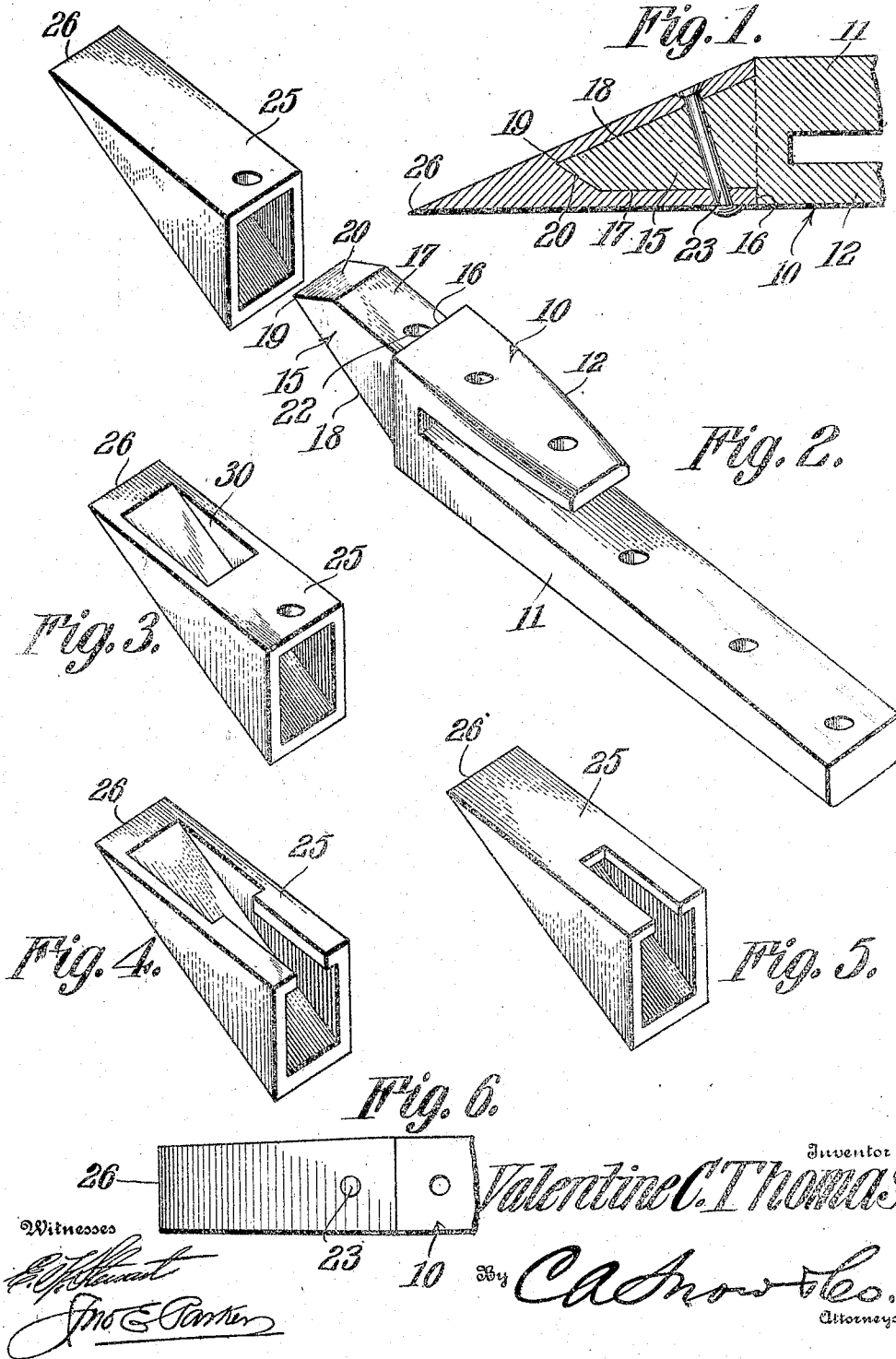


V. C. THOMAS.
DIPPER TOOTH.
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UNITED STATES PATENT OFFICE.

VALENTINE C. THOMAS, OF CARROLLTOWN, PENNSYLVANIA.

DIPPER-TOOTH.

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To all whom it may concern:

Be it known that I, VALENTINE C. THOMAS, a citizen of the United States, residing at Carrolltown, in the county of Cambria and State of Pennsylvania, have invented a new and useful Dipper-Tooth, of which the following is a specification.

This invention relates to dipper teeth for use in connection with excavating machines, steam shovels, ditching machines, and the like.

The principal object of the invention is to provide a novel form of dipper tooth having a removable point of such shape and so proportioned as to be practically self sharpening and to always present a sharp edge for engagement with the work.

A further object of the invention is to provide a removable tooth point having a wearing surface of an area proportioned to the degree of penetrability of the material being operated upon, so that different points may be used for such materials as hard rock, soft rock, hard dirt or shale, or soft earth or gravel.

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 vertical section of a dipper tooth constructed in accordance with the invention, the removable point applied thereto being one intended for use in connection with the digging of hard or solid rock. Fig. 2 is an inverted perspective view of the tooth base and the hard rock digging teeth detached. Fig. 3 is an inverted perspective view of the removable point employed in digging hard dirt or shale. Fig. 4 is a similar view of the removable point employed in digging soft earth or gravel. Fig. 5 is a similar view of the removable point employed in the digging of soft rock. Fig. 6 is a plan view of the point, detached.

