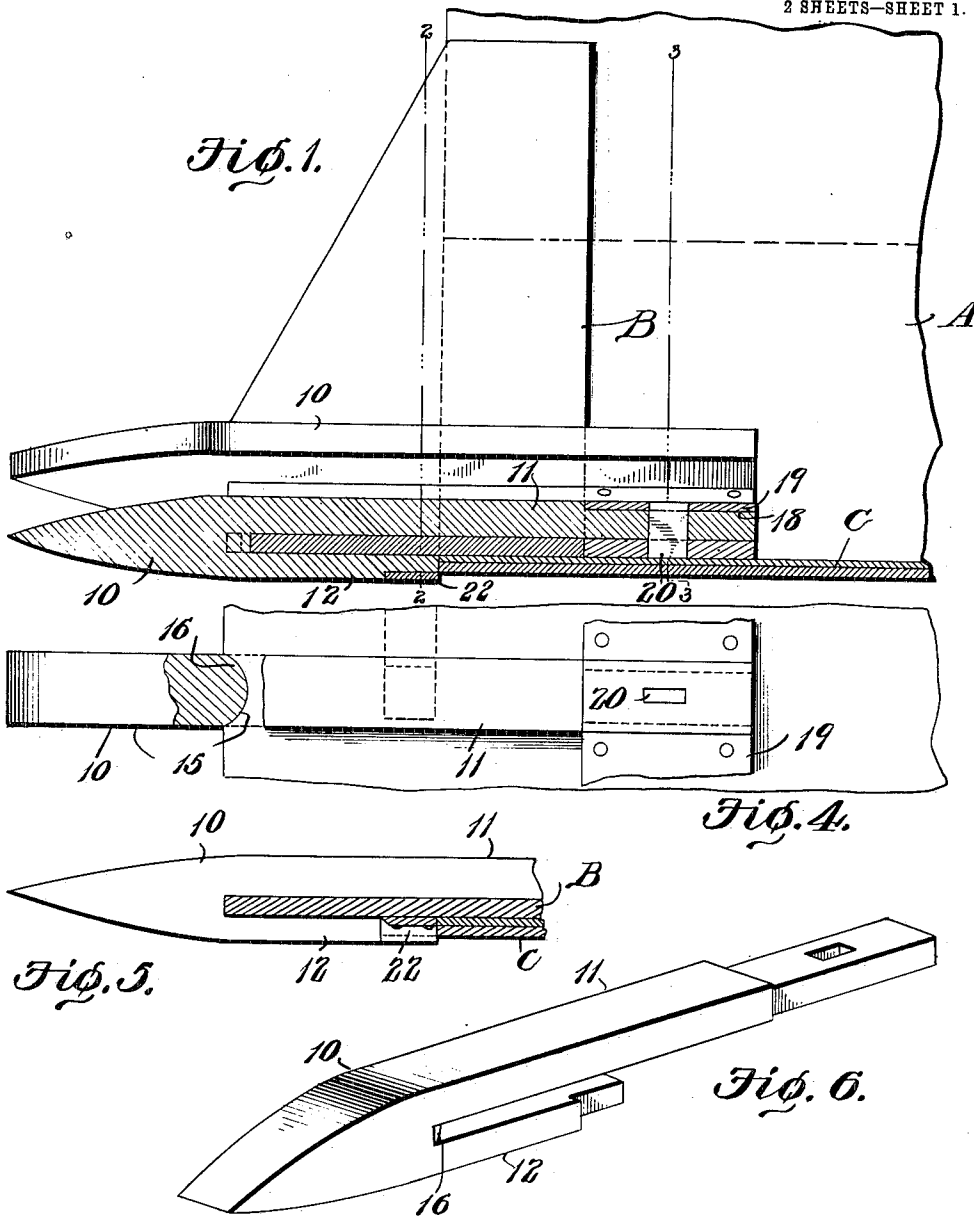


No. 830,960.

PATENTED SEPT. 11, 1906.

W. H. BATES.  
STEAM SHOVEL TOOTH.  
APPLICATION FILED APR. 5, 1906.

2 SHEETS—SHEET 1.



WITNESSES:

