June 12, 1956 A. HARFERT 2,749,827

SOIL CONDITIONER

Filed Sept. 9, 1953 2 Sheets-Sheet 1

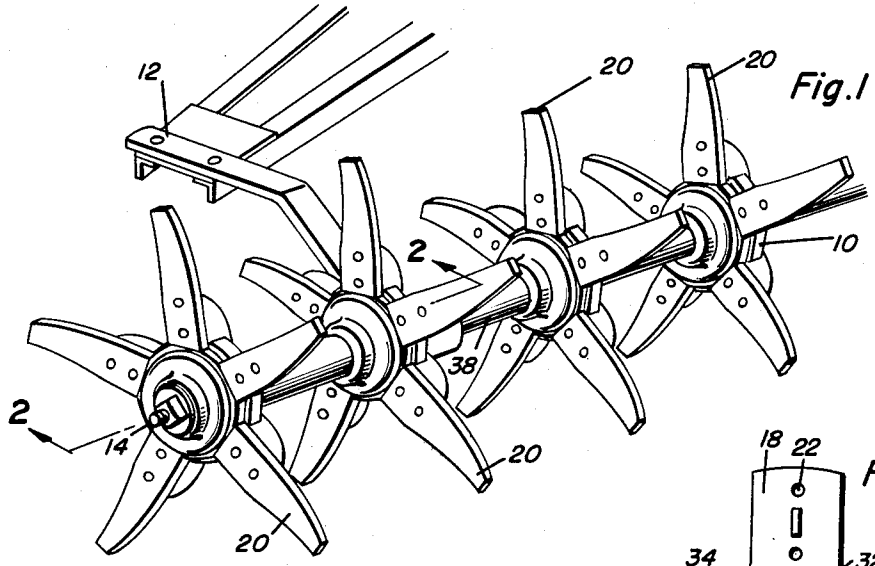


Fig. 1

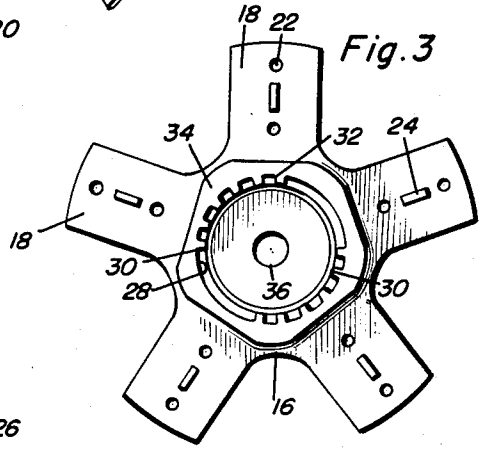


Fig. 3

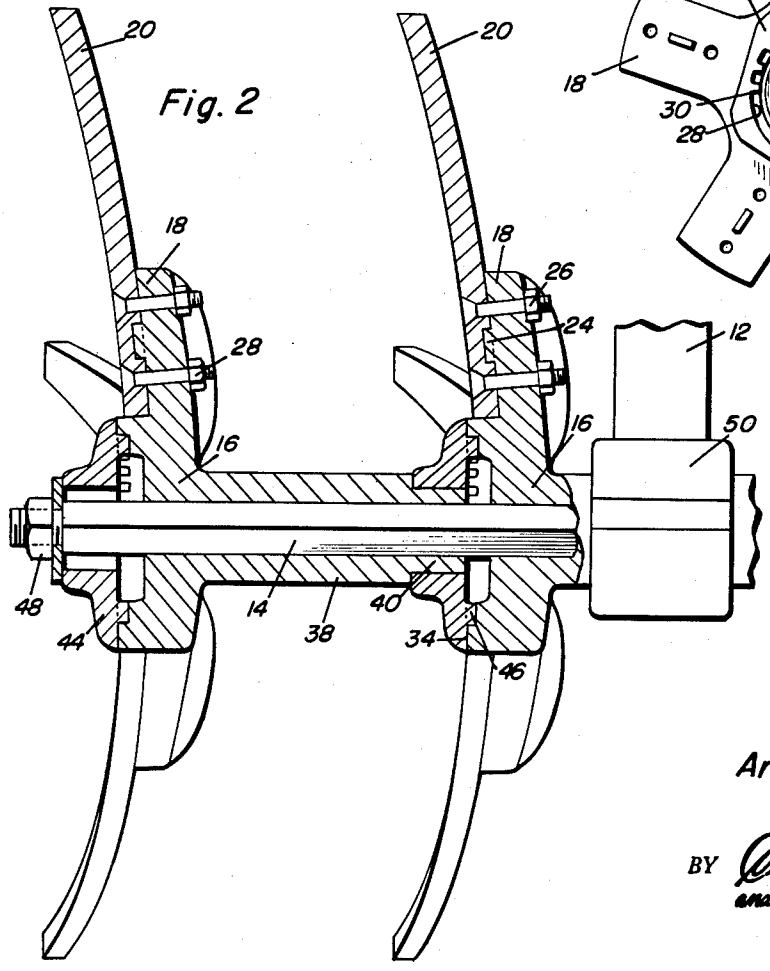


Fig. 2

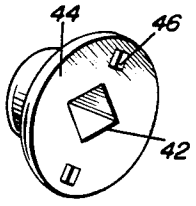


Fig. 4

Arthur Harfert
INVENTOR.

