United States Patent

[11] **3,604,478**

[72] Inventor **Frank Gowens**
Wareham, England

[21] Appl. No. **826,132**
[22] Filed **May 20, 1969**
[45] Patented **Sept. 14, 1971**
[73] Assignee **Flight Refueling Limited**
London, England

[54] **FUEL-TANK-FILLING DEVICES**
15 Claims, 7 Drawing Figs.

[52] **U.S. Cl.** **141/59,**
141/206, 141/293, 141/349, 141/383, 285/310
[51] **Int. Cl.** **B67d 5/371**
[50] **Field of Search** 141/59,
198, 206, 210, 211, 214, 215, 217, 218, 225, 226,
291–296, 302, 346–349, 383, 386; 285/308–311

[56] **References Cited**

UNITED STATES PATENTS

2,737,401	3/1956	Lindsay	141/346 UX
2,845,965	8/1958	Rittenhouse	141/210 X
3,042,084	7/1962	Boone et al.	141/225
3,102,555	9/1963	Botkin	141/225 X
3,125,135	3/1964	Boyer et al.	141/293 X
3,126,213	3/1964	Lewis	285/311 X

Primary Examiner—Laverne D. Geiger
Assistant Examiner—Edward J. Earls
Attorney—Arthur B. Colvin

ABSTRACT: A fuel-tank-filling device including a coupling element comprising a hosecock **10** connected to a fuel supply hose and to a vent hose **16,** a manually opened and spring closed valve in the hosecock **10** to shut off the supply of fuel, a head member **12** for coupling with a receiving unit mounted on the vehicle, passages **13, 14** in the head member **12** communicating with the hoses, spring-loaded valves closing the passages **13, 14** and arranged for automatic opening simultaneously with the operation of a spring-released manually operated latch **37** which is held manually against the action of the spring release to hold the head member **12** in engagement with the receiving unit, corresponding spring-loaded valves which close corresponding passages in the receiving unit also being opened by the action of coupling the coupling element with the receiving unit.

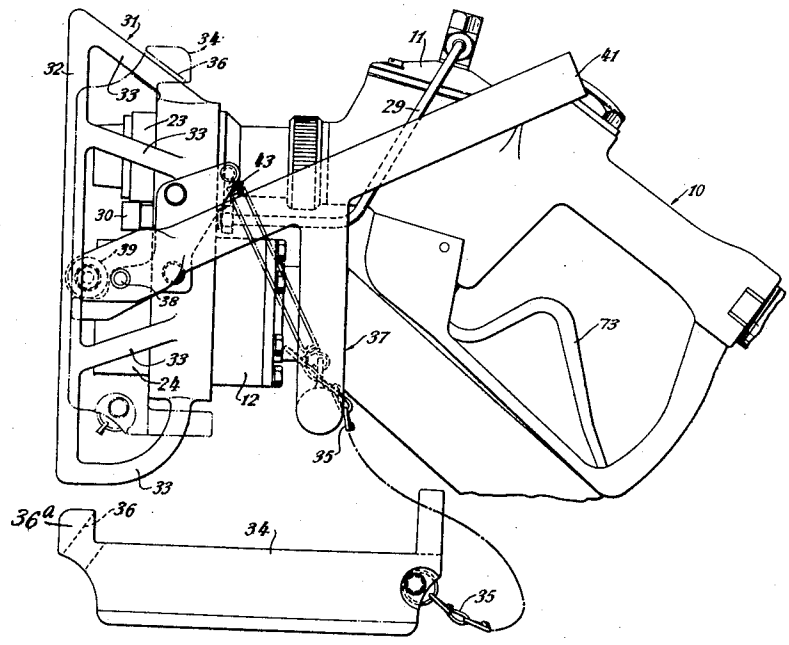
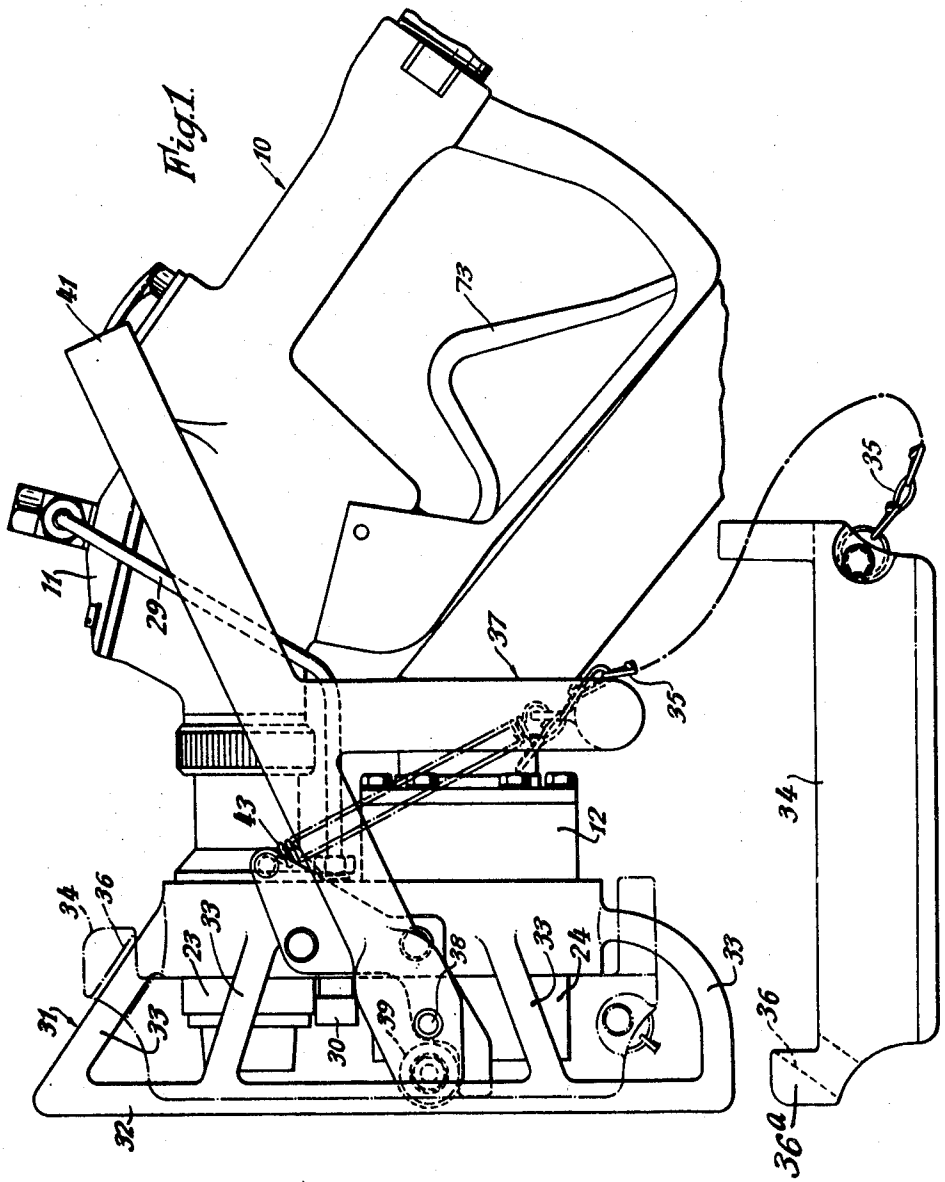


