

No. 753,691.

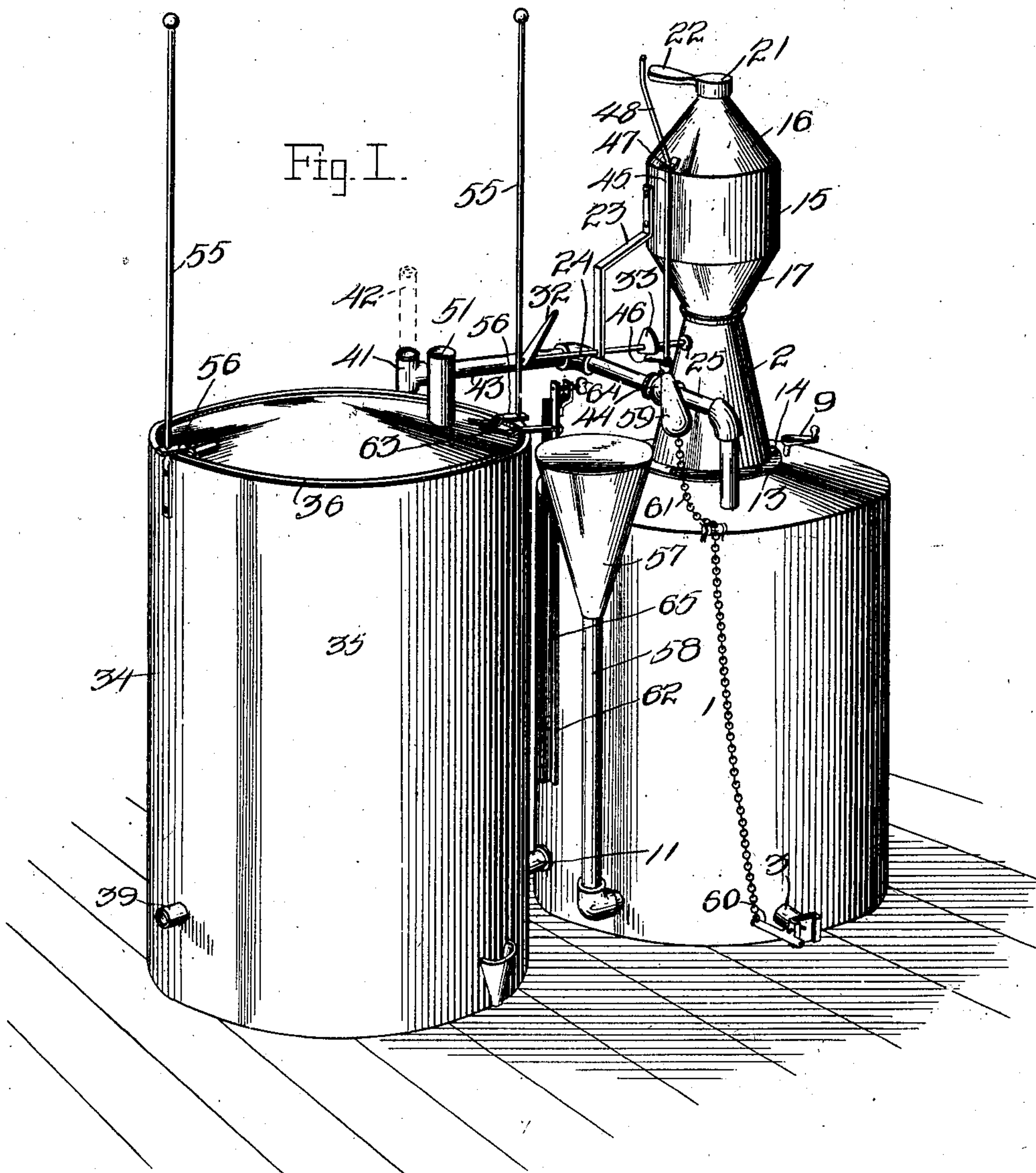
PATENTED MAR. 1, 1904.

J. M. & P. M. FLUGSTAD.
ACETYLENE GAS GENERATOR.

APPLICATION FILED JULY 9, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses

C. H. Krenkenbach

J. M. Flugstad

Inventors

*J. M. Flugstad and
P. M. Flugstad*

By

A. R. Wilson

Attorney

No. 753,691.