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

In dipper teeth as ordinarily constructed, it is practically impossible to use the same shovel and teeth proper in the digging of materials of different degrees of penetrability. Where the surface area of the tooth or tooth point that is exposed to wear is constant, the tooth may be well adapted for the digging of soft earth or gravel, but would soon become dull if employed in connection with the digging of harder materials, such as shale or solid or soft rock. In carrying out the present invention, therefore, provision is made for proportioning the area exposed to wear in accordance with the character of the work to be performed.

The tooth base 10 is provided with the usual upper and lower shanks 11 and 12, spaced to fit over the lip of the shovel and provided with the usual openings for the passage of securing devices.

Projecting from the forward end of the base is a pointed shank 15, the base of which is approximately rectangular in cross section and is of less cross sectional area than the main portion of the tooth in order to form a square shoulder 16 against which the rear end of the tooth point may abut. The lower surface 17 of the shank is continued out in general parallel relation with the tooth proper, while the upper surface 18 tapers downward at a considerable angle toward a point 19. The forward end of the lower surface tapers upward, as indicated at 20, toward the point. This shank tapers slightly in width from the base toward the point, and is provided with an opening 22 for the passage of a rivet, bolt or other securing device, such as indicated at 23. The shank member is arranged to receive points of slightly different construction, as indicated in Figs. 2, 3, 4, and 5 in accordance with the character of work to be performed. All of these points are of the same general contour, being slightly tapered in width from the rear end to the point, and their lower faces 25 being arranged to form continuations of the lower wall of the base member 12, while the upper surface of each tooth tapers downward from the rear end toward the point, so that a sharp, chisel like edge 26 is formed. Each of the points is hollow for the reception of the shank, and the cross sectional contour of the point is such that its rear end will abut squarely against the shoulder 16 and all of its surfaces will form continuations of the similar surfaces of the base member 10. The

- wear on the upper inclined surface of the point is practically a constant factor, but the wear on the lower surface is in a greater degree, dependent on the degree of penetrability of the material being operated upon, for this lower surface of the point is in frictional contact with the material being operated upon from the time the tooth enters such material until it emerges therefrom.
- 10 This sliding friction on the lower surface of the tooth will wear the metal away and the wear is greatest near the point of the tooth and gradually lessens toward its base or rear end. In order, therefore, to provide a point
- 15 that will wear evenly, and, therefore, will always remain sharp, the area of this lower surface is increased or diminished in accordance with the character of the work, thus in the construction shown in Figs. 1 and 2 the
- 20 entire lower surface of the removable point is solid, and this point is adapted for the digging of hard rock where the sliding friction will wear the entire lower surface of the point, while for a point adapted for digging softer
- 25 material, a portion of its area is cut away.
- In Fig. 3 is shown a point adapted for the digging of hard dirt or shale, and it will be noted that in this case there is an opening 30 formed immediately rearward of the digging edge presenting for a considerable portion of the tooth only a pair of edges which will wear away in common with that portion of the lower surface of the point between the opening 30 and the chisel point.
- 35 In Fig. 4 is shown a tooth adapted for the digging of soft earth or gravel, where there is less frictional resistance and in this case almost the entire lower surface of the point is cut away in order to materially reduce the amount of metal to be worn away for the purpose of maintaining the digging edge sharp.
- 40 In Fig. 5 is shown a point that is adapted for the digging of comparatively soft rock. In this case the frictional wear is greatest
- 45 near the point and the lower surface of the tooth is solid for more than half its length, a portion of the lower surface being cut away near the rear end of the tooth so as to reduce the frictional area at this point.
- 50 It will be seen that in all cases the friction or wearing area is proportioned to the degree of penetrability of the material, and the

lower surface of the point will therefore remain flat and the chisel like edge will be preserved until the removable point is entirely worn out.

What is claimed is:—

1. A shovel tooth of the type described having a removable point provided with a frictional wearing surface of an area corresponding to the degree of penetrability of the material being acted upon.
 2. A shovel tooth having a removable point, said point having a lower surface presenting a frictional wearing area corresponding to the nature of the material being excavated.
 3. A shovel tooth comprising a base and shank, and removable points arranged to be attached to said shank, said points having frictional wearing areas of different extent.
 4. A shovel tooth comprising a base, a shank extending from the forward end thereof and interchangeable digging points arranged for attachment to said shank, the points having frictional wearing areas of different extent to correspond to the degree of penetrability of the material being operated upon.
 5. A shovel tooth having a detachable point, a portion of the area of the lower surface of said point being cut away to reduce the amount of metal in frictional engagement with the material being excavated.
 6. A shovel tooth having a movable point, the frictional area of the lower surface of the point being less than the entire superficial area of said lower surface.
 7. A shovel tooth comprising a base, a shank member extending from the forward end thereof and having a cross sectional area of less than that of the base to form an abrupt rectangular shoulder, and a removable digging point recessed for the reception of the shank, the base of the point being of a cross sectional area corresponding to that of said base.
- In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

VALENTINE C. THOMAS.

Witnesses:

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