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Barbieri

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[54] **SAFETY APPARATUS FOR GARBAGE TRUCKS**

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Related U.S. Application Data

[60] Continuation-in-part of Ser. No. 870,704, July 7, 1969, abandoned, Division of Ser. No. 732,252, May 27, 1968, Pat. No. 3,503,531.

[52] **U.S. Cl.** .....**214/83.3,** 123/198 D

[51] **Int. Cl.** **B65f 3/00**

[58] **Field of Search** .....214/83.3, 82, 503; 123/198 D

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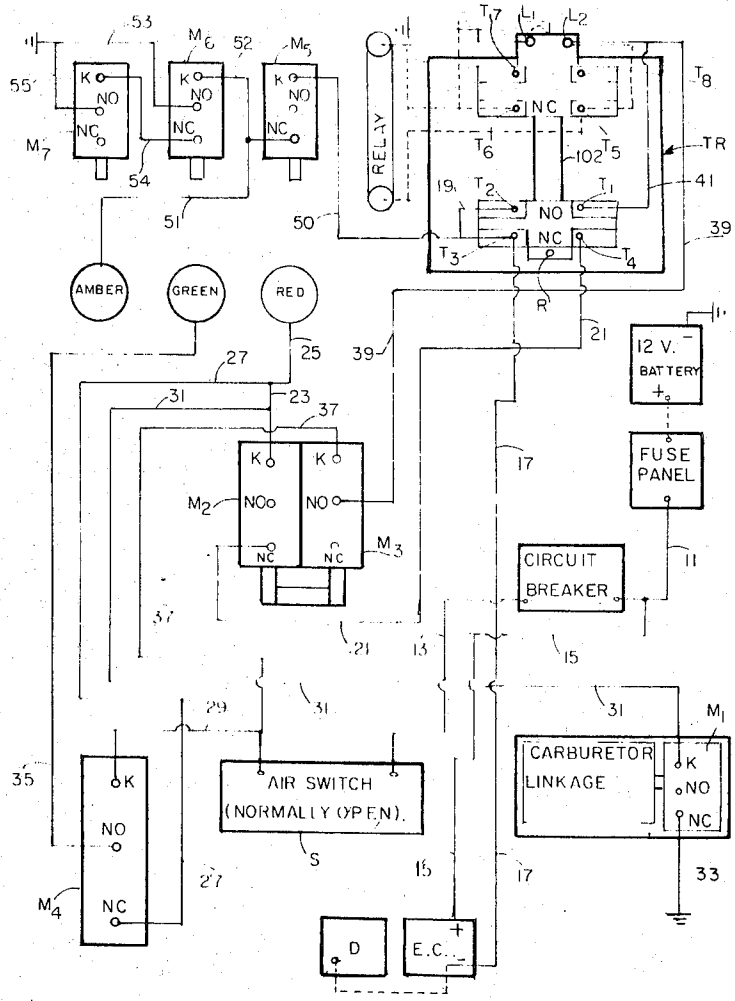
[57] **ABSTRACT**

Safety apparatus for controlling refuse packing cycles in a garbage truck, said garbage truck having a transmission and a refuse packing assembly in operative association with one another, said transmission having a plurality of operative positions. The safety apparatus comprises a first system operatively associated with the transmission for initiating a refuse packing cycle, a second system operatively associated with the transmission when the latter is in one of the operative positions for permitting the refuse packing cycle to continue to normal completion, and a third system operatively associated with the transmission when the latter remains in another of the operative positions for immediately terminating the refuse packing cycle prior to completion of the latter.

