March 25, 1930. J. C. WOODFORD 1,752,048

AIR SERVICE STATION

Filed July 5, 1927

4 Sheets-Sheet 1

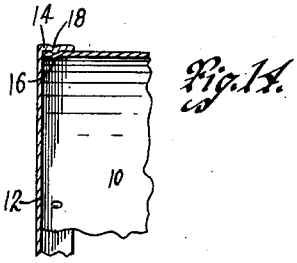


Fig. 14.

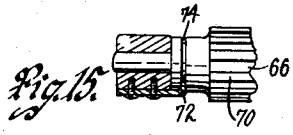


Fig. 15.

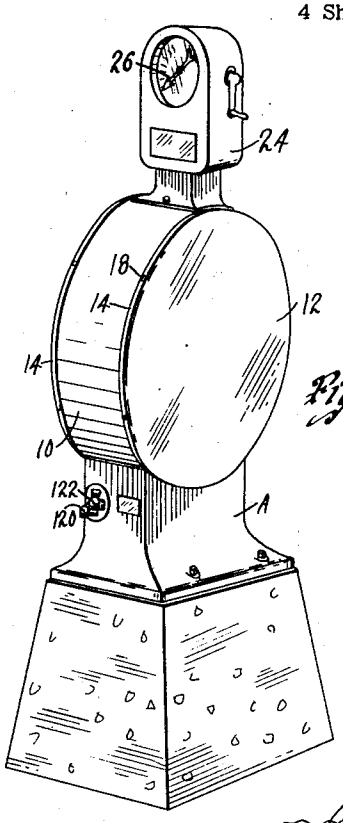


Fig. 1

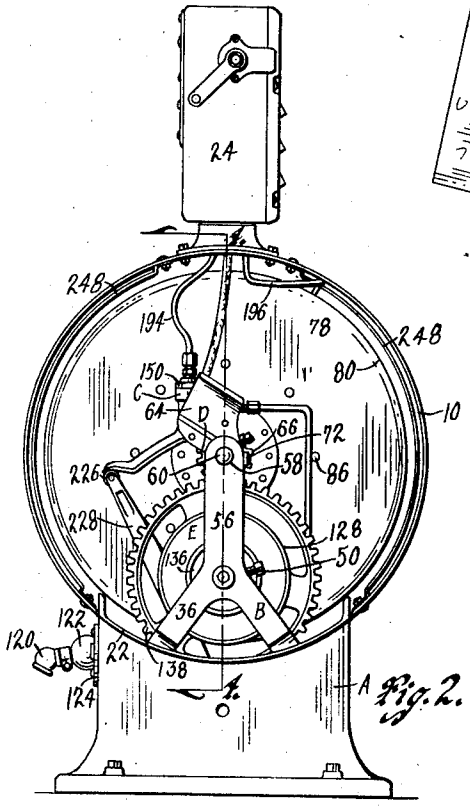


Fig. 2.

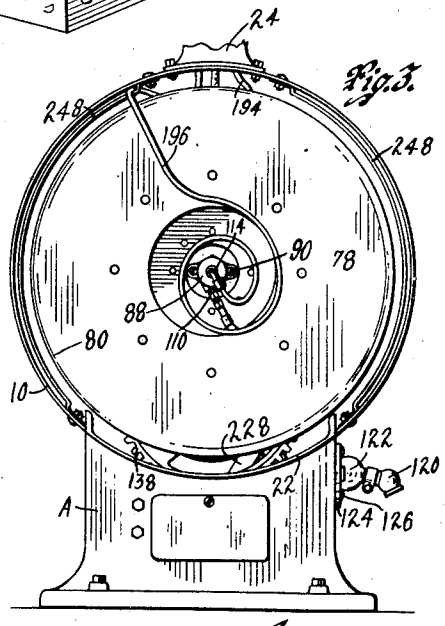


Fig. 3.

