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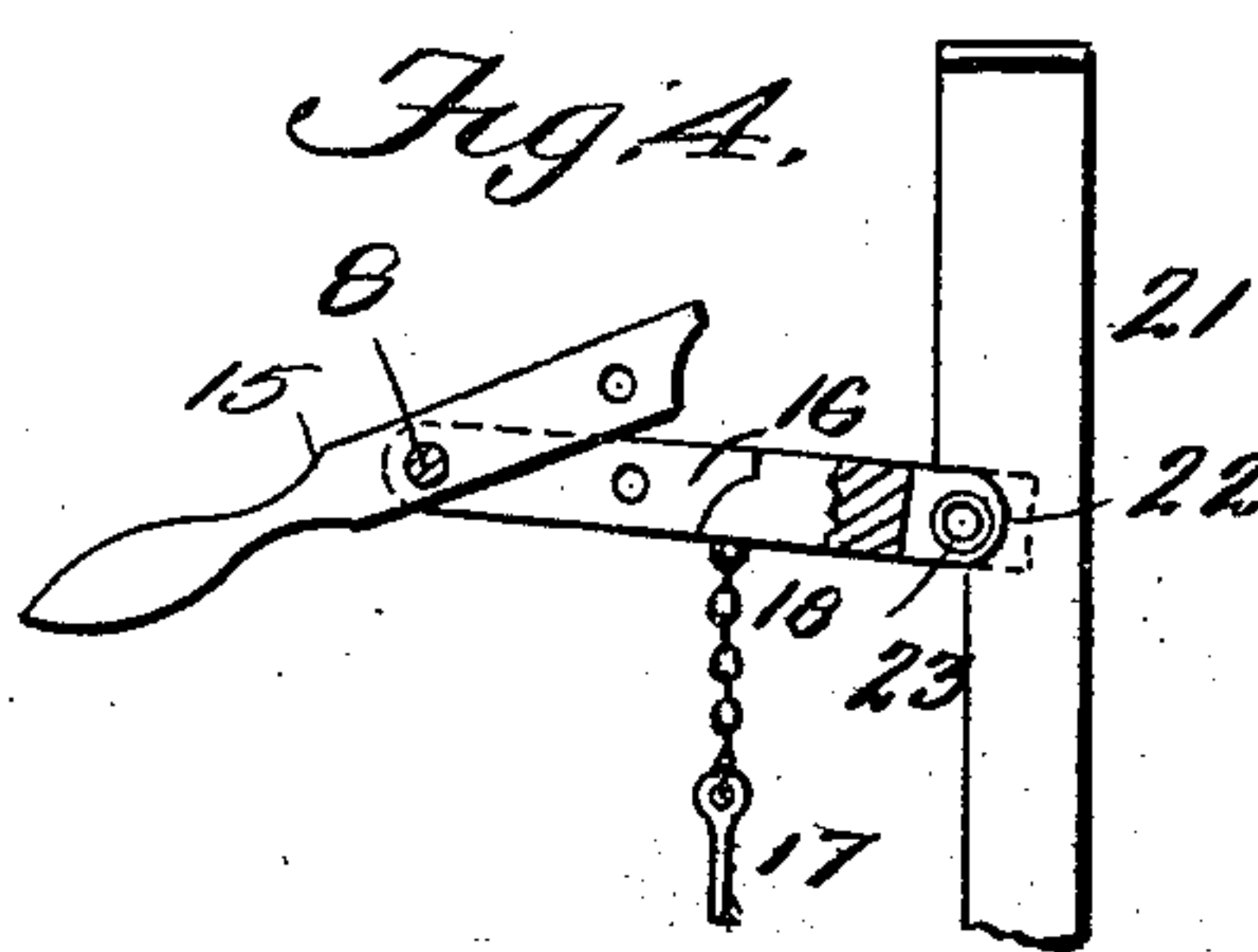
