No. 703,168. Patented June 24, 1902.

B. ASPLEN.

ROAD SCARIFIER AND TRENCH CUTTER.

(Application filed July 27, 1901.)

(No Model.) 2 Sheets—Sheet 1.

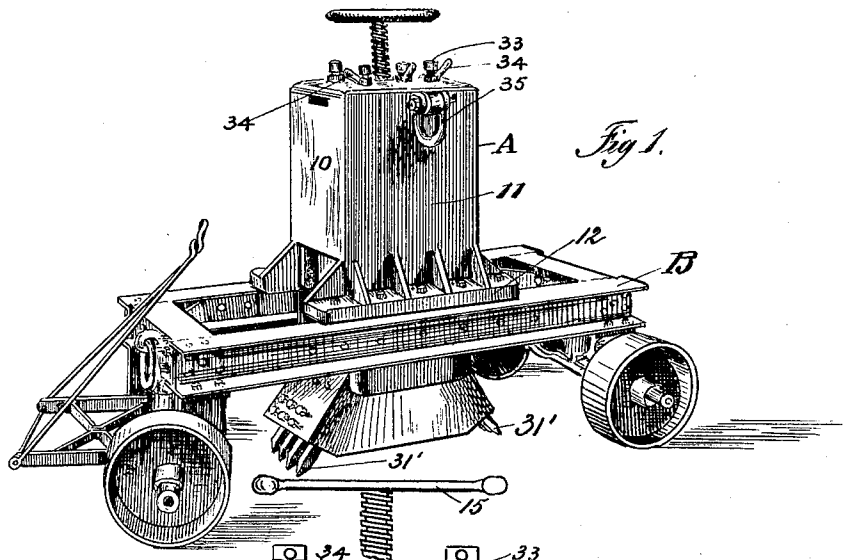


Fig. 1.

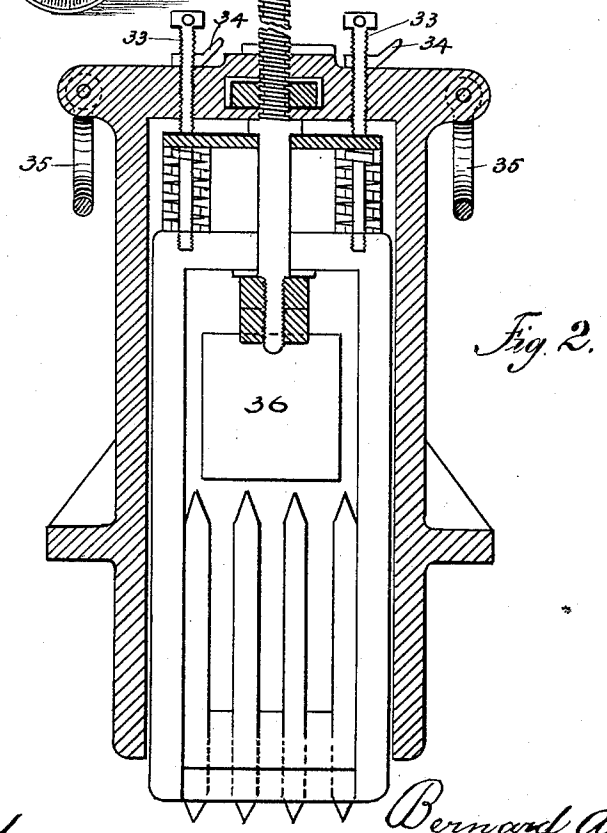


Fig. 2.