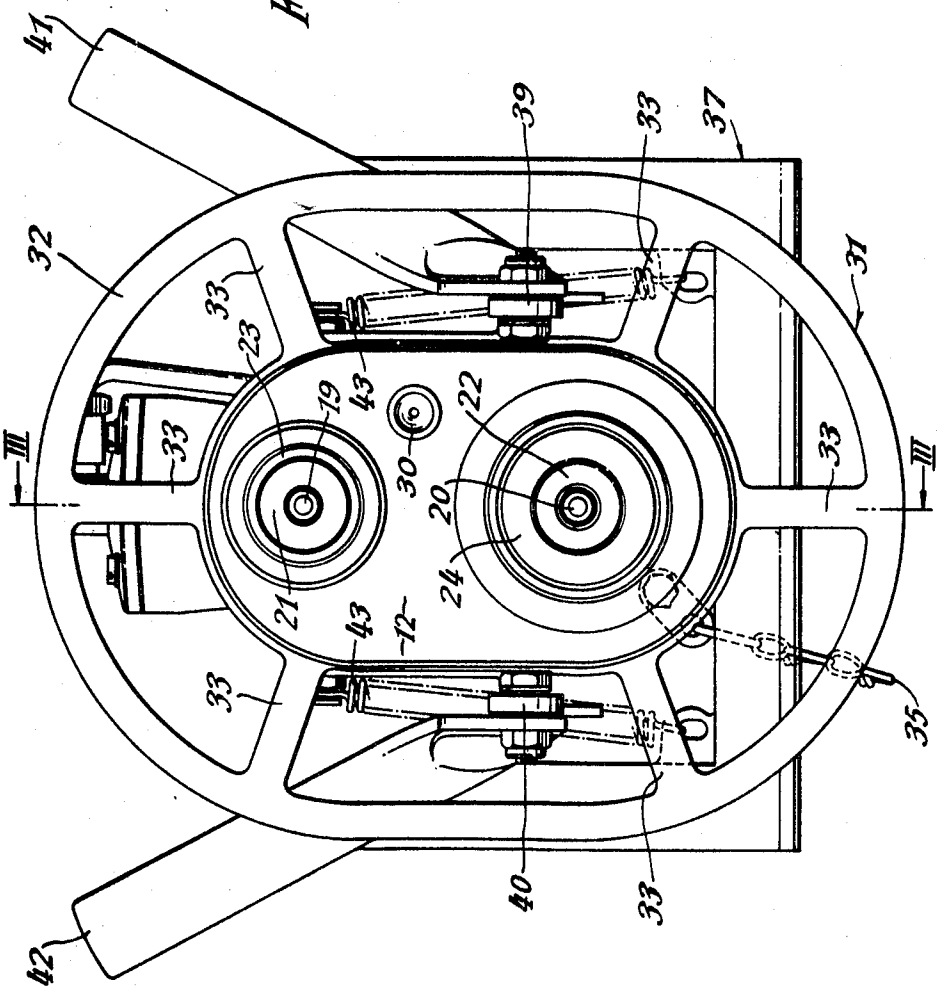
Fig. 1.



