Feb. 2, 1932. J. O'F. CLARK 1,843,205

INTERTOOTH SCRAPER FOR EXCAVATING IMPLEMENTS

Filed Dec. 3, 1927

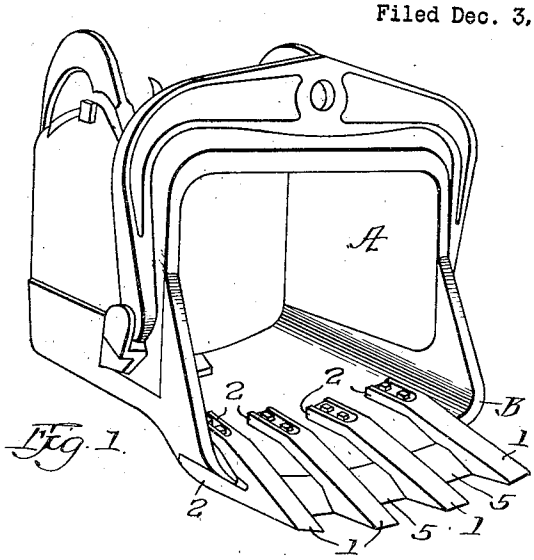


Fig. 1.

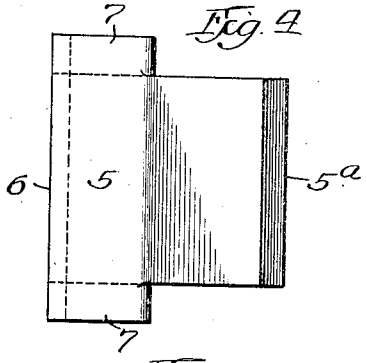


Fig. 4

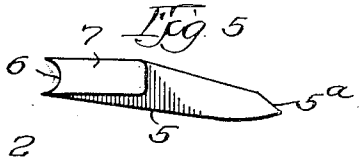


Fig. 5

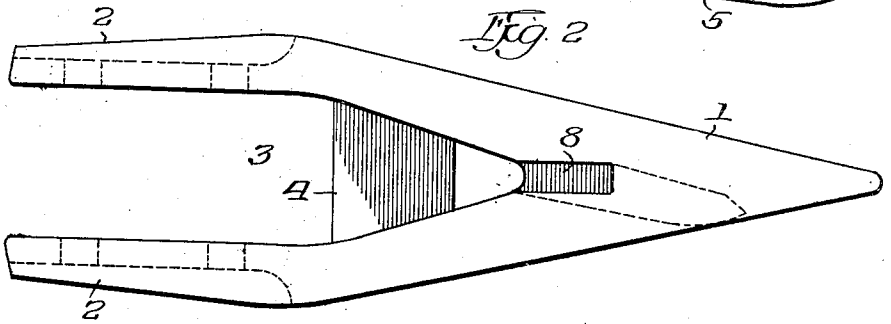


Fig. 2

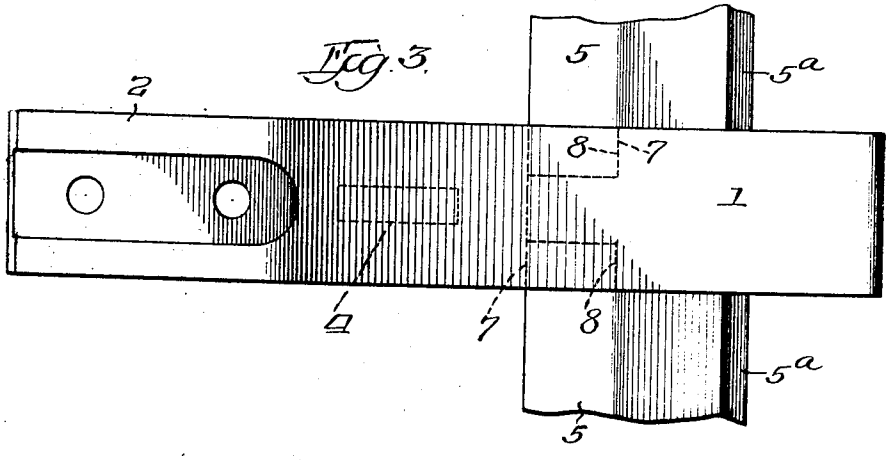


Fig. 3.