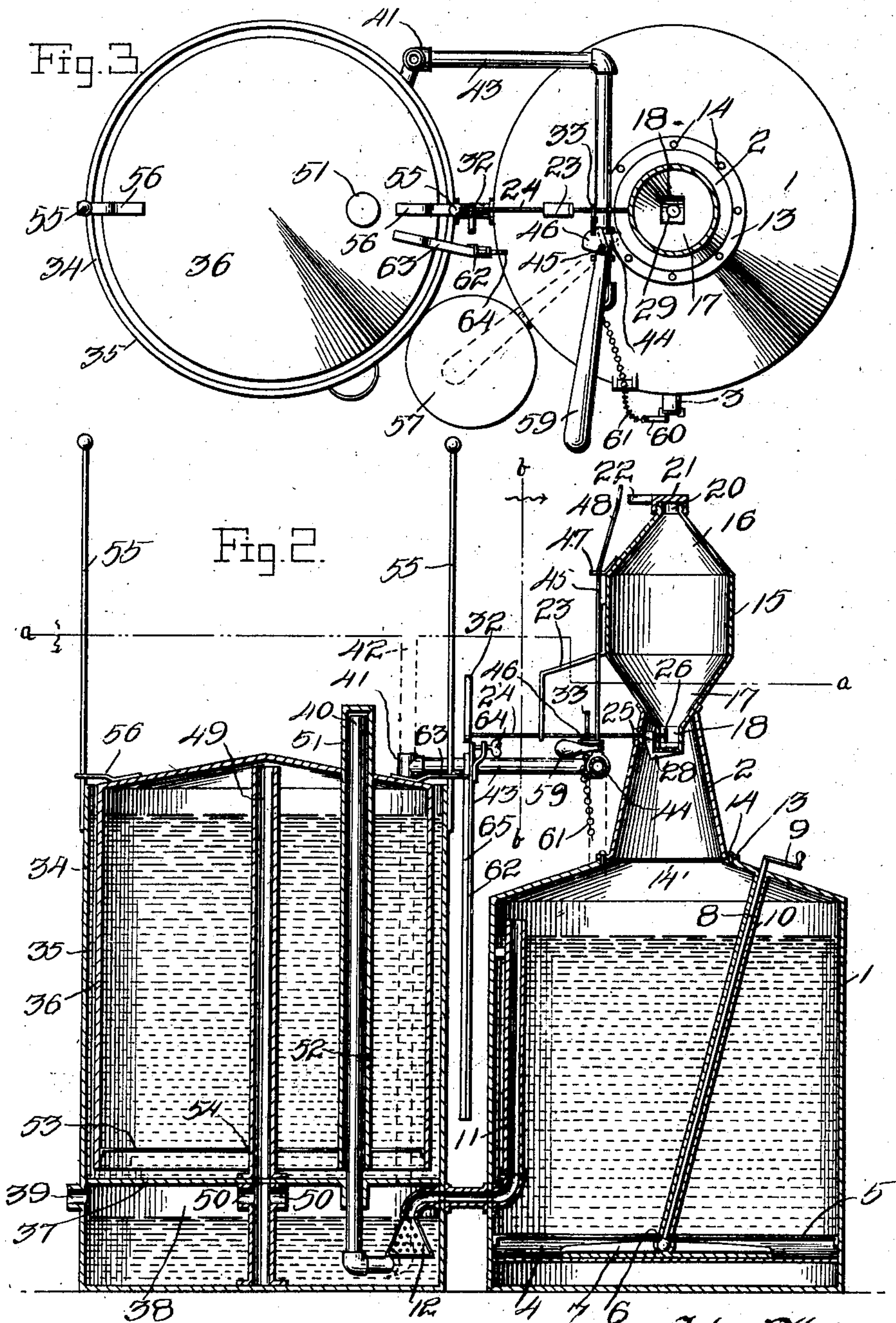
PATENTED MAR. 1, 1904.

J. M. & P. M. FLUGSTAD.
ACETYLENE GAS GENERATOR.

APPLICATION FILED JULY 9, 1903.

NO MODEL.

3 SHEETS—SHEET 2.



Witnesses

C. H. Reichenbach.

[Signature]

Inventors.

J. M. Flugstad and
P. M. Flugstad

By

[Signature]

Attorney

No. 753,691.

PATENTED MAR. 1, 1904.

J. M. & P. M. FLUGSTAD.
ACETYLENE GAS GENERATOR.

APPLICATION FILED JULY 9, 1903.

NO MODEL.

