Jan. 7, 1958 J. M. KENNEDY III 2,818,791

TAMPER ATTACHMENT FOR TRUCK WHEEL

Filed Feb. 1, 1954 2 Sheets-Sheet 1

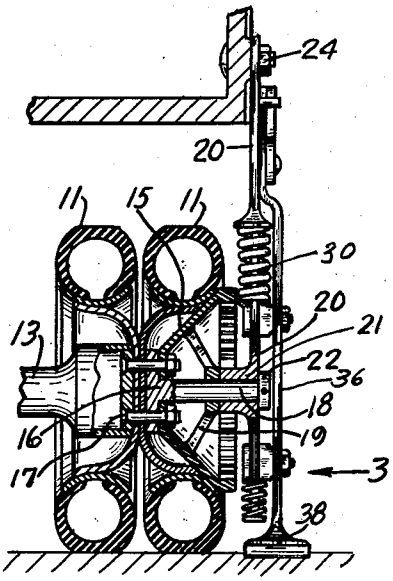


FIG. 2.

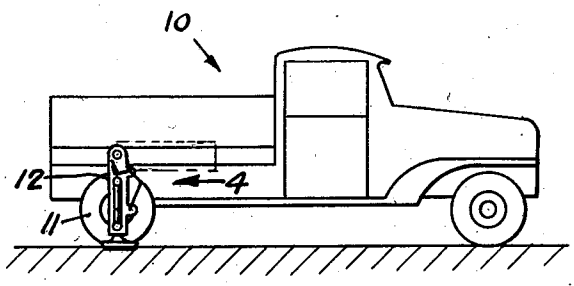


FIG. 1.

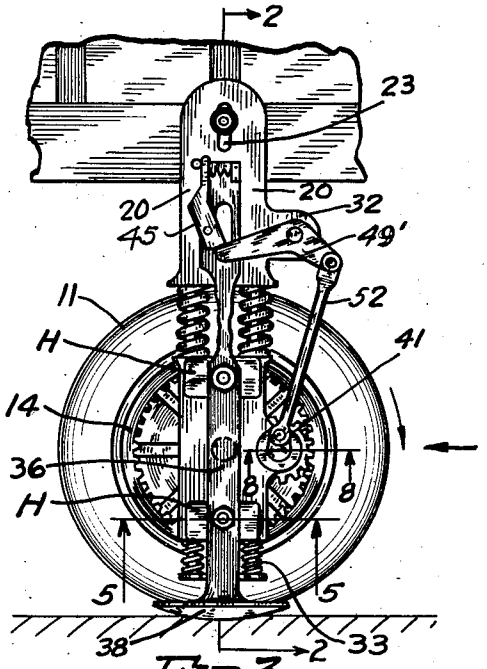


FIG. 3.

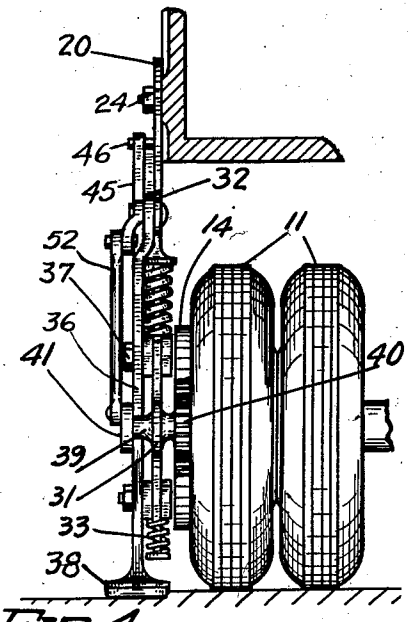


FIG. 4.

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TAMPER ATTACHMENT FOR TRUCK WHEEL

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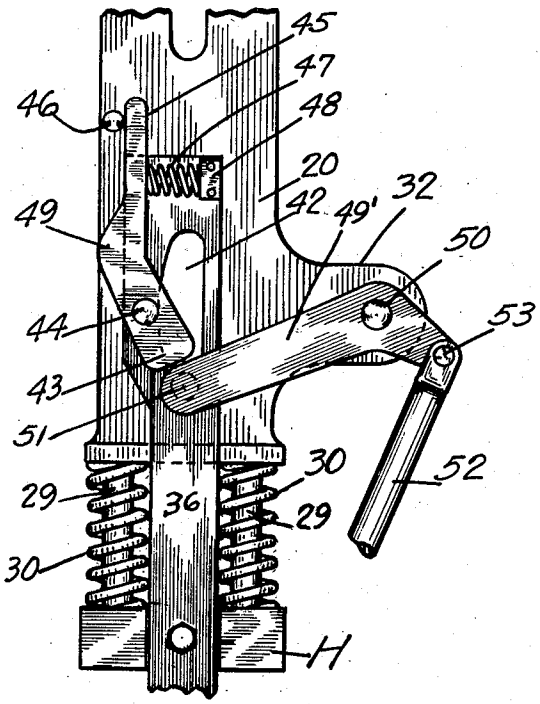


FIG. 6.

