Nov. 24, 1942. E. K. TROUP 2,302,899

SCARIFIER

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Fig. 1.

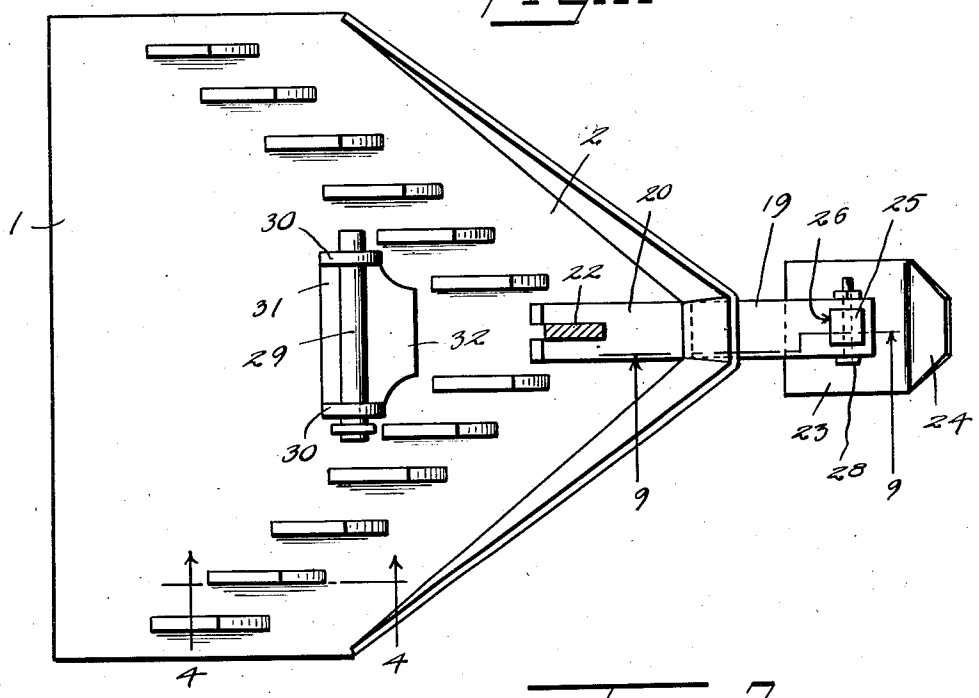


Fig. 2.

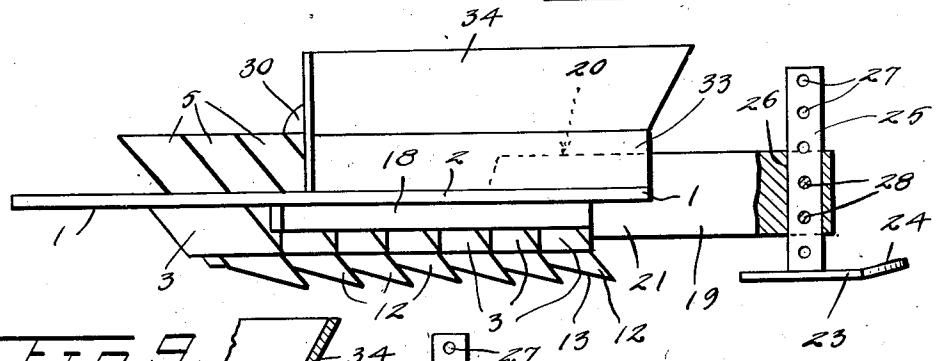
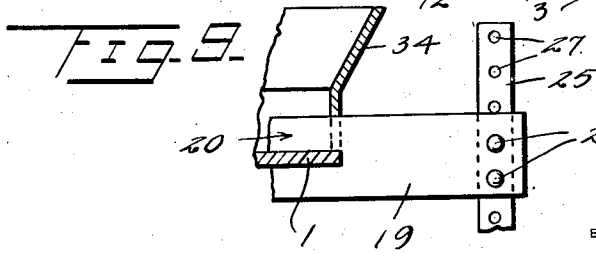


Fig. 3.



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Fig. 3.