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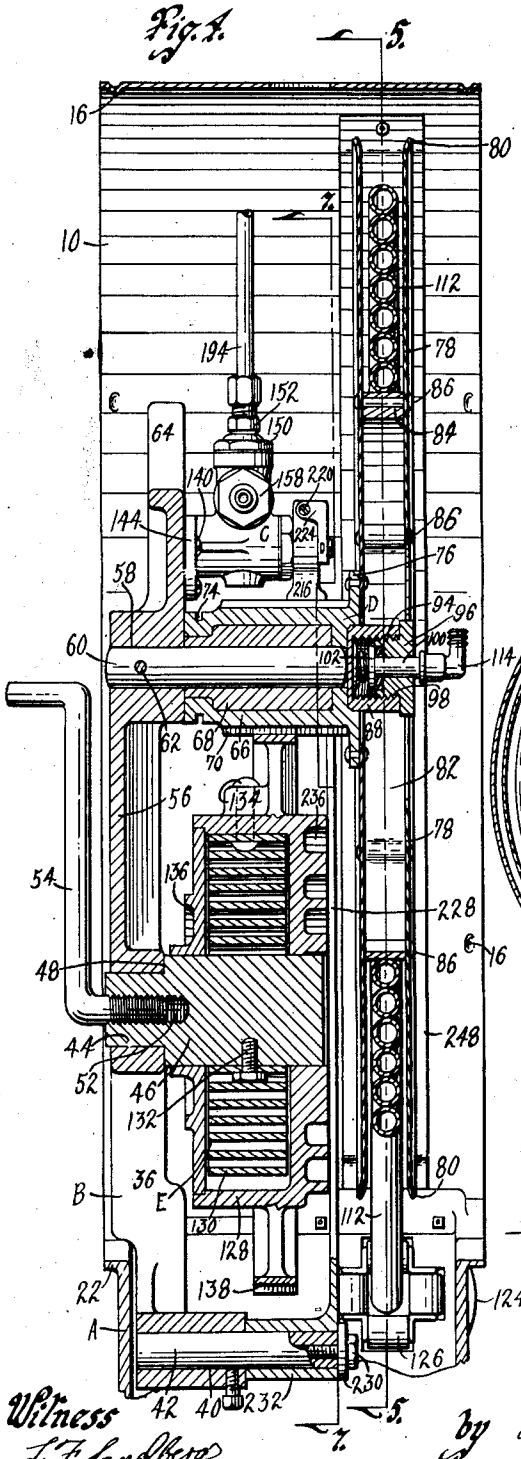
March 25, 1930. J. C. WOODFORD 1,752,048

AIR SERVICE STATION

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4 Sheets-Sheet 2

Fig. 4.



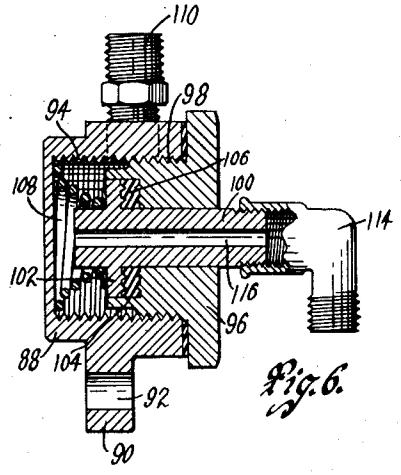


Fig. 6.

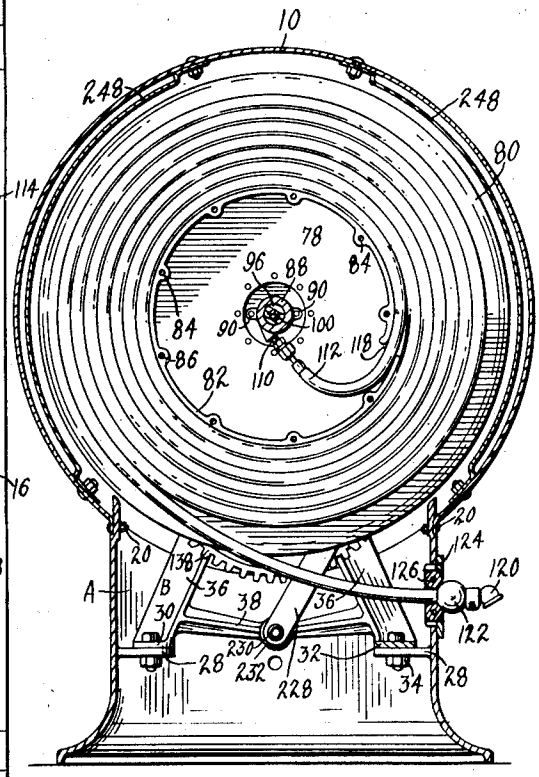


Fig. 5.

