No. 795,478.

PATENTED JULY 25, 1905.

C. E. BLACKBURN & F. C. NICKEL.

ACETYLENE GAS GENERATOR.

APPLICATION FILED FEB. 21, 1905.

3 SHEETS—SHEET 1.

Fig. 1.

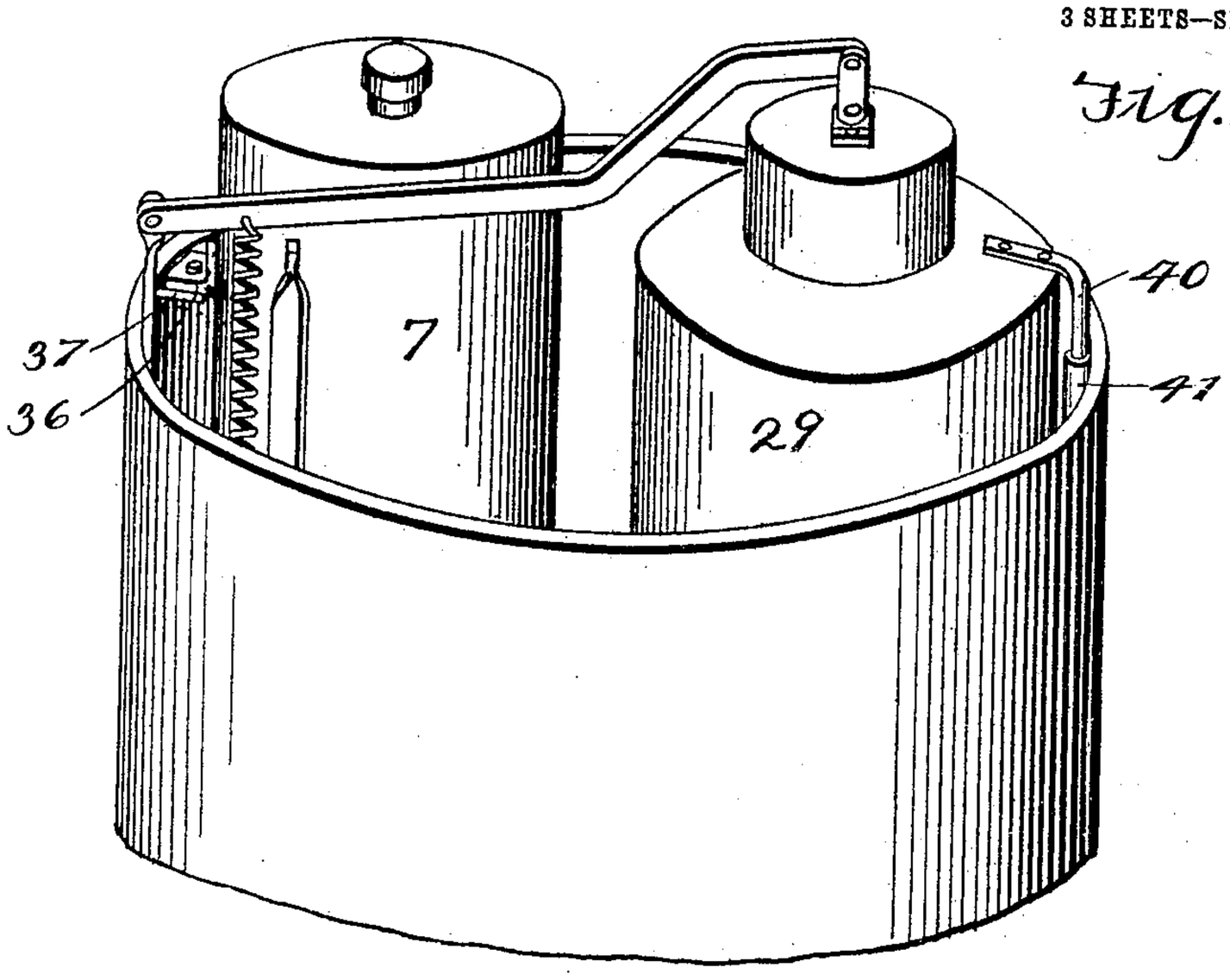


Fig. 6.