Witness:

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UNITED STATES PATENT OFFICE

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INTERTOOTH SCRAPER FOR EXCAVATING IMPLEMENTS

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This invention relates to excavating implements, such as power operated dippers, buckets, and the like, in which the digging lip is provided with teeth to increase the digging efficiency; and the invention has for its primary object to provide separately formed members entering into assembly with the inter-tooth spaces of the lip for the purpose of protecting the same from wear, as well as (in the preferred embodiment of the invention) providing scrapers which add digging efficiency to the lip and by their ready replaceability adapt the lip to be kept up to such efficiency; a collateral object of the invention being to so construct replaceable inter-tooth lip members or scrapers, as well as the teeth between which they are used, that an inter-engagement will be established between them, whereby the teeth will serve to hold the lip members or scrapers in position upon the implement by mere placement of the parts into assembly and as a step in mounting at least one of the teeth upon the implement, as distinguished from the more complicated and less reliable principle of first mounting the teeth upon the implement and then rigidly securing the separately formed lip member to the teeth, which necessarily involves additional, separately formed assembly parts that may become loose or wear away in service.

In carrying out the invention, the replaceable lip members are formed separately from the lip and the teeth, with a design that adapts them for rearward seating against the lip of the implement, and also for inter-engagement laterally with teeth between which they are, respectively, located, the teeth being likewise designed to act as complementary members in such inter-engagement, so that the separately formed lip members will be held in place by the act of properly assembling them and securing the teeth to the implement; the inter-engagement, in the preferred embodiment, consisting in proportioning each separately formed lip member so that it will bridge the distance between two teeth, and forming upon the sides of the member laterally extending lugs which enter into recesses in the sides of the teeth, such recesses being preferably at the forward ends of the crotches through which the teeth embrace the lip of the implement; and the scraping function of the separately formed lip members being afforded by a blade extending forwardly and preferably inclined downwardly from the portion of the lip member which carries the lugs.

In the accompanying drawings—

Figure 1 is a perspective view showing a typical form of excavating implement, to-wit, a power operated dipper, to which the subject-matter of the present invention is applied, by way of illustration.

Figure 2 is a side elevation, on an enlarged scale, of one of the digging teeth employed in the embodiment shown in Figure 1.

Figure 3 is a plan view of the tooth shown in Figure 2, together with fragmentary portions of separately formed lip members that enter into engagement with the tooth, on either side thereof.

Figures 4 and 5 are, respectively, a top plan view and a side elevation of one of the inter-tooth separately formed lip members.

A represents the body of a power operated dipper which typifies a class of excavating implements to which the present invention may be applied, and B represents the digging lip of such an implement.

1 represents digging teeth which are essentially wedge-shaped members mounted upon the lip B, and which are commonly constructed with spaced arms or tangs 2 which together provide a bifurcated base with embracing crotch 3, tied together against spreading through means of the web 4, and assembled with the implement by entering into embrace with the lip B in spaced positions defined by slots (not shown) that receive the webs 4.

According to the present invention, lip B has mounted upon it, in addition to the digging teeth 1, separately formed lip members 5, the preferred construction of which is best shown in Figures 4 and 5, according to which each member 5 has a concave seat 6 at its rear end, has a main transverse horizontal dimension corresponding to the distance between two teeth 1, and has upon the rear por-

tions of its sides tooth engaging lugs 7. The forward main portion of the body of the member 5 is designed to provide a scraper 5*a*, and is given such inclination with reference to the horizontal that it will function as a displacing and lifting element in guiding material into the implement. Teeth 1, otherwise embodying any approved design adapting them for proper assembly with the implement, involve the novelty of having upon their lateral faces, through which they meet the separately formed lip members 5, means for inter-engaging with the members 5, which means when used in connection with the form of lip member illustrated, consists of recesses 8 in which the lugs 7 fit, so positioned, for instance, at the forward end of the lip-receiving crotches 3, that they engage the lug 7 against forward or vertical displacement, when the concave seats 6 are resting against the forward margin of the implement lip B, and hold the members 5 in such assembly that while rearward thrust resulting from encountered material is borne by the lip B, said members 5 are firmly held against tipping and with a predetermined angular presentation that adapts them to serve the purposes for which they are intended.

