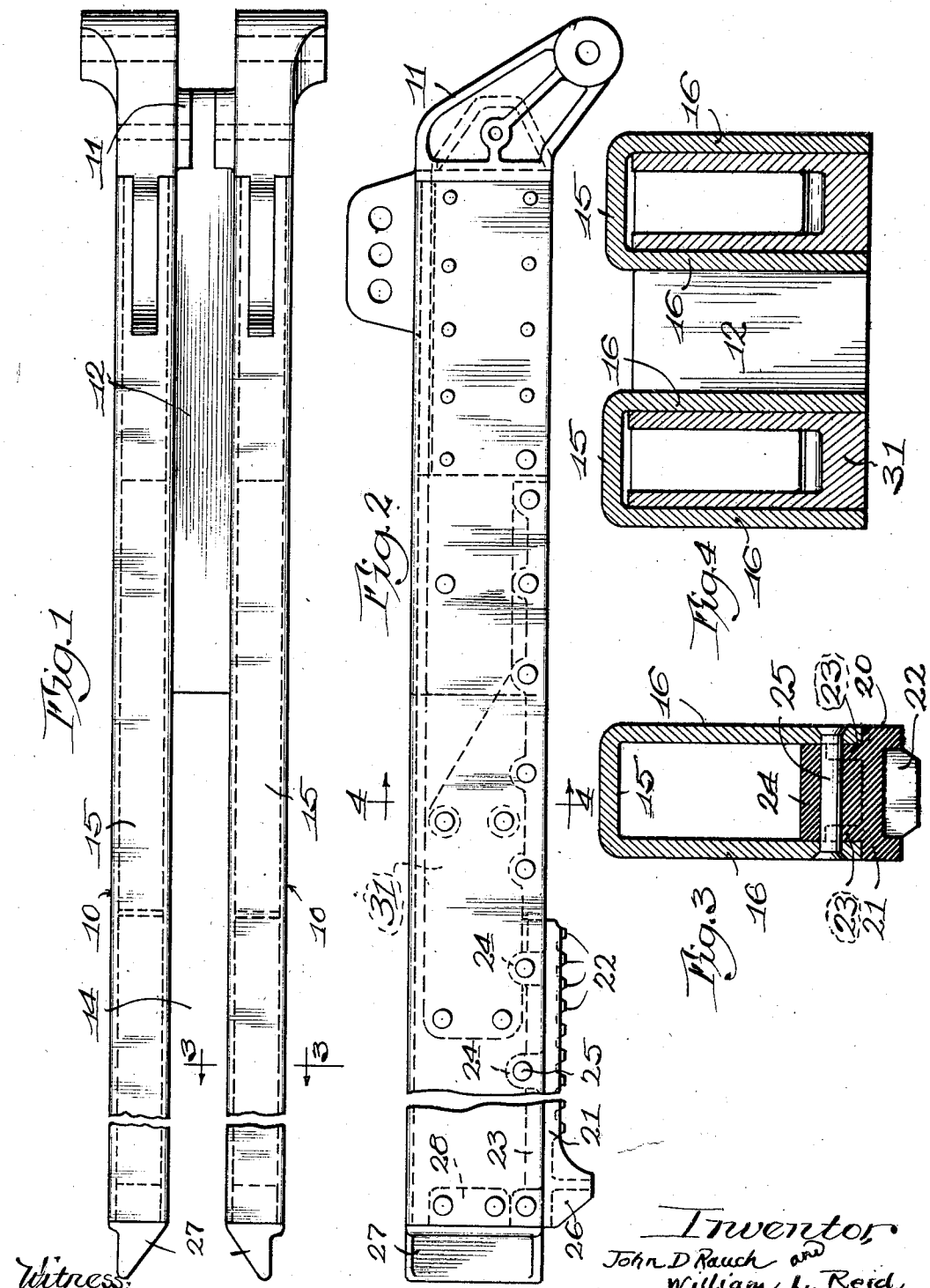
July 7, 1931. J. D. RAUCH ET AL 1,813,864