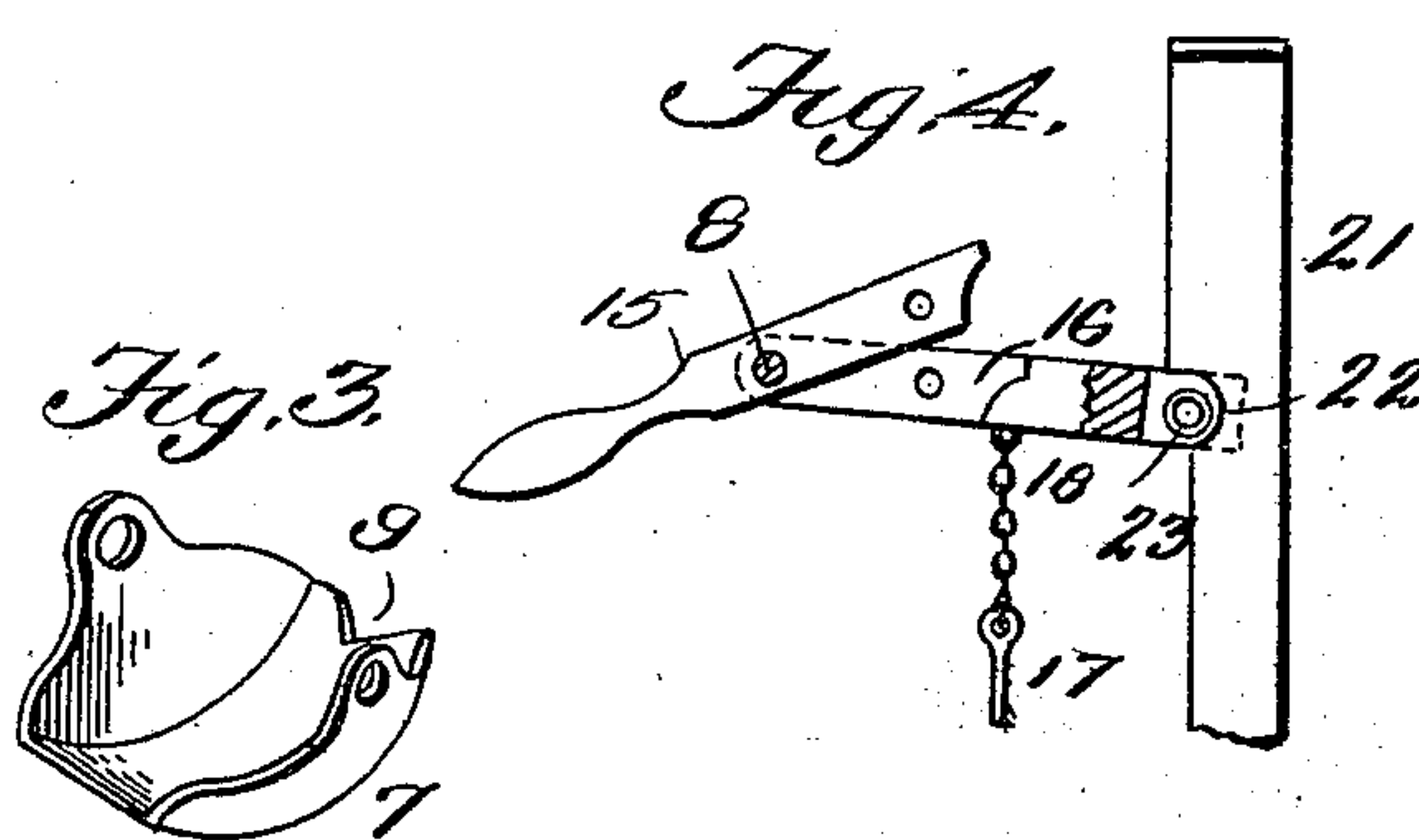
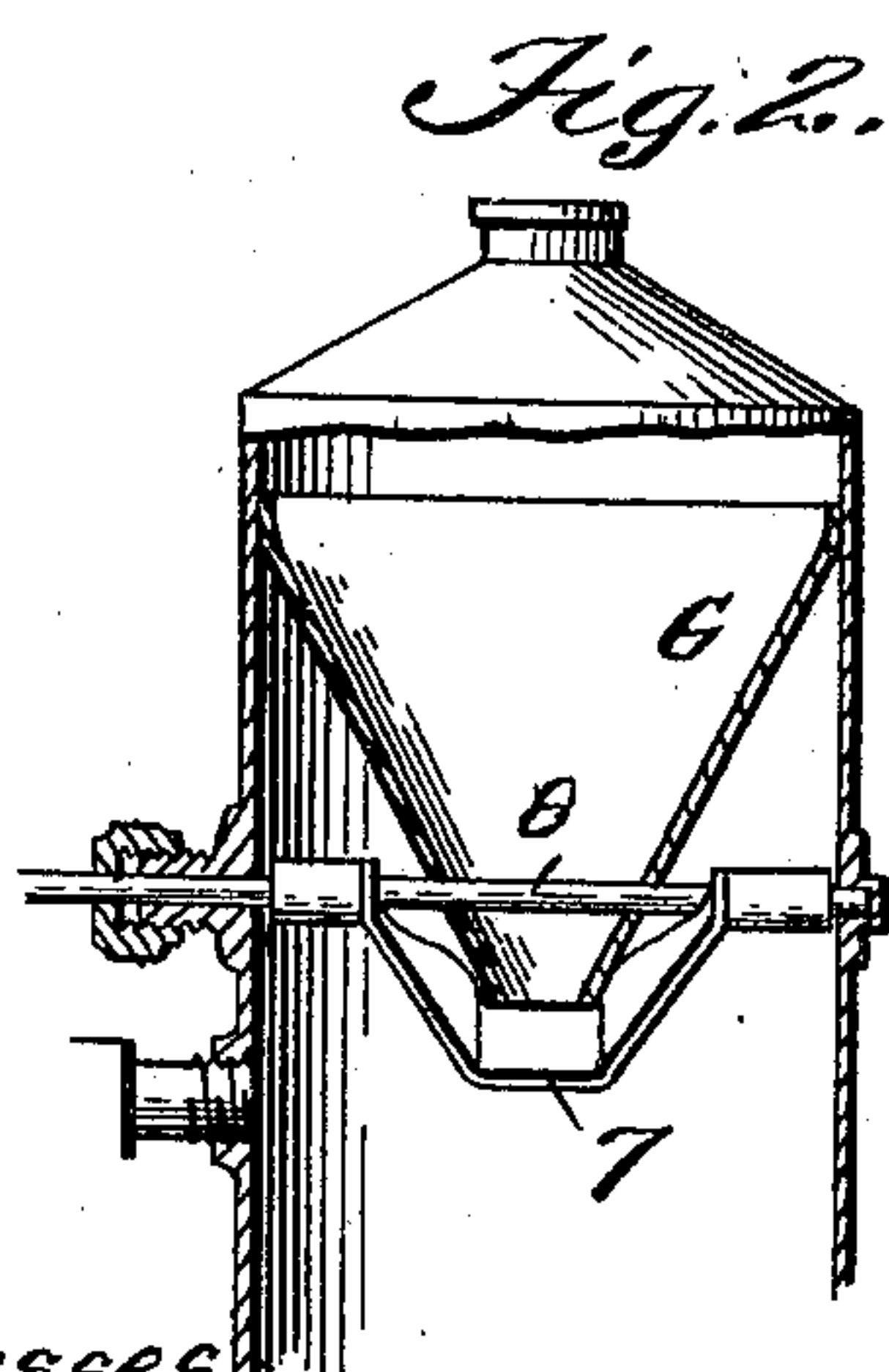