INVENTOR
FRANK GOWENS

BY Robert B. Clair
ATTORNEY

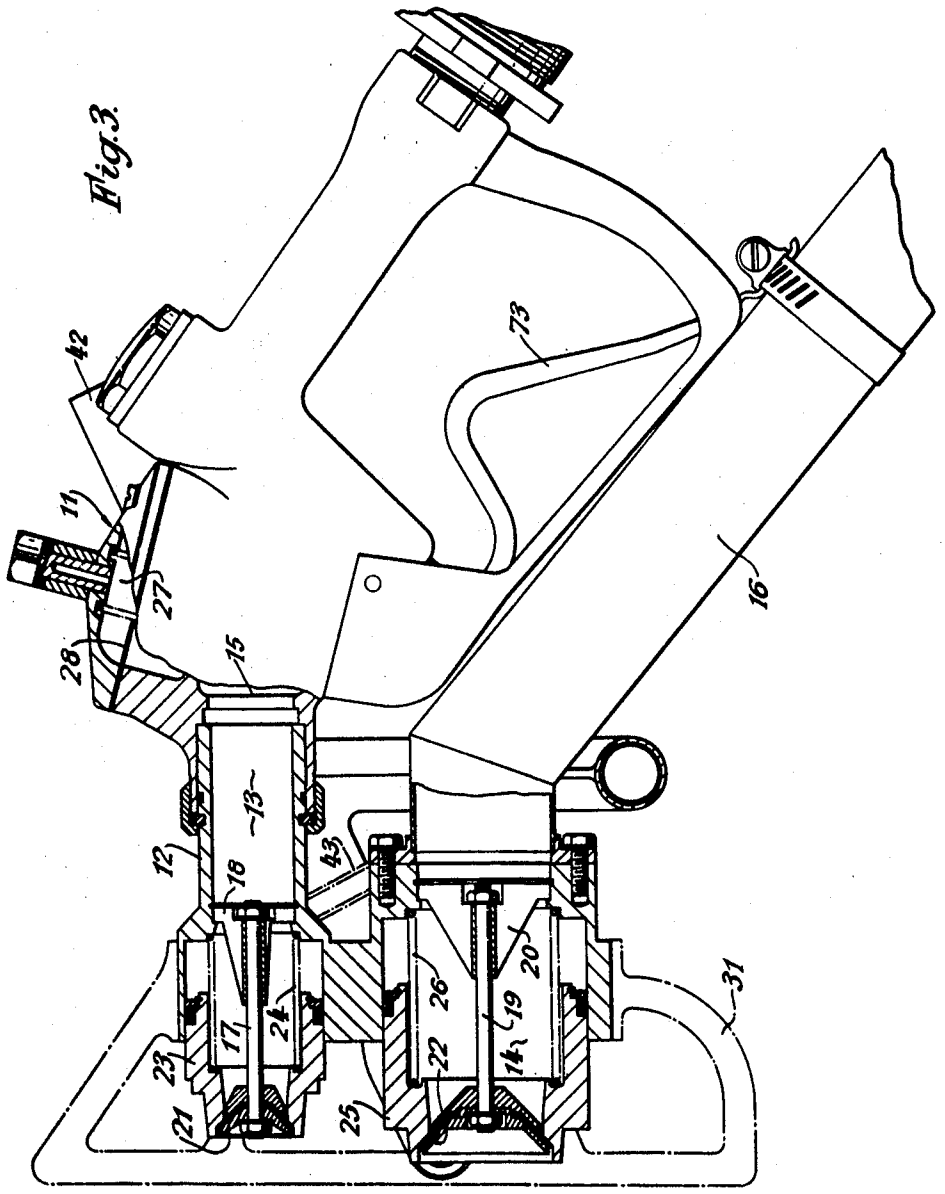
Fig. 2.



INVENTOR
FRANK GOWENS

BY
ATTORNEY

Fig. 3.