WITNESSES

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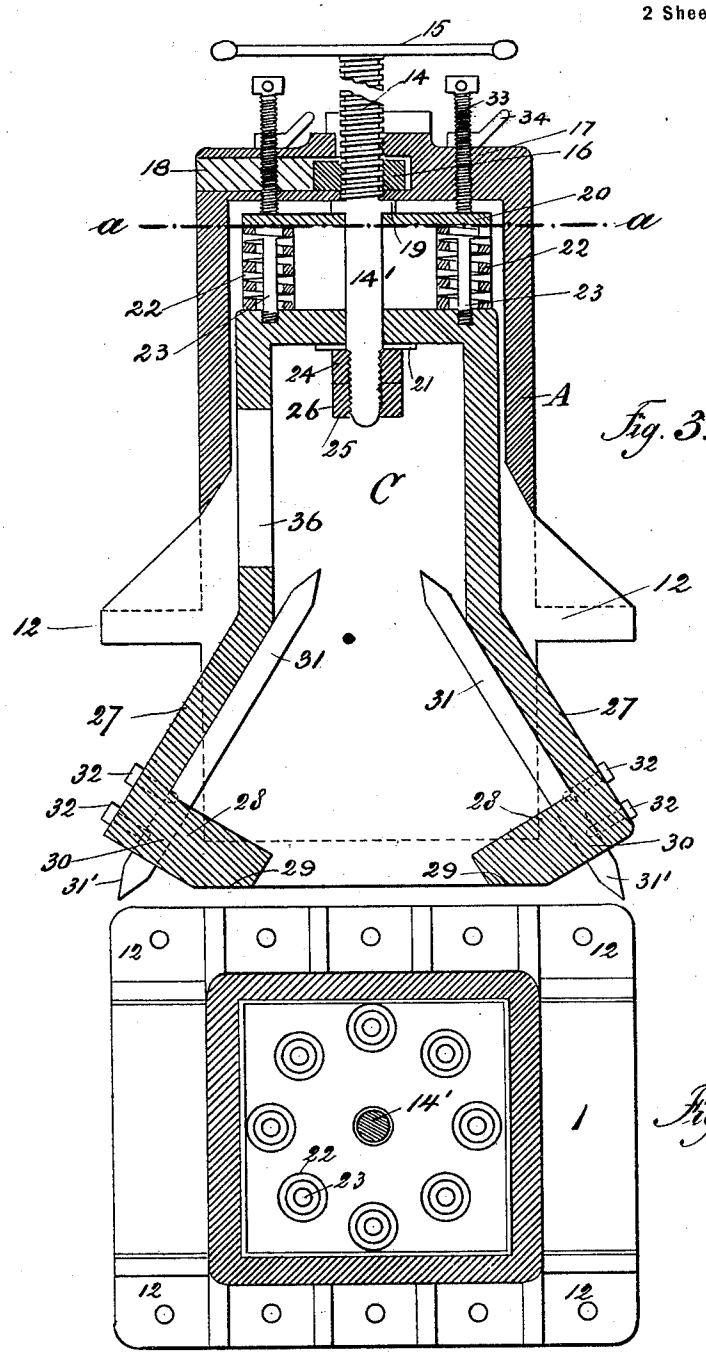


Fig. 3.

Fig. 4.

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UNITED STATES PATENT OFFICE.

BERNARD ASPLEN, OF HARWICH, ENGLAND.

ROAD-SCARIFIER AND TRENCH-CUTTER.

SPECIFICATION forming part of Letters Patent No. 703,168, dated June 24, 1902.

Application filed July 27, 1901. Serial No. 69,877. (No model.)

To all whom it may concern:

Be it known that I, BERNARD ASPLEN, a subject of the King of Great Britain, residing at Harwich, in the county of Essex, England, have invented certain new and useful Improvements in Road-Scarifiers and Trench-Cutters, of which the following is a full and complete specification, such as will enable those skilled in the art to which it appertains to make and use the same.

The object of my invention is to provide a road-scarifier and trench-cutter of a new and improved form by which hard, stony, and refractory soils, such as macadamized roads, may be scarified, broken up, and loosened or trenched, so that the soil may be treated or removed, which scarifier and trench-cutter may be carried by a suitable carriage of its own or attached to suitable fittings on the road-roller or traction-engine of any form.

To such ends my invention consists in substance of an outer casing of cast-iron or steel, an inner casing projecting out of the upper casing at the bottom and reciprocating up and down in such outer casing, provided with forward and rear flaring portions at the lower end thereof, a screw-shaft upon which the inner casing is reciprocatingly mounted, carried by a screw-bushing in the top of the outer casing, a buffer-plate reciprocatingly mounted upon the screw-shaft above the top of the inner casing, buffer-springs interposed between the top of the inner casing and buffer-plate, regulating-screws passing through the top of the outer casing adapted to regulate the position of the buffer-plate, lock-nuts mounted upon such screws, a plurality of teeth or tines adjustably secured against the inner side of each of the bottom flaring portions of the inner casing and passing through a suitable slot or slots, orifice or orifices, formed to receive the same, in and through an inwardly-extending bottom flange portion of the flaring end walls of such inner casing, supporting side flanges on the outer casing, and a wheeled carriage rigidly secured to such flange, so as to support the device, although it is not to be understood that the invention is limited to a device necessarily comprising at once all of the devices or means before mentioned, as the invention consists of various combinations or arrangements of devices and parts and the construction of certain devices and parts, all substantially as hereinafter more particularly set forth in the specification and pointed out in the claims.

In the accompanying drawings, forming part of this specification, in which like characters of reference designate corresponding parts in the several views, Figure 1 is an end side view in perspective of my improved form of road-scarifier and trench-cutter as the same appears when mounted upon the carriage designed expressly to support it. Fig. 2 is a view of my improved scarifier in central vertical cross-section looking from the front or rear. Fig. 3 is a like view in central vertical longitudinal section looking from the side, and Fig. 4 is a top view thereof in cross-section on the line *a a* of Fig. 3.