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AIR SERVICE STATION

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4 Sheets-Sheet 3

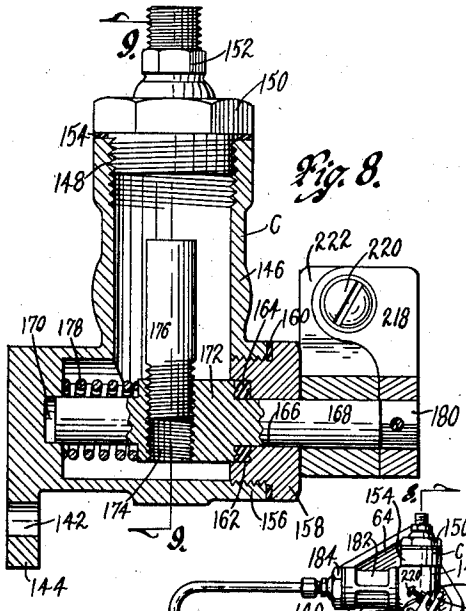


Fig. 8.

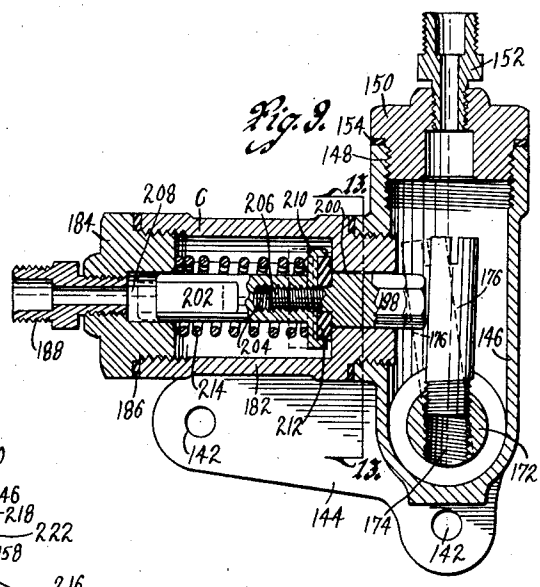


Fig. 9.

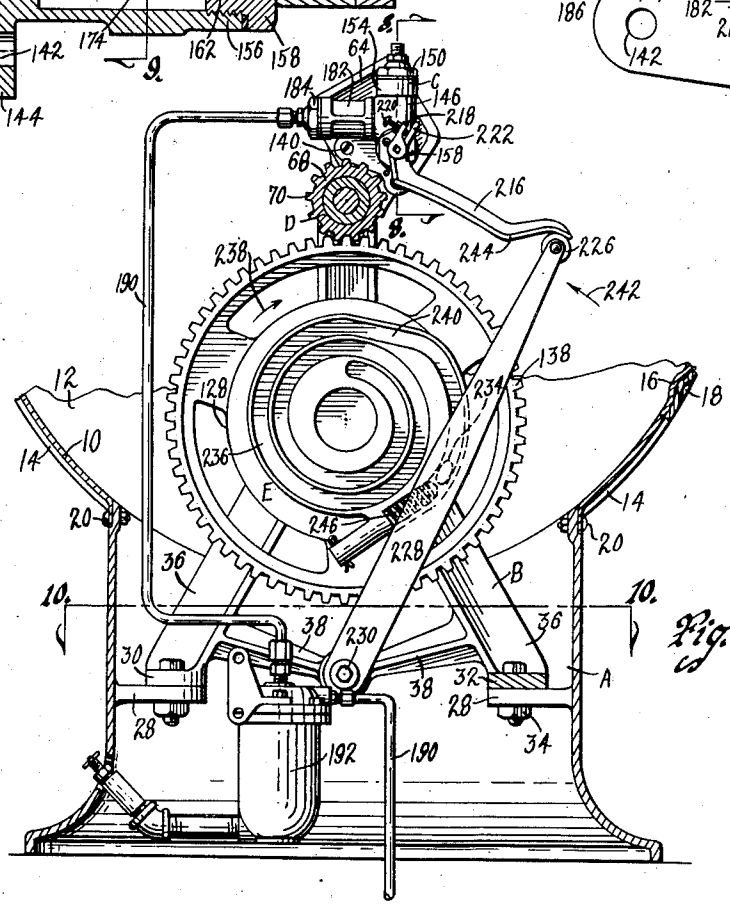


Fig. 7.