INVENTOR
FRANK GOWENS
BY Mott & Colum
ATTORNEY

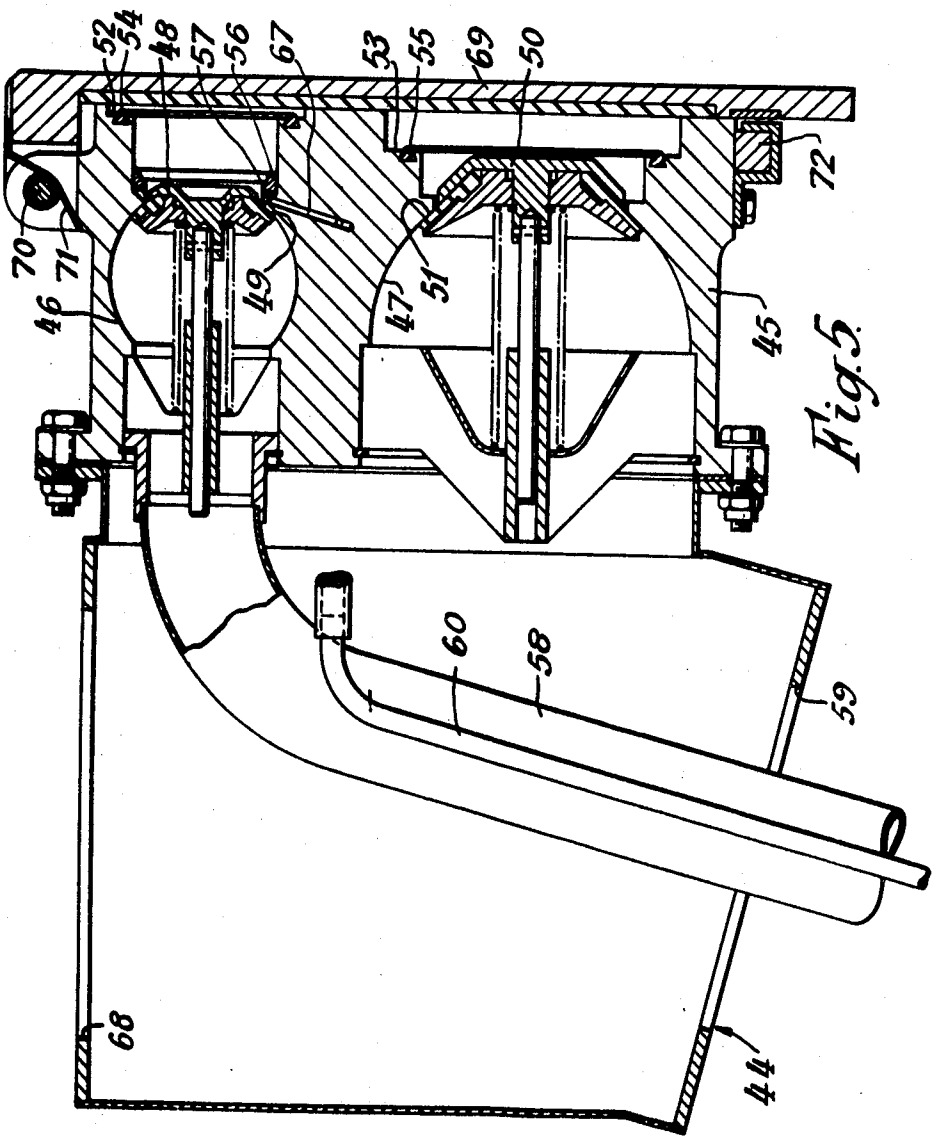


Fig. 5

INVENTOR
FRANK GIUENS

BY Albert B. Colvin

ATTORNEY

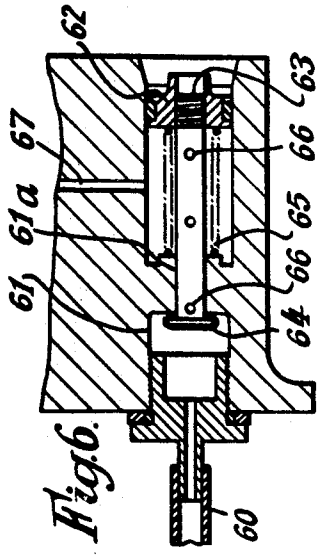


Fig. 6.

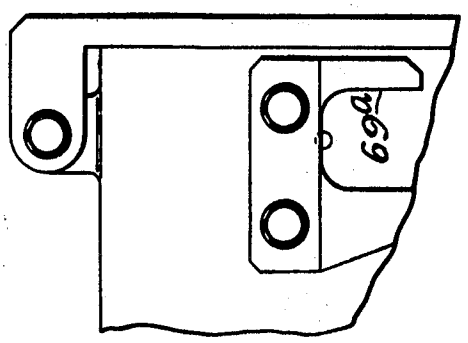


Fig. 7.

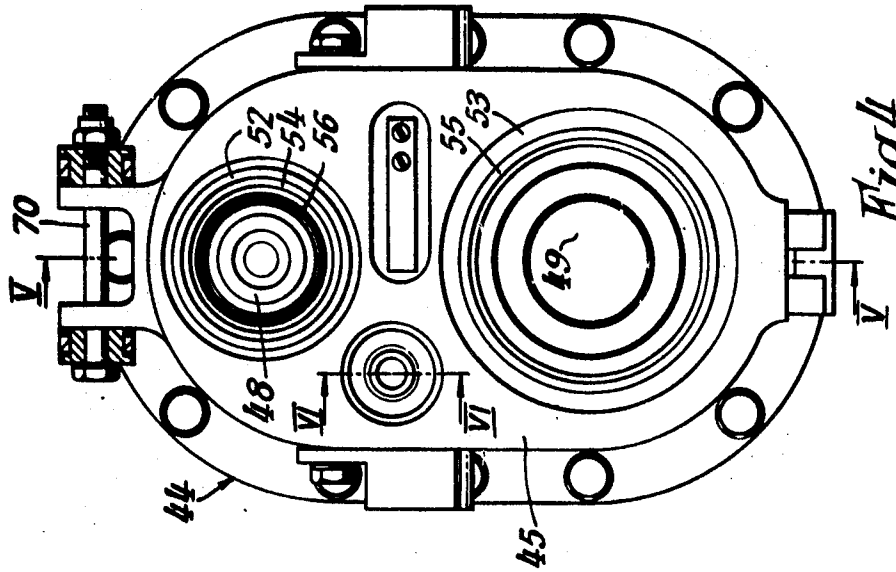


Fig. 4.

INVENTOR
FRANK GOWENS
BY Arthur B Colvin
ATTORNEY

FUEL-TANK-FILLING DEVICES

This invention relates to fuel-tank-filling devices for transferring liquid fuel from a supply source to the fuel tanks of aircraft, vehicles and boats. The filling device according to the invention is particularly suited for use with helicopters or other aircraft, vehicles or boats for military uses which may have to be refueled under emergency conditions and may have to move away from the refueling point with no delay after refueling or even before refueling is completed.

If a helicopter is refueled under such conditions by removing a filler cap from a fuel pipe which leads to the helicopter's fuel tanks and by inserting the nozzle of a manually operated open-ended hosecock into the mouth of the fuel pipe, there is the danger that fuel will be discharged inadvertently from the open end of the nozzle, following hurried removal of the nozzle from the fuel pipe, and ignited, thus setting fire to the helicopter, by being ingested by the engine air intake while the engine is still running or, if the helicopter is of the kind having a normally exposed engine, by being sprayed onto hot parts of the engine.

According to one aspect of this invention a fuel-tank-filling device includes a coupling element adapted to be connected to a hose leading from a fuel supply source and to be coupled with a receiving unit mounted on a vehicle to be refueled, the coupling element defining a throughpassage and having a spring-loaded valve closing the throughpassage and a manually **61***and spring-closed valve for controlling fuel flow through that passage, the spring-loaded valve being arranged for automatic opening by the action of bringing the coupling element into coupled relation with the receiving unit so that, when the coupling element is connected to the hose and is coupled to the receiving unit, fuel may be supplied to the receiving unit through the fuel supply hose and the through passage.*

Preferably the coupling element, which is also adapted to be connected to a vent hose, has a further throughpassage, and a further spring-loaded valve closing the further throughpassage, the further spring-loaded valve being arranged for automatic opening by the action of bringing the coupling element into coupled relation with the receiving unit so that, when the coupling element is connected the vent hose, the receiving unit is placed in the communication with the vent hose through the further through passage.

According to a feature of this invention, the fuel-tank-filling device includes spring-released manually operated latch means adapted to be held manually against the action of the spring release so as to hold the coupling element in coupled relation with the receiving unit.