7 Claims, 2 Drawing Figures



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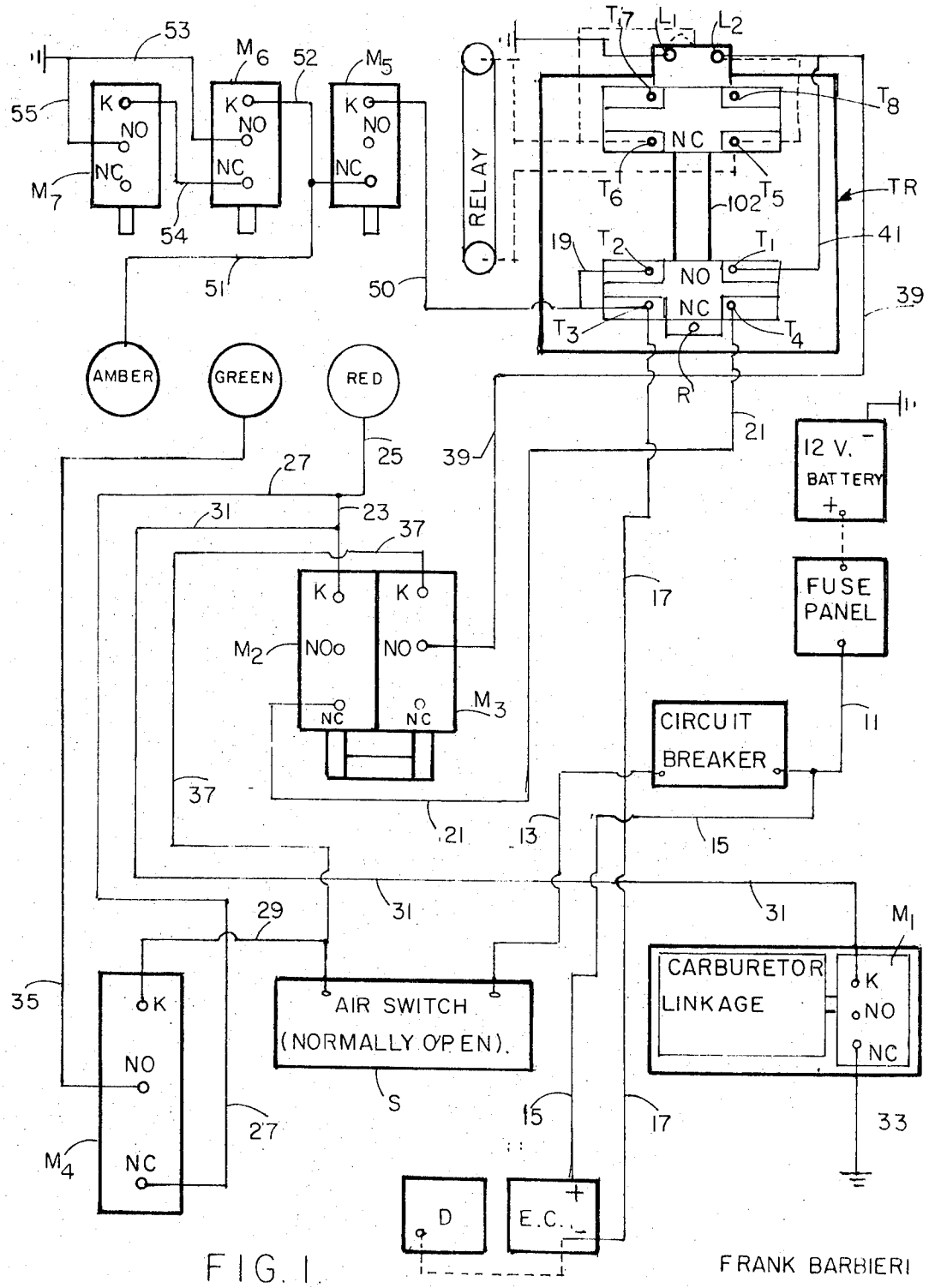

FIG. 1.