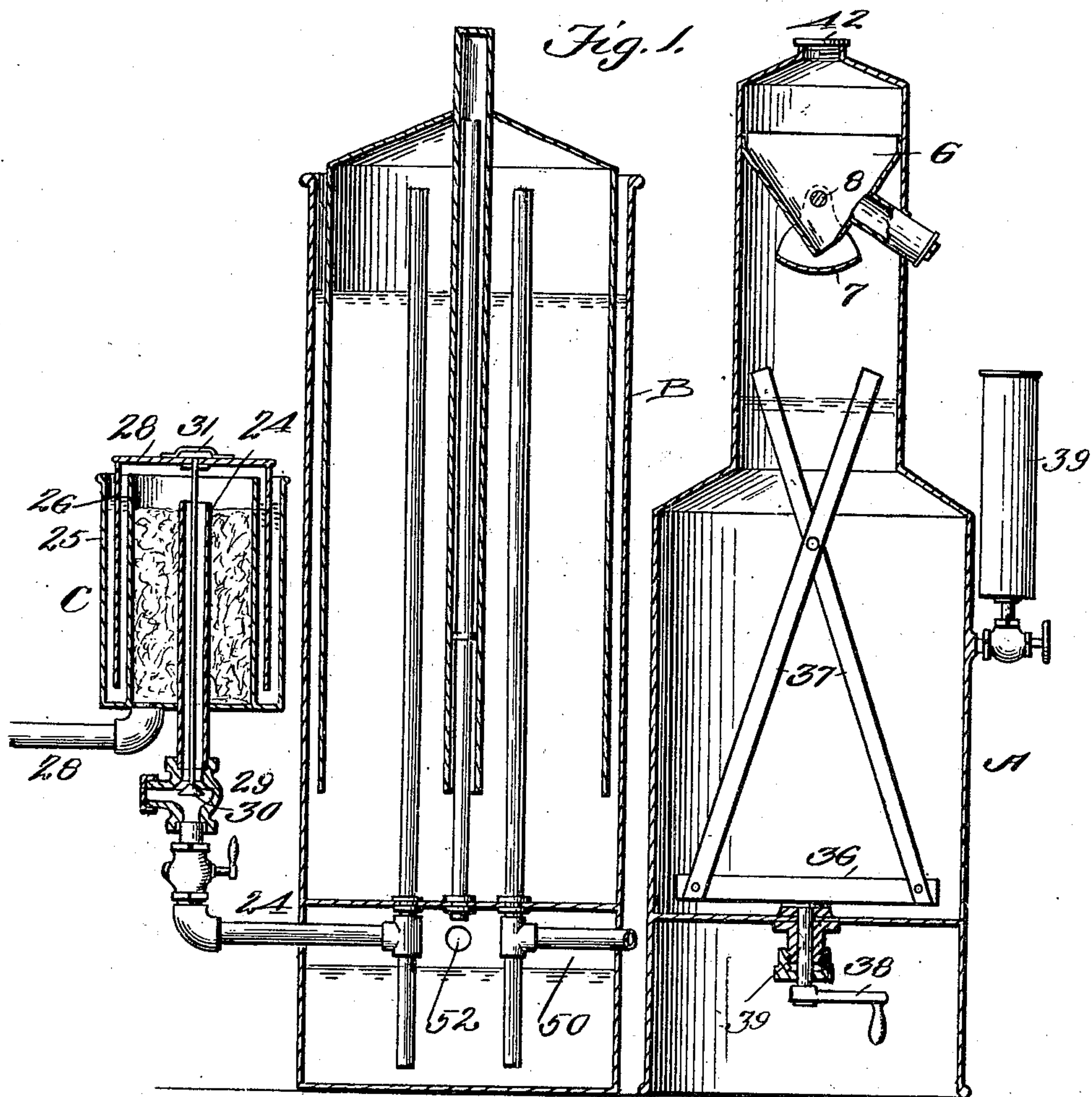
Patented Oct. 29, 1901.