The coupling element conveniently comprises a hosecock and a head member, the hosecock being adapted to be connected to the fuel supply hose and the head member being adapted for coupling with the receiving unit, the spring-loaded valve or valves being mounted within the head member. In such an arrangement means may be provided which are adapted to be coupled to sensing means the receiving unit, when the head member and the receiving unit are in engagement, and which are operable to shut off the supply of fuel through the fuel supply hose and the coupling element when the fuel in the vehicle fuel tank rises to a predetermined level.

According to another aspect of this invention a fuel-tank-filling device includes a coupling element comprising a hosecock adapted to be connected to a hose leading from a fuel supply source and to a vent hose, a manually opened and spring-closed valve in said hosecock to shut off the supply of fuel through the fuel supply hose, a head member carried by said hosecock and adapted for coupling with a receiving unit mounted on a vehicle to be refueled, passages in said head member communicating with said hoses, spring-loaded valves to close the said passages, said spring-loaded valves being arranged for automatic opening simultaneously with the operation of spring-released manually operated latch means adapted to be held manually against the action of the spring release so as to hold said head member in engagement with said receiving unit, and means in said hosecock adapted to be coupled to sensing means in said receiving unit when the head member and the receiving unit are in engagement, to close the fuel passage in the hosecock when the fuel in the vehicle fuel tank rises to a predetermined level.

According to a further feature of this invention a fuel-tank-filling device includes a receiving unit for mounting on a vehicle, the receiving unit being adapted for coupling with the coupling element and including a body defining a passage which is in communication with the vehicle fuel tank when the receiving unit is mounted on the vehicle, a spring-loaded valve closing the passage and arranged to be opened simultaneously with an associated spring-loaded valve in the coupling element by the bringing of the coupling element into coupled relation with the receiving unit, so as to place said passage defined by said body in communication with a corresponding throughpassage defined in the coupling element.

One embodiment of this invention will now be described by way of example with reference to the accompanying drawings of which:

FIG. **1** is a side elevation of a coupling unit for a helicopter fuel-tank-filling device in accordance with this invention;

FIG. **2** is a front elevation of the coupling element of FIG. **1**;

FIG. **3** is a part-sectional side elevation similar to FIG. **1** sectioned on the line III—III of FIG. **2**;

FIG. **4** is a front elevation of a receiving unit for a helicopter fuel-tank-filling device in accordance with this invention, with the cover removed;

FIG. **5** is a part-sectional elevation of the receiving unit of FIG. **4** sectioned on line V—V of FIG. **4**;

FIG. **6** is a fragmentary sectional view taken on the line VI—VI of FIG. **4**; and

FIG. **7** is a fragmentary side elevation showing a detail of the receiving unit of FIG. **4**.

Referring to the FIGS. **1** to **3**, the coupling element comprises a hosecock **10** which is generally similar to hosecocks conventionally used for supplying liquid fuel to the fuel tanks of motor road vehicles and which includes, in addition to the usual manually controlled shut off valve (not shown) operated by the usual hand lever **73**, suction operated means **11** to close the passage through the hosecock **10** automatically, and a head unit **12** which is secured to the hosecock **10** and is formed with two parallel passages **13** and **14**. Passage **13** is connected to the outlet end of the fuel passage **15** through the hosecock **10**, and passage **14** is connected to a vent hose **16** which is secured to the hosecock **10** and which extends to a discharge point at a substantial distance from the refueling point. A stem **17** is mounted on a spider **18** in the passage **13** so as to protrude axially therefrom and a stem **19** is similarly mounted in the passage **14** on a spider **20**. Each stem **17**, **19** carries a respective fixed valve head **21** or **22**. A sleeve member **23** is slidably mounted in the passage **13** and is urged outwardly by a spring **24** to seat on the valve head **21** and close the passage **13**. A sleeve member **25** is slidably mounted in the passage **14** and is urged outwardly by a spring **26** to seat the valve head **22** and close the passage **14**.

The suction operated means **11** is of the type in which the flow of fuel draws air from a chamber **27** in the hosecock **10**, one wall of the chamber being defined by a flexible diaphragm **28**. Air is drawn from the chamber **27** through a relatively small diameter pipe **29** which terminates in a spigot **30** fitted with a face seal and located adjacent the valve heads **21** and **22**. Evacuation of air from the chamber **27** results in movement of the diaphragm **28** which trips a valve (not shown) to close the fuel passage **15**.

The head member **12** carries a guard rail **31** which has a rim **32** and spokes **33** which diverge from the head member **12** and hold the rim **32** beyond the valve heads **21** and **22**. A cover **34** (FIG. **1**) is shown at the end of a retaining chain **35** which is secured to the head member **12**. The cover **34** is adapted to be fitted over the end of the head member **12**, as shown chain dotted in FIG. **1**, so as to protect the spring-loaded valves and the spigot **30**. The cover **34** is made of rubber, or other suitable material, and is provided with a recess **36** which has a nar-

row mouth opening into the sidewall **36***a* of the cover **34**. In fitting the cover **34** to the head member **12** that part of the cover defining the narrow mouth of the recess **36** is snapped over the top spoke **33** so that the top spoke **33** enters and is retained within the recess **36**. The cover **34** is held in position by the top spoke **33** retained in the recess **36**.

A latch member **37** is pivotally mounted at **38** on the head unit **12** and carries rollers **39** and **40**. The latch member **37** has a pair of handles **41** and **42** and is spring loaded to the position shown in FIG. **1** by a pair of springs **43**.

