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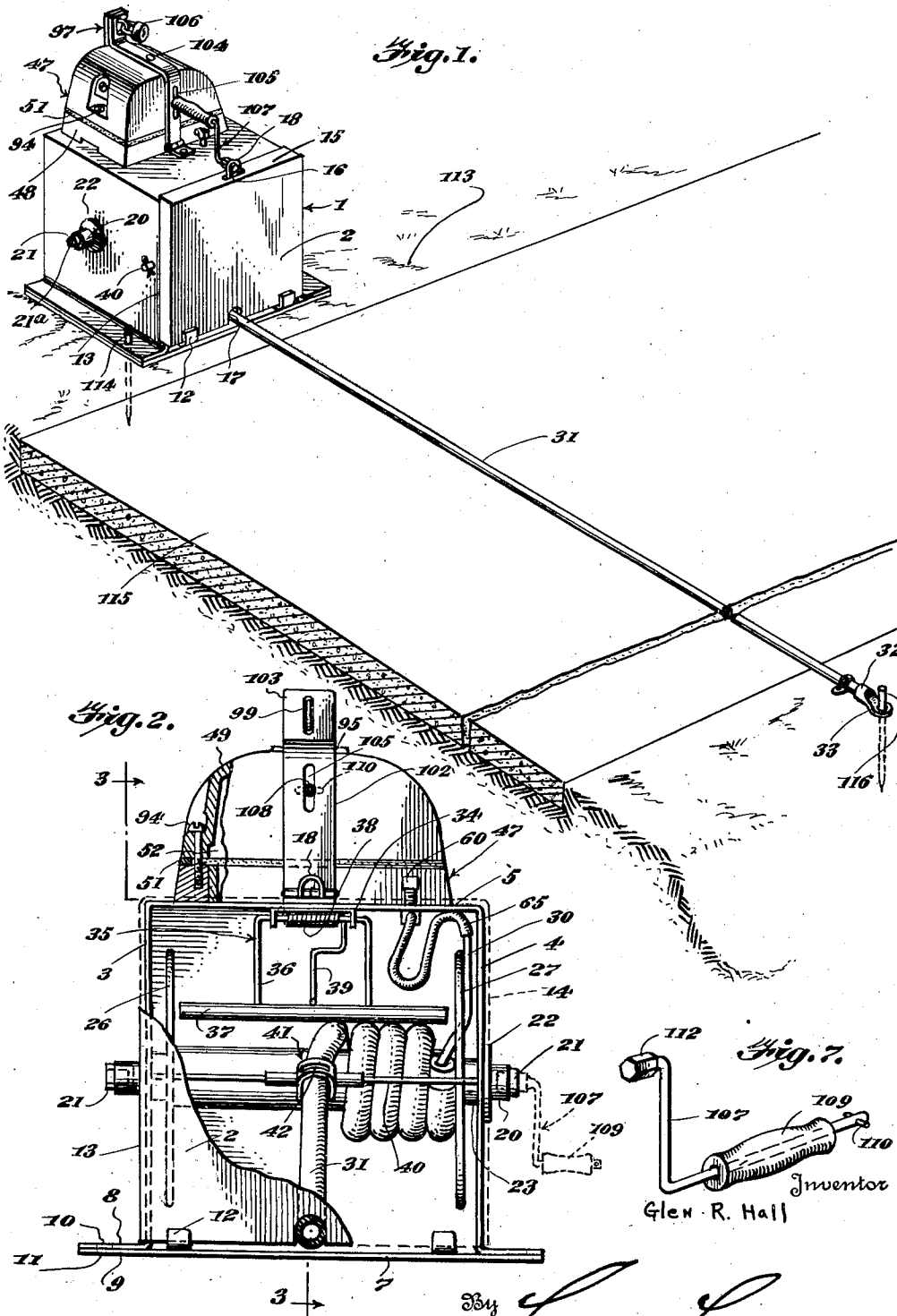
G. R. HALL