A. WHITE & F. HARBAUGH.
ACETYLENE GAS GENERATOR.

(Application filed Feb. 11, 1901.)

(No Model.)

2 Sheets—Sheet 1.



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2 Sheets—Sheet 2.

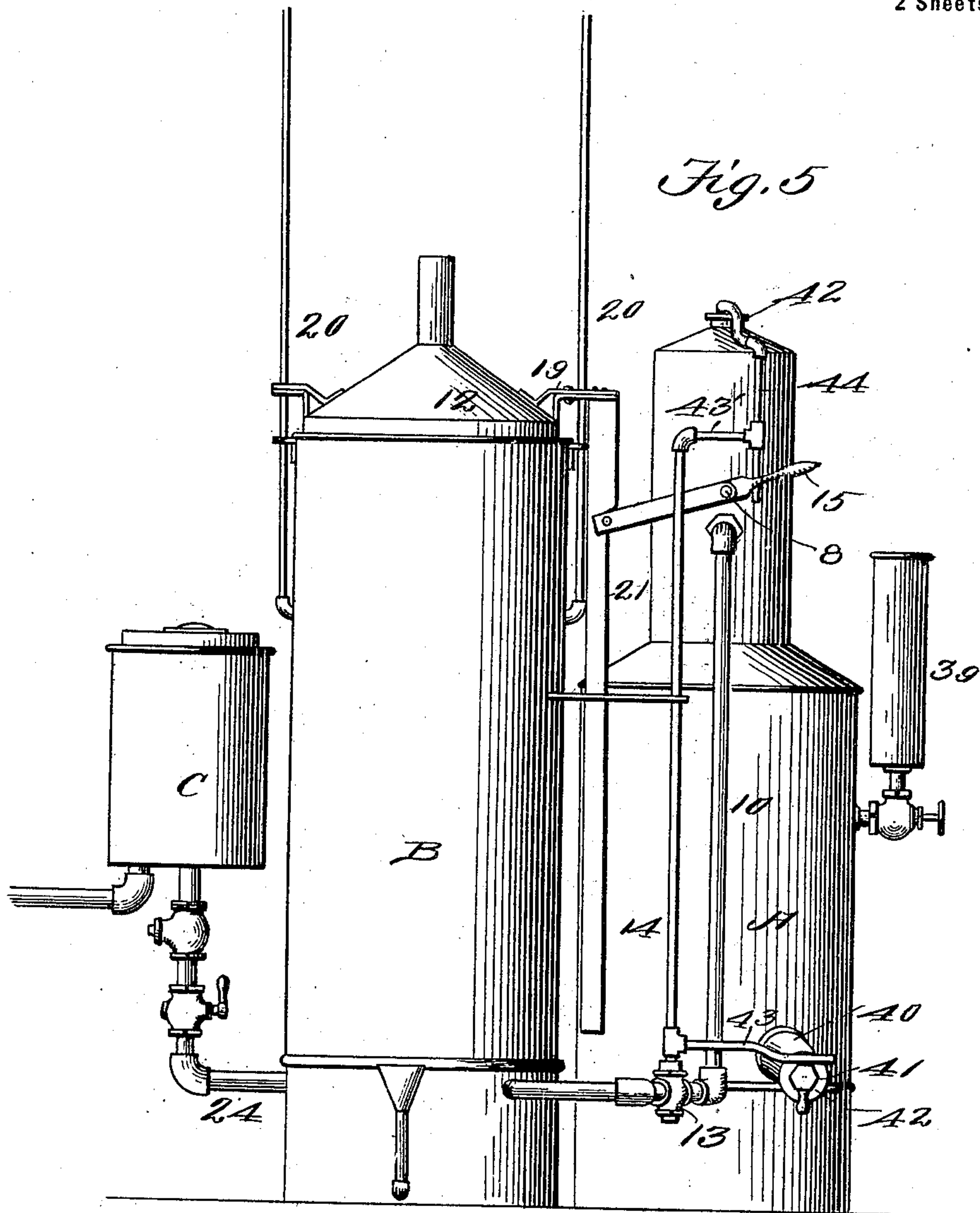


Fig. 6.

