E. E. VANDERHOEF & F. E. JOHNSON.

DIPPER FRONT.

APPLICATION FILED OCT. 13, 1911.

1,126,319. **Patented Jan. 26, 1915.**

2 SHEETS—SHEET 1.

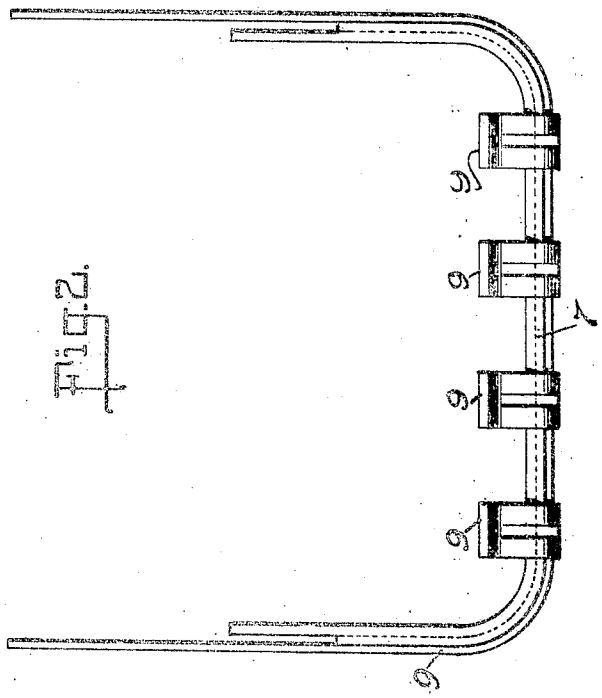


Fig. 2.

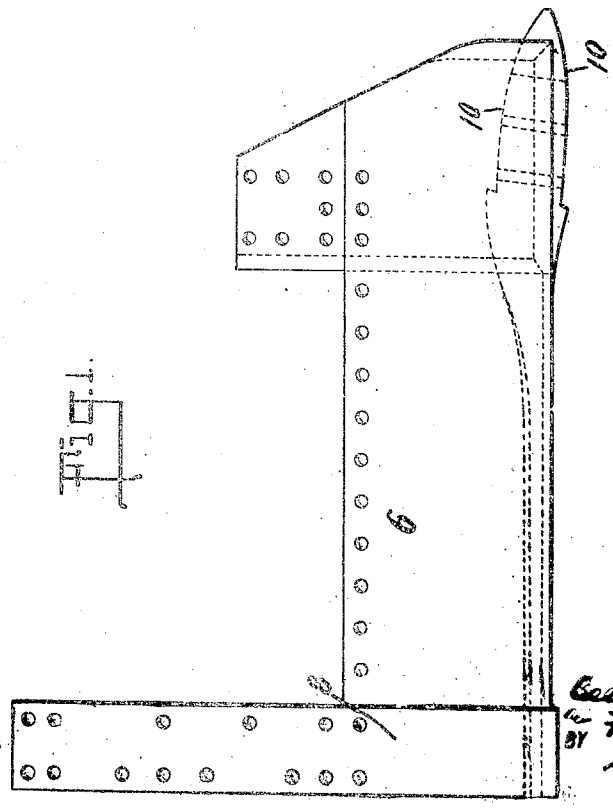


Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 3.