2,403,277

TRAFFIC COUNTER

Filed Nov. 17, 1941

2 Sheets-Sheet 1



Inventor
Glen R. Hall

Lacey, Lacey, Attorneys

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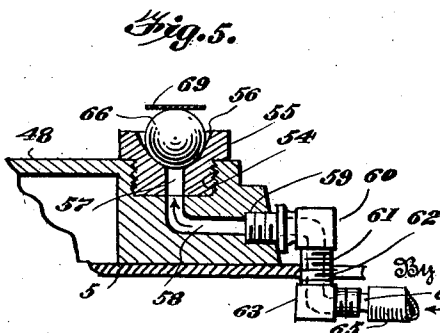
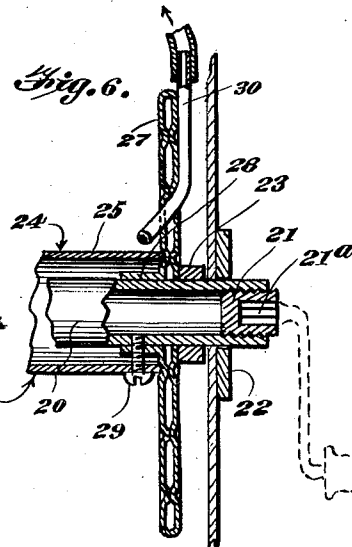
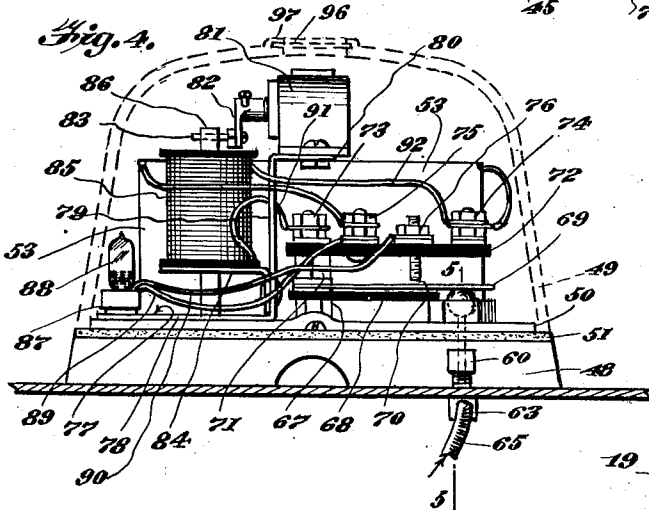
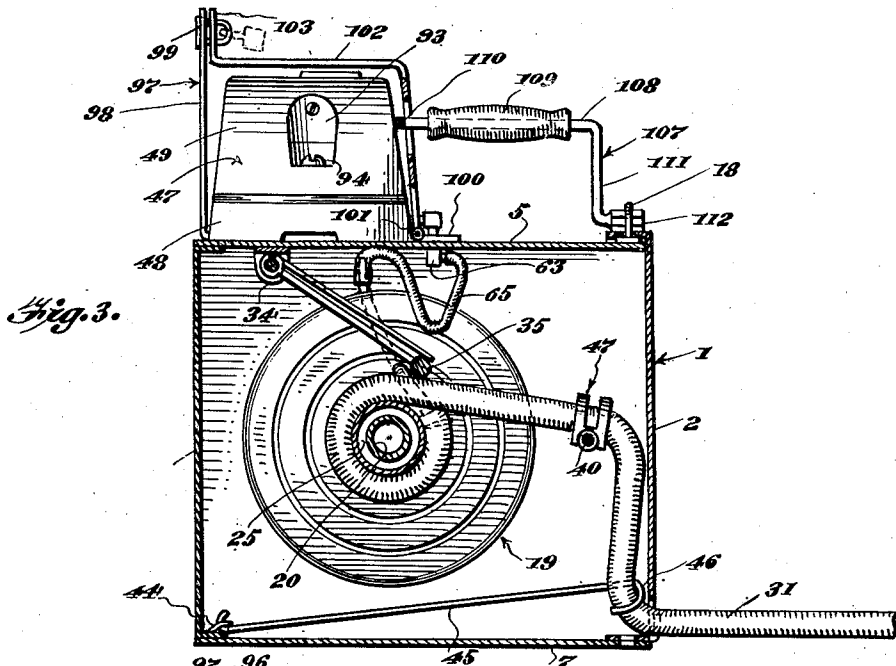
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Inventor
Glen R. Hall