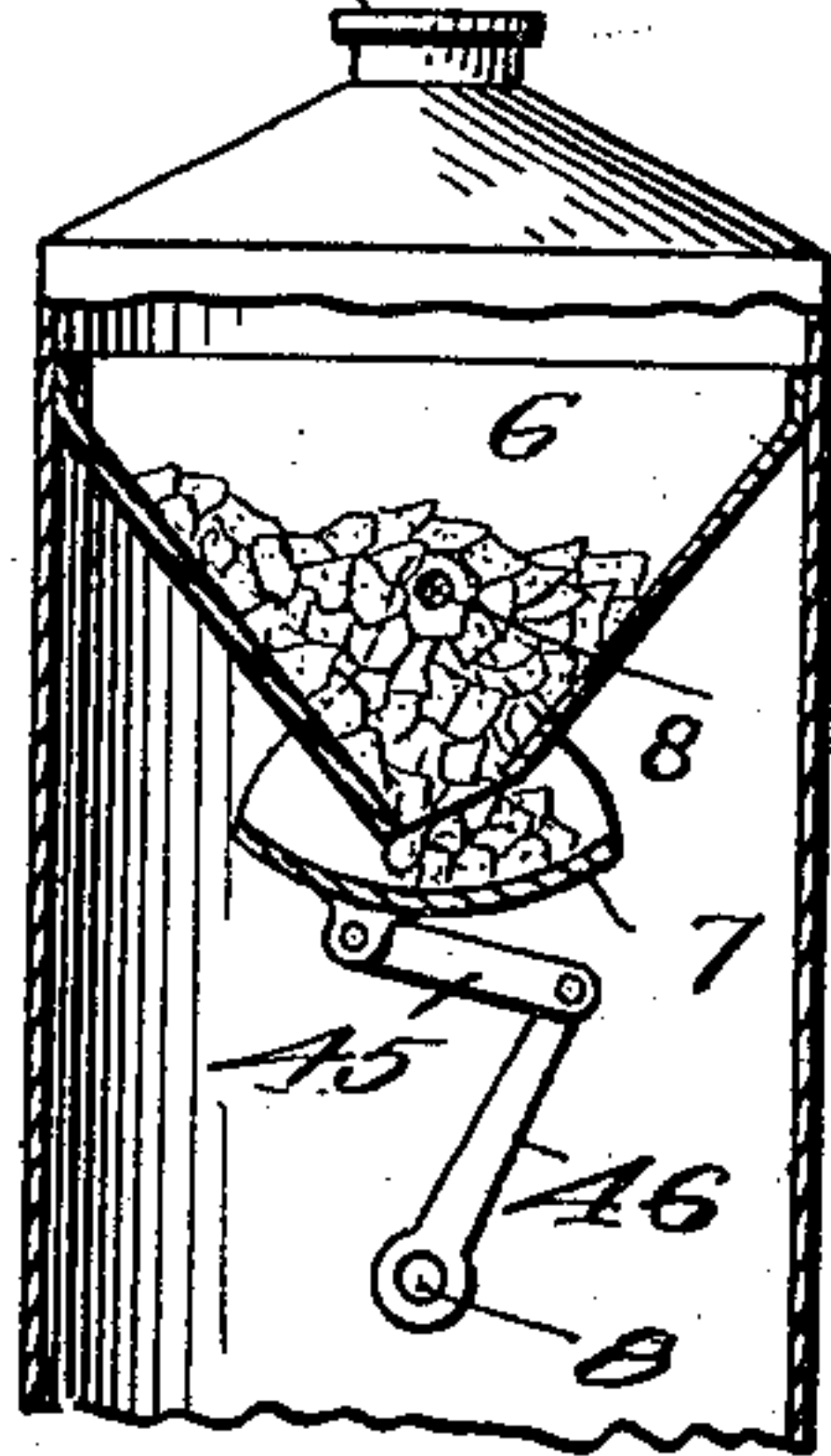
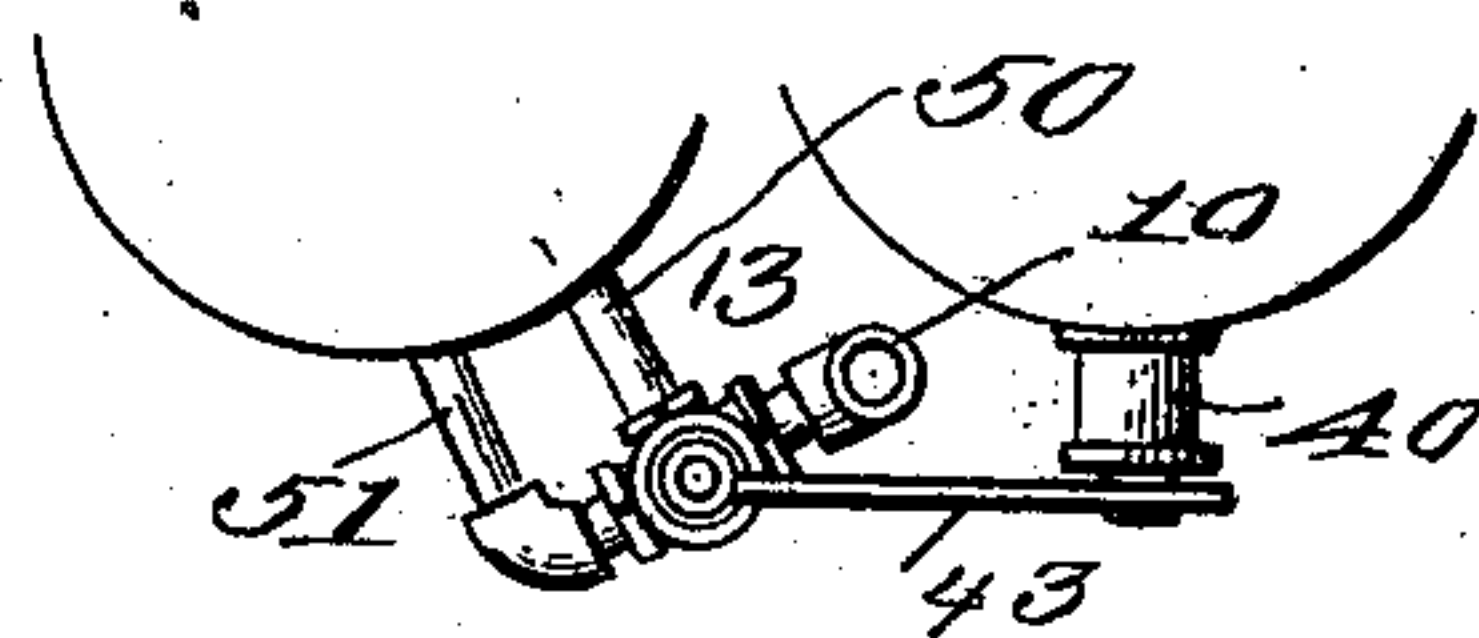


