This invention relates to a device for controlling the feed of liquid fuel from the supply tank to the vacuum tank or carburetor in transit to the combustion chambers of an internal combustion engine and refers more particularly to the means for normally maintaining a reserve supply of fuel for use in case the main supply should become exhausted.

In most of the machines now in common use the fuel feed pipe extends through a suitable gland in the top of the supply tank to a point in proximity to the bottom thereof with a suitable inlet in or near the bottom of the feed pipe to allow the liquid fuel to flow from any level above the bottom to the vacuum tank or carburetor under the suction of the engine and the main object of the present invention is to construct the portion of the feed pipe within the tank in such manner that it may be adjusted to different positions; one position for cutting off the supply from any level in the tank, another position for supplying the liquid fuel from the tank down to a predetermined level some distance above the bottom of the tank whereby a definite quantity of the fuel may be reserved to allow the machine to be driven a reasonable distance where the fuel may be replenished and a third position in which practically the entire fuel supply may be exhausted from the tank, all of said adjustments being made through the medium of the single member operable from a point external to and preferably above the top of the tank.

Other objects and uses relating to specific parts of the device will be brought out in the following description.

In the drawings:

Figure 1 is a top plan of a portion of a fuel supply tank and adjacent portion of my improved controlling device in operative position thereon.

Figure 2 is a vertical sectional view taken on line 2—2, Figure 1, except that the central portions of the tank and adjacent portions of the feed tube are broken away.

Figure 3 is a horizontal sectional view taken in the plane of line 3—3, Figure 2.

Figures 4 and 5 are detail horizontal sectional views taken respectively in the planes of lines 4—4, and 5—5, Figure 2.

In order that the invention may be clearly understood I have shown a portion of a fuel supply tank —1— which of the usual construction is provided in its top wall with an internally-threaded opening —2— for receiving the lower reduced threaded end of a hollow bushing —3—.

The lower reduced end of the bushing —3— is provided with a socket —4— in which is tightly secured the upper end of a tubular guide member —5— having its lower end extended downwardly to a point in close proximity to the bottom —1— of the tank —1— and tightly closed by a plug —6—.

This guide tube —5— is provided at or near its lower end with a fuel inlet opening —7— just above the plug —6— but in relatively close proximity to the bottom of the tank —1—, said tube being also provided at a higher level with an additional fuel inlet opening —8— which may be termed the reserve level for the reason that it is used as the primary inlet for the fuel from the tank to the engine under normal running conditions when the lower inlet —7— is closed thereby assuring a reserve equal to the volume in the tank between the two levels in case the fuel in the tank becomes exhausted to the upper level.

The bushing —3— is tightly screwed in the opening —2— in the tube of the tank and carries the main tube —5— so that both of those parts may be removed or replaced by simply unscrewing or screwing the bushing —3— from and into the top of the tank —1—.

The bushing —3— is provided in its upper end with an internally threaded socket —9— in which is screwed the lower reduced threaded end of a head —10— having its upper end provided with an internally threaded socket for receiving an elbow nipple —11— forming a part of the connection between the fuel controlling device and vacuum tank or carburetor of an internal combustion engine, not shown.

A tube —12— is telescopically and rotatably mounted within the main tube —5— to extend from the lower opening —7— through and some distance above the bushing —3— and head —10— and has its upper end seated in a socket —13— in the lower end of the elbow nipple —11— for relative rotation therein and also to permit relative rotation of the elbow connection thereon.

The upper end of the head —10— is pro-
vided with an internally-threaded socket in which is screwed the lower reduced threaded end of the elbow —11— as shown in Figure 2.

This extension of the upper end of the tube —12— into the elbow —11— together with the screwing of the lower end of the elbow in the upper end of the head —10— around the tube assures a liquid and air tight joint at the junction.

The upper end of the bushing —3— is reduced in diameter to form an annular shoulder and upon this reduced end is tightly secured a disk —14— preferably concentric with the tubes —5— and —12— and bushing —3—, said disk being provided with a semi-circular slot —14’— for a purpose presently described.

The upper reduced end of the bushing —3— extends some distance above the disk —14— and into an annular recess or socket —15— in the lower end of the head —10— which is rotatable relatively to and upon the bushing —3— for turning the tube —12— relatively to and within the main tube —5—.