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AIR SERVICE STATION

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4 Sheets-Sheet 4

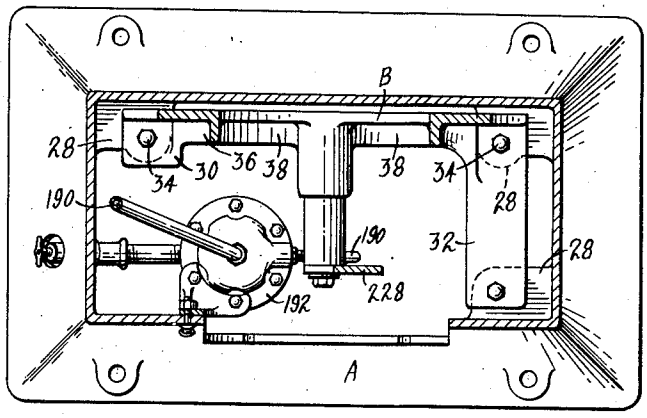


Fig. 10.

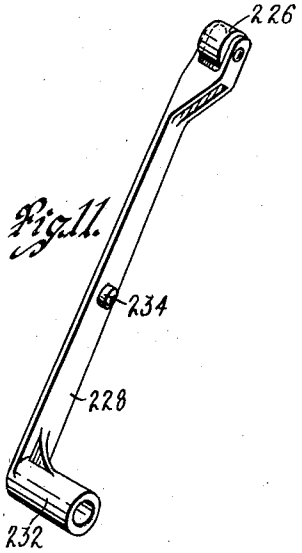


Fig. 11.

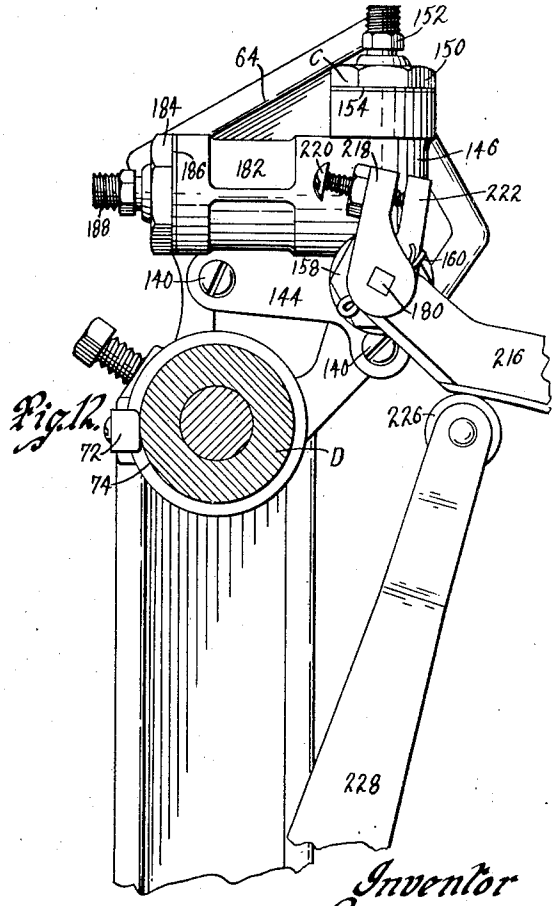


Fig. 12.

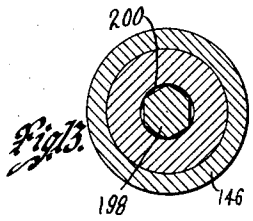


Fig. 13.

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UNITED STATES PATENT OFFICE

JOE C. WOODFORD, OF BRYAN, OHIO, ASSIGNOR TO SERVICE STATION EQUIPMENT COMPANY, OF BRYAN, OHIO, A CORPORATION OF DELAWARE

AIR-SERVICE STATION

Application filed July 5, 1927. Serial No. 203,301. REISSUED

The object of my invention is to provide an air service station particularly adapted for use in connection with servicing automobiles for supplying them with air for their tires, the device being durable and very practical.

More particularly my invention relates to an air service station having a hose reel therein for containing and storing the air service hose when not in use.

Still another object is to provide a cut-off valve for the supply of air whereby the return of the hose upon the reel within the station itself will allow the air from the service hose to be cut off.

A further object is to provide a hose reel which cooperates with a cut-off valve for the supply of air in such a manner as to necessitate the withdrawing of the hose for a short distance before any air is admitted thereto.

Still another object is to provide a spiral connecting portion in the air service line just before it connects with the air hose reel.

Another object includes a casing having a pair of discs arranged to snap on to the casing for completely closing it and the arrangement of hose guards on the interior of the casing for preventing the hose from possibly leaving its reel.