BY Thomas A. O'Brien and Harvey B. Jacobson
Attorneys

June 12, 1956 A. HARFERT 2,749,827

SOIL CONDITIONER

Filed Sept. 9, 1953 2 Sheets-Sheet 2

Fig. 5

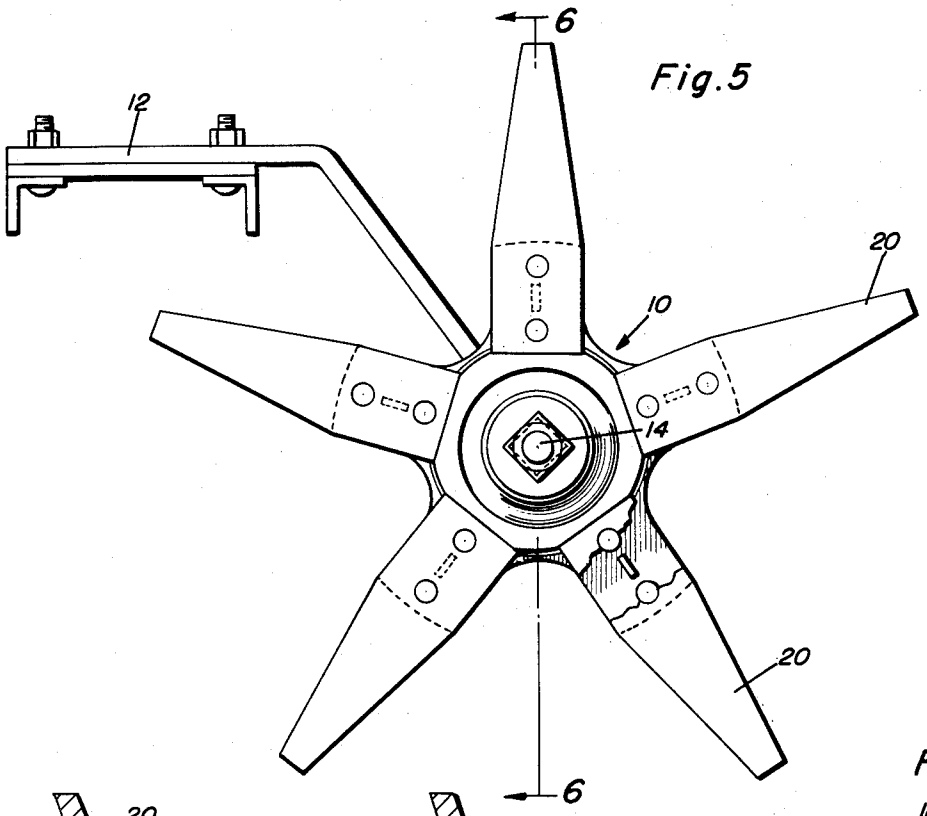


Fig. 6

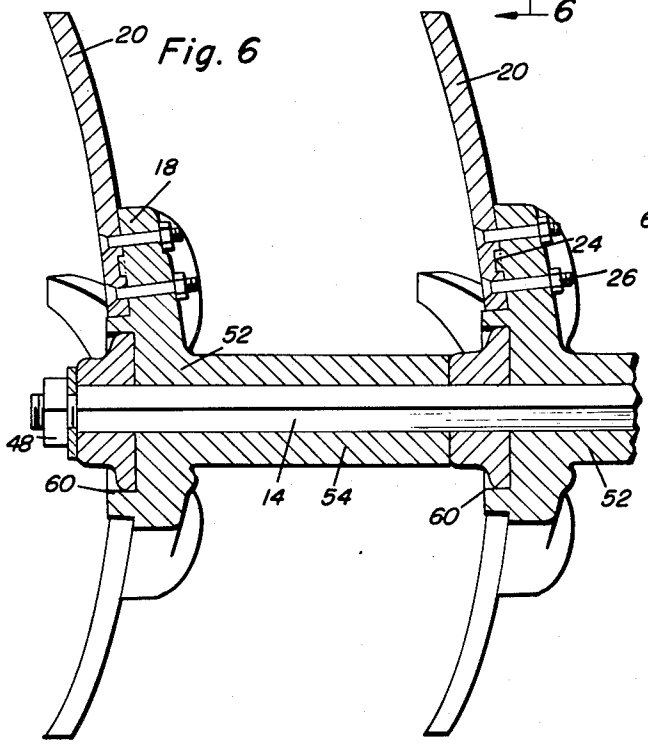


Fig. 7

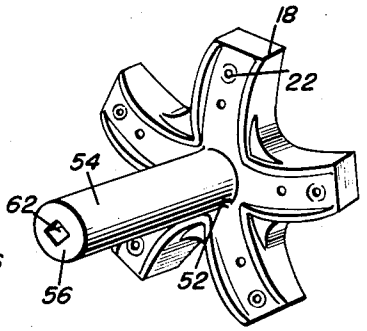
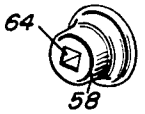


Fig. 8



Arthur Harfert
INVENTOR.

BY Thomas A. O'Brien and Harvey B. Jacobson
Attorneys

United States Patent Office 2,749,827 Patented June 12, 1956

2,749,827

SOIL CONDITIONER

Arthur Harfert, Colorado Springs, Colo.

Application September 9, 1953, Serial No. 379,237

3 Claims. (Cl. 97—212)

This invention relates to a soil conditioner and more specifically provides a device for tilling soil which may be attached to a standard disc plow or disc harrow in place of the usual disc or plows.

An object of this invention is to provide a soil conditioner which may be substituted for the ordinary disc harrow or disc plow.

Another object of this invention is to provide a soil conditioner which may be substituted on a conventional axle of a disc harrow or plow.

A further object of this invention is to provide a soil conditioner having a plurality of soil piercing or agitating teeth thereon.

Yet another object of this invention is to provide a soil conditioner having soil agitating teeth wherein the teeth of the individual disc may be set in angular relation to each other.

Still another object of this invention is to provide a soil conditioner which is sturdy in construction, efficient in operation and lends itself to the ease of manufacture.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a perspective view showing the soil conditioner of this invention mounted on a conventional disc harrow axle which is supported by the usual frame;

Figure 2 is a longitudinal, vertical section taken substantially along section line 2—2 in Figure 1 showing details of the soil conditioner hub, teeth mounting means and cup;

Figure 3 is a front end elevation of one of the hub members showing the series of notches extending into a recess in the center of the hub;

Figure 4 is a perspective end view of a cup which engages in the recess and notches of the hub;