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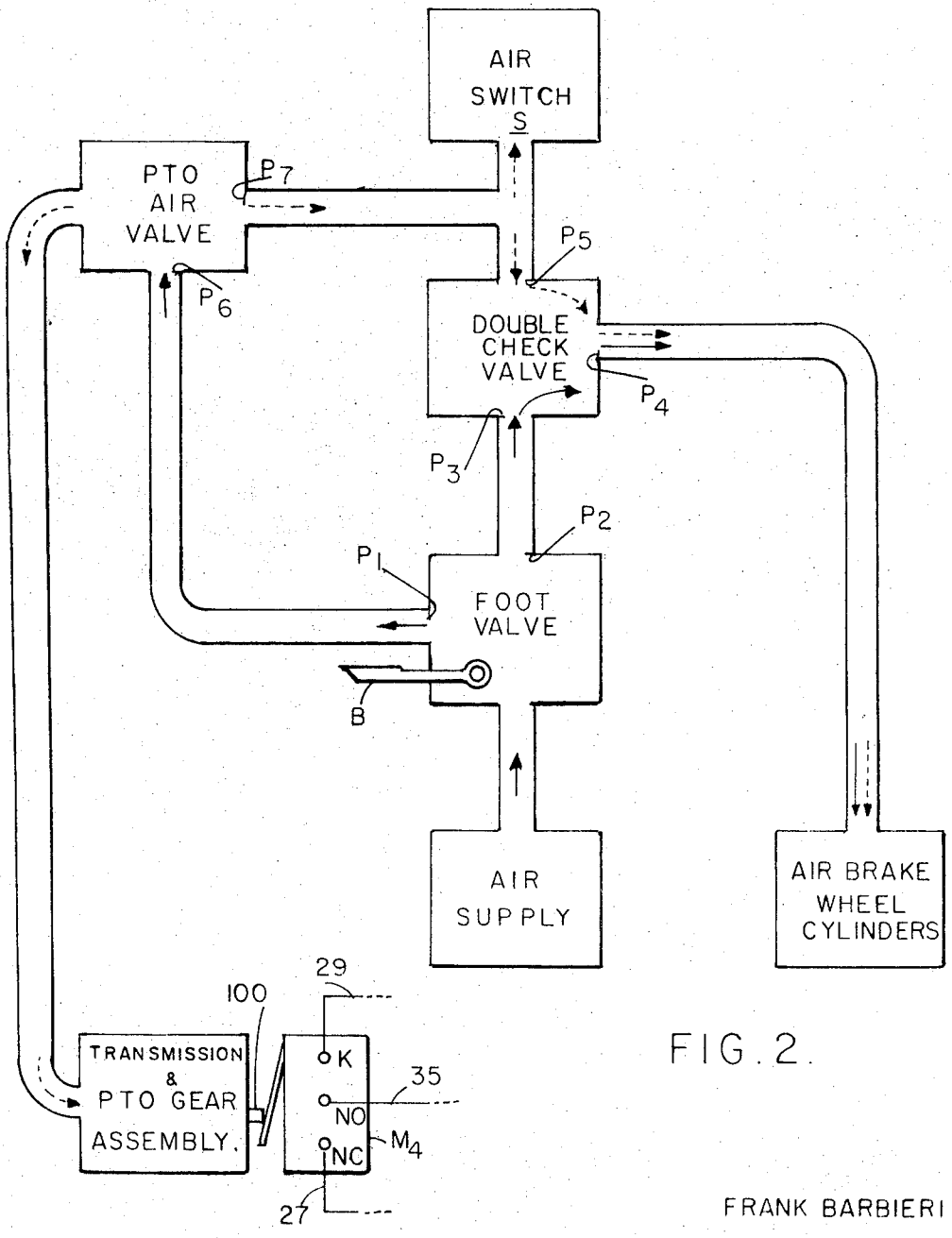

FIG. 2.

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SAFETY APPARATUS FOR GARBAGE TRUCKS

CROSS-REFERENCE TO RELATED APPLICATIONS

This is a continuation-in-part to my co-pending U.S. Pat. application, Ser. No. 870,704, filed on July 7, 1969, now abandoned, which is a divisional application of U.S. Pat. application Ser. No. 732,252, filed on May 27, 1968, now U.S. Pat. No. 3,503,531.

BACKGROUND OF THE INVENTION

The present invention relates generally to the packing cycle assembly in garbage trucks and the like, and more particularly to safety apparatus for controlling the refuse packing cycles in a garbage truck.

The conventional garbage truck is generally provided with a refuse packing cycle assembly into which refuse may be deposited and thereafter compacted and mechanically carried into the refuse collection area internally of the garbage truck. Generally, the driver of a garbage truck stops the truck at a specific location at which refuse is to be collected, activates a power take-off unit while the transmission of the truck is in "drive" and then shifts the truck or transmission of the latter into "neutral". The refuse collection personnel externally of the truck thereafter may activate a control lever which is operatively associated with the transmission for compacting the refuse deposited into the refuse depository in the truck. If the refuse collection personnel and driver of the truck operate the refuse packing assembly in a manner as precisely described above, then there is little chance that damage may occur to the truck mechanism since the truck mechanism is adapted for specifically accommodating the specific sequential operation aforementioned.

However, as may often be the case, due to human error, the precise sequence of operating the refuse packing cycle assembly aforementioned may not necessarily be effected and, therefore, it is very possible to damage the truck mechanism because of the excessive load that may be subjected to the transmission. Thus, it is vital that either the refuse packing cycle assembly be activated in a manner as precisely described above to obviate the possibility of damage to the truck mechanism or, alternatively, there must be provided a safety apparatus or system which readily senses the improper sequential operation of the refuse packing cycle assembly and will immediately terminate the refuse packing cycle prior to completion thereof before any damage can be subjected to the transmission or truck mechanism in general.

The garbage truck of conventional variety is not provided with a safety system for immediately terminating the refuse packing cycle upon sensing an improper sequential operation of the refuse packing cycle assembly and, therefore, as indicated above the garbage truck of conventional variety is potentially subject to being damaged because of human error.