Lacey & Lacey
Attorney

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TRAFFIC COUNTER

Glen R. Hall, Uhrichsville, Ohio

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4 Claims. (Cl. 60—62.5)

1

This invention relates generally to counting machines and more particularly to an improved traffic counter.

One object of the invention is to provide a traffic counter which may be quickly and easily installed on the berm of a road and which will be operative for counting vehicles passing along the road so that a survey may be made to determine how heavily the road is traveled.

Another object of the invention is to provide a device of this character which is simple in construction and which will be highly efficient in use.

A further object of the invention is to provide a traffic counter employing extremely sensitive electrically operated means for the counting unit.

A further object of the invention is to provide a traffic counter having a reel for containing the compressible hose employed, said hose being extendible across the road and portions thereof being compressible upon engagement by automobile tires for providing air pressure for operating the electrically operated means, said hose being contained within the casing employed about the reel when not in use.

And still another object of the invention is to provide a counting machine of the character mentioned employing improved air valve mechanism the use of which will dispense with supplementary release valves.

And another object of the invention is to provide, in a traffic counter, safety switch means for power control.

Other objects of the invention not specifically mentioned hereinbefore will become apparent during the course of the following description.

In the drawings:

Figure 1 is a perspective view showing my improved traffic counter as it would appear installed and ready for use,

Figure 2 is an enlarged vertical sectional view, partly in elevation, of the device,

Figure 3 is a longitudinal vertical sectional view on the line 3—3 of Figure 2 looking in the direction indicated by the arrows,

Figure 4 is an enlarged side elevation showing the counting unit and the electrically operated means for operating said counting unit,

Figure 5 is an enlarged detail sectional view of the air valve mechanism, on the line 5—5 of Figure 4,

Figure 6 is an enlarged detail sectional view showing the construction of the reel with the inlet tube mounted thereon, and

Fig. 7 is a perspective view of the combined handle and crank.

2

In the drawings similar numerals of reference will be employed to designate like parts throughout the views.

The numeral 1 indicates generally the casing of my improved traffic counter. The casing 1 is substantially cube shaped and is formed of sheet metal or other suitable material. As best seen in Figures 1 to 3 of the drawings, the casing 1 includes a removably mounted front wall 2, integral side walls 3 and 4, a top wall 5 and a rear wall 6. The casing is closed at its bottom by a bottom wall 7. As best seen in Figures 1 and 2, the side walls 3 and 4 are turned laterally and outwardly at their lower end margins to define flanges 8 which overlie side margins 9 of the bottom wall 7. The flanges 8 and side margins 9 are formed, respectively, with aligned openings 10 and 11, to receive a fastening device. Mounted on the forward margin of the bottom wall 7 are retaining clips 12 which are of substantially reversed L shape and which have their upstanding portions engageable with portions of the lower margin of the front wall 2, for retaining the lower end of said front wall in proper operative position.

The front wall 2, as best seen in Figures 1 and 3, includes side flanges 13 and 14 and a top flange 15, said top flange having a longitudinal slot 16 formed medially of its length and width. Formed in the lower margin of the front wall 2 medially of its width is a substantially inverted U-shaped opening 17. The opening 16 normally receives therethrough a keeper 18 which is mounted on the forward margin of the top wall 5 medially of its width. The keeper 18 is of substantially inverted U-shape and serves a two-fold function, as will be described in more detail hereinafter. The side flanges 13 and 14 overlie the front margins of the side walls 3 and 4 so that the front wall will be firmly held in operative position.

