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JOINT DIGGER AND CLEANER FOR CONCRETE PAVEMENTS

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2 Sheets-Sheet 2

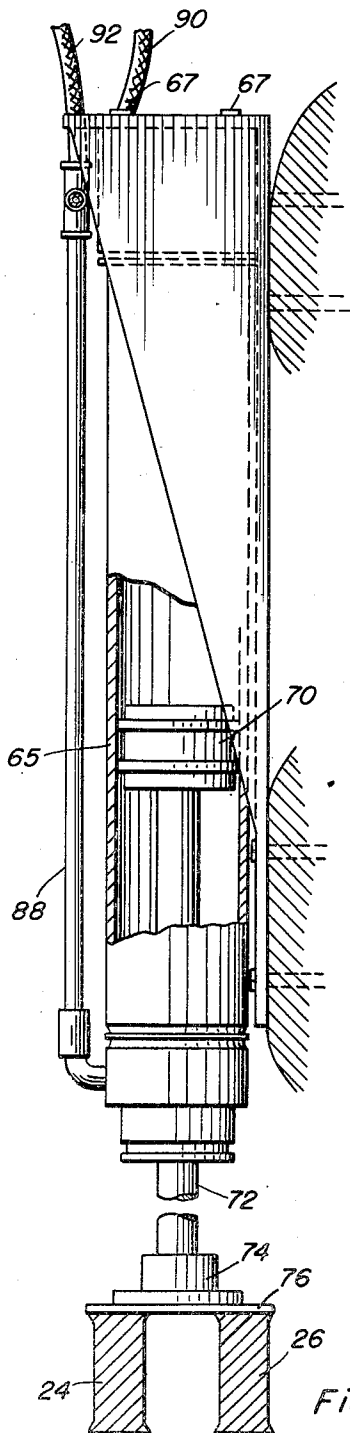


Fig. 4.

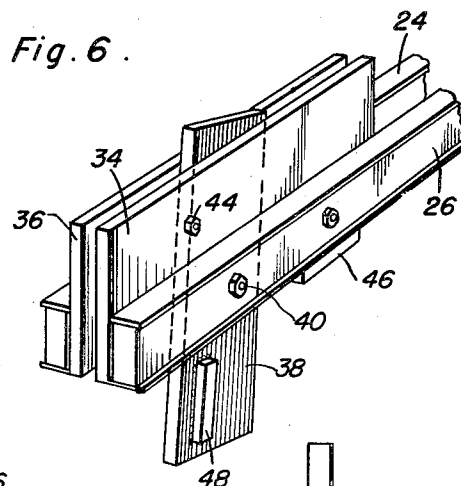


Fig. 6.

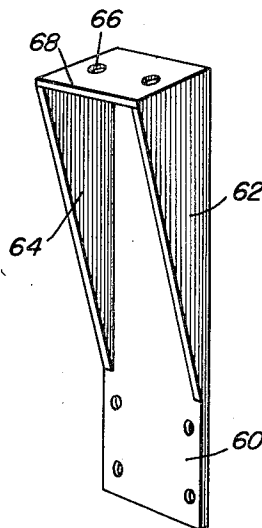


Fig. 5.

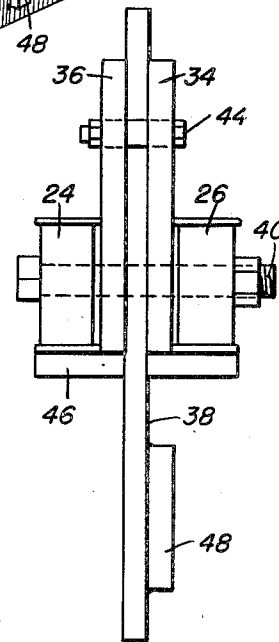


Fig. 7.

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JOINT DIGGER AND CLEANER FOR
CONCRETE PAVEMENTS

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3 Claims. (Cl. 262-8)

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This invention relates to novel and useful improvements in devices for removing the usual filler from between concrete sections in roadways, air-strips and the like.

An object of this invention is to clean the conventional filler from between the sections of concrete highways, air-strips and the like by mechanical means.

Another object of this invention is to urge a tool or cutter between the conventional roadway sections, which cutter is capable of various adjustments to compensate for the depth to be cut.