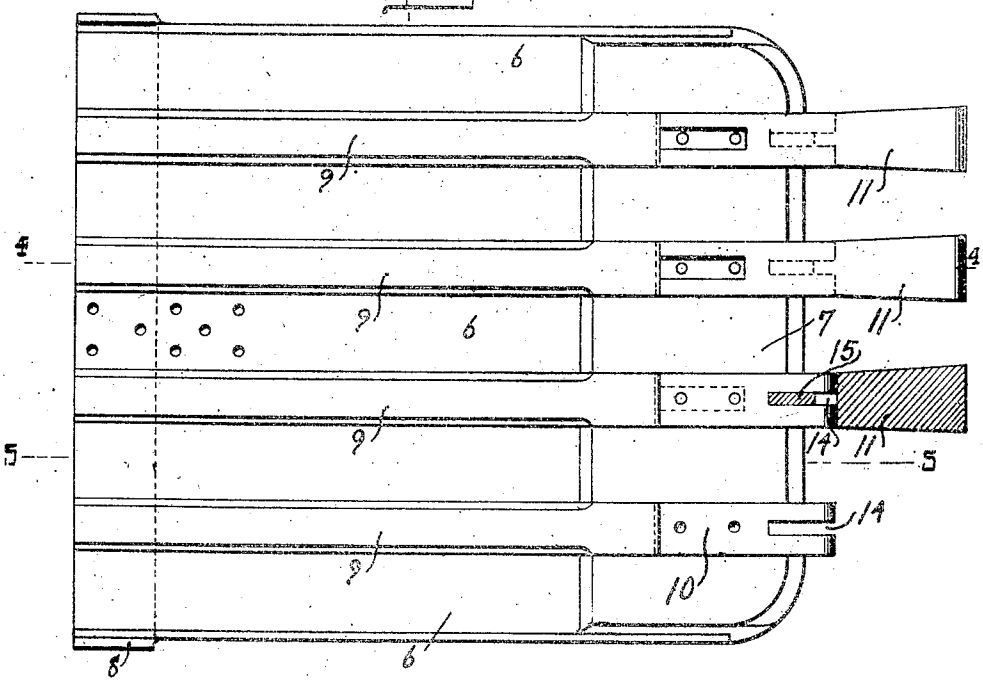


Fig. 4

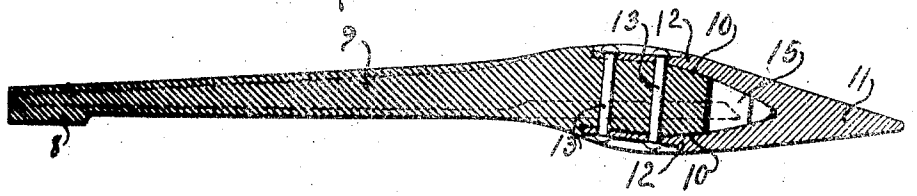
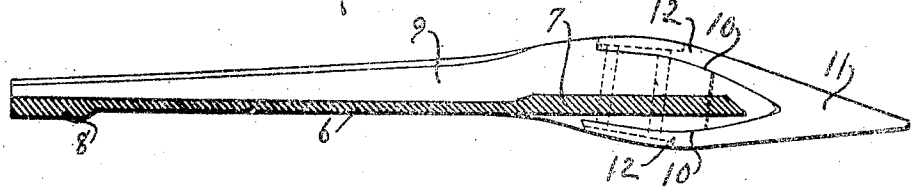


Fig. 5.



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UNITED STATES PATENT OFFICE.

ELLISON EDWARD VANDERHOEF, OF RUTH, NEVADA, AND FRANK E. JOHNSON, OF SALT LAKE CITY, UTAH, ASSIGNORS TO EDGAR ALLEN AMERICAN MANGANESE STEEL COMPANY, OF AUGUSTA, MAINE, A CORPORATION OF MAINE.

DIPPER-FRONT.

1,126,319. Specification of Letters Patent. Patented Jan. 26, 1915.

Application filed October 13, 1911. Serial No. 654,566.

To all whom it may concern:

Be it known that we, ELLISON EDWARD VANDERHOEF, a citizen of the United States, and a resident of Ruth, Nevada, and FRANK E. JOHNSON, a citizen of the United States, and a resident of Salt Lake City, Utah, have made and invented certain new and useful Improvements in Dipper-Fronts, of which the following is a specification.

Our invention relates to fronts for dippers for excavating, dredging and similar machines, and more particularly to fronts for dippers formed in a single piece from cast metal, manganese steel being the material from which said fronts are commonly formed; and the object of our invention is to provide a single piece cast metal front for dippers for excavating machines; the same having a plurality of ribs extending longitudinally of the front, and formed integrally therewith.