The inner feed tube —12— is provided near its lower end with an opening —7’— adapted when turned to one position to register with the opening —7— in the outer tube and is also provided at a higher level with an additional opening —8’— adapted to register with the opening —8— in the tube —5— when turned to a different position.

In other words, the openings —7— and —7’— are at one and the same lower level while the openings —8— and —8’— are arranged at one and the same higher level, both sets of openings being so relatively arranged that when those of one set are open those of the other set will be closed or both sets may be closed by the angular adjustment of the inner tube —12— to a neutral position as shown in Figures 4 and 5.

As previously intimated the inner tube —12— is tightly secured to and within the head —10— to rotate therewith relatively to the outer tube —5— and bushing —3— and also relatively to the elbow —11—.

The means for effecting this angular adjustment of the inner tube consists in this instance of the collar —16— split by means of a key —17— upon the periphery of the head —10— and provided at one side with a handle —18— lying closely adjacent the upper face of the disk —14— but extending beyond the periphery thereof for convenience of manipulation.

The handle portion —18— of the collar —16— is provided on its underside with a stud —19— extending into the slot —14’— of the disk —14— for limiting the angular movement of the heat —10— and tube —12— carried thereby.

A locking pin —20— is also secured to the underside of the handle portion —18— of the collar —16— for engagement in an aperture —21— in the underlying portion of the plate —14— for locking the head —10— and tube —12— in their central or neutral positions against angular movement.

The axial distance between the upper face of the plate —14— and a flange —13’— on the elbow —11— which engages the upper face of the head —10— is somewhat greater than the axial length of the collar —16— to permit said collar to be moved axially or upwardly from its normally locked position for withdrawing the pin —20— from its aperture —21— and thereby permitting angular movement of the collar —16— and tube —12— in either direction from its neutral position.

Operation.

For example, when the collar —16— is adjusted to its neutral position the handles —18— and locking pin —21— together with the stop pin —19— will be substantially midway between the ends of the semi-circular slot —14’— under which conditions both of the apertures —7— and —8’— will be out of registration with their companion apertures —7— and —8— respectively in the outer tube —5— thereby cutting off the fuel supply from the tank to the engine, the locking pin —20— being then engaged in the aperture —21— and more or less concealed from view to prevent malicious opening of the fuel supply from the tank to the tube —12—.

Now when it is desired to operate the motor vehicle the collar —16— is first drawn upwardly sufficiently to disengage the locking pin —20— from the keeper —21— and is then rotated toward the left hand of Figure 3 until the pin —19— engages the corresponding end of the slot —14’— at which time the fuel inlet opening —8’— will be registered with the opening —8— to allow the flow of the fuel from the tank into the tube —12— at the upper level indicated by the line 4—4.

This level may be termed the minimum normal running but if through inadvertence the level of the fuel should fall below the level of the registering openings —8— and —8’— there will still be left a sufficient quantity in the tank below that level for a considerable period of operation of the engine.

Under these conditions the collar —16— and head —10— together with the tube —12— may be adjusted to the right hand of Figure 3 until limited by the engagement of the stop pin —19— with the corresponding end of the slot —14’— at which time the opening —8’— will be moved out of registration with the opening —8— and the open-
ing — 7′ — will be moved into registration with the opening — 7′ — thereby cutting off the supply of fuel from the upper level and turning on the supply at the lower level indicated by line 5′—5′ thus permitting practically the entire fuel content of the tank to be exhausted.

It is evident however that when the fuel supply falls below the upper level requiring the adjustment of the valve tube — 12′ — to connect the interior of the tube with the lower level the operator will in all probability seek replenishment of the fuel tank from the nearest service station at which time the fuel supply at the lower level will be cut off and restored at the upper level by the adjustment previously described.

What I claim is:

1. In a vacuum tank feeder, a bushing having means for securement to the top wall of a liquid container and provided with a tube adapted to extend into the container to a level near the bottom thereof and open at the bottom, an additional tube extending through the first-named tube to the level of the lower end thereof and having its lower end closed and its upper end extended some distance beyond the top of the first-named tube, a nipple loosely fitted over and upon the upper end of the inner tube to permit said inner tube to be rotated relative to the outer tube and nipple, said tubes being provided with separate sets of apertures at different levels, those of each set being adapted to register with each other and to de-register those of the other set when the inner tube is adjusted rotarily to different positions, and means operatively connected to the inner tube between the bushing and nipple for rotating the inner tube.