With these and other objects in view my invention consists in the construction, arrangement and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a perspective view of my improved air service station mounted upon a base or pedestal.

Figure 2 is a side view of the same with one of the discs or cover plates of the casing removed.

Figure 3 is a similar view showing the opposite side of the device from that shown in Figure 2.

Figure 4 is a vertical sectional view taken on the line 4—4 of Figure 2.

Figure 5 is a sectional view taken on the line 5—5 of Figure 4 illustrating the hose reel construction.

Figure 6 is a detail sectional view through the connection between the hose of the hose reel and the supply line.

Figure 7 is a sectional view taken on the line 7—7 of Figure 4, parts being broken away to better illustrate the construction.

Figure 8 is a sectional view taken on the line 8—8 of Figure 7 disclosing a portion of the cut-off valve.

Figure 9 is a sectional view taken on the line 9—9 of Figure 8.

Figure 10 is a horizontal sectional view taken on the line 10—10 of Figure 7.

Figure 11 is a perspective view of the control lever for the cut-off valve.

Figure 12 is an enlarged detail view of the cut-off valve in another position from that shown in Figure 7.

Figure 13 is a detail sectional view taken on the line 13—13 of Figure 9.

Figure 14 is a detail sectional view through a portion of the casing and cover plate, and

Figure 15 is a detail view showing the connection of the hose reel with the bracket upon which it is mounted.

In the accompanying drawings I have used the reference character A to indicate a frame or casing forming a part of my air service station. The frame A is in the form of a rectangular housing or casing upon which is mounted a sheet metal casing 10 substantially drum shaped.

The casing 10 includes a pair of side cover plates or discs 12 having inturned peripheral flanges 14. The casing 10 along each of its side edges is formed with indents 16 which receive and coact with inwardly extending projections 18 formed upon the flanges 14. The cover plates 12 snap on to the casing 10.

The casing 10 is, of course, made of sheet metal and when the discs or cover plates are in position, the casing is quite rigid. The casing 10 is formed of a band or strip of material which has its ends resting against the frame A and secured thereto by bolts or the like 20 as clearly illustrated in Figure 7 of the drawing.

The frame A has an each side an outturned

flange 22 which gaps the space between the ends of the casing 10 so that the flanges 14 of the cover plates 12 may extend over the flange 22 as though it were part of the casing 10.

The frame A is preferably of cast material while the casing 10 is of sheet material. Mounted upon the casing 10 is a housing 24 adapted to receive an automatic weighing unit 26. The unit 26 weighs or measures the amount of air permitted to pass through the device into the inner tube of an automobile. The weighing unit forms no part of my present invention.

A suitable crank handle is provided upon the housing 24 which controls the weighing unit as to the desired number of pounds of pressure wanted.

The frame A on its interior is provided with spaced inwardly extending lugs 28 on which is mounted an inverted Y-shaped bracket B. The bracket B is formed with a short leg 30 arranged to rest upon one of the lugs 28 and is also provided with a long leg 32 arranged to rest upon the other two of the lugs 28 as clearly illustrated in Figure 10 of the drawings.

The bracket B is thus mounted within the housing A upon the lugs 28 at three points. Bolts or the like 34 extend through suitable openings in the legs 30 and 32 and in the lugs 28. Near the lower ends of the two arms 36 and connecting them together is a bridge 38 having an elongated bearing 40 therein.

A shaft 42 is mounted in the bearing 40. The bearing 40 is centrally located between the ends of the arms 36. The purpose of the shaft 42 will be hereinafter more fully set forth.

At the junction of the arms 36 of the bracket B, I provide a bearing opening 44 for receiving a substantially enlarged shaft 46 having a shoulder 48 thereon arranged to rest against one side of the bracket B. The shaft 46 is normally set or locked within the bearing opening 44 by a suitable set screw 50.

The end of the shaft 46 adjacent the bracket B is formed with an interiorly screw threaded opening 52 arranged to coact with a crank arm 54 having one end screw threaded to coact with the screw threaded opening 52 clearly illustrated in Figure 4 of the drawings.

The purpose of the crank arm 54 and its connection with the shaft 46 will hereinafter be more fully set forth in connection with the practical operation of my device.

The bracket B has the leg portion 56 projecting up above the junction point of the arms 36 and a bearing opening 58 is formed in the leg 56 for receiving a reel supporting shaft 60. The shaft 60 is locked or keyed to the bracket B by a suitable pin or the like 62.