DIPPER HANDLE

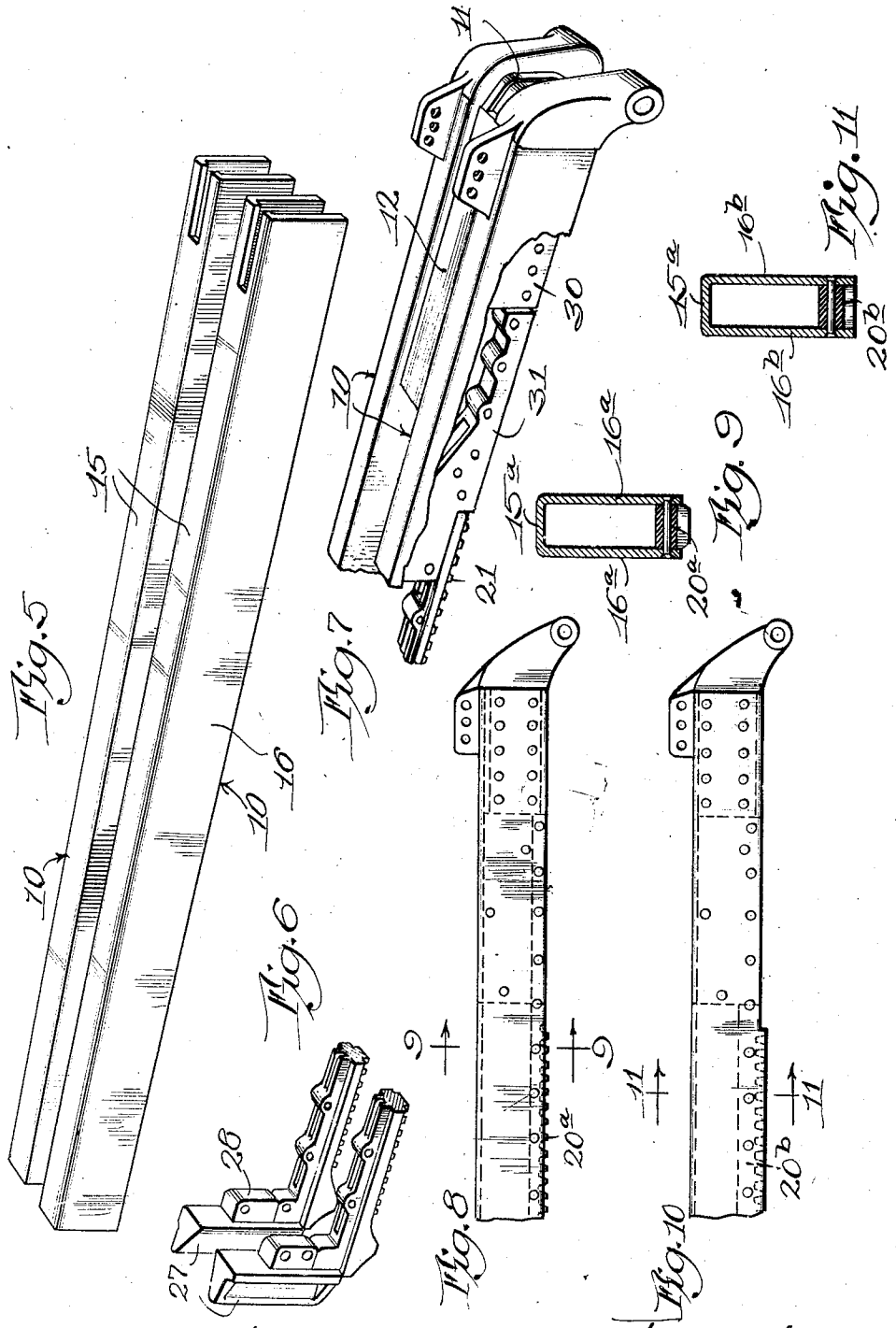
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DIPPER HANDLE

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# UNITED STATES PATENT OFFICE

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## DIPPER HANDLE

Application filed November 5, 1928. Serial No. 317,193.

This invention relates to improvements in dipper handles adapted to be used with power shovels, and the like, and has for its principal object to provide an improved and simplified construction so as to eliminate to a large degree the use of rivets or bolts.

As heretofore constructed, dipper handles are usually built up of fabricated steel with members bolted or welded together and with the rack members secured by vertically disposed bolts projecting to the top of the handle and obstructing the sliding plate which runs on top of the handle for holding the rack teeth in mesh with the pinions.

In carrying out our present invention, we construct each of the pair of beam members of a single pressed steel plate which is folded over into a three-sided box section and having the rack members secured along the lower edge of each section to enclose the same whereby the construction of the beam and rack members is greatly simplified and the use of vertical bolts for securing the racks to the beams is entirely eliminated.

The invention may best be understood by reference to the accompanying drawings, in which

Figure 1 is a top plan view of a handle constructed in accordance with our invention with a portion of the handle broken away.

Figure 2 is a side view of the handle shown in Figure 1.

Figure 3 is an enlarged sectional view taken on line 3—3 of Figure 1.

Figure 4 is an enlarged section taken on line 4—4 of Figure 2.

Figure 5 is a perspective view showing the two pressed steel beam members forming the main part of the handle.

Figure 6 is a detail perspective view of the rear ends of the rack members.