Figure 5 is an end view of the structure of Figure 1 showing the relationship of the hub to the mounting frame;

Figure 6 is a longitudinal, vertical section taken substantially along section line 6—6 of Figure 5 showing details of a modified form of hub and cup;

Figure 7 is a perspective view showing details of the modified form of hub; and

Figure 8 is a perspective view showing details of the modified form of cup.

Referring now more specifically to the drawings, it will be seen that the numeral 10 generally designates the soil conditioner of this invention mounted upon a frame 12 and having a transverse axle 14 which is well known in conventional disc harrows or disc plows.

On the axle 14 is a plurality of hub members 16 having radially extending lugs 18 with each lug 18 receiving a soil piercing or agitating member 20. As will be seen in Figures 2 and 3 the lug 18 is provided with apertures

22 and a projecting lug 24 for securing the soil piercing member 20 thereon with suitable bolts 26. Now looking specifically at Figure 3 it will be seen that the hub member 16 has a recessed portion 28 with a plurality of notch forming projections 30 projecting therein and forming a plurality of notches 32. Surrounding the recess portion 28 is a facing surface 34 and in the center of the hub 16 is a longitudinal bore 36 for receiving the axle 14. Extending from the other side of the hub 16 is a spacer member 38 integral therewith and having a polygonal extension 40 to be received in a polygonal aperture 42 on the cup member 44 and it will be seen that the cup member 44 has a pair of projecting lugs 46 for registry with the notches 32 of an adjoining hub 16 thereby orientating the angular relationship between adjoining hubs and adjoining soil piercing teeth 20. On the end of an axle 14 is a suitable nut 48 for securing the hub 16 and cups 44 in assembled relation and over one of the spaces 38 is a suitable bearing 50 for securing the assembled device to a frame 12 as best shown in Figure 1. Obviously, the axle 14 may be of any suitable shape and the bore 36 may be either circular or polygonal depending upon the shape of the axle 14.

