Nov. 17, 1964 E. M. ASBURY 3,157,267

ROADWAY SIGNAL DEVICE RETRIEVER

Filed Oct. 3, 1962

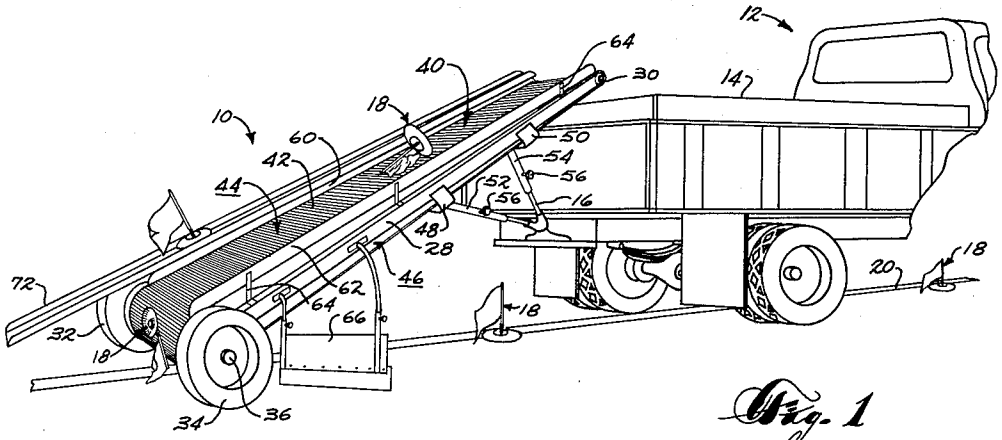


Fig. 1

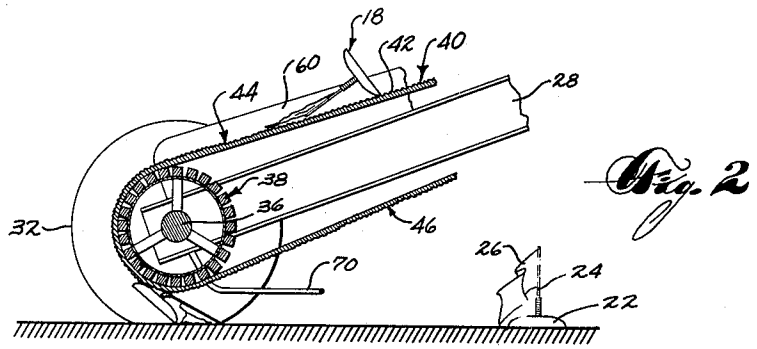


Fig. 2

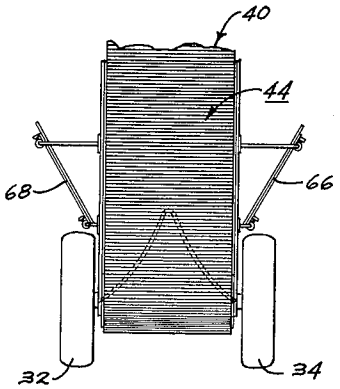


Fig. 4

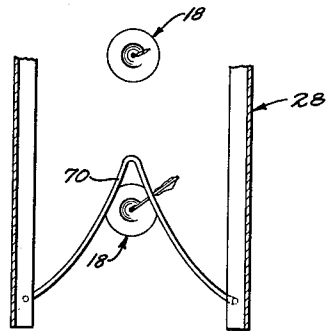


Fig. 3

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ROADWAY SIGNAL DEVICE RETRIEVER

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This invention relates to a roadway signal device retriever and more particularly to a metallic roadway signal device retriever wherein metallic roadway signal devices are picked up from the road surface by a magnetic device and conveyed to a haulage vehicle.

Roadway signal devices are used to alert motorists of recently painted lines on the roadway. The signal devices are positioned at spaced intervals on the road surface adjacent the newly painted lines and remain on the road surface until the paint has dried. Recent improvements in the method and apparatus for painting the lines on the road surface have increased the speed at which the paint is applied to the road surface. The method of positioning and retrieving the signal devices has not kept pace with these improvements.

Of more importance, however, is the manner in which the signal devices are now being picked up or retrieved from the road surface. The vehicle used to retrieve the signal devices has a platform extending laterally therefrom on which a workman is stationed. The platform is usually built close to the road surface and the vehicle is steered so that the workman can reach out and manually retrieve the signal devices.