The shaft 60 projects inwardly within the casing upon one side of the bracket B. It will be noted that the bracket B is located adjacent one side edge of the casing 10. Formed integral with the bracket B and extending upwardly therefrom above the leg 56 is an extension 64 arranged to support a cut-off valve structure C. The cut-off valve structure C will be more fully set forth.

Hose reel assembly

Upon the extended portion of the shaft 60 I mount a hose reel assembly D. The hose reel assembly D includes an elongated sleeve 66 having babbitt bearing material 68 therein. The sleeve and its babbitt material 68 is mounted upon the shaft 60.

The outer surface of the sleeve 66 is formed with gear teeth 70. The sleeve 66 is rotatably mounted on the shaft 60. A finger 72 is fixed to the bracket A and extends into an annular groove 74 formed in the sleeve 66 adjacent the end which engages the bracket B. The sleeve 66 is, therefore, rotatably but non-slidably mounted upon the shaft 60.

The sleeve 66 upon the end opposite from the bracket B is formed with an outwardly extending annular flange or disc 76. The hose reel proper is fixed to the disc or flange 76. The hose reel itself is formed of a pair of spaced sheet metal plates 78 having their outer edges outturned as at 80.

The two plates 78 are spaced apart by a spacing ring 82 which has its outer surface spirally arranged. The spacing ring is formed with a number of openings 84 through which are extended rivets or the like 86 which also extend through openings formed in the plates 78. The spacing ring 82 serves to space the two discs or plates 78 a proper distance apart and at the same time provides for a base or drum upon which the service hose may rest when in reeled-up position.

The air service line is connected to the hose reel by a suitable connection clearly disclosed in Figure 6 of the drawing. The connection just referred to includes a casing element 88 having spaced ears or lugs 90 which are bolted or riveted to the flange 76 of the sleeve 66.

One of the plates 78 is formed with an enlarged opening through which the connection of Figure 6 may be extended. The connection of Figure 6 also extends through the other plate 78 and into a recess formed in the sleeve 66.

Each of the lugs 90 is formed with an opening or the like 92 for accommodating a rivet or bolt for connecting it to the sleeve 66 or the flange 76. It will be noted that the sleeve 66 and the flange 76 are formed integrally.

From the construction of the parts just described, it will be seen that when the sleeve 66 is rotated upon the shaft 60 that the hose reel and the air connection thereof will rotate in unison.

The casing 88 is interiorly screw thread-

ed as at 94. A plug or cap 96 is formed with a screw threaded portion 98 and arranged to coact with the screw threads 94. A stem 100 is received within the cap 96 and is formed with a flange 102 which is received within a cup shaped opening 104 formed in the cap 96.

Between the flange 102 and the cap 96 and within the cup shaped opening 104, is a gasket or the like 106 of any suitable material.

A spirally arranged coil spring 108 is placed within the casing 88 and has one end resting against the back side of the flange 104 and its other side resting against the bottom of the casing 88. The spring 108 normally forces the stem 100 outwardly and against the cap 96 thus providing an air tight connection between the stem and the cap 96 by means of the gasket 106.

It will be noted that the cap 96 together with the casing 88 and the parts received therein, are capable of rotation or revolving around the stem 100. Upon one side of the casing 88 and in communication therewith, is a fitting 110 which is connected to one end of a flexible air service hose 112. The fitting 110 is in communication with the interior of the casing 88.

Upon the outer end of the stem 100 is an elbow fitting 114. The stem 100 is also provided with a central opening or port 116. The air service hose 112 is wrapped around the spacer ring 82 and extends through an opening 118 formed between the ends of the ring 82. The free end of the air service hose 112 is formed with an air chuck 120 adapted to coact with the valve stem of an automobile inner tube.

A rubber ball or the like 122 is mounted upon the hose 112 adjacent the chuck 120. A fitting 124 is placed within the housing or frame A and has four anti-friction rollers 126 mounted therein for allowing the hose to pass therethrough and to be pulled in any direction at a minimum amount of frictional resistance.

The parts just described from the hose reel assembly unit of my air service station.

Hose reel return assembly

In order to have the air service hose 112 return and be wound upon the reel after it has been used, I provide a spring actuated device E. The device E is mounted upon the shaft 46. A drum casing 128 is mounted upon the shaft 46 and is capable of revolving thereon.