SUMMARY OF THE INVENTION

Accordingly, it is an ojbect of the present invention to provide safety apparatus for controlling refuse packing cycles in a garbage truck.

It is another object of the present invention to provide safety apparatus for controlling refuse packing cycles in a garbage truck, which safety apparatus readily senses improper sequential operation of the refuse packing cycle assembly and immediately upon sensing an improper sequential operation the safety apparatus acts to immediately terminate the refuse packing cycle prior to completion of the latter before any damage can be subjected to the transmission and truck mechanism.

It is still a further object of the present invention to provide safety apparatus for controlling refuse packing cycles in a garbage truck having electrical circuitry operatively associated with the refuse packing cycle assembly and transmission of the garbage truck, which safety apparatus electrically deactivates the refuse packing system immediately upon sensing improper sequential operation of the refuse packing assembly.

It is a further object of the present invention to provide safety apparatus for controlling refuse packing cycles in a garbage truck having pneumatic circuitry operatively associated with electrical circuitry for controlling not only the refuse packing cycles but also for controlling the air brakes of the truck.

It is still a further object of the present invention to provide safety apparatus for controlling refuse packing cycles in a garbage truck having electrical circuitry operatively associated with the carburetor linkage for "stalling" the truck whenever the driver of the truck inadvertently depresses the accelerator while the transmission is in neutral to prevent racing of the truck engine while the engine is cold.

To this end, the present invention relates to safety apparatus for controlling refuse packing cycles in a garbage truck, the safety apparatus comprising first means operatively associated with the truck transmission for initiating a refuse packing cycle, second means operatively associated with said transmission when the latter is in neutral for permitting the refuse packing cycle to continue to normal completion, and third means operatively associated with said transmission when the latter remains in drive for immediately terminating the refuse packing cycle prior to completion of the latter.

BRIEF DESCRIPTION OF THE DRAWINGS

With the above and additional objects and advantages in view as will hereinafter appear, this invention comprises the devices, combinations, and arrangements of parts hereinafter described and illustrated in the accompanying drawings of a preferred embodiment in which:

FIG. 1 illustrates a schematic electrical diagram of the safety apparatus pursuant to the present invention; and

FIG. 2 illustrates the pneumatic circuit operatively associated with the electric circuit illustrated in FIG. 1.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to the drawings and more particularly to FIG. 1 thereof, the present invention includes a plurality of switches such as air and micro-switches electrically coupled with a 12 volt battery source of the garbage truck, with a timing device or time delay relay such as that manufactured by the General Electric Company Model no. CR2820B, and also with the truck transmission and the refuse packing assembly, for controlling the latter through the intermediary of a pneumatic circuit as illustrated in FIG. 2. The refuse

packing assembly is generally conventional and includes at least one control lever which is mounted externally of the truck, at the tailgate of the latter, and because of its conventional nature is not illustrated in the drawings or described further herein.

As illustrated in FIG. 1, there is provided a 12 volt battery, illustratively designated as such, which is connected to a fuse panel, illustratively designated as such, the latter being electrically coupled to a circuit breaker, illustratively designated as such, through the intermediary of line 11. The circuit breaker is electrically coupled with an air switch S, which is normally open, through the intermediary of a line 13. The fuse panel is also electrically coupled to an engine coil EC through the intermediary of a line 15, at the negative side of the engine coil, which engine coil is connected to the truck distributor D through an existing line illustrated in phantom.

The negative side of the engine coil EC is electrically coupled to the terminal T3 of a time delay relay TR through the intermediary of a line 17. A line 19 interconnects the terminal T3 and the terminal T2 of the time relay TR, whereas a line 21 interconnects the terminal T4 of the time relay TR to the normally closed terminal of a micro-switch M2. The common terminal K of the micro-switch M2 is electrically coupled to a red light source through the intermediary of lines 23 and 25.

A line 27 interconnects the common terminal K and the normally closed terminal NC of the micro-switch M4. The common terminal K of the micro-switch M4 is electrically coupled to the other terminal of the air switch S through the intermediary of line 29. A line 31 also interconnects the common terminal K of the micro-switch M2 and the common terminal K of the micro-switch M1. The normally closed terminal of the micro-switch M1 is illustrated as electrically being grounded. The normally opened terminal NO of the micro-switch M4 is electrically coupled to a green light source through the intermediary of a line 35.