Now referring more specifically to Figures 5 through 8, it will be seen that the modified form of the device is substantially similar to the device in Figure 1 with the only difference being in the specific details of the hub and cup. Referring more specifically to Figure 6 it will be seen that the hub 52 has a spacer member 54 having a smooth end face 66 for receiving the abutting end of a cup 58 as shown in Figure 8. The hub 52 has a centrally located recess 60 therein for receiving the large end of the cup 58 and the cup 58 and the hub 52 each has a bore 62 and 64 which may be polygonal to fit over a polygonal axle or it may be circular to fit a circular axle depending upon the type of axle which the disc plow or harrow may have. In existing disc harrows and plows some are conventionally provided with polygonal axles and others are provided with circular axles and the soil conditioner of this invention may be used with either.

The operation of the device will be readily understood. With the frame 12 hooked to a tractor (not shown) or other source of power the soil conditioners 10 will be pulled over the ground and perform the tilling operation as the individual teeth 20 pierce and agitate the soil. The spacer portion 38 of the hub 16 will rotate in the bearing 50 and the teeth and axle necessarily rotate therewith in an obvious manner. By placing the projecting lugs 46 on the cup 44 and selector notches in the recess portion 28 of the hub 16 the angular relationship of the teeth 20 may be set as desired. In other words, the teeth may be staggered throughout the longitudinal length of the soil conditioner 10. Obviously, the nut 48 is secured to the end of the axle 14 with a suitable washer between the nut and the end cup member thereby affording a tight clamping and abutting relationship of the cup members 44 and hub members 16. Obviously, the device may be used on existing disc harrows or disc plows which may have polygonal or circular shaped axles.

A soil conditioner of this invention may be constructed of any suitable material which is well known in the metals industry and the specific shape and size of the teeth may be provided after determining the type of soil and nature of the vegetation thereon which is to be conditioned. Obviously, the number of sets of teeth is governed by the length of the axle on which they are mounted and the particular angle that the axle is set in relation to the line of movement of the soil conditioner may be determined by the thoroughness of the agitation desired and the type of soil to be conditioned.

From the foregoing, the construction and operation of the device, will be readily understood and further expla-

nation is believed to be unnecessary. However, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the appended claims.

What is claimed as new is as follows:

1. A soil conditioner comprising a central hub having a plurality of radially extending lugs, a soil piercing member secured to each of said lugs, said hub having an axle receiving bore and a projecting spacer element rigid therewith, and a cup engaging a recess in one face of said hub and adapted to abut a portion of the end of the spacer element of an adjacent hub, said hub and cup being provided with interengaging means to adjust the relative angular positions of adjacent hubs.

2. A soil conditioner comprising a central hub having a plurality of radially extending lugs, a soil piercing member secured to each of said lugs, said hub having an axle receiving bore and a projecting spacer element rigid therewith, and a cup engaging a recess in one face of said hub and adapted to abut a portion of the end of the

spacer element of an adjacent hub, said spacer element being provided with a polygonal projecting portion for engaging a polygonal bore in said cup.

3. A soil conditioner comprising a central hub having a plurality of radially extending lugs, a soil piercing member secured to each of said lugs, said hub having an axle receiving bore and a projecting spacer element rigid therewith, and a cup engaging a recess in one face of said hub and adapted to abut a portion of the end of the spacer element of an adjacent hub, said recess having a plurality of inwardly directed notches and said cup having a longitudinally projecting lug for engaging the notches on said hub for adjusting the angular relationship of adjacent hubs and soil piercing members.

References Cited in the file of this patent

UNITED STATES PATENTS

930,250	Waterman	Aug. 3, 1909
951,924	White	Mar. 15, 1910
2,501,364	Traver	Mar. 21, 1950

FOREIGN PATENTS

118,059	Australia	Jan. 24, 1944