Rotatably mounted within the casing 1 is a reel which is shown generally at 19. The reel 19, as best seen in Figures 2 and 6, includes a tubular inner shaft 20 which is threaded at its outer ends to receive closure plugs 21, said closure plugs having hexagonal shaped sockets 21^a. The outer end portions of the shaft 20 are projected through the walls 3 and 4, and said walls are provided with bushings 22 which surround said outer end portions and provide reinforcement for said walls. Mounted on the inner tubular shaft is a spacer 23.

The reel 19 includes a spool 24 which comprises a tubular mandrel 25 and heads 26 and 27, said heads being disposed at the opposite ends of the mandrel and in spaced relation to the walls 3

and 4. As best seen in Figure 6, the head 27, which is typical, is formed of pressed sheet metal and is of double thickness. The head 27 is formed, axially of the mandrel and inwardly thereof, with a tubular inwardly directed flange 28 which is engaged with the shaft 20. A screw 29 is projected through the end portion of the mandrel and through the flange 28 and into the shaft 20 for locking the head 27 on the mandrel and locking the reel on the shaft 20. Mounted on the head 27 and extending radially thereon and past the circumferential edge of said head is an inlet tube 30. The inlet tube is mounted on the outer surface of the head 27 but has its inner end portion projecting obliquely through the head and terminating in close spaced relation to the end portion of the mandrel. Normally wound about the mandrel 25 of the spool of the reel 19 is a flexible rubber tube or hose 31. The hose 31 has its inner end operatively connected with the lower end of the inlet tube 30 and said tube or hose 31 is of a sufficient length to extend entirely across a roadway or the like. Normally closing the hose at its outer end is a plug 32, said plug having a flattened portion 33 which is apertured to receive a fastening device.

Mounted on the inner surface of the top wall 5 medially of its length is a yoke 34 and swingingly mounted in said yoke is a follower 35, said follower having a U-shaped portion 36, with its bight portion hingedly mounted in said yoke 34, and a follower rod 37 which is substantially circular in shape and which is secured to the outer ends of the arms of the U-shaped portion. The follower rod is of a length sufficient to extend throughout the major portion of the length of the mandrel and so to overhang the hose coils about the said mandrel. Normally urging the follower 35 into engagement with the hose is a coiled spring 38 which surrounds the bight portion of the follower between the arms of the yoke 34. The spring 38 has an end portion 39 which extends into engagement with the mid-portion of the rod 37. It will thus be seen that, by the use of the follower 35, the hose 31 will always be kept under tension so that accidental unreeling thereof may not take place.

Mounted in the casing 1 and extending between the side walls 3 and 4 thereof near their corresponding forward ends and in spaced parallel relation to the reel 19 is a guide rod 40. The guide rod 40 has its opposite ends anchored in said side walls 3 and 4 and has mounted thereon a guide sleeve 41, said guide sleeve including a guide element 42 and a mounting sleeve 43. The guide element 42 is adapted to slidably receive the tube or hose 31 therethrough so that said hose will always be properly directed on or away from the reel 19. The sleeve 43 will, of course, be slidable on the rod 40 so that the device may follow the hose as it winds or unwinds laterally on the reel.

As best seen in Figure 3 of the drawings, the central portion of the bottom flange of the rear wall 6 is raised and apertured to define a lug 44 and swingingly mounted in said lug 44 is a restraining rod 45. The rod 45 is formed of heavy wire or other suitable material and extends throughout the major portion of the depth of the casing. Said restraining rod has a hook 46 disposed at its forward end and said hook is engaged partially about the hose 31 at a point immediately above and inwardly of the opening 17, after the tube is placed across a highway. The purpose of the restraining rod 45 is to prevent

additional portions of the tube from being pulled off the reel after the counter is locked.

The counting mechanism and the mechanism for operating it will now be described in detail.