*E. F. Stewart*  
*J. E. Cantin*

William H. Bates, INVENTOR

By *C. A. Snow & Co.*  
ATTORNEYS

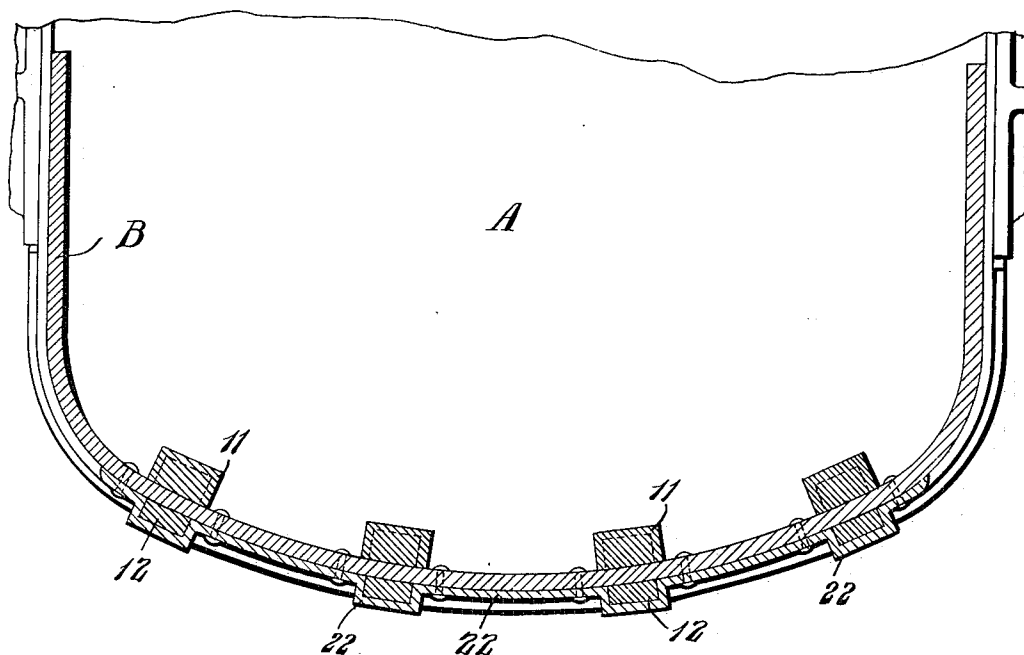
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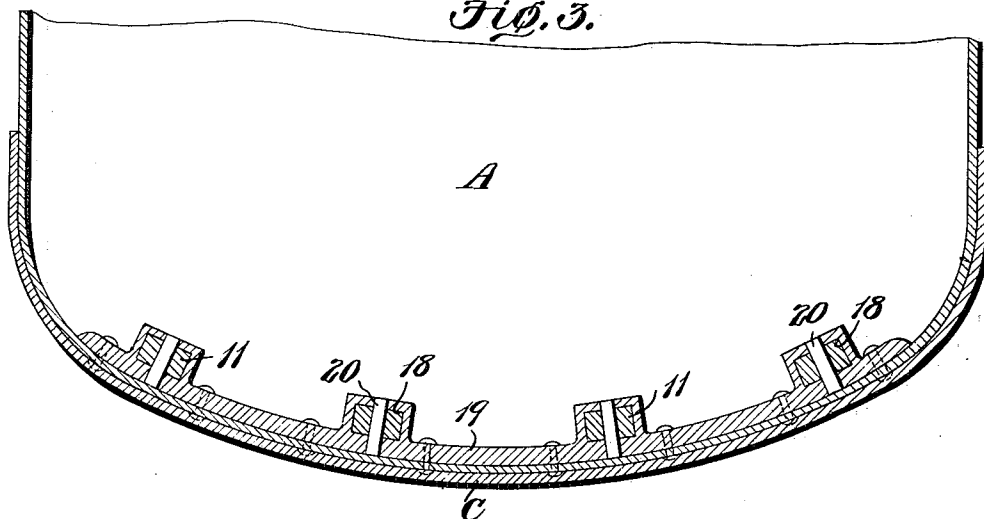
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2 SHEETS—SHEET 2.

*Fig. 2.*



*Fig. 3.*



WITNESSES:  
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*John C. Carter*

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# UNITED STATES PATENT OFFICE.

WILLIAM HURBERT BATES, OF CULEBRA, PANAMA.

## STEAM-SHOVEL TOOTH.

No. 830,960.

Specification of Letters Patent.

Patented Sept. 11, 1906.

Application filed April 5, 1906. Serial No. 310,111.

*To all whom it may concern:*

Be it known that I, WILLIAM HURBERT BATES, a citizen of the United States, residing at Culebra, Panama, have invented a new and useful Steam-Shovel Tooth, of which the following is a specification.

This invention relates to power-shovels, and has for its principal object to provide a novel form of detachable tooth which may be readily renewed when worn.

A further object of the invention is to provide a tooth that may be held in place by a single fastening-key or similar members, so that it may be readily detached when a new tooth is to be inserted.

A still further object of the invention is to provide a novel form of fastening means which will not offer any obstruction to the movement of the shovel during the excavating operation and which will not tend to retard the discharge of the material from the shovel.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts, hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a sectional view of a portion of a steam-shovel provided with detachable teeth arranged and constructed in accordance with the invention. Fig. 2 is a transverse sectional view of the same on the line 2 2 of Fig. 1. Fig. 3 is a similar view on the line 3 3 of Fig. 1. Fig. 4 is a plan view of a portion of the dipper and one of the teeth, the latter being partly in section. Fig. 5 is a vertical section through the forward edge of the lip of the dipper, showing a tooth in elevation. Fig. 6 is a detail perspective view of one of the teeth detached.