Line 37 acts to electrically interconnect the common terminal K of the micro-switch M3 to the line 29 and the latter said terminal of the air switch S. The normally opened terminal of the micro-switch M3 is electrically coupled to the terminal L2 of the time relay TR through the intermediary of a line 39. Line 41 acts to electrically interconnect the terminal L2 of the time relay TR and the terminal T1 of the time relay TR. The terminals L1 and L2 and terminals T5 and T6 are also electrically coupled with one another through the intermediary of the lines which are illustrated in phantom in FIG. 1, the use of phantom lines generally indicating the already existing lines in the time relay TR as supplied by the manufacturer.

Also illustrated in FIG. 1 are a plurality of micro switches, M5, M6 and M7 which are electrically coupled to one another and to the time relay TR through the intermediary of the lines 50–55, the function of the micro switches M5–M7 being clarified further below.

As illustrated in FIG. 2 there is provided a pneumatic circuit which is operatively associated with the electric circuit as illustrated in FIG. 1, which pneumatic circuit includes an air supply, illustratively designated as such, a conventional foot valve, illustratively designated as such, and pneumatically communicating with the air supply, a power take-off air valve, illustratively designated as such, having a control lever for use by the driver inside the truck, not shown, for initiating a refuse packing cycle in the garbage truck, the aforementioned air switch S pneumatically communicating with the power take-off air valve, and a power take-off gear assembly in conventional operative association with the transmission and pneumatically communicating with the power take-off air valve, which power take-off gear assembly is operatively associated with the micro-switch M4 for activating the latter. Also illustrated in FIG. 2 is a conventional double check valve, illustratively designated as such, which pneumatically communicates with the air switch S, the power take-off air valve and the foot valve for pneumatically operating upon the air brake wheel cylinders.

In operation, the driver of the garbage truck generally turns on the ignition and current is thereby supplied from the 12 volt battery through the fuse panel and circuit breaker into the air switch S which is normally opened and also into the engine coil EC through line 15 and in turn into the distributor D. The engine thereby begins to idle and warm up. Should the driver for some reason or inadvertently depress the gas peddle or accelerator (not shown) while the transmission is in neutral, the current which flows to the terminal T3 of the time relay TR through the intermediary of line 17 from the engine coil passes across the normally closed terminal of the micro-switch M2 from T4 and line 21.

The current thereafter will issue through the common terminal K of the micro-switch M2 into line 31 and into the common terminal K of the micro-switch M1 and issue through the normally closed terminal of the micro-switch M1 through the line 33 and "short-out" the circuit to "stall" the engine, since as discussed above the normally closed terminal of the micro-switch M1 is illustrated as being grounded through the intermediary of line 33 as are the negative side of the 12 volt battery and the terminal L1 of the time relay TR. The illustrative use of the grounds generally denote that the terminals of the specific apparatus with which the grounds are associated are simply at a common potential as those skilled in the art readily appreciate.

The carburetor linkage, illustratively designated as such, is operatively associated with the micro-switch M1 in that the linkage maintains the micro-switch M1 in a depressed condition wherever the accelerator peddle is not depressed and, therefore, the normally closed terminal of the micro-switch M1 will remain open and will not conduct any current to the grounded line 33. Immediately, however, upon depressing the accelerator peddle, the carburetor linkage permits the micro-switch M1 to revert to its normal conditions thus conducting current to the normally closed terminal which is grounded through the intermediary of the line 33 and causing the circuit to short-out.

Of course, the micro-switches M2 and M3 are commonly associated with the shift lever (not shown) of the transmission in that the shift lever of the transmission acts to depress and release alternately the micro-switches M2 and M3 whenever the shift lever is shifted between the drive and neutral positions. Thus, when the shift lever is shifted from neutral to drive the normally open and normally closed terminals respectively

change condition and, therefore, thenormally closed terminal of the micro-switch M2 will open and prevent current from issuing through the common terminal K of the micro-switch M2 into the line 31 and thus prevent the micro-switch M1 from short circuiting the system. It should be clear, therefore, that whenever the driver inadvertently depresses the accelerator peddle when the transmission is in neutral the micro-switches M2 and M1 cooperatively with the carbureter linkage act to short circuit the system. However, whenever the transmission is in drive the micro-switch M2 prevents the micro switch M1 from short circuiting the system.

The utilization of the above circuitry is a protective measure for preventing the driver from "racing" the engine whenever the latter is "cold" and thus will always short-out the system anytime the driver depresses the accelerator when the transmission is in neutral.

After the truck has "warmed up" and the truck is on the open road for collecting refuse, the driver simply depresses the brake peddle B which in turn acts to open the port P2 of the foot valve thereby permitting pressurized air to be supplied to the air brake wheel cylinders through the intermediary of the double check valve, the latter which opens at the port P3 for permitting the pressurized air to exit through the port P4 thereof. In this manner, the truck is brought to a safe stop opposite the location where refuse is to be collected.