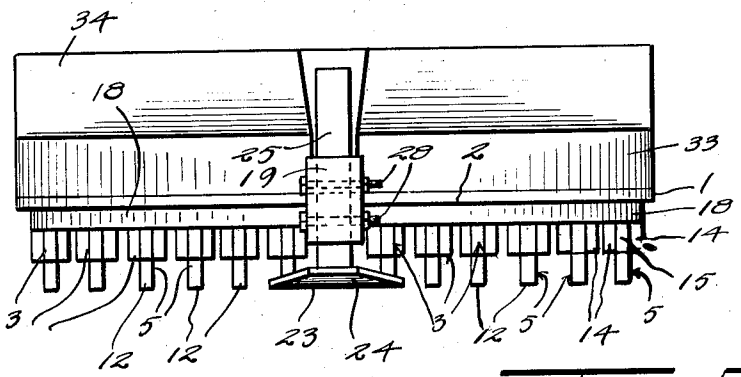


Fig. 4.

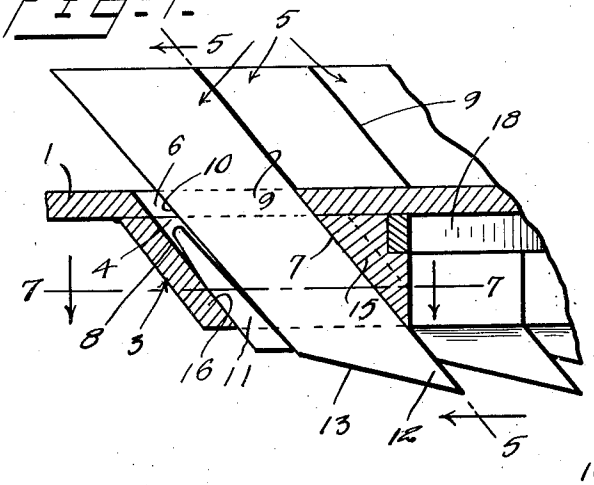


Fig. 5.

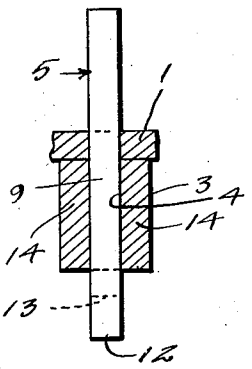


Fig. 6.

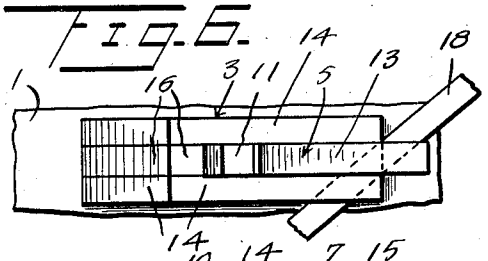


Fig. 8.

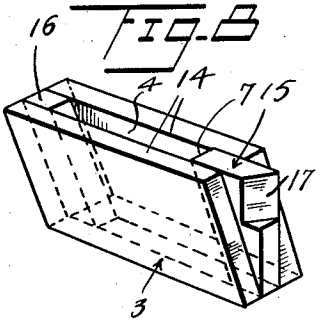
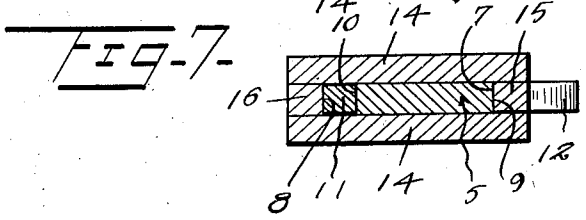


Fig. 7.



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2,302,899

SCARIFIER

Elmo K. Troup, Miami, Fla.

Application December 13, 1939, Serial No. 309,059

6 Claims. (Cl. 262—8)

This invention relates to scarifiers and more particularly for general grading purposes and the mining of limestone rock and similar geological deposits but without absolute limitation to such use, one object being to improve generally upon scarifiers of this character.

A particular object is to simplify the structure and minimize the weight thereof without sacrificing strength and durability.

A further object is to minimize the cost of manufacture and also the maintenance of the scarifier in working condition.