3 SHEETS—SHEET 3.

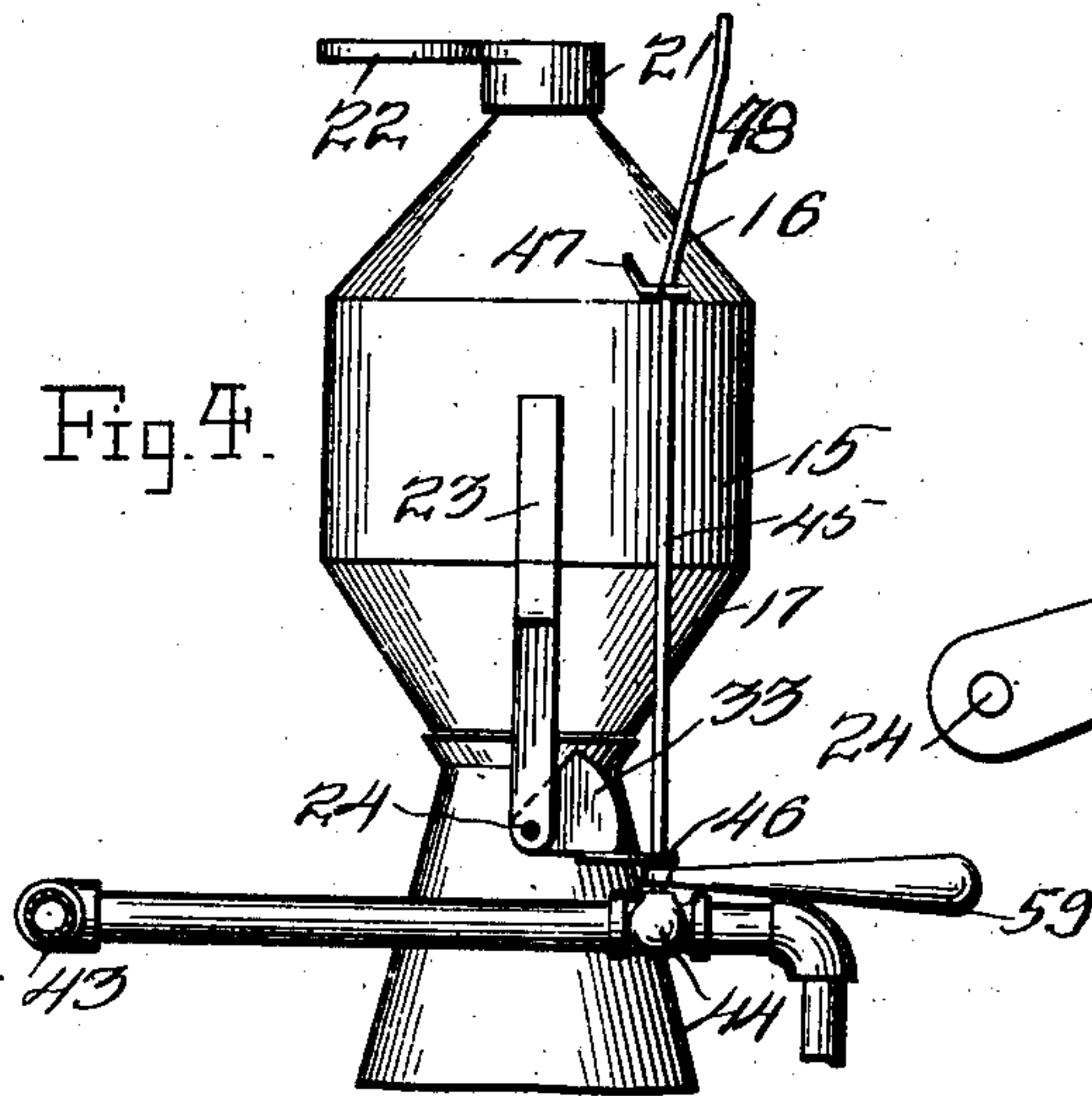


Fig. 5.