The counting mechanism includes a housing 47 and said housing includes a base 48 and a removable cover 49. The housing is mounted on the top wall 5 of the casing 1 at the rear thereof and said housing extends throughout the major portion of the length of said top wall and throughout substantially half its depth. The base is preferably cast as a single unit and is substantially rectangular in shape. The base, as best seen in Figure 4, is rabbeted to define a shoulder 50 and normally positioned on the shoulder is a gasket 51 which is of rubber or other suitable material. The gasket is normally confined between the cover 49 and the base and serves effectively to prevent entry of moisture to the interior of the casing. The base 48 is provided with a recess 52 in which is normally mounted a battery 53. Formed in the base 48 between the recess and the outer front edge of said base is an internally threaded socket 54 and screwed into the socket 54 is a removable valve insert 55. The valve insert 55 is formed with a hemispherical valve seat 56 and an axial opening 57 which communicates between the opening 56 and the lower end of the insert. The base is formed with an opening 58 which communicates between the socket 54 and the side wall of said base. The opening 58, adjacent its outer end, is enlarged to define an internally threaded socket 59 and screwed in the socket 59 is an inverted L-shaped elbow 60. The head of the elbow 60 has a nipple 61 screwed into its lower side face and said nipple 61 extends through an opening 62 in the top wall 5. An elbow 63 is screwed on the nipple 61 and carries a reduced nipple 64 which receives the inner end of a relatively small flexible tube 65, said tube being relatively short in length and having its opposite end adapted for engagement over the upper end of the inlet pipe 30 after the hose has been unwound the desired length from the reel.

Normally positioned in the valve seat 56 of the insert 55 is a ball valve 66.

Mounted on the base 48 in longitudinal alignment with the valve insert 55 and substantially medially of the length of the housing is a standard 67 which is formed of brass or other suitable material. Mounted on the standard 67 and extending between said standard and the valve insert 55 is an insulating strip 68 and mounted on said standard in close spaced relation above the insulating strip is a resilient strip 69. As best seen in Figures 4 and 5, the resilient strip extends from the standard laterally so that its end portion overlies the ball valve 66 in engagement therewith. A contact 70 is fixed on the resilient strip 69 substantially medially of its length. Above the resilient strip 69 the standard carries spacers 71 and mounted on the standard above said spacers 71 is an insulating strip 72. Carried on the insulating strip 72 at its inner and outer ends are binding posts 73 and 74. A binding post 75 is mounted on the strip 72 in close spaced relation to the post 74. A contact screw 76 is also mounted on the strip 72 and is disposed between the posts 74 and 75. The contact screw has its lower end disposed for engagement with the contact 70 on the resilient strip 69.

Mounted on the upper surface of the base 48 and in alignment with the valve insert 55 and the standard 67 is a bracket 77. The bracket 77 in-

cludes a lower horizontal leg 78, a vertical leg 79 and an upper horizontal leg 80. Mounted on the leg 80 of the bracket 77 is a counting unit 81 which is of conventional construction and which includes an operating lever 82 which carries, at its free end, an operating pin 83. Screwed or otherwise suitably secured to the lower portion of the vertical leg 79 of the bracket 77 is a horizontal bracket 84 and mounted on the horizontal bracket 84 is a solenoid 85. The solenoid includes a plunger 86 which has its upper end apertured to receive the pin 83.

Mounted on the horizontal leg 78, near its outer end, is a socket 87 and normally positioned in the socket is a mercury switch 88. The terminal wires of the mercury switch are indicated at 89 and 90. The terminal wire 89 is connected to the binding post 75 while the terminal wire 90 is connected with the contact post 75. One terminal of the solenoid 85 is connected to the post 73 by a wire 91 and the other terminal of said solenoid is connected to the post 74 by a wire 92. One terminal of the battery 53 is connected to the post 74 and the other terminal of said battery is connected to the post 75. It will now be seen that the coil of the solenoid 85 is connected with the battery 53 through the resilient strip 63, the contact post 75 and the mercury switch 88.

The cover 49 is recessed at its opposite ends, as indicated at 93, to provide shoulders through which are projected clamping screws 94, said clamping screws extending through the gasket 51 and into the base for tightly clamping the cover in place. The cover 49 is formed, medially of its top wall, with a sight opening 95 and said sight opening is normally closed by a pane 96, said pane being disposed above the window of the counting unit 81 for permitting observation of the characters on the counting unit disks without removal of the cover.