Within the drum 128 is a spiral spring 130 having one end fixed to the shaft 46 as at 132 and having its other end fixed to the drum 128 as at 134. A cover plate 136 coacts with the drum 128 for forming a housing or casing for the spring 130.

Formed integral with the drum 128 is a large pinion 138 arranged to coact with the gear teeth 70 of the sleeve 66.

It will be noted that when the air service hose 112 is withdrawn or unwound from its reel that the gear teeth 70 will impart rotation to the pinion 138 causing the spring 130 to be wound-up or tensioned.

When the air service hose is released, the spring 130 will tend to resume its normal untensioned position thus imparting rotation to the pinion 138 and in turn imparting rotation to the sleeve 66 and the hose reel assembly. The spring 130 may be adjusted to various tensions by releasing the set screw 50 and by rotating the crank arm 54 with the hose reel remaining stationary.

After the tension has been arranged to the required degree, then the set screw 50 is set and the crank arm 54 may be removed from the screw threaded opening 52 of the shaft 46. The crank arm 54 is normally removed so that one of the cover plates 12 may extend over one side of the casing 10.

Air cut-off valve

The cut-off valve C is mounted upon the extension 64 of the bracket B by means of bolts or the like 140 which extend through openings 142 formed in the flange 144 of the cut-off valve casting. The cut-off valve casting includes a tubular shaped portion 146 having a screw threaded opening 148 in its upper end for receiving a cap or plug 150.

A screw threaded fitting 152 coacts with the screw threaded opening formed in the cap 150 and is in communication with the interior of the tubular shaped portion 146. A gasket 154 is interposed between the cap or plug 150 and the upper end of the tubular portion 146. The tubular portion 146 adjacent one end is also provided with a screw threaded opening 156 for receiving a cap or plug 158.

A gasket 160 is interposed between the cap 158 and tubular portion 146. The plug 150 on its inner side is formed with a cup shaped opening 162 which receives a rubber gasket or the like 164. The plug or cap 158 has a central opening 166 which has a valve opening and closing shaft 168 mounted therein.

One end of the shaft 168 is received within a recess 170 formed in a portion of the casting forming the cut-off valve C. Between the ends of the shaft 168 is an enlarged portion 172 having a central screw threaded opening 174 therein. A control pin or plug 176 is mounted within the opening 174.

A coil spring 178 is disposed around the shaft 168 and has one end resting against the casting of the cut-off valve C and has its other end resting against the enlarged portion 172 of the shaft 168 for normally pressing the enlarged portion 172 against the gasket 164.

A rib or the like is formed on the cap 158 and on the enlarged portion 172 for engage-

ment with the opposite sides of the gasket 164. The gasket 164 provides for an air tight connection or mounting of the shaft 168. The outer end of the shaft 168 is squared as at 180.

In communication with the tubular portion 146 of the cut-off valve C is a sleeve 182 having a screw threaded neck at one end coacting with a screw threaded opening in the tubular portion 146 for providing communication between the sleeve 182 and the interior of the tubular portion 146.

A cap or plug 184 is screw threaded into the free end of the sleeve 182 and a gasket 186 is interposed therebetween. A fitting 188 is screw threaded into the plug 184 and is therefore, in communication with the interior of the sleeve 182. The fitting 188 is similar to the fitting 152.

Within the sleeve 182 is mounted a valve member which controls the passage of air from the inlet fitting 188 through the outlet fitting 152. Interposed in the air supply line 190 is an air cleaner and sediment trap 192. The air cleaner and sediment trap is of the kind disclosed in my copending application filed May 31, 1927, Serial Number 195,234.

The air supply line 190 is in communication with the inlet fitting 188. After air passes through the cut-off valve C it travels through a supply line or pipe 194 up to the automatic weighing unit 26 and thence through a supply pipe 196 which is arranged spirally at the point of its connection with the fitting 114.

The spiral arrangement of the pipe 196 which is of metal such as copper tubing, is quite desirable in that it takes care of "shock" which is imparted to the hose reel when the hose is first withdrawn and thereafter when it is returned.

By providing the spiral arrangement of the pipe or line 196, I find that the vibration and shock effect imparted to the connection between the metal pipe line 196 and the fitting 114, is such as to minimize likelihood of breaking the connection between the line 196 and fitting 114.

Any irregularity in size or wearing of the bearing parts of the hose reel assembly, does not effect the connection due to the spiral arrangement of the line 196. It will thus be seen that air entering the supply line 196 is permitted to be discharged through the air service hose 112 after having passed through the cut-off valve member and the weighing unit 26.