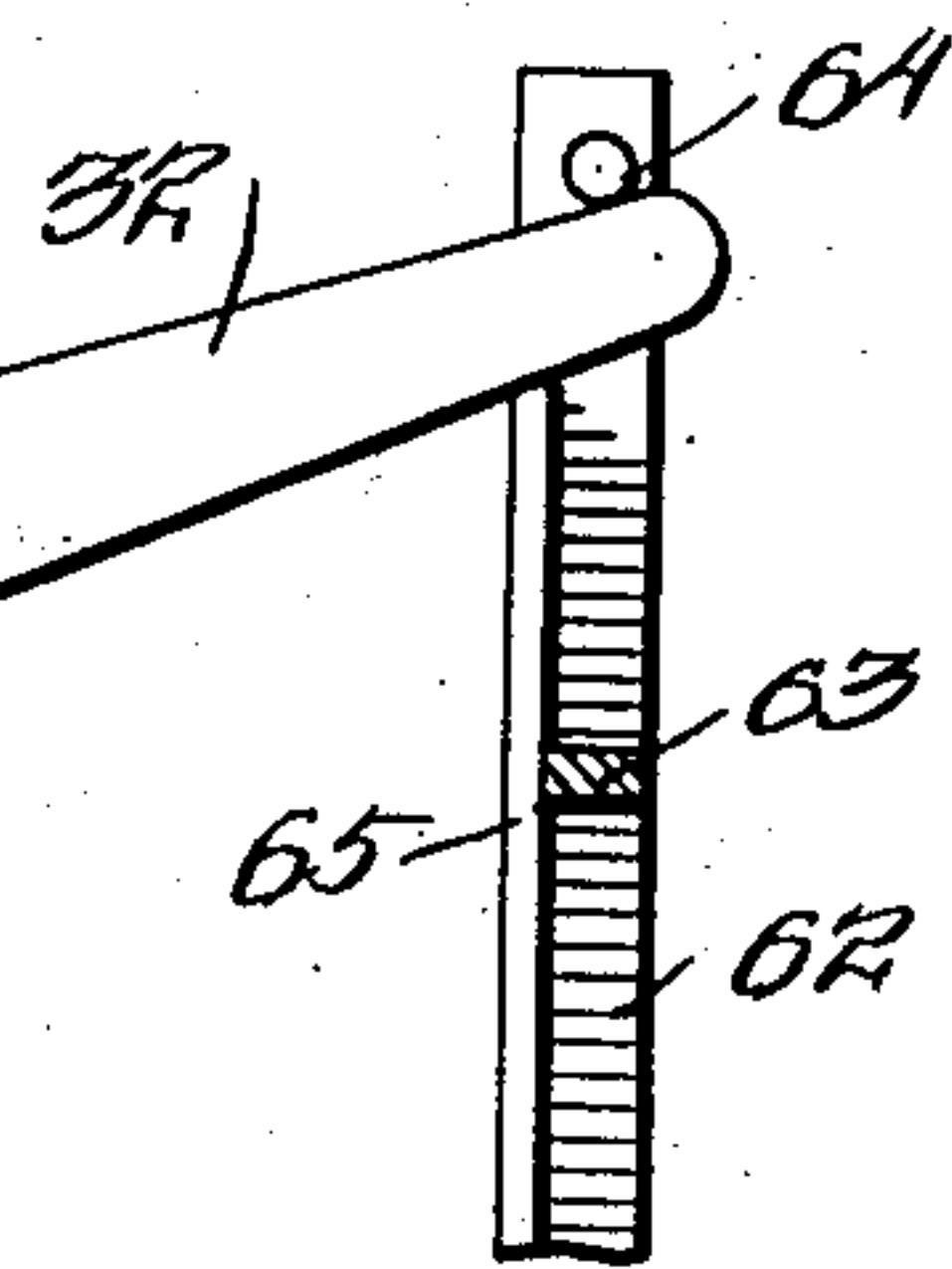
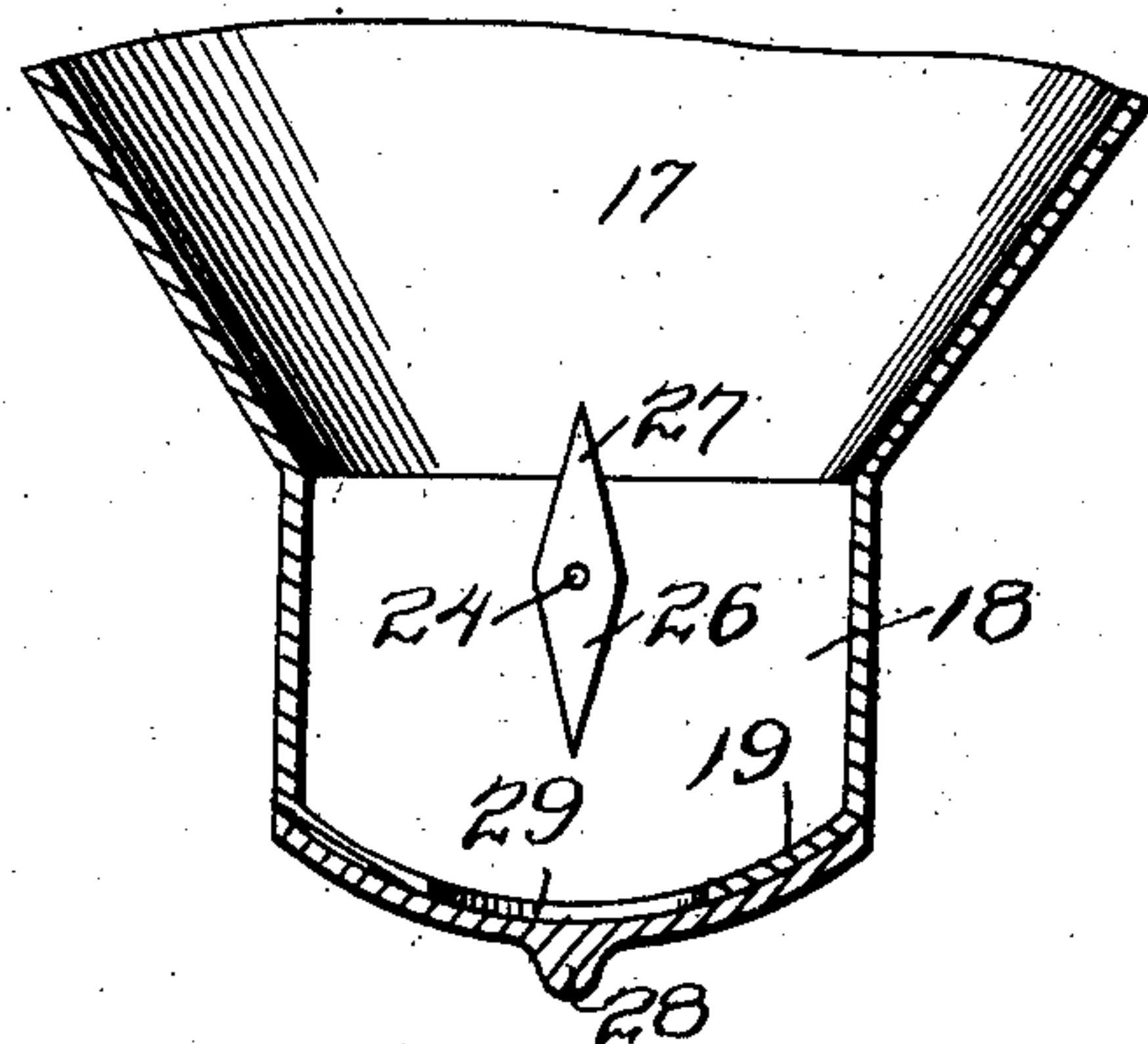