Another object of this invention is to resiliently bias a frame which has said cutter supported thereon and to selectively raise and lower the frame against the biasing force of the resilient biasing means.

Another object of this invention is to control the depth of cut to be taken by means which is easily accessible from a convenient location on a conventional prime mover, such as a tractor or like.

Another object of this invention is to support the frame having the tool thereon in such a manner so as to be capable of slight lateral movement to compensate for certain irregularities in the street which would tend to tilt the prime mover or to compensate for slight deviations from the proper course of travel of the prime mover.

Another purpose of this invention is to clean the filler from between conventional concrete sections of roads, air-strips and the like by improved means which substantially obviates the necessity of manual cleaning.

Other objects and features of novelty will become apparent in following the description of a preferred form of the invention, illustrated in the accompanying drawings, wherein:

Figure 1 is an elevational side view of the preferred form of the invention, showing the same in use with a conventional prime mover, a tractor in this instance;

Figure 2 is a sectional view taken substantially on the line 2-2 of Figure 1 and in the direction of the arrows;

Figure 3 is a sectional view illustrating a detailed construction and taken substantially on the line 3-3 of Figure 2 and in the direction of the arrows;

Figure 4 is a transverse sectional view of the invention, taken substantially on the line 4-4 of Figure 1 and in the direction of the arrows;

Figure 5 is a perspective view of the bracket utilized in clamping the cylinder-piston construction to a tractor or other suitable prime mover;

Figure 6 is a perspective view of a portion of the frame forming part of the invention and having the cutting tool associated therewith; and

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Figure 7 is an end view of the detailed construction illustrated in Figure 5.

This invention has been developed to provide a device for removing the conventional filler normally present between concrete sections in aircraft runways, roads, streets and other concrete structures. The prime field of utility of the present invention is in association with the above-mentioned appurtenances and the machine was designed to eliminate cleaning and removing by hand all filler from joints in concrete pavement. This work has previously been done by hand and must be periodically performed, so that additional filler may be placed in the joints between the concrete, to prevent water from entering and undermining the foundation and base of the pavement.

The old filler is first removed, which filler also includes a function of serving as an expansion joint, by a bit or digger or other cutting tool, which is pressed into the joint and moved forward by means of a conventional prime mover such as the tractor illustrated in Figure 1. The filler is removed by plowing or gouging the bituminous material from the joint.

Referring now to the illustrated preferred form of the invention, the conventional tractor is generally indicated at 10 and is provided with all of the usual appurtenances contiguous to a tractor. These appurtenances include the rear wheels 12 and 14 respectively as well as the axle housing 16 extending therebetween.

A frame composed of any suitable material such as angle iron, I-beams and the like is supplied and is adapted to be secured to the undercarriage of the conventional tractor. The specific points of attachment may be the axle housing 16, if so desired. When the axle housing is utilized as an attachment point (see Figure 2) the bearings or brackets which are illustrated in Figure 3 may be utilized. Here a conventional strap 18 is attached around the axle housing 16 and a substantial shackle 20 is attached thereto by means of conventional screws with nuts 22.

These shackles 20 may be of U-shaped construction as is seen in Figure 1 for reception of the terminal portions of the said frame. The specific structure of the frame includes a side member 24 which is substantially straight and a second side member 26 having an offset portion in order to direct an attachment to the axle housing 16 adjacent the opposite wheel 14. It is readily apparent from inspection of Figure 3 that the terminal portion of the said side member 24 is seated on and pivotally engaged with a pin 28 which might be a conventional screw with a nut 30 fixed thereto. Careful inspection of Figure 3 also discloses a plurality of washers 32 used for centering the terminal portion of the

frame members 24 and 26 within the shackle 24.

These washers may be of conventional type. However, it is desirable that slight lateral movement be present at this point of the frame in order to compensate for various irregularities in the air-strip or the like and also to compensate for imperfect steering of the tractor 10. It will be noted that little movement of the frame at this connection will result in a rather large movement at the opposite end of the frame wherein the tool is positioned. The washers 32 may be of conventional locking type or even more resilient such as certain types of rubber.