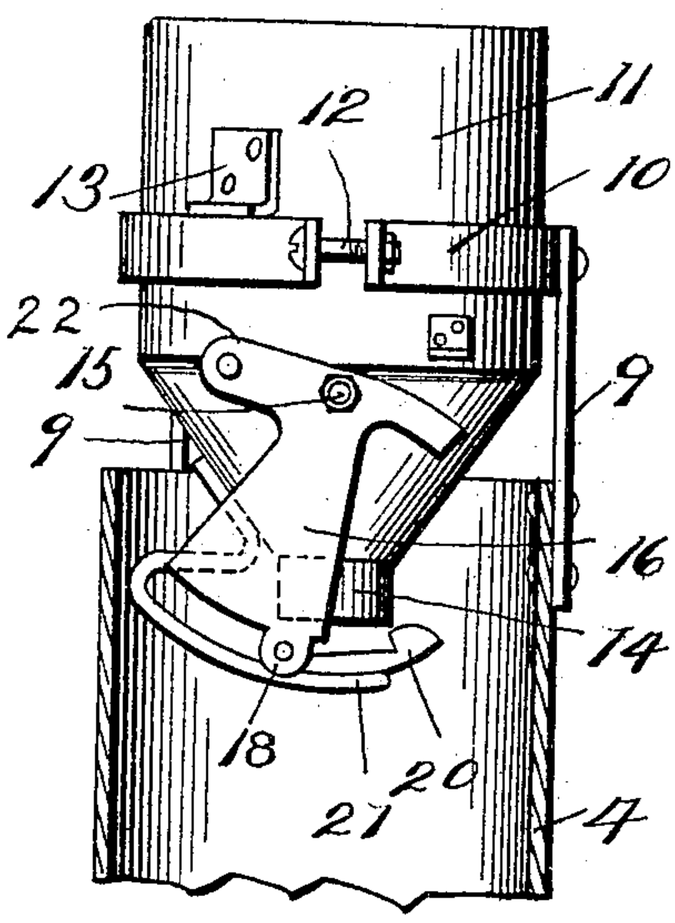
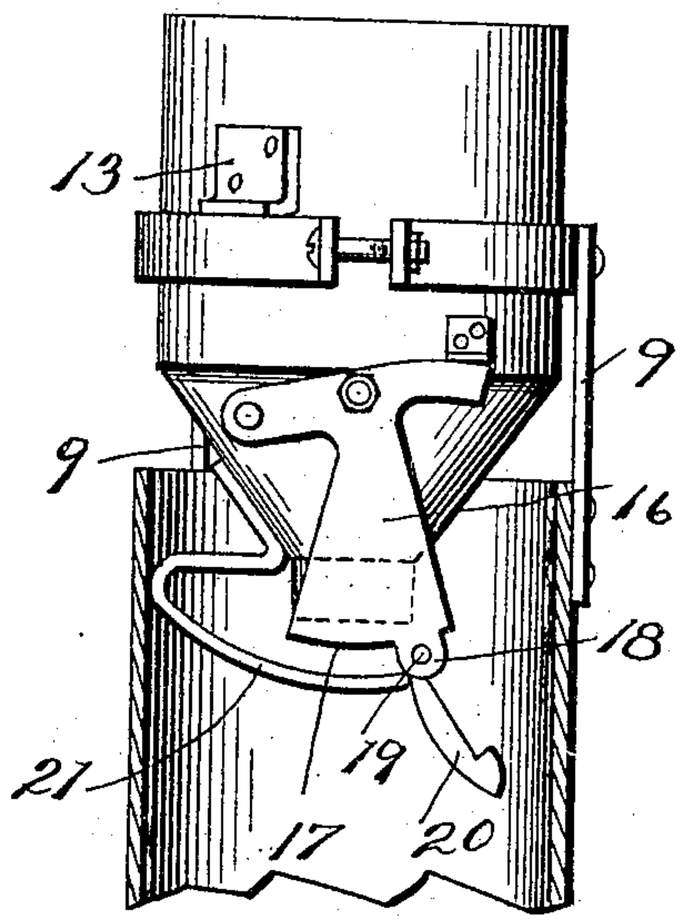


Fig. 7.