Our invention contemplates the use of detachable dipper teeth as is usual in dippers for excavating or dredging machines, and one of the purposes for which the ribs above mentioned are provided is to provide a shank to which the detachable tooth is secured, and which shank is formed in one piece with the front as the same is cast, and therefore remains a permanent part of the front, instead of being formed as a separate piece and secured to the front as is the usual practice in dipper construction.

With the objects of invention above mentioned in view, our invention consists in the improved integral cast metal front for dippers, illustrated in the accompanying drawings, described in the following specification, and particularly claimed; and in such variations and modifications thereof as will be obvious to those skilled in the art to which our invention relates.

In the drawing wherein the preferred embodiment of our invention is illustrated; Figure 1 is a view showing a dipper front in side elevation: Fig. 2 is a view showing the same in plan; Fig. 3 is a view showing the dipper front as seen looking into it from a position at the left of Fig. 2; Fig. 4 is a view showing a section upon a plane indicated by the line 4—4, Fig. 3; and, Fig. 5 is a view showing a section upon a plane indicated by the line 5—5, Fig. 3.

Referring to the drawings, 6 represents the front portion of a dipper, the same being formed from cast metal in a single piece, and the form thereof being varied in accordance with the different types or shapes of dipper of which it is to form a part. This front portion is commonly provided with sides as shown in Figs. 1 and 2, although the extent of these sides varies in different types of dipper, our invention relating to the front itself, which term, however, commonly includes side extensions whereby the front is secured to the body portion of the dipper, Fig. 1 illustrating a series of holes for receiving rivets whereby the front is attached to the body portion of the dipper as will be understood.

The front 6 is thickened at its upper portion (by which we refer to the portion of the front which digs into the bank when the dipper is used in digging), as shown at 7 to form a lip, and the lower portion of the front is preferably formed with projecting portions 8 to strengthen the lower end of the front, both these portions being formed integrally with the front of the dipper as the same is cast.

The reference character 9 designates a plurality of ribs extending longitudinally of the front and formed integrally therewith as the same is cast. These ribs are shown as located upon the inner surface of the front, and extending along such inner surface and terminating adjacent the lower end thereof, although it will be understood that the ribs may be upon either the inner or outer surface, or partly upon each surface, the essential feature of our invention being that ribs are provided which are formed integrally with the front. The upper ends of these ribs extend somewhat beyond the edge of the lip of the front, as best shown in Figs. 1 and 5, and such upper ends are provided with a seat to which a detachable dipper tooth may be secured. This seat, as best shown in Figs. 1, 4 and 5, is preferably formed in opposite walls of the upper end of the rib shown at 10, and the same extends from the free upper end of the rib past the upper edge of the front and toward the lower end thereof, so that the greater part of said seat lies to the rear of or below the free upper edge or lip of the dipper; from which it follows that when the tooth next referred to is secured in place,

it will project beyond the lip of the dipper to a much less extent than would be the case if the seat was located entirely or for the most part beyond the upper edge of the lip, as is commonly the case in dippers of the type to which our invention relates.

The reference character 11 designates a detachable and reversible dipper tooth, the base of which is bifurcated to thereby provide two arms 12 which embrace opposite sides of the outer or free end of the rib 9, and which arms lie within the seats 10 above mentioned. The dipper tooth is secured in position upon the ends of the ribs by means of suitable fastening means as shown at 13, and the arms 12 thereof merge into the ribs 9 as is best shown in Figs. 4 and 5. The ribs 9 are provided each with a transverse slot 14 at its upper or free end, and the tooth 11 is provided with a transverse web 15 connecting the arms 12 and centrally located with reference to the tooth, which web lies within the transverse groove 14 when the detachable tooth is secured in position upon the outer end of the rib 9, the purpose of this web and groove being to prevent sidewise movement of the detachable tooth when the dipper is in use.