Reviewing now Figure 6 it will be seen that the terminals of the frame members 24 and 25 respectively are spaced slightly and a pair of plates 34 and 36 respectively seat on the inner surfaces of the said frame members. These plates are also mutually spaced in order to accommodate a work or cutting tool. The preferred cutting tool is in the form of a plate 38 having an aperture therein for accommodation of a pivot pin 40. The said pivot pin extends through the plates 34 and 36 as well as the side or frame members 24 and 25. An additional pin or bolt 44 extends through the plates 34 and 36 at a position to restrict the pivotal travel of the said plate 38. Further, a bearing block 46 is attached to the undersurfaces of the frame members 24 and 26 for strengthening purposes as well as for limiting the travel of the cutting plate or tool 38 in pivotal movement.

The leading edge or forward portion of the said cutting plate 38 is in the nature of a guide as well as a cutter and a protuberance 48 is formed on the said plate 38 for additional cutting operations along the edges or sides of the space between the concrete sections of roads, air-strips and the like. It is noted that the plate 38 and the protuberance 48 may be of very hard metal for wear resistant purposes. Further, the plate 38 is detachable in nature whereby a plurality of different shapes or sizes of plate 38 may be inserted.

Means for raising and lowering the frame is provided. The preferred means consists of a conventional pump 50 which is attached to the conventional tractor 10 adjacent the seat 52 thereof and a selector valve 54 associated therewith. This selector valve is of course manually operated and a plurality of conduits properly positioned and properly connected inter-communicate the pump 50 and the selector valve. A storage tank 56 is also supplied in the hydraulic system serving a conventional function.

Referring now to Figure 5 a suitable bracket having a back plate 60 and a pair of side plates 62 and 64 respectively is illustrated. This plate is attached to the side of a tractor 10 by conventional means and has a cylinder 65 attached between the side members 62 and 64 through the medium of suitable bolts or the like 67 extending through the apertures 66 formed in the top portion 68 of the said bracket. This cylinder has a conventional piston 70 slidably received therein with a piston rod 72 extending therefrom. The said piston rod terminates in a cup-like element 74 which seats on a suitable plate 76. The said suitable plate 76 is rigidly secured to the frame and as the piston 70 is actuated in the cylinder 65, the piston rod 72 will be selectively urged for forcing the frame in a downward direction, pivotally about the pins 28.

It will be noted that the cup-like member 74 is non-circular and the piston rod 72 is permitted

to travel somewhat therein. This forms a lost motion connection between the piston rod 72 and the frame to compensate for the pivotal movement of the said frame.

As stated above the piston rod merely urges the frame 24 in the downward direction and resilient means is utilized for returning the frame. The preferable resilient means consists of a spring 80 which is attached to a suitable bracket or perch 82, which is in turn attached to the side element 24 of the frame. The upper end of the spring 80 is attached to a perch 86 which is in turn rigidly secured to the side 64 of the said bracket illustrated in Figure 5.

In the fluid flow system a conduit 88 attaches to a lower portion of the said cylinder 65, beneath the piston 70. Fluid is supplied thereto through the medium of flexible conduits 90 and 92 respectively which are operatively associated with the selector valve and the pump. The same conduits are, of course, used for fluid return as is conventional in certain types of constructions.

While there has been described but a preferred form of the invention, it is apparent that variations may be made without departing from the spirit thereof. Accordingly, limitation is sought only in accordance with the scope of the following claims.

Having described the invention, what is claimed as new is:

1. In a road filler removing device, a prime mover, a frame, means for pivotally securing said frame to said prime mover, fluid actuated means for pivotally actuating said frame, means for resiliently biasing said frame, cutting means having a guide associated therewith attached to said frame, said pivotal securing means including a bracket having a pivot pin, said pivot pin being journaled in said bracket, and resilient centering means associated with said pin permitting slight movement of said frame in a direction substantially transversely of the pivotal movement of the frame.

2. In a road filler removing device, a prime mover, a frame, means for pivotally securing said frame to said prime mover, fluid actuated means for pivotally actuating said frame, resilient means for lifting said frame and opposing the operation of said fluid actuated means, a cutter, a pair of spaced plates attached to said frame and forming a guide for said cutter, means pivotally mounting said cutter between said plates, said fluid actuated means including a pump mounted on said prime mover, a cylinder having a piston associated with said pump, lost motion means for connecting said piston and said frame, said lost motion means including a non-circular cup attached to said frame having the piston rod seated therein, and means for maintaining said frame in selected elevated position.

3. The combination of claim 2 and stops operatively connected with said plates and said cutter to limit the pivotal movement of said cutter.

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