Fig. 7.



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UNITED STATES PATENT OFFICE.

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ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 685,545, dated October 29, 1901.

Application filed February 11, 1901. Serial No. 46,846. (No model.)

To all whom it may concern:

Be it known that we, ALEXANDER WHITE and FRANK HARBAUGH, citizens of the United States, residing at Waterloo, in the county of Blackhawk and State of Iowa, have invented new and useful Improvements in Acetylene-Gas Apparatus, of which the following is a specification.

This invention relates to acetylene-gas apparatus; and it includes certain peculiar features hereinafter more particularly described and claimed.

In the drawings forming a part of this specification, Figure 1 is a central vertical section of an acetylene-gas apparatus. Fig. 2 is a transverse section of the carbide-containing hopper and immediate parts. Fig. 3 is a detail perspective view of a swinging pan for controlling the feed of the carbide. Fig. 4 is a detail view of the duplex arm and actuator therefor. Fig. 5 shows a controlling device for several of the parts. Fig. 6 shows a different way of mounting the pan. Fig. 7 is a detail view of the three-way cock and adjacent parts.

Like characters refer to like parts in all the figures of the drawings.

The apparatus involves as a part thereof a generator in which the calcium carbide and water are brought into contact to form a gas which is conducted from the generator to a gas-holder, and means of a peculiar and novel character are furnished for supplying the carbide in accurate quantities automatically and in accordance with the amount of gas desired.

The generator is denoted by A, and it may be of any suitable size and made from the usual materials generally employed for this class of work.

The generator A is provided at its upper end with a carbide-containing hopper 6, tapered below its middle to the discharge orifice or opening, the carbide passing through this opening and falling onto the pan or cradle 7. The pan is supported for oscillation or swinging movement below the hopper, it being adapted when moved rearward to spill off a portion of the carbide sustained thereon into the water in the generator A, and it is some-

what concaved or dished, it having side walls inclined upwardly and outwardly and fastened to the transverse rock-shaft 8, extending through the generator and hopper-walls, respectively, it being sustained by suitable bearings thereon. This shaft is automatically actuated at proper times to swing the pan back to cause the feed of the carbide.

The pan or cradle 7 is supported some distance below the hopper, and when it is in its normal position, as shown in Fig. 1, its outer edges are located beyond the lower portion of the hopper, so that the pieces of carbide on the pan will not fall therefrom, it being evident that a banked-up mass of carbide is sustained on the pan entirely free of the hopper and at opposite sides of its discharge-opening. When the pan or cradle, however, is rocked backward a short distance, the carbide falls or is pushed therefrom and gravitates into the water in the generator, and thereafter the pan resumes its initial position before it reaches a point where it would open a free passage from the hopper. It will be understood that when the pan is given its primary operation only so much carbide drops off as was located at the delivery edge thereof, and no more can fall until the pan is swung farther rearward. However, as soon as the carbide is supplied the bell of the gas-holder is caused to rise and to swing the pan to its initial position. When the pan reaches such initial position, a supply of carbide passes from the hopper to take the place of that which has just been furnished the generator.

It will be observed that the discharge edge of the pan or cradle 7 has a notch or opening, as 9, shown as V-shaped, by which construction the quantity of carbide supplied to the generator can be accurately regulated under all conditions. When only a few burners are used, the bell of the gas-holder goes down very slowly, and hence the pan is moved correspondingly, and when it tilts we find that just the requisite quantity falls off to maintain the lights, and when the bell rises the pan is caused to resume its primary position to control the supply.