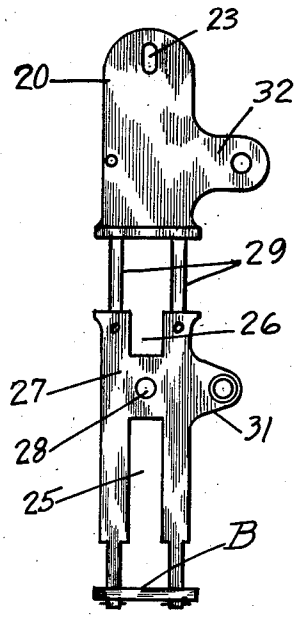


FIG. 7.

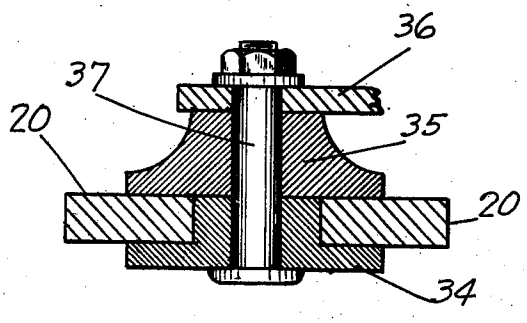


FIG. 5.

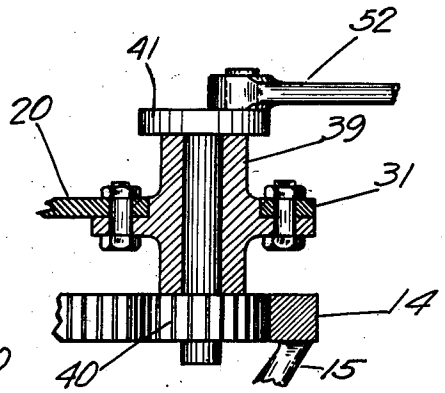


FIG. 8.

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TAMPER ATTACHMENT FOR TRUCK WHEEL

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Application February 1, 1954, Serial No. 407,267

5 Claims. (Cl. 94—49)

This invention relates to improvements in tampers and has reference to an attachment for trucks.

The main or arterial highways of this country are practically all paved either by an asphalt containing mixture or by concrete. The asphalt paving due to its lower cost is extensively employed for road pavements and for the paving of city streets. Asphalt pavements for various reasons have weak spots that soon break and must be patched. The edges of the pavement are usually the first to deteriorate. When breaks occur in asphalt pavements they must be patched by first removing the crumbled paving material and cleaning and tamping the foundation surface, after which fresh paving material is deposited and spread so as to fill the cavity or opening. The new paving material must be highly compressed in order to produce a lasting patch and this is generally effected by running the wheel or wheels of a heavy truck back and forth over the patch. Where the material replaced covers a sufficient area to warrant it heavy road rollers are employed. Where there are one or more separated patches of small area the material is either tamped by hand or it is compressed by running the rear wheels back and forth over the patch. The most satisfactory results are attained by tamping which is effected by heavy manually operated tampers or by tampers operated by internal combustion engines.

Since most patching jobs are spaced far apart and are comparatively small it is not practical to employ heavy highway rollers.

It is the object of this invention to produce a tamper in the form of an attachment to the ordinary highway trucks, so constructed and arranged that it will be driven by power derived from a rear wheel drive wheels of the truck in such a manner that it will deliver a series of tamping strokes in quick succession when the truck moves in either direction.

A further object is to provide a tamper attachment of a simple and substantial construction and of such a design that it can be applied to and removed from a highway truck with the expenditure of a comparatively small amount of time and effort.

The above and any other objects that may become apparent or to which attention may be called as the description proceeds are attained by means of a construction and an arrangement of parts that will now be described in detail, for which purpose reference will now be had to the accompanying drawing, in which,

Figure 1 shows a side elevation of an ordinary highway truck showing the position of the device when in use by full lines and when not in use, by broken lines;

Figure 2 is a vertical section taken on line 2—2, Figure 3;

Figure 3 is a side elevational view looking in the direction of arrow 3 in Figure 2;

Figure 4 is a front elevational view looking rearwardly in the direction of arrows 4 in Figures 1 and 3;

Figure 5 is a section taken on line 5—5, Figure 3;

Figure 6 is an enlarged view showing the upper end of the attachment;

Figure 7 is a side elevational view showing the guide plate separated from the rest of the device; and

Figure 8 is a section taken on line 8—8, Figure 3.