In order to prevent unauthorized removal of the cover 49, and consequent tampering with the counting unit or its operating mechanism, I provide structure including a bracket 97 which is of substantially L shape and which is mounted on the top wall 5 medially of its width. The bracket 97 includes a vertical leg 98 which is disposed in substantially the same vertical plane with the rear wall 6 and which carries a keeper 99 in its upper end, said keeper being forwardly presented. The bracket also includes a horizontal leg 100 which is fastened to the upper surface of the wall 5 and which, adjacent its forward end, is provided with hinge loops 101. It will be understood that the horizontal leg 100 extends beneath the base 48, said base being formed with a slot for the purpose. Swingly connected with the horizontal leg 100 is an inverted L shaped locking strap 102. The locking strap 102 carries a hinge loop at its lower end which cooperates with the hinge loops 101 for hingedly connecting the strap with the leg 100. Near its upper end the strap 102 is formed with an upwardly bent portion 103 which is slotted to receive the keeper 99. The horizontal portion of the strap 102 is formed with a sight opening 104 to permit observation of the unit 81 beneath the pane 96. The vertical portion or leg of the strap 102 is formed with a slot 105, the purpose for which will be set forth in more detail hereinafter.

When the strap 102 is moved to locking position, as shown in Figure 3, with the keeper 99 projecting through the portion 103, a padlock 106 is passed through the keeper for locking the strap in place. After this has been done, it will be im-

possible to remove the cover with the result that the unit 81 and the operating mechanism therefor will be effectively protected.

At 107 is shown a combined crank and handle. The crank and handle 107 includes a relatively long portion 108 on which is freely mounted a handle member 109. Extending through the free end of the portion 108 is a locking pin 110. The combined crank and handle 107 includes a handle or short portion 111 which terminates at its lower end in an enlarged hexagonally shaped right angularly disposed wrench and lock 112.

When the device is to be placed in locked operative position, the end of the portion 108 is engaged through the slot 105, before the strap 102 is moved to locked position. Also, the wrench and lock 112 is engaged in the keeper 18 after, of course, the front wall 2 has been placed in closed position with said keeper extending through the opening 16 in the flange 15. When the strap 102 is locked in position, as previously described, the combined crank and handle will also be locked in the position shown in Figure 3 and will serve the two-fold function of locking the front wall 2 in position and also providing a carrier to permit ready carrying of the device from place to place.

A brief description of the manner of operation of my improved traffic counter will now be set forth.

The device is first moved to the spot along the roadway where the survey is to be made. The casing is placed on the berm 113 of the road and is kept in position by fastening devices 114 which are passed through the openings 10 and 11 in the flanges 9 at each side of the casing. The casing is placed with the front wall 2 removed and the flexible hose 31 is then withdrawn across the roadway at right angles to said roadway, the roadway being indicated at 115. The free end of the hose 31 is made fast by means of a fastening device 116 which is projected through the apertured end 33 of the plug 32. The free end of the tube 65 is then connected to the upper end of the inlet pipe 30. The tube is then hooked over the restraining rod 45, to prevent slippage, and the front wall 2 is locked in place. The device is then ready for use.

When the tires of a motor vehicle pass over with the hose 31, said hose will be instantaneously compressed with the result that air will be forced therethrough and through the tube 65 into the valve insert 55, it being understood, of course, that the air will flow through the nipples, elbows and openings hereinbefore described. Air flowing into the insert 55 will impinge against a portion of the ball valve 66 and will urge said ball valve upwardly for shifting the resilient strip 69 upwardly and engaging the contact 70 with the lower end of the contact screw 76. The circuit to the solenoid 85 will be momentarily closed and the plunger 86 will be shifted upwardly for actuating the lever 82 and moving the counting mechanism once. The passage of the vehicle will thus be recorded. Attention is directed to the fact that, in view of the use of the ball valve, supplemental release valves will not be required to take care of excessive pressure, as the pressure is released as the ball moves upward. However, the pressure will be sufficient to keep the resilient strip 70 in raised position to make one contact for each axle of the vehicle so that a double movement of the counter will be made for each vehicle.