To carry out my invention, I provide a heavy rectangular casing of cast-iron or steel A, the front and rear walls 10 of which extend down more than half-way the length thereof and the side walls 11 of which are provided just below the bottoms of the front walls 10 with supporting-flanges 12, by which the same may be secured upon the frame of a rectangular carriage B by suitable bolts, as shown in Fig. 1, or secured in like manner to a frame formed integral with the frame of a road-roller or traction-engine. Fitting snugly in the interior of the rectangular casing A is an inner casing C, formed of the same material, which fits snugly therein, with just sufficient contact to permit of the same being freely reciprocated therein by means of a screw 14, provided with a hand-wheel 15, which screw fits in a female-threaded bushing 16, of phosphor-bronze or similar material, located in a hole formed to receive it in the top part of casting 17 of the outer casing A, being passed into the same through a side slot and afterward secured therein by a key-plug 18. The screw 14 is provided at the bottom of the screw-thread with a flange 19, below which extends an unthreaded portion 14', upon which reciprocates the buffer-plate 20. Interposed between the buffer-plate and the top plate 21 of the inner casing C are a plurality of strong buffer-springs 22, held in position in any desired manner, usually by short pins or studs 23, extending up into the centers thereof a short distance, as shown in Figs. 2 and 3. The unthreaded portion 14' of the screw 14 passes through the top 21 of the in-

ner casing C and is provided with a securing-nut 24 and a lock-nut 25, screwed upon a thread formed for that purpose upon the outer end thereof, and between the securing-nut 24 and the top plate 21 of the inner casing is interposed a washer 26, so as to permit of free revolution of such screw in such top plate. The inner casing C is provided at the front and rear with outwardly-flaring lower end portions 27, provided with the inwardly and downwardly extending flange portions 28, which so extend at substantially a right angle to such flare, the lower corners of which flanges are cut off, as shown at 29, and these backwardly-extending flange portions 28 are provided adjacent to the walls of the securing portions 27 with a plurality of rectangular orifices 30, adapted to receive therein the scarifying teeth or tines 31, which are usually formed of tempered steel and are firmly secured in such slots or orifices 30 by means of set-screws 32, so as to project any desired distance beyond the bottom of the flanges 28, as shown at 31′ in Fig. 3, when in such position the upper edges of each of such teeth or tines resting snugly against the inner side of the flaring lower end portion of the inner casing C, whereby the same are rigidly held in position. Passing through the top plate 17 of the outer casing A and abutting against the buffer-plate 20 are regulating-screws 33, provided with lock-nuts 34, by which the tension of the buffer-springs 22 may be regulated to suit different soils and different depths of trench.

To facilitate the hoisting in and out of the carriage B of the scarifier, the same is usually provided with stout rings or shackles 35.

To operate the device, the inner casing C is lowered, so that the lower ends 31′ of the teeth or tines will enter the earth to the required depth, the teeth or tines 31 having been first secured at the required height in the slots 30 by means of the screws 32, and the tension-regulating screws 33 are then screwed down, so as to give the screws the required tension, and the lock-nuts 34 are screwed down thereon, so as to lock the same against any upward movement. If now the carriage B be by any suitable power, such as a road-roller or traction-engine, drawn over the road or field to be scarified or trenched, it is evident that no matter how hard or refractory the soil may be the points 31′ of the tines 31 upon the forward side will rip into and tear up such soil and that the same will be further scarified by the less forceful action of the backwardly-turned teeth or tines 31, carried by the rear backwardly-extending flaring flange of the casing C.

The angle at which the flaring end portions of the inner casing, and consequently the scarifying teeth or tines, are set is usually, as shown, that of about sixty degrees, as I have found this the most efficient angle, and formed in one side of the inner casing is an orifice 36, by which the interior can be reached when the same is lowered or resting upon the ground, such opening being upon the front or rear, so as to drop below the lower end of the short end wall. By this construction it will be seen that the device may be used with any form of carriage desired, and may be fixed directly to a road-roller as before stated, and that in any event it can be used with equal facility in either direction.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a carriage of the class described, the combination with an outer casing of an inner casing movable up and down in the outer casing; means for securing the said inner casing in position, said inner casing being provided at the bottom and on the opposite sides with outwardly-flaring walls provided at their lower ends with inwardly-extending flanges and adjacent to the inner side of said flaring walls with slots or orifices and scarifying teeth or tines adapted to enter said slots or orifices and to project outwardly beyond the flanges and end walls, substantially as shown and described.

2. In a device of the class described, the combination with an outer casing, of an inner casing supported within the outer casing, buffer-springs interposed between the top of the inner casing and that of the outer casing, and a plurality of scarifying teeth or tines secured to the lower end of the inner casing projecting therefrom outward at an angle less than that of a right angle, substantially as shown and described.

3. In a device of the class described, the combination with an outer casing provided with side supporting-flanges, of an inner casing reciprocating up and down in the outer casing provided on two sides of the bottom with outwardly-flaring end walls provided with backwardly-extending flanges provided adjacent to the inner side walls of the flare with slots or orifices, scarifying teeth or tines located in said slots and projecting outward beyond the flange, a supporting-screw having an upper thread coacting with a screw-thread carried by the top of the outer casing, the lower end of which screw-rod is unthreaded and is revolubly connected to the top of the inner casing, a buffer-plate reciprocatingly mounted upon such lower portion of the screw, a plurality of buffer-springs interposed between the buffer-plate and the top of the inner casing, and a plurality of regulating-screws passing through the top of the outer casing, substantially as shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of the subscribing witnesses, this 15th day of July, 1901.

BERNARD ASPLEN.

Witnesses:
BENJAMIN GEORGE HANSON,
FRANCIS W. FRIGOUT.