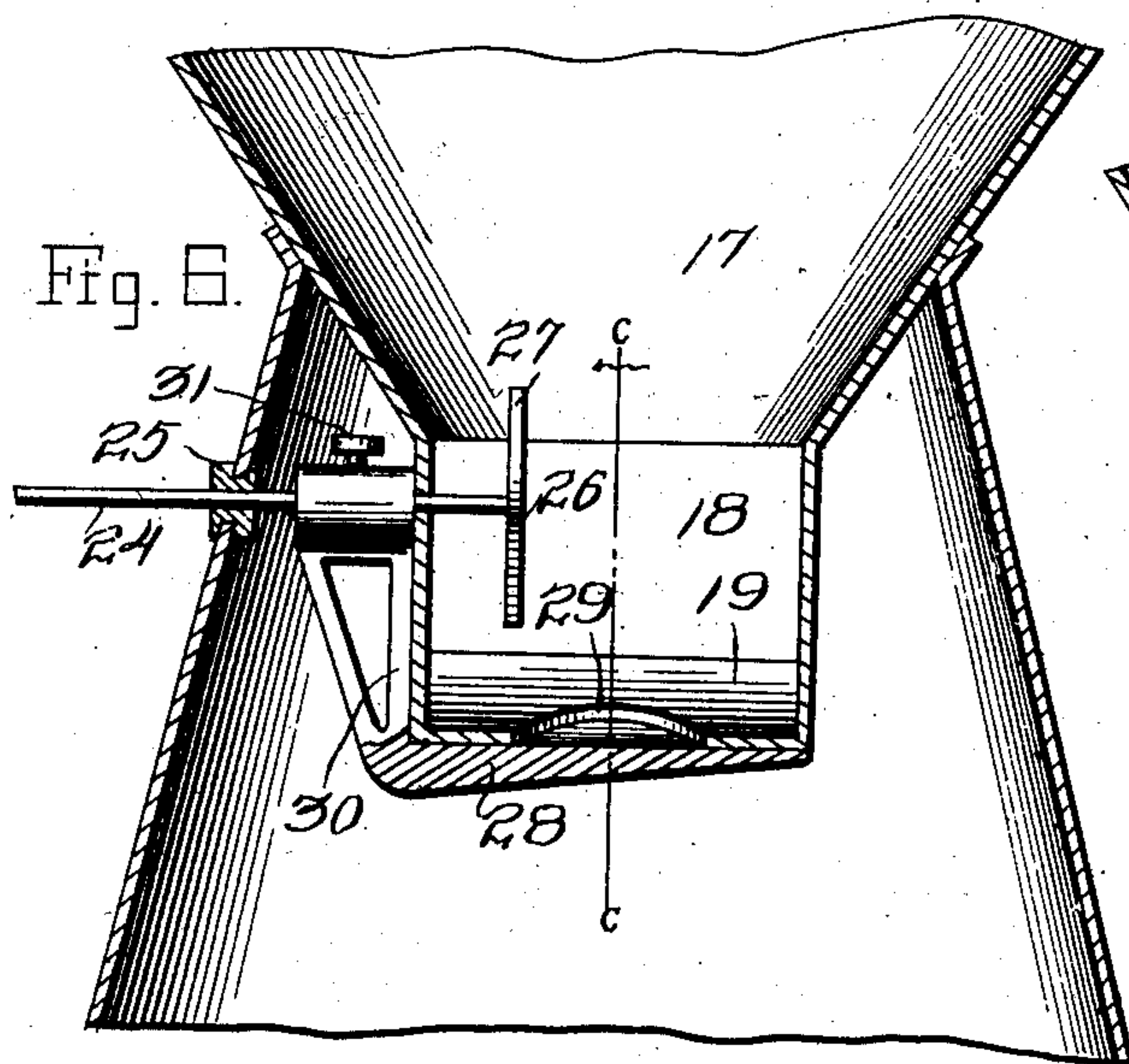