Referring now to the drawing, reference numeral 10 designates a truck of the ordinary kind used in highway repair, 11 designates the right hand side rear drive wheels, and 12 designates the tamping attachment in its entirety. In Figures 2, 3 and 4 only the rear drive wheels and a portion of the truck body have been shown. The wheels have been shown as dual and have both been designated by numeral 11. Numeral 13 designates a portion of the rear axle housing. Attached to the outer of the dual wheels is an internal ring gear whose toothed rim has been designated by numeral 14. The manner in which the internal gear is attached to the wheel varies with the construction of the wheel, but in the drawing the internal ring gear is provided with inwardly ranging spokes 15 that join it to a central hub 16. Bolts 17 secure the internal gear to the wheel as shown most clearly in Figure 2. A stub shaft 18 projects outwardly from hub 16 and is held rigidly in concentric axial position by a plurality of braces 19. The plane of the ring gear is preferably positioned close to but outside of the outer plane of the tire as shown in the drawing.

The outer end of shaft 18 serves as a support for the remaining parts of the attachment. An elongated support and guide member 20 is provided with a hub 21 that serves as a bearing for shaft 18. A washer and pin 22 holds the guide member in position on shaft 18. The upper end of guide member 20 is provided with a bolt slot 23 which receives the bolt 24 that projects from the truck body. Guide plate 20 is provided on the inside with the hub 21 to which attention has already been called and has two longitudinally spaced longitudinal openings 25 and 26 that are separated by a section 27 from the rear or inside surface of which hub 21 projects. Hole 28 is in communication with the opening in hub 21 as shown in Figure 2. Guide plate 20, as shown, is formed from two parts that are connected by round rods 29 that are surrounded by helical compression springs 30. The ends of rods 29 are secured to the guide plate by any suitable means and must be separable from the plate at one end to permit replacement of a spring should it break; the specific connection has not been shown. Plate 20 has two lateral projections 31 and 32 to which reference will be made hereinafter. The lower ends of the lower section terminate in sections of reduced diameter for the reception of helical springs 33. A bar B is removably attached to said reduced ends and forms an abutment for springs 33. Slidable in each of the openings 25, 26 is a cross head H comprising two blocks 34 and 35 as shown in Figure 5. A bar 36 is attached to the cross heads by bolts 37. The cross heads are spaced as shown in Figure 3 so that when the lower cross head rests on springs 33, the upper cross head will be engaged by the lower ends of springs 30. Attached to the lower end of bar 36 is a tamper head 38 that projects below the lowermost point of the wheel peripheries as shown in Figures 2, 3 and 4.

Operating mechanism

Since this machine is designed to effect a tamping of the material used for repairing pavements, it is necessary to provide means for reciprocating the tamper and this will now be described. Attention has been called to projections 31 and 32 and to the hub that extends inwardly from projection 31. On the outside of projection 31 a hub 39 has been shown. The two hubs form a bearing for a shaft to the inner end of which pinion 40 is attached. A crank, arm or disk 41 is attached to

the outer end of said shaft. Since pinion 40 is in mesh with internal gear 14, as shown in Figures 3 and 4, it will turn in the same direction as the wheel when the truck travels.

Referring now more particularly to Figure 6, it will be seen that bar 36 is provided near its upper end with an elongated opening 42 and that a detent 43 is attached to bar 36 by a pivot 44. The detent has an extension 45 that projects up beyond pin 46, which is attached to plate 20, when bar 36 is in its lowermost position, as shown.

A compression spring 47 is positioned between extension 45 and abutment 48 and normally holds extension 45 in engagement with pin 46. When the parts are in the position shown in Figure 6, the lower end of the detent covers the opening 42. When bar 36 is moved upwardly until cam 49 passes pin 46 the detent turns in a clockwise direction and removes the obstruction of opening 42. A lever 49' is pivoted at 50 to projection 32. The longer arm terminates in a pin 51 that extends into opening 42. A rod 52 has its lower end connected to the crank pin on disk 41 and its upper end connected by pivot 53 to the outer end of lever 49'. It is now apparent that when the truck travels, crank disk 41 turns and lever 49' rocks about pivot 50. It is evident that the radius of the circle described by the crank pin on disk 39 must be so related to the distance between pivots 50 and 53 and the distance between pivot 50 and pin 51, that the latter will move the desired distance. Since the drawing has not been made to scale, the relative distances shown may not be strictly correct.