The generated gas from the tank A passes

through the pipe 10 into the gas-holder, having the usual vertically-movable bell 12. This gas-holder is of a known kind, and hence a detailed description of the same is unnecessary.

5 The pipe 10 has adjacent the gas-holder a three-way cock 13 of some suitable kind, the stem of which is connected to the upright arms 14 of a device adapted to prevent certain operations except at the correct times, and said device will be hereinafter more particularly described.

10 The pipe 10 has branches, as 50 and 51, controlled by the three-way valve 13, the branch 50 passing into the gasometer to normally supply the same with gas from the generator, and when the generator is to be charged said valve will be turned to shut off connection of pipe 10 to the gas-holder and open connection to the escape-pipe 51 for any gas coming over from the generator, the gas from the escape-pipe entering the under side of the gasometer and flowing from thence to atmosphere through the vent 52.

25 As the bell 12 descends it will through immediate mechanism, now to be described, swing the pan 7 backward to spill the carbid on said pan to generate gas, which flows into the gas-holder and causes the bell to rise and cause the return of the pan to its normal position.

30 The rock-shaft 8 where it extends beyond the generator-wall carries a duplex arm consisting of two members, one loose on the shaft and the other fixed thereto, but which during the normal operation of the apparatus are rigidly connected together, so as to form, in effect, a continuous arm in a single plane.

35 The fixed arm is denoted by 15 and the loose one by 16, the latter having a pin 17, connected thereto by a cord or chain, as 18, the pin being adapted to pass through holes in the respective arms, so as to rigidly unite them. When the two arms are connected by the pin, the arm 16 will be engaged by a device operable from the bell 12, so as to swing the pan 7 and supply the carbid to the generator in the manner described.

40 With the apparatus empty and with the arms 15 and 16 coupled the pan or cradle 7 will be swung back, and it is of course necessary that this pan should be in a position to prevent the entrance of carbid into the generator when the hopper 6 is to be charged. To accomplish this, the pin 17 will be withdrawn, thereby uncoupling the arms, so that the arm 15, which is fixed to the shaft 8 and which is in the nature of a handle, can be grasped and drawn down as far as it will go to bring the pan to the position shown in Fig. 1, and by the arm or handle 15 the pan may be actuated to permit the carbid to fall into the generator, thereby forming gas, which flows to the gas-holder, and as the bell rises it will at a proper point through intermediate means operate the arm 16 to bring it into line with the arm 15, at which time the pin 17 can be inserted in the holes in said arms.

The bell 12 is provided near its upper side with ears, as 19, having openings to receive the vertical guide-rods 20 on the fixed part of the gas-holder, by which the bell is prevented from turning. The bell is provided with a depending vertical actuating-bar 21, having a notch, as 22, to receive the antifriction roller or projection 23 at the outer bifurcated end of the arm 16 at a proper time so that the arm 16 and shaft 8 may be operated to swing the pan 7 backward.

75 When the bell 12 rises to a point where the pan is in its initial position, the roller 23 will pass out of the notch or recess 22, and when said bell descends as the gas is consumed the roller 23 will enter said notch, and on a slight further descent the arm 16 will be rocked by the bar 21 to drop carbid into the water in the generator, generating gas and causing the bell to rise and effect the return of the pan 7 to its normal position.

85 The gas from the holder B passes through the pipe 24 into a combined regulator and filter, as C, including an outer cylinder 25, separated by a short distance from a cylinder 26, the space between the two being adapted to contain water and the part C being substantially like the gas-holder B, except that it is smaller, and the water serves to prevent the escape of gas. The bell 28 is interposed between the two cylinders and serves a peculiar function.

90 The discharge end of the pipe 24, which supplies gas to the tank C, is located some distance above the bottom of said tank, and the gas is taken from the latter through the pipe 28'.

95 The pipe 24 passes through the center of the tank C and has just below the same an enlarged portion or chamber 29, in which a conical valve, as 30, is located, the valve being conveniently formed of rubber and serving to control the admission of gas to said tank C. The stem of the valve passes upward through that part of the pipe 24 that is within the tank C and is tapped into or otherwise connected to a weight, as 31, which may be in the form of a casting secured to the top of the bell 27. During the normal pressure of the gas the bell 27 will be down, thereby maintaining the valve 30 open. When an excessive pressure takes place, the bell rises and closes or nearly closes the valve and shuts, for the time being, the pressure off and holds it in the gas-pipes at practically the same pressure all the time.

105 In order to remove fine particles from the gas before it reaches the burners, we will fill the space inside the bell 27 with animal wool packed comparatively tight, the wool being saturated or dampened with animal oil or grease, the oily surface of the wool as the gas passes therethrough catching any fine particles that may be therein, so that the gas is discharged from the tank C entirely free from objectionable matter.

130 We locate in the generator an agitator of

peculiar form, now to be described. A vertical spindle or shaft extends through the bottom of the generator and has the base-piece 36 of an agitating-frame secured through the diagonally-disposed arms 37, being fastened to the base-piece near its opposite ends. These arms cross each other and are connected together where they cross, their upper ends extending to and a slight distance above the water-level. The lower end of the shaft 35 is provided with a hand-crank, as 38, by which the agitator may be operated.