This method of retrieving signal devices is extremely hazardous in that the workman stationed on the platform is not protected from oncoming vehicles and the laterally extending platform is an unnatural structure unfamiliar to the average motorist. There have been instances where the platform has been struck by oncoming vehicles and the workman either killed or seriously injured. With my roadway signal device retriever this unsafe practice of stationing a workman on the laterally extending platform is eliminated. In fact, with my retriever it is no longer necessary to require manual retrieving of the signal devices.

Briefly, my invention includes a retriever connected to the rear of a haulage vehicle. The retriever includes a magnetic member adjacent the road surface that picks up the metallic signal devices and deposits them on the upper conveying run of the endless conveyor. The conveyor conveys the signal devices up to the haulage compartment of the vehicle. With this arrangement the haulage vehicle straddles the newly painted lines and the signal devices positioned adjacent thereto and the magnetic member picks up the devices from the roadway as the magnetic device passes thereover.

My improved retriever is especially suitable to be used with metallic roadway signal devices as described and claimed in my patent entitled "Signal Device," U.S. Patent No. 3,016,035 dated January 9, 1962. It should be understood that although my retriever is described herein and illustrated retrieving signal devices similar to that disclosed in my Patent No. 3,016,035, my retriever device is also suitable for use with other types of metallic roadway signal devices.

Accordingly, the principal object of this invention is to provide a signal device retriever that picks up the signal devices over which it passes.

Another object of this invention is to provide a signal device retriever that has a magnetic member that picks up the signal devices and positions them on a conveyor.

The method and apparatus which comprise this invention accomplish the foregoing and other functions in a novel way as will now be explained. Further features, objects and advantages will either be specifically pointed out or become apparent when, for a better understanding

of the invention, reference is made to the following written description, taken in conjunction with the accompanying drawings which form a part hereof, and in which:

FIGURE 1 is a perspective view of my retriever connected to a haulage vehicle.

FIGURE 2 is a view in section illustrating my magnetic tail pulley and the guide means for the flexible staff of the signal device.

FIGURE 3 is a top plan view of the guide member which deflects the flexible staff of the signal device.

FIGURE 4 is a fragmentary top plan view of the conveyor and illustrates the laterally extending wings which direct the signal devices toward the tail pulley.

Referring to the drawings and particularly to FIGURE 1 there is illustrated my signal device retriever generally designated by the numeral 10. A haulage vehicle 12 has a haulage compartment 14 into which the signal devices are deposited.

The retriever 10 is connected to a trailer hitch 16 extending from the frame of vehicle 12. In FIGURE 1 signal devices 18 similar to those illustrated and described in my Patent No. 3,016,035 are shown positioned on the road surface adjacent a newly painted line 20. The wheels of the truck 12 straddle both the painted line 20 and the signal devices 18 and as the truck 12 progresses down the roadway the signal devices 18 are picked up by means of retriever 10 and deposited in the haulage compartment 14 of truck 12.

The signal devices 18 have a base member 22 and a flexible staff portion 24 with a flag 26 secured thereto. The flexible staff 24 may be bent relative to the base 22, as is clearly described in my previously mentioned patent.

The retriever 10 has a frame 28 with suitable lateral cross members (not shown). Rotatably secured to the frame 28 adjacent one end is a head pulley 30. Wheels 32 and 34 are nonrotatably secured to an axle 36 and the axle 36 is, in turn, rotatably secured to an end portion of frame 28 in a conventional manner so that the wheels 32 and 34 and axle 36 are supported by frame 28 and rotatable relative to the frame 28.

Nonrotatably secured to the axle 36 is a tail pulley 38 which is fabricated of a series of magnets longitudinally secured or imbedded in the cylinder so that the outer surface of tail pulley 38 will attract magnetic members as subsequently described. Reeved around the head pulley 30 and the tail pulley 38 is an endless conveyor belt 40 which is fabricated of nonmagnetic material and preferably has corrugations 42 to provide an uneven or waffle like outer surface so that the signal devices will not slide as they are conveyed thereon. The endless belt 40 is maintained in tension between the head pulley 30 and tail pulley 38 by means of a suitable take-up device (not shown) that adjusts the head pulley 30 relative to tail pulley 38 and tensions the belt 40 therebetween. The endless belt 40 defines a conveying run 44 and a return run 46. The signal devices 18 are conveyed up the inclined conveying run 44, as later described.