Figure 7 is a detail perspective view of the front end castings secured therein, a portion of the side of one beam member being broken away to show the reinforcing and rack castings therein.

Figure 8 is a side view of a modified form of rack construction.

Figure 9 is an enlarged section taken on line 9—9 of Figure 8.

Figure 10 is a side view of another modified form of rack construction, and

Figure 11 is an enlarged section taken on line 11—11 of Figure 10.

Referring now to details shown in the drawings, the dipper handle is made up of two beams 10—10 arranged in spaced relation with each other. The beams are suitably connected together, as for instance by foot casting 11 adapted for connection to the shovel, and a wood filler 12 at the front end of the handle. In the form shown the beams 10, 10 are unconnected adjacent their rear ends to form an open slot 14 therebetween in the usual manner.

Each of the beams 10—10 consists of a single metal member of inverted U-shape form having an upper wall 15 and side walls 16—16. Said metal members are preferably made by forming a single plate under a hydraulic press into the desired shape, so as to form a single piece three-sided box section extending the full length of the beam.

The rack 20 is secured between the lower edges of the side walls 16—16 throughout the major portion of the length of the beam, where such rack is required. In the preferred form of rack shown in Figures 2, 3, 6 and 7 said rack consists of a metallic member 21 having rack teeth 22—22 along its lower edge. A pair of integral strips 23—23 on the top of the rack member 21 are spaced longitudinally from the outer sides thereof so that their outer faces fit between the lower edges of upright walls 16—16 of the beam members, as clearly shown in Figure 3. A plurality of transversely extending bosses 24—24 are provided in spaced relation along the top of the rack 20 extending between the strips 23—23, said bosses being perforated so as to receive rivets 25—25 which are passed through opposite sides of the beam at spaced intervals so as to secure the rack to the beam. The rack shown in Figures 2 and 3 is primarily designed to be formed of cast metal, the only machining necessary being along the outer sides of the racks so as to fit the same to their U-shape beams respectively.

A suitable stop 26 is provided at the rear end of each rack to limit movement of the

handle relative to the boom. A pair of head castings 27—27 may also be provided to close the rear ends of the handle beams, said castings having inwardly projecting portions 28—28 which are secured between the side walls of the beams.

The foot castings 11 are connected to the beams by any suitable means, said head casting as shown in Figure 7 including integral portions 30 secured between the side plates of each beam. A reinforcing member 31 also extends between the rear end of each foot casting and the front end of the adjacent rack 21 so as to provide overlapping support for the front end of the rack, as shown in Figures 2 and 7.

With the arrangement of parts above described it will be seen that each of the beams 10—10 are formed of a single piece of steel pressed into an elongated U-shape, and closed by the rack on the under face, thus providing a box-section of maximum strength and rigidity to withstand the enormous stresses incident to the use of which the dipper handle is employed. The use of rivets or bolts is eliminated, excepting the rivets which hold the racks in place along the lower edge of each beam. The latter rivets, however, do not materially affect the strength of the beams.

It will be observed further that the top and sides of the beams are unobstructed by bolt heads or joints of any kind such as are ordinarily present in fabricated dipper handles. The upper face 15 of the beams may therefore be directly engaged by the sliding plate of the boom which holds the rack teeth in mesh with the driving pinions.

In the modified form shown in Figures 8 and 9, the entire rack member 20*a* is secured between the lower margins of the side walls 16*a*—16*a* of each beam except that the teeth of the rack project below the beams. In this form there are no bosses 24—24 such as used in the form shown in Figures 2 and 3.

In the modified form shown in Figures 10 and 11, a similar rack construction is used excepting that the side walls 16*b*—16*b* extend downwardly and entirely enclose the ends of the rack teeth.

Although we have shown and described certain particular embodiments of my invention, it will be understood that we do not wish to be limited to the exact constructions shown and described, but that various changes and modifications may be made without departing from the spirit and scope of our invention, as defined in the appended claims.

We claim as our invention:

1. In a dipper handle, a beam made up of a single pressed steel plate formed in U-shape, and a rack member bridging the open margins of said plate and secured directly thereto.

2. In a dipper handle, a beam made up of a single pressed steel plate formed in U-shape, and a rack member bridging the open margins of said plate and secured directly thereto by means extending transversely of said rack.

3. In a dipper handle, a beam made up of a single pressed steel plate formed in U-shape, and a rack member bridging the open margins of said plate and secured thereto by rivets passing transversely through said rack member and both edges of said plate.

4. In a dipper handle, a beam made up of a single metal plate formed in U-shape, a rack member bridging the open margins of said plate and secured thereto, a head piece connected to one end of said beam, and a supporting member extending within said beam between said head piece and the adjacent end of said rack member.

Signed at Lima, Ohio, this 28th day of Oc ober, 1928.

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