Fig. 7.



Witnesses

E. K. Reinhardt.

[Signature]

Inventors

J. M. Flugstad and
P. M. Flugstad.

By

[Signature]

Attorney

UNITED STATES PATENT OFFICE.

JOHN M. FLUGSTAD AND PETER M. FLUGSTAD, OF CORVALLIS,
MONTANA.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 753,691, dated March 1, 1904.

Application filed July 9, 1903. Serial No. 164,846. (No model.)

To all whom it may concern:

Be it known that we, JOHN M. FLUGSTAD and PETER M. FLUGSTAD, citizens of the United States, residing at Corvallis, in the county of
5 Ravalli and State of Montana, have invented certain new and useful Improvements in Acetylene-Gas Generators; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable
10 others skilled in the art to which it appertains to make and use the same.

Our invention relates to improvements in acetylene-gas generators; and it consists in the construction and combination of devices here-
15 inafter described and claimed.

In the accompanying drawings, Figure 1 is a perspective view of an acetylene-gas generator embodying our improvements. Fig. 2 is a vertical sectional view of the same. Fig. 3
20 is partly a top plan view and partly a horizontal section taken on the plane indicated by the line *a a* of Fig. 2. Fig. 4 is a detail sectional view taken on the plane indicated by the line *b b* of Fig. 2. Fig. 5 is a detail ele-
25 vation of the feed-bar and valve-operating arm. Fig. 6 is a detail elevation of the carbid-valve, the coacting parts of the carbid-chamber being shown in section. Fig. 7 is a detail sectional view taken on the plane indi-
30 cated by the line *c c* of Fig. 6.

A gas-generating chamber 1, which is adapted to contain a quantity of water, is here shown as a tank which is provided at its upper side with a contracted neck portion 2. The said
35 tank is provided on one side with a valve 3 for the discharge of water and sludge or spent carbid from the tank, and the bottom 4 of the tank inclines toward the said valve to facilitate the discharge of the sludge therefrom. At a
40 suitable distance from the bottom of the tank 1 is a cross-bar 5, which has an opening 6. A stirrer 7, which is revoluble, is disposed in the tank 1 immediately above the bottom thereof and is provided with an operating-rod
45 8, which extends upwardly through the tank and the top thereof and is provided at its upper end with the crank-handle 9, by which it may be rotated. The said operating-rod 8 is disposed in and extends through a tubular cas-

ing 10, the lower portion of which is sub- 50 merged in the water in the tank 1 and forms a water seal which effectually prevents the escape of gas from the tank around the rod 8. The lower portion of the tubular casing 10 is attached to and braced by the cross-bar 5, and
55 rod 8 also extends through an opening in the said cross-bar. The latter also serves as a brace in the sides of the tank 1 and strengthens the construction of the tank, as will be understood. 60

In one side of the generating-tank 1 is a pipe 11, the upper end of which is open above the water-level in the tank, said pipe serving for the discharge of gas from the tank. The lower portion of the said pipe extends out- 65 wardly through one side of the tank 1, and its extreme lower end is downturned and connected to an inverted-funnel-shaped screen 12, which is preferably made of sheet metal and is perforated, but which may be made of any 70 suitable foraminous material.

The neck 2 is detachable from the generating-tank 1 and is provided at its lower end with an outwardly-extending flange 13, which is secured to the top of the tank by means of 75 bolts 14. Suitable packing material, as indicated at 14', is interposed between the said flange and the upper side of the tank. A carbid-tank 15 is here shown as cylindrical in form, with an inverted-funnel-shaped upper 80 portion 16 and a funnel-shaped lower portion 17, the latter having a discharge-spout 18 at its lower end, which is here shown as cylindrical in form and the lower end of which is curved, as at 19. There is a neck portion 20 85 at the upper side of the carbid-tank, on which is screwed a closure 21, which has an arm 22. The lower end of the carbid-tank is inserted in the upper portion of the neck 2 and securely fastened thereto. To one side of the 90 carbid-tank is a bracket 23, which depends therefrom. A carbid-valve shaft 24, which is horizontally disposed, has its bearings in the bracket 23 and in a stuffing-box 25 in one side of the neck 2. The inner end of said shaft 95 extends into the discharge neck or spout 18 of the carbid-tank and is provided with an agitator or stirrer 26, which within the scope

of our invention may be of any suitable form. It is here shown as comprising a plurality of radially-disposed arms 27, which turn with the shaft. The carbid-valve 28 is a shoe which is curved transversely on the radius of the curved lower side 19 of the discharge neck or spout of the carbid-tank, the inner face of the said shoe being concentric with the shaft 24. The bottom 19 of the neck or spout of the carbid-tank is provided with a discharge-opening 29, which extends laterally across the same and the length of which is practically coextensive with the width of the carbid-valve. The latter has an arm 30, by which it is connected to the shaft 24 for operation thereby, the said arm being here shown as provided with a set-screw 31 to bind it to the shaft. It will be understood that by means of the shaft the carbid-valve may be turned to open the slot or discharge-opening 29 of the carbid-tank to any desired extent and cause carbid to be discharged therefrom and be dropped into the water in the generating-tank. It will be also understood that the agitator or stirrer 26 turns with the shaft 24 and that said agitator or stirrer serves to prevent carbid from lodging in the discharge spout or neck of the carbid-tank. To the outer end of the shaft 24 is attached an operating-arm 32. On the said shaft is also secured a segmental arm 33, which is substantially parallel with the arm 32 and the weight of which is sufficient to cause the shaft 24, and hence the carbid-valve, to turn in one direction when the arm 32 is released by the mechanism hereinafter described. A gasometer 34, which comprises a water-tank 35 and bell 36, is disposed near the generating-tank 1. The water-tank has a false bottom 37, which forms a gas-purifying chamber 38 in its lower side, and the discharge end of the gas-tube 11, provided with the inverted-funnel-shaped screen 12, is disposed in the said chamber 38 and submerged in the water therein. A gas-service pipe 39 leads from the chamber 38 at a point above the water-level. A pipe 40 is disposed in the water-tank 35, is of suitable height, has its upper end open, and said pipe extends downwardly through without communicating with the interior of the purifying-chamber 38 and is connected with a union 41, to which a gas-discharge pipe 42 (shown in dotted lines) may be coupled. A pipe 43 is also coupled to the union 41 and communicates with the gas-space of the generating-tank 1. In the said pipe 43 is a vent-valve 44. The said valve has a vertically-disposed operating-rod 45, on which is secured a horizontally-disposed segmental disk-arm 46, which is adapted to engage the disk-arm 33 of shaft 24. The upper portion of said rod 45 is journaled in a bearing 47, which projects from one side of the carbid-tank, and at the upper end of said rod 45 is a detent-arm 48, which is adapted to engage the arm 22 of the closure 21 to prevent

the said closure from being turned and removed from the feed-opening 20 of the carbid-tank.