It should be understood that in lieu of the valve mechanism shown, a piston type valve may be used.

After the survey has been completed and it is desired to remove my improved traffic counter to another location, it is only necessary to disengage the crank and handle from the strap 102, after unlocking said strap, and remove the front wall. The wrench and lock 112 is then engaged in one of the sockets 21^a and the reel is rotated for reeling in the hose 31 after, of course, disconnecting the hose 65 from the upper end of the pipe 30 and releasing the hose from the restraining rod 45. After the hose has been reeled in, the front wall may be returned to its normal position and the crank and handle and strap returned to their respective locked positions, when the device may be readily carried to a new location.

In view of the fact that I have provided the mercury switch 88, effective control of the electric circuit may be had. In the event that the device should accidentally be tipped on its side, the mercury switch 88 will open the circuit and render the device inoperative.

It is believed that the construction and operation of my improved traffic counter will now be thoroughly understood.

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

1. A device of the character described including a casing, a reel mounted in the casing, said casing having a removable front wall, a housing on the casing, said housing having a cover, means movable to a position for retaining the cover against displacement from the housing, and means engageable with said first mentioned means and with a portion of the front wall in one position of the first mentioned means for retaining the front wall against displacement, the last mentioned means being displaceable from the front wall retaining position and movable to another position for engagement with the reel for rotating said reel, the last mentioned means also serving as a handle for carrying the casing and the housing.
2. A device of the character described, including a casing, a housing mounted on the casing, a reel mounted in the casing, said casing having a top wall and a removable front wall, a keeper on the top wall and engageable with the front wall, a removable cover for said housing, a bracket on the top wall, a strap connected with the bracket and movable to a position engageable with the bracket for locking the cover against displacement, said strap having a slot, a combined crank and handle having one end portion engageable in the slot and having its other end constituting a wrench, the wrench portion being

engageable in the keeper for holding the front wall against displacement when the other end is engaged in the slot and the combined crank and handle is in position to serve as a handle to carry the device, said crank and handle being displaceable to another operative position wherein its wrench portion engages in an end of the reel for rotating the reel when the combined crank and handle is turned.

3. A device of the character described, including a casing, a reel mounted in the casing and including an inner shaft, a spool about the inner shaft and including a mandrel and a pair of heads, said heads having flanges surrounding the inner shaft, fastener means extending through the mandrel and the flanges and into the inner shaft for locking the spool to the shaft, plugs closing the shaft at its ends and formed with sockets open at their outer ends for receiving a handle for turning the reel, a flexible hose wound about the mandrel, an inlet tube having a portion extending through the head for connection with the inner end of the flexible hose, means closing the outer end of the flexible hose, and a flexible tube in the casing having one end detachably connected with the outer end of the inlet tube and its other end adapted for connection with mechanism to be actuated when fluid in the hose is subjected to pressure.

4. A device of the character described, including a casing, a reel mounted in the casing and including an inner shaft, a spool about the inner shaft having a mandrel and a pair of heads, said heads having flanges surrounding the inner shaft, fastener means extending through the mandrel and the flanges and into the inner shaft for locking the spool to the shaft, plugs closing the shaft at its ends, one plug being formed with a socket for receiving a turning handle, a flexible hose wound about the mandrel, an inlet tube mounted on one of the heads of the spool and projecting radially past the circumferential edge thereof, said inlet tube having a portion extending through the wall of the head for connection with the inner end of the flexible hose, means closing the outer end of the flexible hose, a flexible tube in said casing having one end connected with the inlet tube and its other end adapted for connection with an instrument to be actuated when fluid in the hose is subjected to pressure, and a follower mounted in the casing and urged into engagement with portions of the flexible hose for frictionally holding said reel against turning.

GLEN R. HALL.