Referring to FIGS. **4** to **7**, the receiving unit, which may be mounted on the helicopter and connected to the upper, inlet end of a pipe (not shown) which is connected at its other end the helicopter fuel tank, comprises a hollow boxlike body **44** one sidewall of which is formed by a valve block **45** in which are formed two horizontal throughpassages **46** and **47**. The passages **46** and **47** are spaced apart by the same distance as the passages **13** and **14** in the head unit **12**. Passage **46** is closed by a spring-loaded valve closure member **48** which cooperates with an annular seating **49** in the passage **46** and passage **47** is closed by a spring-loaded valve closure member **50** which cooperates with an annular seating **51** in passage **47**.

An annular shoulder **52** is defined in the wall of the passage **46** on the side of the annular seat **49** remote from the helicopter fuel tank and an annular shoulder **53** is similarly formed in the passage **47**. A sealing ring **54** is mounted within the annular shoulder **52** and a sealing ring **55** is mounted within the annular shoulder **53**.

A ring **56** is pressed into the passage **46** and positioned adjacent the annular seating **49** between the annular seating **49** and the annular shoulder **52** so as to define with the annular seating **49** a venturi nozzle in the passage **46**. An annular space **57** is defined between the ring **56** and the annular seating **49** and the ring **56** is shaped so that the generally axially aligned walls of the space **57** are frustoconical and so that the space **57** opens towards the valve member **48**.

A spout **58** is connected inside the body **44** to the end of the passage **46** remote from the shoulder **52** and depends through an opening **59** in the bottom of the body **44**. The opening **59** is adapted to provide communication between the interior of the body **44** and he pipe leading from the receiving to the helicopter fuel tanks. A relatively small diameter pipe **60**, which is shown alongside the spout **58** in FIG. **5** but which conveniently may be passed through the wall of the spout so as to extend inside the spout **58**, leads to a third passage **61** (FIGS. **4** and **6**) in the valve block **45**, the third passage **61** having a central portion **61***a* of a smaller diameter than the two outer portions. An annular piston member **62** slides within the outer portion of the passage **61** remote from the pipe **60** and is mounted on one end of a hollow spindle **63** which slides within the outer portion **61***a* and which carries a valve head **64** within the outer portion of the passage **61**. A spring **65** urges the piston member **62** away from the central portion **61***a* and thus urges the valve head **64** into engagement therewith. Ports **66** in the wall of the hollow spindle **63** provide communication between the interior of the spindle **63** and the outer portion of the passage **61** remote from the pipe **60**, and with the other outer portion of the passage **61** when the valve head **64** is not in engagement with the central portion **61***a*.

A bore **67** in the valve body **45** opens at one end into the space **57** (see FIG. **5**) and at its other end into the outer portion of the passage **61** remote from the pipe **60** (see FIG. **6**). The end of the bore **67** opening into the passage **61** is isolated from the pipe **60** by the valve head **64** when the piston member **62** is in the position to which it is urged by the spring **65**, but may be placed in communication with the pipe **60** by movement of the piston member **62** against the action of the spring **65**.

The receiving unit is provided with an opening **68** in its top surface which is closed by a hinged or other cap (not shown).

A cover **69**, which is pivotally mounted at **70** to the top of the valve block **45**, is urged into the position shown in FIG. **5** by a torsion spring **71** and is held in that position magnetically by a permanent magnet **72** mounted at the bottom of the valve body **45**. It will be appreciated that the cover closes the entrances to the three passages **46**, **47** and **61**.

FIG. **7** shows one of a pair of lugs **69***a* which are mounted on the side of the valve block **45**.

In operation of the fuel-tank-filling device to carry out a refueling operation, the operator first removes the cover **34** from the head unit **12** and lifts the cover **69** out of magnetic engagement with the magnet **72** swinging it upwards about the pivot **70** against the action of the spring **71**. The operator then brings the coupling element up to the receiving unit, using the rim **32** of the guard rail **31** to hold the cover **69** out of the way, and pushes the coupling element towards the receiving unit so that the valve heads **21** and **22** and the spigot **30** are inserted into the respective passages **46**, **47** and **61** of the receiving unit. As the sleeves **23** and **25** enter the respective passages **46** and **47** they engage the respective shoulders **52** and **53** and are thus separated from the fixed valve heads **21** and **22** by further movement of the coupling element towards the receiving unit. As the coupling element is pushed towards the receiving unit the fixed valve heads **21** and **22** engage the corresponding valve closure members **48** and **50**, move them out of engagement with their respective annular seatings **49** and **51** thereby establishing communication between the respective passages **13** and **14** in the coupling element and **46** and **47** in the valve body **45**.

During the establishment of such communication, the spigot **30** has moved the spring-loaded piston member **62** against the action of the spring **65** thus displacing the valve head **64** from engagement with the central portion **61***a* and placing the space **57** in communication with the pipe **60** via the bore **67**, the outer portions of the passage **61**, the ports **66** and the interior of the hollow spindle **63**. The interengagement between the spigot **30** the end face of the piston member **62** is such as to make an adequate seal which permits suctions to be applied to the interior of the pipe **29** by the flow of fuel through the venturi nozzle in the passage **46**, such suction being applied through the bore **67** and the ports **66** in circumstances which will be described below.

Once the operator has pushed the coupling element into its final engaged position relative to the receiving unit, he moves the latch handle **41** thus rotating the latch member **37** about the pivots **38** against the action of the springs **43** and bringing the rollers **39** and **40** into engagement with the lugs **69***a*. The operator maintains his hold on one of the latch handles **41** and **42** to prevent release of the coupling element from the receiving unit and then opens the hosecock **10** by means of the hand lever **73**, causing fuel to flow into the fuel tank of the helicopter through the passages **13** and **46** and the spout **58**.