With the foregoing and other objects and advantages to be attained, as will hereinafter more fully appear, the invention consists in the novel general structure and in the particular parts and combinations and arrangements of parts thereof as hereinafter described and set forth in the appended claims, reference being had to the accompanying drawings illustrating a practical adaptation of the invention, in which—

Figure 1 is a top plan view of the assembled scarifier structure;

Figure 2 is a view mainly in side elevation and with a fragmentary portion of the pilot extension of the structure shown in section;

Figure 3 is a front elevation of the structure shown in Figures 1 and 2;

Figure 4 is a fragmentary section, on an enlarged scale, taken on or about the line 4—4 of Figure 1;

Figure 5 is a fragmentary section taken on or about the line 5—5 of Figure 4;

Figure 6 is a fragmentary inverted plan view beneath one of the socket members with the scarifier tooth and retaining wedge element in place;

Figure 7 is a fragmentary section through the socket member with the scarifier tooth and wedge element inserted and taken on or about the line 7—7 of Figure 4;

Figure 8 is a detail isometric view of a socket member detached from the body plate; and

Figure 9 is a fragmentary section taken on or about the line 9—9 of Figure 1.

Referring now to the drawings in detail, the numeral 1 designates the main body member of the scarifier, said member comprising a metal plate of minimum thickness yet possessing the requisite strength and rigidity for supporting and carrying with stability the several working parts of the scarifier to be later described. As shown, the major rear portion of the plate 1 is of rectangular form and the remainder is forwardly tapered, as at 2.

Secured to the underside of the main body plate 1, preferably by a conventional process of welding, is a series of socket members 3 having openings 4 formed therein for the reception and mounting of the scarifier teeth 5 to be presently more fully described in detail. The openings 4 of the socket members 3 register with longitudinal slots 6 provided in the main body plate 1, the transverse width of the openings 4 of the socket members and that of said slots 6 being the same and corresponding to the thickness of the teeth 5, and the longitudinal side wall faces of the openings 4 and slots 6 being obviously in vertical planes, but the front and end walls thereof are inclined, as at 7 and 8, respectively, and, for practical purposes, the inclination being preferably at an angle of forty-five degrees, but without absolute limitation thereto. In this connection, it is noted that the front longitudinal edge portions 9 of the teeth 5 are at the same angle as the front walls of the openings 4 and slots 6 with relation to the top ends of the teeth, but the rear longitudinal edge portions 10 of the teeth are at a different angle, which, preferably for practical purposes, is substantially thirty-seven degrees, whereby the spaces between the rear edge portions 10 of the teeth and the inclined rear walls 8 of the socket members 3, provided because of the teeth being of a transverse dimension less than the distance between the front walls 7 and rear walls 8 of the socket members 3, are downwardly divergent or flared for the accommodation of tapered wedge elements 11 which are driven upwardly in the respective spaces from beneath the socket members 3. By this provision, each tooth 5 is firmly held in its adjusted position in the socket member 3 with its adjacent forward edge portion in snug engagement with the inclined front wall 7 of the socket member throughout the extent of the latter by the wedge element 11 driven in between the rear wall 8 of the socket member and the adjacent rear edge portion of the tooth so as to effectively resist the thrust upon the digging end portion 12 of the tooth in the scarifying operation. Preferably, the bottom ends of the teeth 5 are cut off and faced at a very acute angle to the front edge portions 9 of the teeth, as at 13.

The socket members 3 may be each made as an integral structure, or otherwise, as desired, but they are preferably constructed as a built-up assembly, as shown more clearly in Figure 8, in which structure the socket member comprises parallel side plates 14 of rhomboidal form, said plates being spaced apart with front and rear

filler elements 15 and 16, respectively, welded therebetween. The rear filler element 16 as shown is in the form of a polygonal bar of square cross section and extends parallel to the inclined ends of the side plates 14 and has its opposite ends beveled in planes flush with the top and bottom edges of said side plates. The front filler element 15 is of general triangular form with its upper forward corner portion cut away angularly, as at 17, to provide a seating recess for a tie bar 18 which is substantially of V-shape and corresponding to the same arrangement of the series of socket members 3 on the underside of the body plate 1 as shown in Figure 1, said tie bar being welded not only to the recessed seating portions 17 of the front filler elements 15 of the socket members but also to the adjacent under face portions of the body plate 1, this tie bar, so positioned and secured, providing a stiffening reinforcement for the body plate 1 as well as effectively tying and bracing the individual socket members 3.