Inasmuch as teeth 1, as is usual, are replaceably secured to the implement A, it follows that the separately formed lip members 5 may be renewed as often as required (usually whenever the teeth 1 are replaced), and the life of the lip B is correspondingly prolonged.

The design of the members 5 is such that they respond well to heat treatment which is indispensable in the production of the parts from manganese steel, which is the most desirable material for the purpose, and the recesses 8 which receive the lugs 7 facilitate heat treatment of the teeth 1, in that they reduce the metal mass at points of maximum thickness.

I claim:

1. In an excavating implement, digging teeth, mounted upon said implement, with a space between them, and a separately formed lip-member located in said space; each of said teeth and the adjacent portion of the lip member being constructed, the one with a projection and the other with a recess, receiving said projection and establishing an inter embrace between them.

2. An excavating implement having spaced teeth, an intervening separately formed lip member and means constituting an independent interembrace between said lip member and each tooth member; said means comprising a projection on one part and a recess on the other part, receiving said projection; and at least one projection and the recess which receives it being adapted for assembly by the movement of the tooth which assembles the tooth with the implement.

3. In combination with an excavating implement, digging teeth mounted at spaced intervals thereon, and separately formed members constructed to seat against portions of the implement which are between the teeth; said teeth being held on the implement independently of and constructed to embrace said separately formed members and hold them in bearing upon the implement.

4. In combination with an excavating implement, digging teeth mounted on said implement with a space between them, and a separately formed lip member located in said space and held in position by said teeth; said teeth and lip member being constructed to inter-engage and prevent displacement of the lip member relatively to the teeth in both directions perpendicular to the plane of the lip member, in both lateral directions in said plane, and in the forward directions in said plane; and said lip member having a seat through which it bears rearwardly against the implement to prevent its displacement in that direction.

5. In combination, an excavating implement, separately formed digging teeth constructed for attachment to said implement, said teeth having recessed sides, and separately formed lip members bridging the spaces between the teeth and having laterally presented lugs entering the recesses in the sides of the teeth whereby the lip members are held in position upon the implement.

6. In combination with an excavating implement, bifurcated digging teeth having crotches through which they embrace said implement and constructed at the forward ends of their crotches with laterally presented scraper receiving recesses, and scrapers adapted to the portions of the implement which lie between said teeth, entering said recesses, and there secured in place.

7. In combination with an excavating implement having a forwardly presented lip, digging teeth mounted upon said lip at spaced intervals, and separately formed lip members seating rearwardly against said lip, in the spaces between the teeth; said teeth having recesses through which they receive and embrace said separately formed lip members and hold the latter seated against the lip.

8. As an article of manufacture, a lip member for toothed excavating implements, said lip member comprising a separately formed piece adapted to enter between two teeth of the implement and constructed at its inner end with a seat through which it is adapted to bear rearwardly against the implement and at its sides with means through which it is adapted to interengage with two adjacent teeth and whereby it is held seated against the implement.

9. As an article of manufacture, an inter-

tooth lip member for toothed excavating implements, comprising a separately formed piece constructed with a forwardly extending scraper, a rearwardly presented seat adapted to receive the forward margin of the implement, and laterally presented attaching lugs adapted for interengagement by two adjacent implement teeth for holding the lip member in position.

10. As an article of manufacture, a tooth for excavating implements, comprising a body portion adapted for assembly with the digging lip of an implement, and having its side which lies forward of the lip when the tooth is in position, a laterally opening recess to receive a separately formed lip member and engage said lip member rearwardly and prevent forward displacement of the lip member when the parts are in position.

11. As an article of manufacture, a bifurcated digging tooth for excavating implements, having a lip-receiving crotch, and, forward of the end of said crotch, laterally presented recesses for the reception of separately formed lip members.

Signed at St. Louis, Mo., this eleventh day of October, 1927.

JOHN O'FALLON CLARK.