A bracket 48 is rigidly secured to the sides of frame 28 and connecting members 52 and 54 depend therefrom. The members 52 and 54 are preferably of tubular construction and portions of the trailer hitch 16 are inserted in the respective tubular members 52 and 54 and secured therein by means of bolts 56. In this manner my retriever 10 is connected to the rear of vehicle 12 and is arranged to follow behind the vehicle 12 and straddle both the newly painted line 20 and the signal devices 18.

A pair of side boards 60 and 62 are secured to the respective sides of frame 28 by means of brackets 64. The side boards 60 and 62 are arranged to prevent the signal devices 18 from falling off the side of the endless belt 40 as they are conveyed upwardly to the vehicle haulage compartment 14. Secured to the side walls of frame

member 28 are depending wings 66 and 68. The wings 66 and 68 are spaced slightly above the road surface and serve to guide the signal devices 18 inwardly toward the tail pulley 38. The side members of frame 28 have secured thereto and depending therefrom a V shaped guide member 70 (see FIGURES 2 and 3) which is arranged to bend or deflect the flexible staff 24 of signal device 18 so that the metallic base 22 is picked up by the tail pulley 38.

A chute 72 is secured to a side wall of frame 28 and extends longitudinally therewith. The chute 72 terminates adjacent the road surface and is used to convey signal devices 18 from the vehicle haulage compartment 14 to the road surface. With this arrangement the signal devices 18 may be easily and quickly positioned adjacent to the newly painted line by means of the chute 72.

Operation

My improved roadway signal device retriever 10 operates as follows. The retriever 10 is secured to the trailer hitch 16 and rear of vehicle 12 so that it follows essentially the same path as vehicle 12. As the vehicle 12 moves along the roadway the wheels 32 and 34 rotate at substantially the same angular velocity as the wheels of vehicle 12. The tail pulley 38 being secured to the live axle 36 rotates at the same angular velocity as the wheels 32 and 34 and propels the belt 40 around tail pulley 38 and head pulley 30.

As the vehicle 12 straddles both the newly painted line 20 and signal devices 18 and progresses down the roadway, the wings 66 and 68 direct the signal devices toward the under side of my retriever device 10 in proximity with the magnetic tail pulley 38. The guide means 70 deflects the staff member 24 so that the metallic base member 22 passes under the tail pulley 38. The tail pulley 38, due to the permanent magnets secured to its cylindrical surface, picks up the signal device 18 by the base portion 22. The signal device 18 adheres to the tail pulley 38 although the conveyor belt 40 is positioned therebetween. The signal device 18 which adheres to the tail pulley 38 rotates about the axis of axle 36 with the tail pulley 38 until the signal device 18 is positioned on the conveying run 44 of conveyor belt 40. The signal device 18 is then disengaged from the magnetic tail pulley 38 and progresses up the inclined conveying run 44 and is discharged into the vehicle haulage compartment 14.

It is apparent with my improved signal device retriever that it is now possible to retrieve metallic roadway signal devices without manually picking up the signal devices from the road surface and manually depositing them in the haulage compartment of a vehicle. My improved signal device retriever is secured to the rear portion of the vehicle and does not create any hazard to oncoming vehicles. My improved signal device retriever also includes a means for easily and simply positioning the signal devices at spaced intervals along a newly painted line on the road surface.

According to the provisions of the patent statutes, I have explained the principle, preferred construction, and mode of operation of my invention and have illustrated and described what I now consider to represent its best embodiment. However, I desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. A metallic roadway signal device retriever for attachment to a vehicle comprising, conveying means including an endless conveyor for said metallic roadway signal devices, support means for said conveying means, connecting means for connecting said support means to a vehicle in a manner that one end of said conveying means is positioned to discharge into said vehicle and the other end of said conveying means is positioned adjacent the road surface, a tail pulley for said conveying means, said tail pulley positioned adjacent said road surface, said tail pulley including magnetic means arranged to pick up said metallic roadway signal devices and position said signal devices on said conveying means, and propelling means for said conveying means arranged to discharge said metallic roadway signal devices positioned on said conveying means into said vehicle.