At this point, the driver of the truck may initiate a refuse packing cycle and should do so in a particular sequence. The particular sequence comprises opening of the power take off air valve while the transmission is in drive and thereafter shifting the transmission into neutral within a preferred time interval, in the instance of the preferred embodiment 6 seconds, and should this particular sequence be followed the refuse packing cycle will continue to completion. However, due to human error, it is quite possible that the driver may not initiate the packing cycle pursuant to the particular sequence aforementioned and in failing to do so may subject the transmission and truck mechanism to damage. For example, the driver may first shift the transmission into neutral and thereafter open the power take-off air valve, or alternately, the driver may properly leave the transmission in drive and open the power take-off air valve yet fail to shift the transmission into neutral within the preferred 6 second interval.

The purpose of incorporating the 6 second time interval is to prevent the refuse collection personnel externally of the truck from activating the external control lever for the refuse packing assembly while the truck transmission is in drive. Obviously, as those skilled in the art readily appreciate, should the refuse collection personnel complete the second stage for initiating a packing cycle, the first stage being the opening of the power take-off air valve by the driver in the truck, while the transmission is in drive, the transmission will be subjected to an overload and be damaged thereby. It should be equally clear that the refuse packing assembly is prevented from operating when the power take-off air valve is opened while the transmission is in neutral so as to prevent the refuse packing assembly from being utilized while the engine is cold after initially having been started up.

In that instance in which the driver properly initiates the first stage of a refuse packing cycle, the power take-off air valve being opened while the transmission is in drive, this being the proper sequence, current at 12 volts will pass from line 13 into the air switch S. The power take-off air valve having been opened supplies air to the air switch S causing the latter to close. The power take-off air valve alsosupplies air to the power take-off gear assembly thereby causing the power take-off gear to become engaged in a conventional manner with the transmission gears, the movement of the latter gears having been stopped upon braking of the truck, the power take-off gear assembly including a displaceable plunger shaft 100 engageable with the micro-switch M4.

As the power take-off gear engages the transmission gears the plunger 100 displaces and acts to close the normally open terminal of the micro-switch M4. With the air switch S closed, current at 12 volts passes out of the latter into the common terminal K of the micro-switch M4 through the line 29 and out of the micro-switch M4 through the now closed normally open terminal of the micro-switch M4 into the line 35 and to the green light. Furthermore, current passes out of the air switch S into line 37 and into the common terminal K of the micro-switch M3. At this point, the normally open terminal of the micro-switch M3 is closed and, thus, 12 volt current will pass into line 39 and into the terminal L2 of the time relay TR.

The terminals L1 and L2 are maintained in a closed position relative to one another for conducting current and, therefore, current will pass from the terminal L2 into the terminal L1, the latter which is at a common potential with the negative side of the battery, and acts to energize the time relay TR. Upon energization of the time relay TR, the latter which includes a displaceable plunger 102, there is effected displacement of the plunger 102 over a preferred time interval, which time interval can be selectively determined through the intermediary of a regulating terminal R provided on the time relay TR. In the instance of the preferred embodiment, the maximum time interval for displacement of the plunger 102 is determined at 6 seconds and, therefore, the normally closed terminals T3 and T4, and T5 and T6 will remain closed until the 6 second displacement of the plunger is effected, whereas the normally open terminals T1 and T2 will remain open during the 6 second displacement of the plunger 102.

Thus, if the driver then shifts the transmission from drive to neutral within the 6 second interval, then current which issues from the terminal L2 into the line 41 and thereafter into the terminal T1 will terminate at T1 since the terminals T1 and T2 remain in a normally open position and, moreover, when the driver shifts the transmission into neutral within the 6 second interval he causes the normally open terminal of the micro-switch M3 to open, the latter being maintained closed when the transmission is in drive and, thus, a flow of current will cease at the common terminal K of the micro-switch M3. Although current flow ceases to flow to the time relay TR the flow of current to the distributor does not cease there having been no shorting out of the electrical system and, therefore, the refuse packing assembly remains in an operative condition and readily permits the refuse collection personnel externally of

the truck to initiate the second stage of a refuse packing cycle, which refuse packing cycle will then complete itself. Upon completion of the refuse packing cycle the truck driver then simply shifts the transmission back into drive and releases the power take-off air valve so as to close the latter thus causing the air switch S to revert to its normally open position.