Projecting forwardly from the apex portion of the scarifier body is a pilot extension 19, said extension 19 comprising a heavy bar or a suitable conventional beam structure which is of general rectangular form and slotted horizontally some distance forwardly from its rear end, the width of the slot corresponding to the thickness of the body plate 1 and the upper leg 20 of the bifurcation thus produced overlapping the adjacent top face portion of the body plate and being welded or otherwise rigidly secured thereto. The lower leg 21 of the bifurcation is likewise secured to the adjacent under face portion of the body plate. It is here noted that the inner end portion of the upper leg 20 of the pilot extension 19 is vertically slotted at a length from its end, as at 22, sufficient for the accommodation of the leading tooth 5 where it projects above the body plate 1. It is further noted that the lower leg 21 of the bifurcated portion of the pilot extension 19 extends only into end abutting relation to the foremost socket member 3. This structural arrangement and particular attachment of the pilot extension 19 to the scarifier body affords ample stability and durability for the rough usage to which the scarifier is subjected.

At the forward end of the pilot extension 19 is a supporting runner comprising a bearing shoe 23 the major portion of which is in the form of a generally rectangular plate which slides flatwise upon the surface of the ground or geological formation to be plowed, the forward portion 24 of the shoe being tapered and turned upwardly as shown in Figures 1, 2 and 3 to prevent intereference in the forwardly sliding movement of the shoe. The rectangular body portion of the shoe 23 is provided with a perpendicular shank 25, of square cross section, which is slidably fitted in a counterpart vertical opening 26 in the end portion of the pilot extension 19, said shank 25 being secured in vertically adjusted position by the provision of a series of transverse apertures 27 in the shank, a pair of said apertures being brought into registration with alined apertures in the pilot extension 19 for the reception of bolts 28.

By thus providing for the vertical adjustment of the bearing shoe 23 as just above stated, it is unnecessary in most cases to readjust the scarifier teeth 5 for different depths of plowing, that is to say, after the teeth 5 are once set with a given length of projection of their cutting points below the bottoms of the respective socket members 3, no further adjustment of the teeth is necessary, because, by adjusting the shoe 23 at different distances below the pilot extension 19 and thereby raising or lowering the forward end of the pilot extension above the ground surface, as the case may be, the plow body is accordingly made to incline at a greater or lesser angle as the teeth take into the ground or geological formation being plowed when the plow is forcibly pushed or drawn forwardly with the shoe 23 sliding on the surface in advance of the teeth 5. In this connection, it is noted that if the shoe 23 is rigidly attached to the shank 25, as it preferably is, the shoe will obviously be canted in the longitudinal direction with a compensating rocking movement in its travel on the surface of the ground or formation being scarified, but, obviously, in some cases, the shoe 23 may be hingedly attached to the lower end of the shank 25 to swing about an axis transversely of the shank, in which case, the shoe will ride flatwise on the ground or formation while the body of the scarifier and pilot extension and its shank are at an inclination. This modification being obvious, detailed illustration thereof in the drawings is deemed unnecessary.

In the use of the scarifier it may be obviously drawn in a manner similar to a conventional scarifying drag device by a cable or hitched as a trailer directly to a tractor. However, in the more general use of the scarifier, it is obviously supported by a conventional power lift on a tractor in advance thereof, for which purpose a hitching element 29 is provided on the main body plate 1 for the attachment of the power lift, said hitching element being located at a central place whereby the supported load is substantially balanced. As shown, the hitching element comprises a transverse bolt which is supported at its ends on ears or lugs 30 struck up from the body plate 1 at opposite sides of a transversely elongated opening 31 formed in the body plate and provided with a lateral offset 32 at its forward side. This opening is provided primarily to facilitate the attaching and detaching of the power lift to and from the hitching element.

To deflect the larger pieces of rock or other plowed material laterally at opposite sides of the apex of the plow during the scarifying operation, a substantially V-shaped deflector is provided coincident with the tapered end of the plow body, said deflector comprising a vertical lower wall portion 33 which merges into an outwardly inclined and overhanging upper wall portion 34, said deflector extending to a considerable height above the body plate 1 whereby to not only cause the larger pieces of rock or other material to roll laterally out of the path of the scarifier but to prevent the smaller pieces from moving onto and accumulating on the top of the main body plate 1. There is a material advantage in deflecting the larger pieces of rock or other material laterally to the opposite longitudinal sides of the scarifier in that the material thus deflected is brought into the path of the traction elements of the tractor, which elements are usually of the caterpillar type, and as such, they are effective in crushing the pieces of rock or other material as the same are brought by the action of the deflector into the path thereof.