It will be seen that the portions of the seat 10 upon opposite sides of the upper end of the rib 9 are of like form, and that the two arms 12 of the detachable point are identical in form, from which it follows that the detachable tooth may be secured in position in either of two ways; and from which it also follows that after the point has become worn in one position it may be removed and secured to the end of the rib in a reverse position, thereby greatly increasing the life of the tooth. This feature of reversibility of the tooth is of great importance as it permits a maximum amount of use of the tooth without resharpening the same, it being the usual practice to use the tooth in an initial and reversed position by which the entire portion thereof with the exception of the arms is worn out.

In view of the premises it will be understood that the ribs 9 form shanks for the detachable teeth 11 and that such ribs being formed integrally with the front of the dipper cannot become detached therefrom.

We are able in our improved front to secure greater strength with the given weight of metal than is secured in former construction wherein a shank for the teeth is provided as a separate element, and the fact that the shank or rib is integral with the front provides a stronger construction than is secured where the shank is formed separate and riveted or otherwise secured to the front. The ends of the ribs being formed integrally with the lip also provide a more rigid support for the detachable tooth than is secured in constructions wherein the lip and shank of the teeth are separate elements. A further advantage following from the fact that the seats for the detachable teeth extend to the rear of the edge of the lip of the dipper is that the teeth project to a minimum extent beyond the edge or lip; and, consequently, the strains produced in the front when the dipper is in use are much less severe than in prior types of dippers, as the forces which produce such strains act upon a much shorter lever arm than in dippers in which the seat for the tooth is located beyond the edge of the lip. Finally, the cost of producing our improved integral front is much less than if the front and shank are formed separate and subsequently secured together as, in our improved construction, the entire front with shanks for the tooth rigidly and permanently secured thereto is produced by a single casting operation, and no machine or hand work is required to be done on the finished casting in order to provide a front complete as to all its parts and ready for immediate use.

We claim—

1. A single piece cast metal front for dippers for excavating machines, the same having a plurality of longitudinally extending ribs formed integrally therewith and each of which ribs has a seat at its upper or free end whereby a series of detachable dipper teeth may be secured one to the end of each of said ribs, said seats extending below the upper edge of the front; and means located below the edge of the front whereby a series of detachable dipper teeth may be secured in place upon said seats.

2. A single piece cast metal front for dippers for excavating machines, the same having two rearwardly extending side portions and a plurality of longitudinally extending ribs formed integrally therewith and the upper or free ends of which ribs project beyond the lip of the dipper and are provided each with a seat formed in opposite walls of the rib, whereby a series of bifurcated detachable dipper teeth may be secured one to the end of each of said ribs, said seats extending below the upper edge of the front and said ribs having each a transversely extending hole located below the edge of the front and through which a securing member may extend to thereby hold a detachable dipper tooth in position upon each of said seats.

3. A single piece cast metal front for dippers for excavating machines, the same having a plurality of longitudinally extending ribs formed integrally therewith and extending along the inner surface of said front to the lower end thereof, and each of which ribs has a seat at its upper or free end whereby a series of detachable dipper teeth may be secured one to the end of each

of said ribs, said seats extending below the upper edge of the front; and means located below the edge of the front whereby a series of detachable dipper teeth may be secured in place upon said seats.

4. A single piece cast metal front for dippers for excavating machines, the same having two rearwardly extending side portions and a plurality of longitudinally extending ribs formed integrally therewith and extending along the inner surface of said front to the lower end thereof, and the upper or free ends of which ribs project beyond the lip of the dipper and are provided each with a seat formed in opposite walls of the rib, whereby a series of bifurcated detachable dipper teeth may be secured one to the end of each of said ribs, said seats extending below the upper edge of the front and said ribs having each a transversely extending hole located below the edge of the front and through which a securing member may extend to thereby hold a detachable dipper tooth in position upon each of said seats.

Signed at Ruth, in the county of White Pine, and State of Nevada, this 3rd day of October, 1911.

ELLISON EDWARD VANDERHOEF.

Witnesses:
H. W. BYRNE,
J. E. BEAUPERT.

Signed at Tonopah, in the county of Nye, and State of Nevada, this 28th day of Sept., 1911.

FRANK E. JOHNSON.

Witnesses:
E. S. WOODWARD,
W. H. ATKINSON.