In the instance where the driver fails to shift the transmission into neutral within the 6 second interval after having opened the power take-off air valve, then the displacement of the plunger **102** of the time relay TR will complete itself and, therefore, the terminals T1 and T2 will close relative to one another from their normally open position thus causing current to flow from the line **41** into the line **19**, into the line **17** and into the negative side of the engine coil, thus, supplying the latter with 12 volts which in turn is supplied to the engine distributor D. The supply of 12 volts to the engine distributor D acts to short out the electrical system of the truck thus, immediately terminating any possibility for refuse packing cycle to complete. In this respect, since the distributor D functions on a maximum of 3 volts and since the distributor D is grounded through the "points" of the ignition system, the excessive voltage of 12 volts acts to short-out the entire electrical system of the truck thereby terminating the refuse packing cycle.

In that instance where the driver attempts to open the power take-off valve while the transmission is in neutral, the air switch S will close because of the supply of air from the power take-off valve thereto and, thus, current at 12 volts will pass to the line **37** and into the common terminal K of the micro-switch M3. Current, however, will terminate at the common terminal K of the micro-switch M3 since the normally open terminal of the latter micro-switch is maintained normally open while the transmission is in neutral. However, current also passes to the line **29** and to the common terminal K of the micro-switch M4.

Since the micro-switch M4 is mechanically operatively associated with the power take-off gear assembly and the displaceable plunger shaft **100** thereof, there is a time lapse before the plunger **100** can actually close the normally open terminal of the micro-switch M4 and open the normally closed terminal of the latter micro-switch.

Thus, because of the lapse in time, current passes from the common terminal K of the micro-switch M4 into the normally closed terminal of the latter micro-switch and out from the latter through the line **27** and into the red light. Furthermore, current is passed to the common terminal K of the micro-switch M2 and out of the normally closed terminal of the latter micro-switch into the line **21** and thereafter into the terminal T4 of the time relay TR. Since the terminal T3 and T4 are normally closed, current will pass from the terminal T4 into the terminal T3 and thereafter into the line **17** and into the negative side of the engine coil. This current is 12 volt current and, as discussed above, when 12 volt current is passed to the negative side of the engine coil, the 12 volt current is also supplied to the distributor which is only capable of withstanding 3 volts and thus the distributor which is grounded through the intermediary of the points of the ignition system acts to short-out the entire electrical system of the truck, this when the driver attempts to open the power take-off air valve whenever the transmission is in neutral.

As is often the case, the tailgate (not shown in the drawings) is mounted upon the truck body and because of the excessive loads of refuse that is usually placed in the tailgate, the latter which acts as a receptacle for the refuse packing assembly, it is possible and often the case that the tailgate may loosen from the truck body and upon loosening present a serious hazard to personnel involved when the refuse packing cycle is initiated because of the extremely heavy loads involved. Thus, in order to prevent this situation there is interposed between the tailgate and the truck body, a micro-switch M5 which is electrically coupled to the terminal T3 of the time relay TR, which micro-switch M5 is maintained depressed thereby maintaining the normally closed terminal thereof in an open position. Therefore, as long as the tailgate remains tightly secured to the truck body, the micro-switch M5 will remain depressed and prevent current from discharging therefrom.

However, as soon as the tailgate loosens from the truck body, the micro-switch M5 will then cause the normally closed terminal to revert from its open position to its normally closed position and thereby conduct current through the line **51** into the amber light. As soon as the amber light is lighted, the latter acts to signal the driver that there is prevalent a dangerous condition in that the tailgate has loosened from the truck body. However, should the driver fail to realize, that the amber light has been lit and should the driver initiate a refuse packing cycle and, furthermore, should the collection personnel externally of the truck shift the control lever which constitutes the second stage of refuse packing cycle initiation, then the control lever, which is one of two control levers provided on the truck and which are operatively associated respectively with the micro-switches M6 and M7, acts on the respective micro-switch M6 or M7 and causes current to pass from the normally closed terminal of the micro-switch M5 into the line **52** and thereafter into the micro-switch M6 at the common terminal K of the latter and out of the normally open terminal, which is closed by the shifting of the associated control lever externally of the truck, into the line **53** which is illustrated as being grounded.

If the control lever for the packing cycle which is operatively associated with the micro-switch M7 is thrown however, then the current supplied to the micro-switch M6 through the line **52** will pass out of the micro-switch M6 through the normally closed terminal thereof into the common K of the micro-switch M7 and into the normally open terminal of the micro-switch M7. In the latter instance where the lever associated with the micro-switch M7 has been thrown the normally open terminal is closed thereby supplying current to the line **55** which in turn is grounded and, thus, in effect shorts-out the entire electrical system of the truck. Thus, the provision of the micro-switches M5–M7 constitutes a safety sensing device which is operatively associated with the remainder of the electrical circuitry aforementioned for signalling a structural defect and potentially hazardous condition in the truck.