While the structure herein illustrated and described embodies a practical adaptation of the invention, it is obvious that considerable modification and alteration may be made therein

without departing from the spirit and scope of the invention as defined by the appended claims. The invention, therefore, is not limited to the specific construction and arrangement shown.

What is claimed is:

1. In the herein described scarifier structure, a main body plate having a substantially wedge-shaped forward portion and provided with a substantially V-shaped series of longitudinal slots extending from side to side thereof and adjacent its tapered end portion, the apex slot of the series coinciding with the longitudinal axis of the body plate, a plurality of separate socket members each correlated to one of the openings of the V-shaped series and being welded to the underside of the body plate, each socket member comprising a spaced pair of vertical side plates of rhomboidal form and interposed front and rear filler plates welded to said side plates, the rear filler plate being of rectangular bar form and extending substantially parallel to the rear ends of the side plates and constituting the rear wall of the socket, the front filler plate being of general triangular form, the inner edge portion of said front filler plate being substantially parallel with the forward edge portions of the outer plates and constituting the front wall of the socket and its upper forward portion being recessed, and a substantially V-shaped tie bar seated at intervals throughout its length in the recessed portions of the front filler plates of the respective socket members, said tie bar being welded to said recessed portions of the respective front filler plates and to the underside of the main body plate.

2. The herein described scarifier structure comprising a main body plate having a series of parallel longitudinal slots between the opposite longgitudinal side margins thereof, a plurality of unitary built-up socket members secured to the underside of the main body plate respectively in correlation to the series of apertures in the main body plate, each aperture being in communicable registration with the opening of its particular correlated socket member, each socket member comprising a pair of spaced parallel side plates welded to interposed filler plates and the top edge portions of the respective side plates and filler plates being welded to the adjacent under face portions of the main body plate, and a tie bar welded at intervals throughout its length to the respective unitary socket members and also being welded to the adjacent under face portions of the main body plate.

3. The herein described scarifier structure, comprising a main body having a series of vertically alined slots between the side edges thereof, a plurality of separate socket members, each correlated to one of the openings of the series and being welded to the underside of the body plate, each socket having obliquely arranged inner front and rear walls and the outer face of the front wall arranged in a vertical plane, and a rectangular bar welded to the lower face of the main body and its vertical rear wall welded to the vertical faces of the front walls of the sockets.

4. The herein described scarifier structure, comprising a substantially wedge shaped body portion, a supporting runner extending forwardly of the apex of the main body, said body having a series of vertically arranged openings running approximately parallel with the slanting side thereof, a plurality of separate socket members, each correlated to one of the openings of the series and welded to the underside of the body plate, each socket having obliquely arranged inner front and rear walls, the outer face of the front wall arranged in a vertical plane, and a V-shaped bar, rectangular in cross section and welded to the lower face of the main body and its vertical rear wall welded to the vertical faces of the front walls of the sockets.

5. The herein described scarifier structure, comprising a main body having a series of vertically alined slots between the side edges thereof, a plurality of separate socket members, each correlated to one of the openings of the series and welded to the underside of the body portion, the rear wall of each socket slanting forwardly, the front wall being of a triangular form and the inner face substantially parallel with the slanting rear wall, a vertical outer face, and a rectangular bar welded to the lower face of the main body and its vertical rear wall welded to the vertical faces of the front walls of the sockets.

6. The herein described scarifier structure, comprising a main body having a series of vertically alined slots between the side edges thereof, a plurality of separate socket members, each correlated to one of the openings of the series and welded to the underside of the body portion, the rear wall of each socket slanting forwardly, the front wall being of a triangular form and the inner face substantially parallel with the slanting rear wall, and a vertical outer face having rectangular notches therein, and a rectangular bar welded to the lower face of the main body and to the walls of the rectangular notches in the front walls of the sockets.

ELMO K. TROUP.