2. A vacuum tank feeder comprising a bushing adapted to be secured to the top of a liquid container and provided with a tube adapted to extend into the container to a level near the bottom thereof, an additional tube extending through the first-named tube, said tubes having separate sets of apertures at different levels, those of each set being adapted to register with each other by the relative rotation of the inner tube to different positions, the inner tube being extended some distance beyond the upper end of the bushing, a nipple loosely fitted over and upon the upper end of the inner tube in spaced relation to the bushing for connection with a vacuum tank and permitting relative rotation of the inner tube, a head having screw connection with the bushing and with the nipple and secured to the inner tube to rotate the same, a rotary and axially movable collar operable at will and splined upon the head to transmit rotary motion thereto, a keeper plate fixed to the head and provided with an aperture, a locking pin on the collar adapted to enter said aperture in the keeper plate for holding the collar and inner tube operated thereby in a neutral position when the collar is adjusted axially in one direction and for releasing said collar when the latter is moved in an opposite direction.

3. A vacuum tank feeder comprising a bushing adapted to be secured to the top of a liquid container and provided with a tube adapted to extend into the container to a level near the bottom thereof, an additional tube extending through the first-named tube, said tube having separate sets of apertures at different levels, those of each set being adapted to register with each other by the relative rotation of the inner tube to different positions, the inner tube being extended some distance beyond the upper end of the bushing, a nipple loosely fitted over and upon the upper end of the inner tube in spaced relation to the bushing for connection with a vacuum tank and permitting relative rotation of the inner tube, a head having screw connection with the bushing and with the nipple and secured to the inner tube to rotate the same, a rotary and axially movable collar operable at will and splined upon the head to transmit rotary motion thereto, a keeper plate fixed to the head and provided with an aperture, a locking pin on the collar adapted to enter said aperture in the keeper plate for holding the collar and inner tube operated thereby in a neutral position when the collar is adjusted axially in one direction and for releasing said collar when the latter is moved in an opposite direction, and cooperate means on the keeper plate and collar respectively for limiting the rotary movement of the collar to and from its neutral position.

4. In a vacuum tank feeder, a bushing adapted to be secured to a liquid container, a tube having one end secured to the bushing and its other end adapted to extend into the container, an additional tube extending through the first-named tube, said tube being provided with separate sets of apertures at different levels, those of each set being relatively moveably into and out of registration with each other by the rotation of the inner tube to different positions relatively to the first-named tube, a nipple adapted to be connected to a vacuum tank and fitted loosely over and upon the upper end of the inner tube in spaced relation to the bushing for connection with a vacuum tank and permitting relative rotation of said inner tube, and means operable at will for adjusting the inner tube rotarily to move its apertures into and out of registration with the apertures in the first-named tube.

5. In a vacuum tank feeder, a bushing adapted to be secured to a liquid container, a tube having one end secured to the bushing and its other end adapted to extend into the container, an additional tube extending through the first-named tube, said tube being
provided with separate sets of apertures at different levels, those of each set being relatively movable into and out of registration with each other by the rotation of the inner tube to different positions relatively to the first-named tube, a nipple adapted to be connected to a vacuum tank and fitted loosely over and upon the upper end of the inner tube to permit relative rotation of said inner tube, and means operable at will for adjusting the inner tube rotarily to move its apertures into and out of registration with the apertures in the first-named tube, and a collar operatively connected to the inner tube between the nipple and bushing and adjustable rotarily at will for rotating the inner tube.

6. In a vacuum tank feeder, a bushing adapted to be secured to a liquid container, a tube having one end secured to the bushing and its other end adapted to extend into the container, an additional tube extending through the first-named tube, said tube being provided with separate sets of apertures at different levels, those of each set being relatively movable into and out of registration with each other by the rotation of the inner tube to different positions relatively to the first-named tube, a nipple adapted to be connected to a vacuum tank and fitted loosely over and upon the upper end of the inner tube to permit relative rotation of said inner tube, and means operable at will for adjusting the inner tube rotarily to move its apertures into and out of registration with the apertures in the first-named tube, and a collar operatively connected to the inner tube between the nipple and bushing and adjustable rotarily at will for rotating the inner tube, a keeper plate secured to the bushing and cooperative means upon the collar and keeper plate respectively for holding the collar in a neutral position against rotary movement, said collar being adjustable axially to disengage said cooperative means.

In witness whereof I have hereunto set my hand this 9th day of January, 1926.

CARL J. FERGUSON.