A tube 49 has its lower portion secured to the bottom of the tank 34 and extended through the false bottom 37 thereof, and said tube extends upwardly above the water-level in the said tank and is open at its upper end under the top of the gas-bell. Said tube communicates with the gas-space of the gas-purifying chamber 38, as at 50. The gas-bell has a tube 51, which is attached to its upper side, depends therefrom, and is of suitable length. The upper end of this tube 51 is closed, and its lower end is open, and said tube telescopes over the tube 40 and slides vertically thereon with the ascent and descent of the gas-bell. At a suitable distance from its lower open end said tube 51 is provided with an opening 52, which when it is above the water-line of the tank 35 enables excess gas to pass from the bell into the pipe 40 and through the latter to the union 41 and discharge-pipe 42, which latter pipe leads to the outer air. A guide-bar 53 extends transversely across the lower portion of the gas-bell and has a central opening 54, through which the tube 49 extends, said guide-rod being thereby adapted to slide on said tube, as will be understood. Two or more guide-rods 55 project upwardly from the water-tank and are engaged by guide ears or brackets 56, which are attached to the upper side of the gas-bell and extend outwardly therefrom and have sliding connection with said guide-rods. Said guide rods and ears or brackets 56 prevent the upper side of the gas-bell from moving laterally, and the same office is performed for the lower end thereof by the bar 53 and tube 49. Hence the gas-bell is adapted to move only in a vertical direction and is entirely prevented from wobbling during such movement or inclining in any direction.

A funnel 57 is attached to one side of the generator-tank 1 and extends above the same, and the lower side of the said funnel is connected by a pipe 58 to the said tank, so that water may be supplied to the latter through said funnel. An arm or lever 59 is attached to the rod 45 and by means of which said rod 45 may be turned to open the vent-valve 44 to supply air to the tank 1 when the latter is being discharged of the water and sludge therein, and this movement of the rod 45 causes its arm 48 to move out of the path of the arm 22 of the closure 21, so that the latter may be opened to permit the supply of carbid to the tank 15. When thus turned, the arm 59 clears the upper side of the funnel 57, so that a new supply of water may be introduced into the generating-tank 1. The discharge-valve 3 of the latter has a lock-bar 60, which is connected by a chain 61 to the said lever 59. When the latter is in the position hereinbefore described to clear the funnel 57, the chain 61 is slack to

permit the lock-bar 60 to drop so that the
 sludge or discharge valve may be operated.
 While the lever 59 is in this position the disk-
 arm 46, which is a detent, is in position to en-
 5 gage the disk-arm 33, which is also a detent,
 the arm 32 having been previously manually
 turned to an elevated position to close the car-
 bid-feed valve, the disks or detents 33 46 coact-
 ing to lock the said carbide-feed valve in a closed
 10 position. Hence the generating apparatus may
 be readily charged with carbide and water and
 cleansed when necessary. It will be under-
 stood that this will only be done when the gas
 in the gasometer has been spent. After thus
 15 charging the apparatus with carbide before
 putting the same in automatic operation the
 valve 28 will be operated manually to drop a
 certain quantity of the carbide into the gen-
 erating-tank 1, and valve 44 being open the
 20 gas generated will expel the air from the
 generating-tank through the pipes 43 and
 42 and prevent it from being forced into the
 gasometer, and hence into the service-pipe.
 Vent-valve 44 will then be closed by turning
 25 the lever 59 to the position shown by dotted
 lines in Fig. 3, which movement of the lever
 causes it to lie above the funnel 57 to prevent
 water from being poured therein and tightens
 the chain 61 to cause the lock-bar 60 to pre-
 30 vent the valve 3 from being opened, and this
 movement of the lever 59 also causes the de-
 tent-disk 46 to be disengaged from and to clear
 the path of the detent disk or arm 33, so that
 thereafter the carbide-feed valve may be au-
 35 tomatically operated by the means which we
 will now describe.

