable extent, independently of the ball member and the parts attached to the dredge, by reason of wave action, while being at the same time retained in place by the bolts, 7, and 8. The swivel elbow permits the floating pipe line to radiate in any direction from the dredge, with perfect freedom, and the pipe line can be readily and quickly disconnected from

the dredge at any time by slackening the nuts on the bolts, 7, and lifting the bolts out of the lugs. A further feature of advantage consists in the fact that the pipe line can be disconnected from the dredge with entire safety, even though the bolt on one side should be disconnected before that on the other. In such case, the socket member and pipe line would roll away from the member on one side only, viz: that on which the bolt was first disconnected, and no breakage of any parts would result, by reason of the articulated connection of the bolts, 7 and 8.

I claim as my invention and desire to secure by Letters Patent:

1. In a discharge pipe for hydraulic dredges, the combination of a ball member fixed to a discharge pipe section, a socket member in which said ball member is fitted and which is fixed to another discharge pipe section, lugs formed oppositely on the ball member, eye bolts passing through said lugs, U bolts secured to the socket member and engaging the eyes of the eye bolts, spherical faced washers on the eye bolts fitting correspondingly faced recesses in the lugs, and nuts engaging threads on the eye bolts and drawing said washers to a bearing on the lugs.

2. In a discharge pipe for hydraulic dredges, the combination of a ball member fixed to a discharge pipe section, a socket member in which said ball member is fitted and which is fixed to another discharge pipe section, lugs formed oppositely on the ball member, eye bolts passing through said lugs, U bolts secured to the socket member and engaging the eyes of the eye bolts, spherical faced washers on the eye bolts fitting correspondingly faced recesses in the lugs, elastic washers fitting against said spherical faced washers, and nuts engaging threads on the eye bolts and exerting bearing on said washers.

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Witnesses:

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