At any time when fueling is to be terminated, the operator releases the latch handle **41** and the hosecock hand lever **73**, with the result that the coupling unit is force out of engagement with the receiving unit by the action of the springs **24** and **26** acting on the valve sleeves **23** and **25** of the coupling element, the springs acting on the valve closing members **48** and **50** of the receiving unit, and the disengagement of the rollers **39** and **40** from the lugs **69***a* under the influence of the springs **43**, whereupon the helicopter is at once free to move away, the passages **13** and **14** in the hosecock unit and **46** and **47** in the receiving unit being automatically closed to prevent spillage of fuel. Even if the operator fails to release the hosecock hand lever **73**, no fuel will be spilled owing to the closure of the spring-loaded valve in the passage **13**.

If the operator should become incapacitated during a refueling operation, the latch handle **41** would would be moved automatically by its springs **43** to release the latch thus disengaging the rollers from the lugs **69***a*. In such a maneuver, the coupling element will be separated from the receiving unit in the same way as if the latch handle **41** had been released intentionally.

It will be appreciated that the passages **47** and **14** and the vent hose **16** allow air to escape from the fuel tanks during a refueling operation. The flow of fuel through the venturi noz-

zle in the passage **46** creates suction which draws air from the passage **61** through the bore **67** and the annular space **57**. The air drawn through the bore **67** is normally drawn from the area at the end of the pipe **60** below the opening **59**, but, if the fuel in the tanks rises to this level such that it submerges the end of the pipe **60**, the air is drawn from the chamber **28** through the pipe **29** with the result that the pressure of air in the chamber **28** is reduced and the associated valve is tripped shutting off the supply of fuel through the hosecock **10**. If this valve should fail to close, any fuel which may overflow through the passages **47** and **14** is conducted by the vent hose **16** to a remote position where it presents no risk of fire causing danger to the helicopter.

The refueling device described above enables the fueling of helicopters to be carried out safely with the engine of the helicopter running and the rotors rotating, the danger of fire resulting from inadvertent spillage onto the hot parts of the engine being minimized.

It will be appreciated that the fuel-tank-filling device described above is not limited in its application to helicopters and may be employed to safely refuel aircraft, vehicles or boats whilst their engines are running. Furthermore, the receiving unit may be mounted on the vehicle at a point below the maximum permissible level of fuel in the vehicle's fuel tanks. In such an arrangement the spout **58** and the pipe **60** would be arranged so as to extend upwardly from the body **44**, the pipe **60** terminating at the maximum fuel level.

The helicopter may be refueled under normal conditions, when the helicopter's engine is not running and is not hot enough to ignite spilled fuel, through the opening **68** using a conventional hosecock.

In order to increase the section generated inside the pipe **29** if it is found to be insufficient to trip the valve and close the fuel passage **15** satisfactorily at both high and low rates of fuel flow through the passage **15**, the stem **17** may be mounted within the spider **18** so as to be freely slidable therein. In such an arrangement the valve head **21** would move with movement of the stem **17** and would abut the valve closure member **48** when the coupling element is engaged with the receiving unit, and the two parts **21** and **48** would move together according to the fuel flow volume passing through the passages **15** and **46**, the valve closure member **48** being moved against its spring loading by the fuel pressure. It will be understood that the freely movable stem **17** carries a stop which limits its movement to the left in FIG. **3** so that the sleeve member **23** can be brought into engagement with the valve head **21** to close the fuel passage **13**.

Although the pipe **29** is shown running outside the remainder of the coupling elements, the two parts it interconnects may be interconnected by a suitable passage formed with the body of the coupling element.

I claim:

1. A fuel-tank-filling device including a coupling element comprising a hosecock adapted to be connected to a hose and to a vent hose, said first-named hose leading from a fuel supply source, a manually opened and spring-closed valve in said hosecock to shut off the supply of fuel through the fuel supply hose, a receiving unit adapted to be mounted on a vehicle to be refueled, a head member carried by said hosecock and adapted for coupling with said receiving unit, passages in said head member communicating with said hoses, spring-loaded valves to close the said passages, said spring-loaded valves being arranged for automatic opening by the action of bringing the head member into coupled relation with the receiving unit, manually operated latch means arranged to hold said head member in coupled relation with said receiving unit so long as manual pressure is applied to said latch means, and spring release means arranged to disengage said latch means upon removal of said manual pressure, and means in said hosecock adapted to be coupled to sensing means in said receiving unit when said head member and the receiving unit are in engagement, to close the fuel passage in the hosecock when the fuel in the vehicle fuel tank rises to a predetermined level.

2. A device for filling a fuel tank in a vehicle comprising a combination of a coupling element adapted to be connected to a hose leading from a fuel supply source, and a corresponding receiving unit adapted to be mounted on a vehicle, said coupling element including coupling means for coupling said coupling element to said receiving unit, a throughpassage defined in said coupling element, and a manually opened spring-closed valve for controlling fuel flow through the throughpassage; said receiving unit including a body defining a passage adapted to be connected in communication with the fuel tank and a spring-loaded valve closing said passage; wherein the improvement comprises the combination of:

i. means within said throughpassage defining a valve seat;

ii. a valve member movable within said throughpassage;

iii. Spring means acting upon said valve member to urge said valve member to seat on said valve seat and close the throughpassage; and

iv. said coupling means including manually operated latch means arranged to hold said coupling element in coupled relation with said receiving unit so long as manual pressure is applied to said latch means, and spring release means arranged to disengage said latch means upon removal of said manual pressure; the arrangement being such that said spring-urged valve member is moved against the action of said spring means to open said throughpassage automatically and said spring-loaded valve is opened simultaneously by the acting of bringing the coupling element into coupled relation with the receiving unit so that said passage defined in said body is placed in communication with said throughpassage, and when the coupling element in connected to the hose and is held manually in coupled relation with the receiving unit which is mounted on the vehicle, fuel my be supplied to the fuel tank through fuel supply hose; said throughpassage and said passage defined in said body.