The feed-bar 62, which is vertically disposed
 and of suitable length, is connected at a suit-
 able distance from its upper end to the top of
 40 the gas-bell by a bracket or other suitable de-
 vice 63, and said feed-bar is disposed on one
 side of the water-tank 34 and rises and falls
 with the gas-bell. Near its upper end it is
 provided with bearings for a tappet-screw 64,
 45 which has a winged head whereby it may be
 readily turned to protrude from one side of
 the feed-bar into the path of the arm 32 or
 to be withdrawn to a position to disengage
 and clear said arm and permit the same to
 50 be turned manually in position to close the
 valve 28 to start the apparatus in operation,
 as hereinbefore described. The said feed-
 bar has a flange 65, which projects laterally
 therefrom. The upper end of the said flange
 55 is at a suitable distance below the tappet-
 screw 64 to enable said arm 32 to bear be-
 tween the upper end of said flange and said
 tappet-screw, as will be understood, when the
 gas-bell is at the lower limit of its move-
 60 ment. When the apparatus has been charged
 with carbide and water, as hereinbefore stated,
 and has been put in operation, the arm 33 is
 turned down below the tappet-screw 64, the
 latter being turned so as to bear against the
 65 upper side of said arm. This opens the car-

bid-feed valve and causes gas to be generated
 in the tank 1, the gas passing from said tank
 through the pipe 11 and screen 12 into the
 water in the tank 38 said screen causing the
 gas to be broken up into small particles, as it
 70 were, and hence subjected to the thorough
 cooling and cleansing action of the water, and
 the gas after bubbling up through the water
 in the tank 38 passing directly into the serv-
 ice-pipe 29. If this gas-supply is greater than
 75 the capacity of the burners supplied by the
 service-pipe, which is always the case, the ex-
 cess gas passes up through the pipe 49 into
 the gas-bell and becomes stored therein, the
 bell being caused to rise by the pressure of
 80 the gas thereunder, whereupon the feed-bar
 65 moves upwardly with the bell and coacts
 with the lever 32 by turning the latter in an
 inclined position to close the carbide-feed
 valve. As the gas is expended the bell lowers
 85 until the tappet-screw 64 reengages the arm
 32, the weight-disk 33, as hereinbefore de-
 scribed, causing the shaft 24 to turn to the
 extent required to thus reengage the tappet-
 screw with the arm 32, and the continued de-
 90 scent of the gas-bell after the tappet-screw has
 been thus engaged with the arm 32 causes the
 latter to reopen the carbide-feed valve, and thus
 cause another quantity of gas to be generated.
 Hence the apparatus is automatic in its oper-
 95 ation. The flange 64 bears against the free
 end of the arm 32 during the ascent and de-
 scent of the gas-bell at such times as the arm
 32 is not in engagement with the upper end
 of said flange and the tappet-screw 64. 100

From the foregoing description, taken in
 connection with the accompanying drawings,
 the construction and operation of the inven-
 tion will be readily understood without re-
 105 quiring a more extended explanation.

Various changes in the form, proportion,
 and the minor details of construction may be
 resorted to without departing from the prin-
 ciple or sacrificing any of the advantages of
 110 this invention.

Having thus fully described our invention,
 what we claim as new, and desire to secure by
 Letters Patent, is—

1. In acetylene-gas-generating apparatus,
 the combination of a generator vessel, a car-
 115 bid vessel, a carbide-feed valve, a partly-revo-
 luble rod to operate the carbide-feed valve, said
 rod having a detent segment-arm 33 and an
 operating-arm, a gasometer having a gas con-
 nection with the generating vessel and a mov-
 120 able element having means to engage and ac-
 tuate the operating-arm, and a partly-revolu-
 ble, manually-operated element having a seg-
 ment-arm 46, to coact with the segment-arm
 33 to lock the carbide-feed-valve-operating rod
 125 in position to close the valve and maintain the
 operating-arm out of operative relation to the
 actuating means of the movable element of
 the gasometer.

2. In acetylene-gas-generating apparatus, 130

the combination of a generator vessel, a carbide vessel having a supply-port and a closure therefor, a carbide-feed valve, a rod to operate it, said rod having a detent element and an automatically-operating element, a gasometer having a gas connection with the generating vessel and a movable element having an automatically-operating element to coact with that of the carbide-feed-valve-operating rod, and manually-operated means to lock the said rod in position to close the carbide-feed valve and disengage the automatically-operating element of the said rod from that of the gasometer, said manually-operated means, having a lock element operated thereby, effective, when the carbide-feed-valve-operating rod is released, to lock the closure of the carbide-vessel-supply port.

3. In acetylene-gas-generating apparatus, the combination of a generator vessel, a vent-valve, water-supply funnel therefor, and a sludge-valve therefor, means to lock the sludge-valve, a carbide-feed element, a rod to operate said carbide-feed element, said rod having an automatically-operating element, a gasometer having a gas connection with the

generating vessel and further provided with a movable element having an automatically-operating element to coact with that of the carbide-feed-element-operating rod, and manually-operating means effective when in one position to lock said rod in position to suspend action of said carbide-feed element, to disengage the automatically-operating element of said rod from that of the movable element of the gasometer, open the vent-valve and release the sludge-valve lock, and effective when in another position to release the carbide-feed-element-operating rod, engage the automatically-operating element thereof with that of the movable element of the gasometer, close the vent-valve, lock the sludge-valve, and feed the water-supply funnel.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

JOHN M. FLUGSTAD.
PETER M. FLUGSTAD.

Witnesses:

THOMAS H. IRVINE,
DAVID A. BISHOP.