The valve member of the cut-off valve will now be described. My valve member includes a hexagonal shaft 198 extending through an opening 200 formed in the sleeve 182. A spindle 202 is formed with a screw threaded opening 204 arranged to receive the screw threaded shank 206 formed on the shaft 198.

The spindle 202 is slidably mounted within a recess 208 formed in the plug 184 and has its sides flattened so as to provide a passageway around the spindle when it is received within the opening or recess 208.

A cup shaped flange 210 is formed on one end of the spindle 202 and has a rubber disc 212 received therein which seats against one end wall of the sleeve 182 and seals the opening for preventing air from within the sleeve passing through the opening 200.

The shaft 198 has one of its ends arranged adjacent the control pin or plug 176 and movement of the plug 176 as indicated by dotted lines in Figure 9 of the drawings, will impart sliding movement to the shaft 198 and spindle 202 thereby unseating the rubber gasket 212.

The valve member is closed or returned to closed position by a coil spring 214 mounted within the sleeve 182 and around the spindle 202. The control pin or plug is operated from a cam arm 216 which is loosely mounted upon the shaft 168. A crank arm 218 is fixed upon the squared portion 180 of the shaft 168 and has a set screw 220 mounted therein which is adapted to coact with a portion 222 of the cam arm 216.

The crank arm 218 is formed with a lateral projection 224 which receives the set screw 220. Adjusting the set screw 220 to different positions, changes the relative time or point of operation of the cam arm 216. The cam arm 216 coacts with a roller 226 mounted upon a lever 228. The lever 228 is mounted upon the shaft 42 and is held thereon by a washer and cap screw 230.

The lever 228 is formed with an elongated bearing 232 which receives the shaft 42. The lever 228 is clearly illustrated in Figure 11 of the drawings. The roller 226 upon the lever 228 travels against the underside of the cam arm 216. The lever 228 is also formed with a lug or pin 234 arranged to travel in a spirally arranged groove or channel 236 formed in one wall of the drum casing 128.

Figure 7 shows the lever in the position it is in when the cut-off valve is closed. Figure 12 shows the same lever in the position that it is in when the cut-off valve C is open. When the service hose 112 is withdrawn from its reel, then the reel D rotates in the direction indicated by the arrow 238.

When the lug or pin 234 reaches the flat or cam portion 240 of the groove 236, then the lever 228 will be swung upon its pivot in the direction indicated by the arrow 242. Such movement in turn imparts an upward swinging movement to the cam arm 216 and causes the valve member to be opened.

After the valve member is once opened, it remains open so long as the hose is withdrawn. The cam arm is so arranged that the cut-off valve is moved to open position when the

roller 226 engages the cam arm at the point 244.

Further coaction of the roller 226 with the cam arm 216 does not affect the valve member. It will be noted that the air service hose must be partly withdrawn before the air is actually permitted to pass thereto.

I provide a rebounder or shock absorber in the groove 236 in the form of a spring 246 which is placed within the groove 236 and in a socket arranged for the purpose. When the hose reel is permitted to return for winding the hose thereon, then as it reaches its limit of such movement, the spring 246 engages the pin 234 and the spring serves as a shock absorber.

It will be further noted that when the cam arm 216 is moved, that it imparts movement to the control pin or plug 176 which in turn opens the valve member of the cut-off valve C.

Upon the casing 10 adjacent the ends of the plates 78 which form the hose reel, I provide a pair of guard rails 248 which are positioned quite close to the outer edge of the hose reel and prevent the hose when suddenly released from being forced out of the reel.

My air service station has gone into commercial use and is very practical in that the hose is always enclosed and the air leading to the hose is normally cut off except when the hose is in service position.

Some changes may be made in the construction and arrangement of the parts of my device without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents, which may be reasonably included within their scope.

I claim as my invention:

1. An air service station including a bracket, a hose reel revolubly mounted thereon, an air service hose wound on said reel, an air service line having an air tight connection with said hose at the center of the reel, a portion of said air service line being metallic tubing and being spirally arranged around such air tight connection whereby to preclude the rupturing of the connection upon movement of the connection relative to the air service line.

2. An air service station comprising a housing, a reel therein, an air service hose wound thereon, a metallic air service line connected with said hose, said air service line being spirally arranged at and around the point of its connection with the air service hose.

Des Moines, Iowa, June 11, 1927.

JOE C. WOODFORD.