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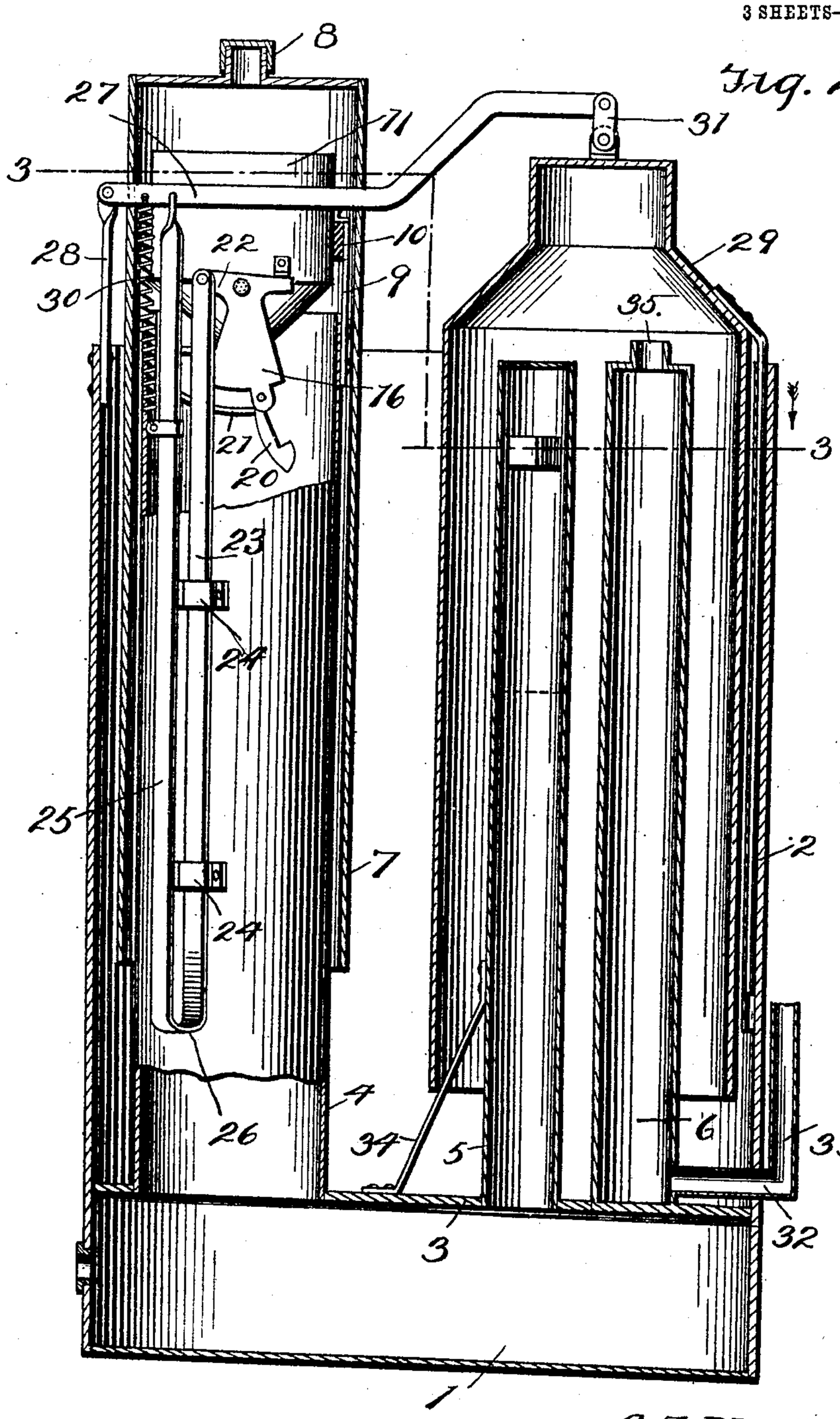
3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 3.