As discussed above, the foot valve illustrated in FIG. **2** is simply a conventional valve operatively associated

with the brake peddle B and includes 2 ports, one of which P2 is opened and closed by depressing and releasing respectively the brake peddle B and the other of which P1 remains in a constant open condition in communication with the port P6 of the power take-off air valve. The double check valve illustrated in FIG. 2 is provided with a plunger which is displaceable between two extreme positions for opening one port P3 and closing the other P5, whenever the power take-off air valve is in a closed condition. However, when the power take-off valve is open air will flow out of the port P7 of the latter and into the port P5 of the double check valve thereby causing the plunger to close the port P3 and open the port P5 respectively of the double check valve.

Thus, the air flow from the air supply traverses two routes one of which is illustrated as the solid arrows and the other by the arrows in phantom. The significance of the double check valve permits the driver to release the brake peddle B after he has open the power take-off air valve thereby permitting air to flow into the port P5 and out of the port P4 respectively of the double check valve and thereafter into the air brake wheel cylinders. In this manner, the air brake wheel cylinders will remain locked for so long a period as the power take-off air valve remains open without the necessity for the driver to maintain his foot on the brake peddle B. Of course, immediately upon releasing the power take-off valve, the driver again simply places his foot on the brake peddle B to maintain the supply of air to the air brake wheel cylinders and of course as soon as the driver releases his foot from the brake peddle B, the foot valve closes the port P2 of the latter and air is prevented from reaching the air brake wheel cylinders and the truck may be appropriately driven.

Numerous alterations of the structure herein disclosed will suggest themselves to those skilled in the art. However, it is to be understood that the present disclosure relates to a preferred embodiment of the invention which for purposes of illustration only and not to be construed as a limitation of the invention.

What is claimed:

1. Safety apparatus for controlling refuse packing cycles in a garbage truck; said garbage truck having a transmission and a refuse packing assembly in operative association with one another; said transmission having a plurality of operative positions including a neutral position and a drive position; said safety apparatus comprising first means operatively associated with said transmission for initiating a refuse packing cycle; second means operatively associated with said transmission when said transmission is in said neutral position for permitting said refuse packing cycle to continue to normal completion; third means operatively associated with said transmission when said transmission remains in said drive position for terminating said refuse packing cycle prior to completion of said refuse packing cycle; and timing means operatively associated with said transmission and said first, second and third means for determining a maximum time interval between which said transmission must be properly shifted from said drive position to said neutral position after said first means has initiated said packing cycle such that said second means permits said refuse packing cycle to continue to completion upon proper shifting of said transmission within said maximum time interval, and said third means terminates said refuse packing cycle upon failure of said transmission to be properly shifted within said maximum time interval.

2. Safety apparatus as claimed in claim 1 wherein said timing means includes a displaceable plunger and a plurality of electric terminals operatively associated with said plunger for being selectively opened and closed respectively by the latter, alternately over a period defined by said maximum time interval.

3. Safety apparatus as claimed in claim 2 wherein said first means includes a pneumatic circuit, and including a plurality of switches operatively associated with said timing means, two of said switches being commonly associated with said transmission and operated when the latter is shifted between said neutral and drive positions, another switch being operatively associated with said pneumatic circuit through the intermediary of said transmission, and still another switch being constituted as an air switch and operatively associated directly with said pneumatic circuit.

4. Safety apparatus as claimed in claim 3 wherein said pneumatic circuit includes a pressurized gas supply, a treadle valve in communication with said gas supply, a packing cycle control valve in communication with said treadle valve, a packing cycle control gear assembly operatively associated with said transmission and operatively communicating with said packing cycle control valve, and said air switch in communication with said packing cycle control valve.

5. Safety apparatus as claimed in claim 4 wherein the garbage truck is provided with air-responsive brakes, said pneumatic circuit further including a double-check valve interposed between and in communication with said threadle valve and packing cycle control valve, said air-responsive brakes being in communication with said double-check valve.

6. Safety apparatus as claimed in claim 1 including means for connecting said refuse packing assembly to said garbage truck, indicator means for signalling loosening of said refuse packing assembly from said garbage truck, and safety means for rendering said refuse packing assembly inoperative upon loosening of the latter from said garbage truck.

7. Safety apparatus as claimed in claim 1 wherein said garbage truck is provided with an engine and a depressible accelerator for racing said engine, and including means for stalling said engine when said accelerator is depressed while said transmission is in neutral position.

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