Similar characters of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The shovel or dipper A is of the usual construction, being provided with a front lip B, that is riveted to the lower front plate C and

projects beyond the forward edge of the same.

The detachable teeth 10 are provided with rearwardly-extending upper and lower shanks 11 and 12, that are spaced from each other for a distance approximately equal to the thickness of the lip B, and the forward edge of the lip is provided with a curved recess 15 for the reception of a correspondingly-shaped shoulder 16, that is formed at the point of bifurcation of the shanks.

The upper shank 11 is considerably longer than the lower shank, being arranged to extend beyond the inner edge of the lip B, but that portion of the shank which extends beyond the rear edge of the lip is reduced in both width and thickness and is received in a pocket 18, that is formed in a cast-metal holding-bar 19. The casting 19 is in the form of an arcuate bar arranged to follow the contour of the bucket or dipper, and its body portion is of a thickness equal to the thickness of the lip B, so that its upper surface will form practically a continuation of such lip and will not offer any obstruction to the passage of the material. The projecting portions which form the pockets 18 are externally of the same size as the body portion of the shank 11 and receive the reduced end portions of the shanks. These pockets and the reduced end portions of the shanks are provided with aligning openings for the reception of locking-pins 20, which serve to hold the teeth in place, and comparatively small pins may be employed, there being little or no strain on these connections. The lower shank member 12 is also reduced in width and thickness at its inner end, its entire length being about equal to the width of that portion of the lip that projects beyond the front plate. The reduced end portions of the shank members 12 are received in pockets that are formed in an arcuate bar 22, that is riveted to the lower side of the lip and is backed up by the forward edge of the front plate. The external area of the pocketed portions of the bar is about equal to the cross-sectional area of the main portion of the shank 12, so that no obstruction beyond the area of the shank will be offered. The forward edge of the bar 22 is preferably tapered in order to lessen the resistance which would otherwise be offered by the front edge of the front plate during the digging operation.

The detachable teeth which form the sub-

ject of the present invention may be quickly applied and may be separately removed and replaced when necessary without the necessity of cutting rivets or like fastenings. The tooth is backed by the forward edge of the lip as well as by the forward edge of the front plate and the two pocketed bars, while at the same time the pocketed bars are of such construction as not to in any manner increase the resistance to the movement of the shovel or dipper through the material being excavated.

I claim—

1. A dipper-tooth having a bifurcated shank, and pocketed bars arranged on both the inner and outer faces of the dipper for engaging both portions of the shank.

2. A dipper-tooth having bifurcated shank, the end of said shank being reduced, and pocketed bars for engaging the reduced portions of the shank.

3. A dipper-tooth having a bifurcated shank fitting over the lip of the dipper, and a bar fitting against the rear edge of the lip and having a pocket or recess for the reception of the inner end of the shank.

4. A dipper-tooth having a shank member arranged to fit within the lip of the dipper, a bar secured to the dipper at a point to the rear of the lip, and of no greater thickness than said lip, said bar having a recess or pocket for engagement with the shank of the tooth.

5. A dipper-tooth having a shank extending within the lip of the dipper, the end of the shank being of reduced cross-sectional area, a bar secured within the dipper at a point to the rear of the lip, and of no greater thickness than said lip, said bar having a pocket or recess for the reception of the reduced portion of the shank.

6. A dipper-tooth having a shank member extending within the lip of the dipper, the

end of said shank being of reduced cross-sectional area, and a pocketed bar receiving the reduced portion of the shank, both the shank and the bar having locking-pin-receiving recesses.

7. A dipper-tooth having a shank member arranged to extend under the lip of the dipper, and a pocketed bar fitting against the edge of the front plate of the dipper for receiving said shank.

8. A dipper-tooth having a shank member extending below the lip of the dipper, and of reduced cross-sectional area at its end, a bar secured under the lip at a point in advance of the edge of the front plate, said bar having a tapered forward end and being provided with a shank-receiving pocket or recess.

9. In combination, a dipper, and a dipper-tooth extending beyond the lip of said dipper, the forward edge of the lip, and the body portion of the tooth having interfitting portions to prevent lateral displacement of said tooth.

10. In combination, a dipper having a lip provided with a recessed front edge, and a tooth having a shoulder fitting within said recess to prevent lateral displacement of the tooth.

11. In combination, a dipper having a lip provided with a recess in its front edge, a tooth having a bifurcated shank, provided with a shoulder at the point of bifurcation, said shoulder fitting within the recess to prevent lateral displacement of the tooth, and means on both the inner and outer faces of the dipper for engaging the shank.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM HURBERT BATES.

Witnesses:

F. H. SAMPSON,

A. O. GORDILLOX.