3. A fuel-tank-filling device including a coupling element adapted to be connected to a hose leading from a fuel supply source, a receiving unit mounted on a vehicle having a tank to be refueled, coupling means for coupling said coupling element to said receiving unit, a throughpassage defined in said coupling element, and a manually opened spring-closed valve for controlling fuel flow through the throughpassage, wherein the improvement comprises the combination of:

i. means within said throughpassage defining a valve seat;

ii. a valve member movable within said throughpassage;

iii. spring means acting upon said valve member urge said valve member to seat on said valve seat and close the throughpassage; and

iv. said coupling means including manually operated latch means arranged to hold said coupling element in coupled relation with said receiving unit so long as manual pressure is applied to said latch means, and spring release means arranged to disengage said latch means upon removal of said manual pressure; the arrangement being such that said spring-urged valve member is moved against the action of said spring means to open said throughpassage automatically by the action of bringing the coupling element into coupled relation with the receiving unit so that, when the coupling element is connected to the hose and is held manually in coupled relation with the receiving unit, fuel may be supplied to the receiving unit through the fuel supply hose and the throughpassage.

4. A fuel-tank-filling device according to claim **3**, wherein the improvement further comprises said valve head being carried by a stem mounted within said throughpassage, and said valve member comprising a sleeve member mounted slidably within said throughpassage, said spring means acting to urge said sleeve member outwardly to seat on said valve seat and hold the stem against the stop means so as to close said throughpassage.

5. A fuel-tank-filling device as claimed in claim **3** wherein said coupling element, which is also adapted to be connected to a vent hose, has a further throughpassage and a further

spring-loaded valve closing the further throughpassage, the further springgloaded valve being arranged for automatic opening by the action of bringing the coupling element into coupled relation with the receiving unit so that, when the coupling element is connected to the vent hose, the receiving unit is placed in communication with the vent hose through the further through passage, and fuel which overflows from the receiving unit during refueling is conducted away from the vehicle through the vent hose.

6. A fuel-tank-filling device as claimed in claim **5**, in which said receiving unit includes a body defining two passages which are in communication with the fuel tank when the receiving unit is mounted on the vehicle, two spring-loaded valves, each spring-loaded valve closing a corresponding one of said passages defined in said body and arranged to be opened simultaneously with an associated spring-loaded valve in the coupling element by the bringing of the coupling element into coupled relation with the receiving unit, so as to place each said passage defined in said body in communication with a corresponding throughpassage defined in the coupling element, the arrangement being such that fuel is supplied to the fuel tank through one of the passages defined in said body and fuel which flows from the fuel tank during a refueling operation flows out of the receiving unit through the other of the two passages defined in said body.

7. A fuel-tank-filling device as claimed in claim **6**, wherein each spring-loaded valve in the receiving unit comprises a valve closure member which is spring loaded into engagement with an annular seating defined in the wall of the respective passage.

8. A fuel-tank-filling device as claimed in claim **7**, including sensing means comprising a venturi nozzle, the annular seating of the passage in the body which corresponds to the fuel supply passage defined in the coupling element being defined by the venturi nozzle, a bore defined in the body another passage which extends through the body from the face of the receiving unit adjacent the coupling element and which is in communication with a pipe which depends from the body so as to terminate at the predetermined fuel level within the vehicle fuel tank when the receiving unit is mounted on the vehicle, wherein one end of the bore communicates with the throat of the venturi nozzle and the other end is placed in communication with the other passage when the coupling element is coupled to the receiving unit.

9. A fuel-tank-filling device as claimed in claim **6**, wherein said coupling means includes a pair of lugs suitably placed on said body which are adapted to receive rollers carried by a pivotally mounted latch member which is mounted on the coupling element, the arrangement being such that the coupling element is held in coupled engagement with the receiving unit when the rollers are in engagement with respective lugs.

10. A fuel-tank-filling device as claimed in claim **6**, including a hinged cap which is adapted to close an opening defined in the top surface of the receiving unit, the arrangement being such that the vehicle on which the receiving unit is mounted may be refueled through said opening.

11. A fuel-tank-filling device as claimed in claim **3**, wherein the spring-urged valve member is arranged to be moved to open said throughpassage simultaneously with opening of a corresponding spring-loaded valve by bringing the coupling element into coupled relation with the receiving unit, the corresponding spring-loaded valve controlling a corresponding passage in said receiving unit leading to the vehicle fuel tank.

12. A fuel-tank-filling device as claimed in claim **3**, wherein the coupling element includes a hosecock which contains said manually opened spring-closed valve and automatic cutoff means for said manually opened spring-closed valve, the hosecock being adapted to be connected to the fuel supply hose.

13. A fuel-tank-filling as claimed in claim **12**, including means adapted to sensing means in the receiving unit, when the coupling element and the receiving unit are in engagement, and which coacts with said automatic cutoff means for said manually opened spring-closed valve to shut off the supply of fuel through the fuel supply hose and coupling element when he fuel in the vehicle fuel tank rises to a predetermined level.

14. A fuel-tank-filling device as claimed in claim **3**, wherein said means within said throughpassage defining a valve seat comprises a stem mounted within said throughpassage and protruding axially therefrom, and a fixed element carried by the end of the stem outside said passage and serving as said valve seat, said valve member comprising a sleeve member slidably mounted within said passage and spring-loaded so as to be urged outwardly to seat on the valve seat and close said throughpassage.

15. A fuel-tank-filling device as claimed in claim **3**, wherein said spring released manually operated latch means comprises a latch member which is pivotally mounted on the coupling element and which carries rollers which are adapted to engage with suitably placed lugs on the receiving unit to hold the coupling element in engagement with said receiving unit, the latch member being provided with a handle by which it may be held with the rollers engaged with the lugs against the spring loading of said release spring means.