When the carbid falls into the water, there is a certain amount of matter that forms in lumps on the surface thereof and there collects, and if left undisturbed it may descend into the water when least expected and form so much gas as to force out the water seal and permit the gas to escape, or possibly other harm might result. By our improvement, however, these disadvantages are not present, for by rotating the agitator the arms thereof will crush these lumps or break up the coating and assure the proper descent of the carbid.

The generator has a valved spout 39, by which water may be supplied thereto, and a draw-off pipe 40, having a gate 41, provided with the finger-piece 42, by which it can be raised.

The carbid-hopper 6 has a cap 42, which can be removed to supply said hopper with carbid.

We provide preventive means for blocking certain operations until certain others have taken place. Thus the three-way valve 13 cannot be opened until the arm or handle 15 has been swung down.

The arm 14, to which reference has hereinbefore been made and which is rigidly secured to the three-way valve 13, has a transverse arm 43 projecting therefrom and which is located over and in contact with the finger-piece 42 of the gate 41, thereby to lock said gate. The arm 43 serves to actuate the three-way valve, and when it is swung out by hand the gate 41 will be released and may, if necessary, be opened.

The upper end of the arm 14 has an extension 43', to which the transverse arm 44 is connected, the lower end of the arm 44 extending back of the arm or handle 15 when the apparatus is empty and the upper part thereof overhanging the cap 42. Therefore the valve 13 cannot be opened by the arm 43 until the arm 15 is swung down. As soon as said arm is actuated the arm 44 will be released, so as to swing the locking-frame outward to permit the gate 41 being opened and the cap 42' removed for charging.

The pan is shown in Fig. 6 pivoted from the hopper, it having on its under side the link 45, jointed thereto and similarly connected to the arm 46 on the rock-shaft 8, it being evident that in this construction the pan is not directly connected to the rock-shaft; but otherwise the construction and mode of operation are the same.

The arm 43 is shown as occupying its normal position in Fig. 7, at which time the gas generated passes from the pipe 10 into the branch 50, while by swinging said arm outward to charge the generator the gas will be diverted into the branch 51 to be disposed of as before described.

The invention is not limited to the construction hereinbefore set forth, as it may be materially modified within the scope of the appended claims.

Having described the invention, we claim—

1. In an apparatus for generating acetylene gas, a generator, a carbid-hopper, a swinging feed-controlling pan for the hopper, a shaft connected with the pan, two arms one loose on the shaft and the other fixed thereto, means for rigidly coupling the arms, a gas-holder having a bell, and means connected with the gas-holder for operating said loose arm.

2. In an apparatus for generating acetylene gas, a generator, a carbid-hopper, a swinging feed-controlling pan for the hopper, a shaft connected with the pan, two arms one loose on the shaft and the other fixed thereto, a pin for rigidly uniting the arms, a gas-holder having a bell, a rod connected to the bell having a notch, and a projection on said loose arm adapted to enter said notch.

3. In an apparatus for generating acetylene gas, a generator, a carbid-hopper, a swinging feed-controlling pan for the hopper, a shaft connected with the pan, two arms one loose on and the other fixed to said shaft, means for rigidly coupling said arms, a gas-holder having a bell, means operative with the bell for operating said loose arm, a pipe connecting the generator and gas-holder having a valve, and means for actuating said valve controlled by said fixed arm.

4. In an apparatus for generating acetylene gas, a generator having a hopper, a controlling-pan for the hopper, an arm for actuating the pan, a cap for the hopper, a discharge-gate for said generator, a gas-holder having a bell, connections between the bell and the arm for operating the latter, a pipe connecting the generator and gas-holder having a valve, an arm operating the valve, having means connected thereto for controlling the cap and discharge-gate and controlled in turn by the arm that actuates said pan.

5. In an apparatus for generating acetylene gas, a generator and an agitator in said generator consisting of a horizontal base-piece and two crossed arms secured at their lower ends to the opposite extremities of the base-piece, the upper ends of the arms extending above the normal surface of the water in said generator and said base-piece having a depending spindle extending through the bottom of the generator provided with means for rotating the same.

6. In an apparatus for generating acetylene gas, a carbid-hopper, a feed-controlling device, a shaft connected with the latter, two arms carried by said shaft one loose and the

other fixed, a gas-holder having a bell, means operative with the latter for engaging the loose arm, and means for rigidly coupling said arms.

- 5 7. In an apparatus for generating acetylene gas, a generator having a hopper, a controlling-pan for the hopper, a shaft connected with said pan, two arms carried by said shaft one fixed and the other loose, means for rigidly coupling said arms, a gas-holder having
10 a bell, means operative with the bell for actuating said loose arm, a pipe connecting the

generator and gas-holder having a valve, an arm connected to said valve, and means normally held from operation by said fixed arm 15 and connected with said last-mentioned arm.

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

ALEXANDER WHITE.
FRANK HARBAUGH.

Witnesses:

GEO. WARDLE,
JOHN KATZENMEYER.