Let us now assume that the truck wheel is turning in the direction of the arrow in Figure 3. Crank disk or arm 41 will turn in a clockwise direction, as the crank pin moves downwardly from the position shown in Figure 3, lever 49' will rock about pivot 50 in a clockwise direction and pin 51 will engage the detent and raise bar 36 and the upper cross head H and this will compress springs 30 which have been shown excessively large for purpose of clearness. When cam 49 reaches pin 46 the detent will begin to turn and when its lower end moves a sufficient distance towards the left it permits pin 51 to pass and when this occurs, bar 36 will be impelled downwardly by the action of gravity and springs 30 and the tamper head 38 will strike the pavement a powerful hammer blow. Attention is now called to springs 33 that are positioned to be engaged by the lower cross head on the downward movement of the tamper. Springs 33 serve as buffers and are of such strength that they will return the parts to such a position that the bottom of the tamper will be positioned above the level of the pavement so that the parts can move along the road. By properly selecting the strength and length of springs 33, they will perform this function without materially reducing the force of the impact blow. After the crank pin has passed its lowermost position and begins its upward movement, lever 49' begins to turn counter-clockwise and finally reaches the position shown in Figure 6 completing a cycle. The operation is the same whether the truck moves forwardly or rearwardly and by alternating the movement of the truck, a repair patch can be quickly and thoroughly tamped.

It is, of course, desirable to operate the tamper as fast as practical and the gear ratios must therefore be selected to obtain the optimum operation.

When not in use the attachment can be disconnected from the wheel and held in the dotted line position shown in Figure 1, or it may be transported in the truck body.

It is obvious that various changes may be made from the structure shown without departing from the invention as defined in the appended claims.

What is claimed as new is:

1. A tamping device for attachment to a highway repair truck, comprising a guide plate for attachment to the truck body in a vertical position, a tamper bar mounted on the guide plate for vertical reciprocation, means comprising vertically spaced cross heads carried by the tamper bar and cross head guides on the guide plate for guiding the tamper bar, and means for raising the tamper bar and for releasing it at the top of its movement for downward movement, said means comprising a crank shaft mounted on the guide plate for rotation about an axis perpendicular to the guide plate, a crank disk attached to the front end of the shaft, a lever of the first class mounted on the guide plate adjacent its top for rocking movement, the inner end of the lever having a lost motion connection with the tamper bar, a rod interconnecting the outer end of the lever with the crank whereby when the crank shaft turns the lever will rock about its pivot, means comprising a pivoted detent carried by the tamper bar at a point above the lever for effecting a releasable connection between the inner end of the lever and the tamper bar, whereby the tamper bar will be raised when the inner end of the lever moves upwardly, means comprising a stationary cam follower on the guide bar and a cooperating cam surface on the detent for moving the latter to bar releasing position when the inner end of the lever reaches the top of its movement, and motion transmitting means for turning the crank shaft by power derived from a truck drive wheel, whereby the tamper bar will be reciprocated as the truck travels.

2. A device in accordance with claim 1 in which helical compression springs are attached to the guide plate at a point above the upper cross head in position engaging the cross head when the tamper bar is raised to its uppermost position whereby when the tamper bar is released by the detent it will be given an initial downward acceleration by said springs.

3. A device in accordance with claim 2 in which at least one spring is operatively associated with the lower end of the guide plate at a point below the lower cross head in position engaging the latter when the tamper approaches the lower end of its downward movement, said spring serving as a buffer and functioning to return the tamper bar to a point above its extreme lowermost position.

4. A device in accordance with claim 3 in which means is provided for supporting the device in a fixed relative position with respect to one of the rear drive wheels, comprising: a short stub shaft in axial alignment with the wheel projecting outwardly therefrom, bearing means in the guide plate to receive the stub shaft and an adjustable connection between the guide plate and truck body.

5. In a tamper adapted to be suspended from the body of a highway truck, comprising a guide plate having vertically separated guides, a crosshead in each guide and mounted for reciprocation, a tamper bar attached to both crossheads holding them in spaced relation, means comprising a crank shaft provided with a crank, a lever of the first class having one end connected with the crank by means of a rigid rod, a pivot carried by the guide plate about which the lever rocks, the other end of the lever lapping the tamper bar, a detent pivotally connected with the tamper bar, means comprising a spring operatively associated with the detent for normally positioning its lower end above and in contact with the outer end of said lever whereby when the latter moves upwardly it will raise the tamper bar, and means comprising a pin projecting from the guide bar, and a cooperating cam surface on the detent for moving it out of engagement with the lever when the tamper bar has been raised to a predetermined height to permit it to return to its lower position.

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