2. A metallic roadway signal device retriever for attachment to a vehicle as set forth in claim 1 in which said magnetic means comprises a cylinder having a magnetic field, said cylinder connected to said propelling means in a manner that said cylinder rotates as said propelling means propels said conveying means thereby picking up said metallic roadway signal devices from the road surface and positioning said signal devices on said conveying means.

3. A metallic roadway signal device retriever for attachment to a vehicle as set forth in claim 1 in which said propelling means includes a pair of wheels and an axle rotatable therewith, said axle connected to said conveying means in driving relation therewith.

4. A metallic roadway signal device retriever for attachment to a vehicle comprising a conveying means including an endless conveyor belt having an upper conveying run and a lower return run, support means for said conveyor belt, connecting means for connecting said support means to a vehicle in a manner that one end of said conveying means is positioned to discharge into said vehicle and the other end of said conveying means is positioned adjacent the road surface, a tail pulley for said conveyor belt positioned adjacent said road surface, said tail pulley including magnetic means arranged to pick up metallic roadway signal devices and position said signal devices on said conveying run of said conveyor belt, and propelling means for said conveyor belt arranged to orbit said endless conveyor belt and discharge said metallic roadway signal devices positioned on said conveying run into said vehicle.

5. A metallic roadway signal device retriever for attachment to a vehicle as set forth in claim 4 in which said support means includes a frame member, a head pulley rotatably connected to said frame member adjacent the discharge end of said conveying means, a tail pulley, said endless conveyor belt reeved around said head pulley and said tail pulley thereby forming an upper conveying run and a lower return run.

6. A metallic roadway signal device retriever as set forth in claim 5 in which said propelling means includes a pair of wheels and an axle rotatable therewith, said tail pulley coaxially positioned on said axle in rotatable relation therewith so that rotation of said wheels rotates said tail pulley and orbits said endless conveyor belt.

7. A metallic roadway signal device retriever as set forth in claim 4 in which said magnetic means comprises a cylinder having a magnetic field, said cylinder serving as a tail pulley around which said endless conveyor belt orbits.

8. A metallic roadway signal device retriever as set forth in claim 7 in which said tail pulley is rotated by said propelling means so that a metallic roadway signal device adhering to said tail pulley is picked up from the road surface and positioned on the conveying run of said conveyor belt.

9. A metallic roadway signal device retriever for attachment to a vehicle comprising an endless conveyor belt having an upper conveying run and a lower return run, a support frame for said conveyor belt, a head pulley carried by said frame adjacent one end, an axle carried by said frame adjacent the other end, a tail pulley coaxially positioned on and rotatable with said axle, a pair of wheels nonrotatably secured to the ends of said axle, said endless conveyor belt reeved around said head pulley and said tail pulley so that upon rotation of said wheels said endless belt orbits about said head pulley, connecting means for connecting said support frame to the rear

portion of a haulage vehicle in a manner that said conveyor head pulley is positioned to discharge into a haulage compartment of said vehicle, said tail pulley positioned adjacent the road surface and said pair of wheels in contact with the road surface so that movement of said vehicle rotates said wheels and orbits said endless conveyor belt, said tail pulley having a magnetic field of sufficient intensity to attract metallic roadway signal devices so that metallic roadway signal devices on the road surface adhere to the side of said tail pulley adjacent the road surface and said tail pulley upon rotation positions said metallic roadway signal devices on said conveyor belt upper conveying run, said conveyor belt upper conveying run arranged to convey said metallic roadway signal devices and discharge said metallic roadway signal devices in said vehicle haulage compartment.

10. A metallic roadway signal device retriever as set forth in claim 9 in which said support frame is at an inclined angle to the road surface and a chute is connected to said frame member to provide a means for conveying metallic roadway signal devices from said vehicle haulage compartment to said road surface.

11. A metallic roadway signal device retriever as set forth in claim 9 in which said frame members each has a gathering wing extending outwardly therefrom, said gathering wings arranged to guide said roadway signal devices toward said tail pulley.

12. A metallic roadway signal device retriever as set forth in claim 9 in which said frame has a guide means extending forwardly therefrom to bend the flexible staff of a roadway marker downwardly so that said roadway signal device base portion is picked up by said magnetic tail pulley.

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