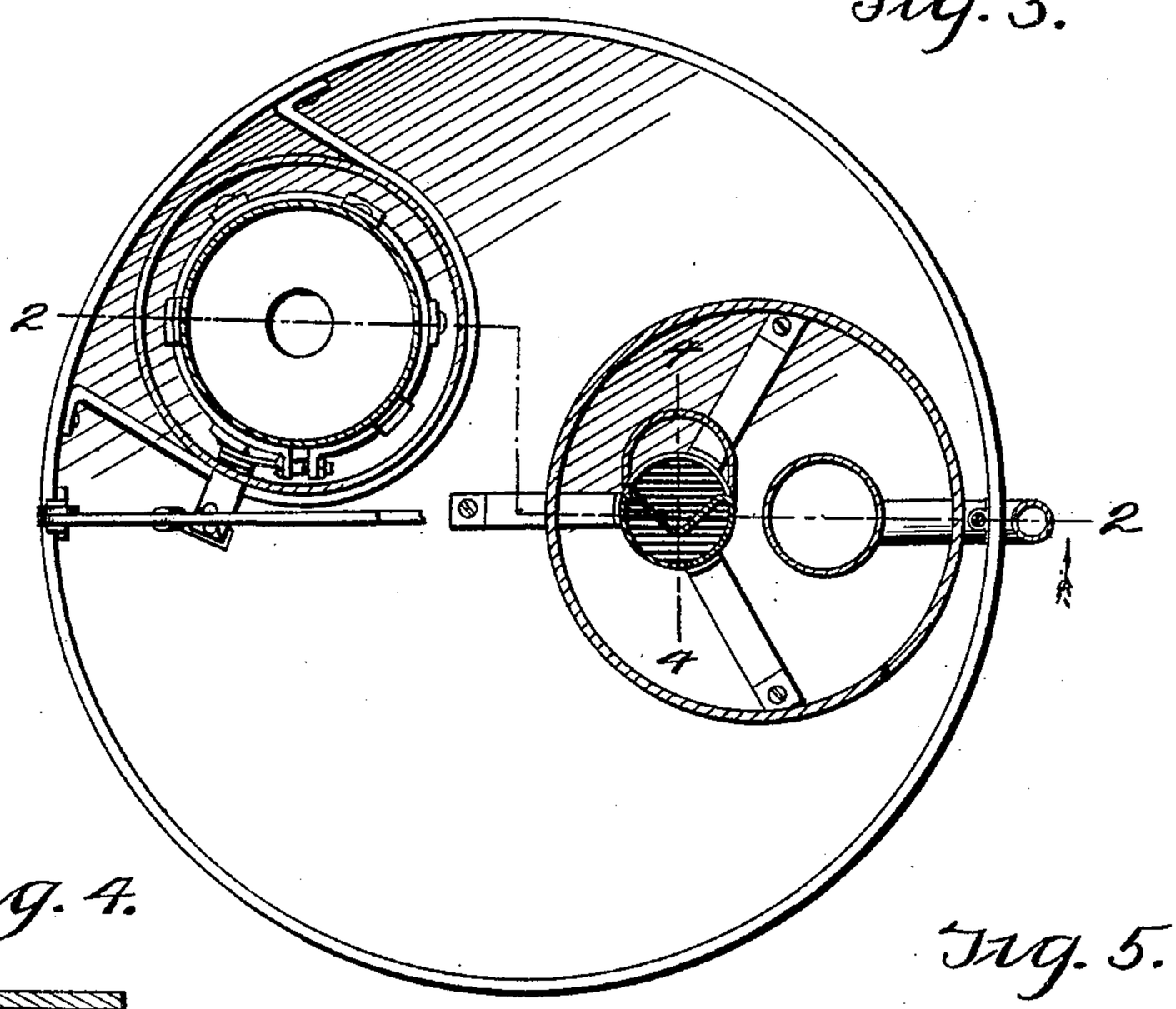


Fig. 4.

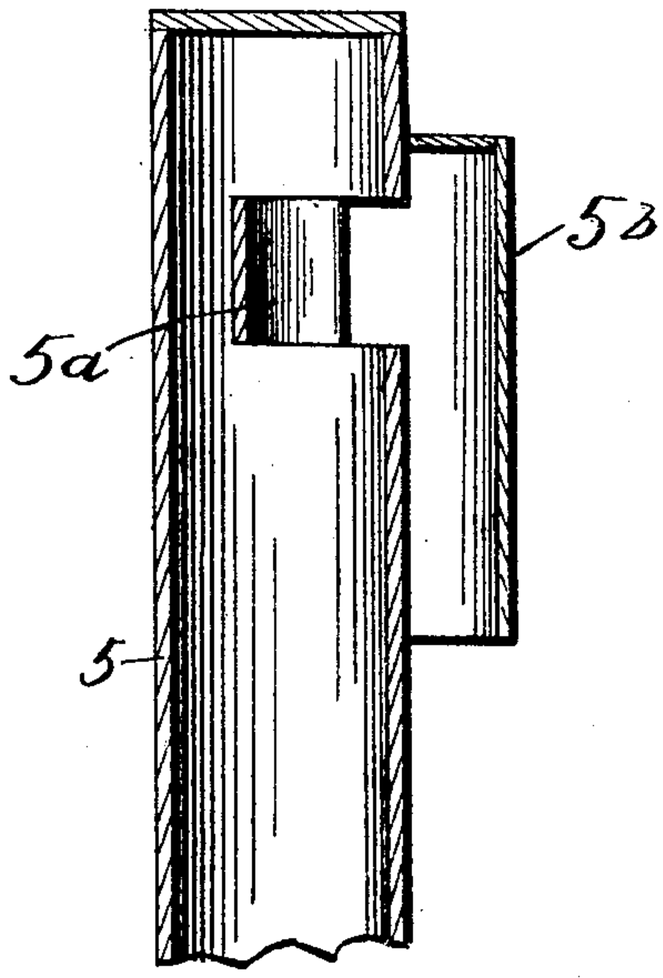
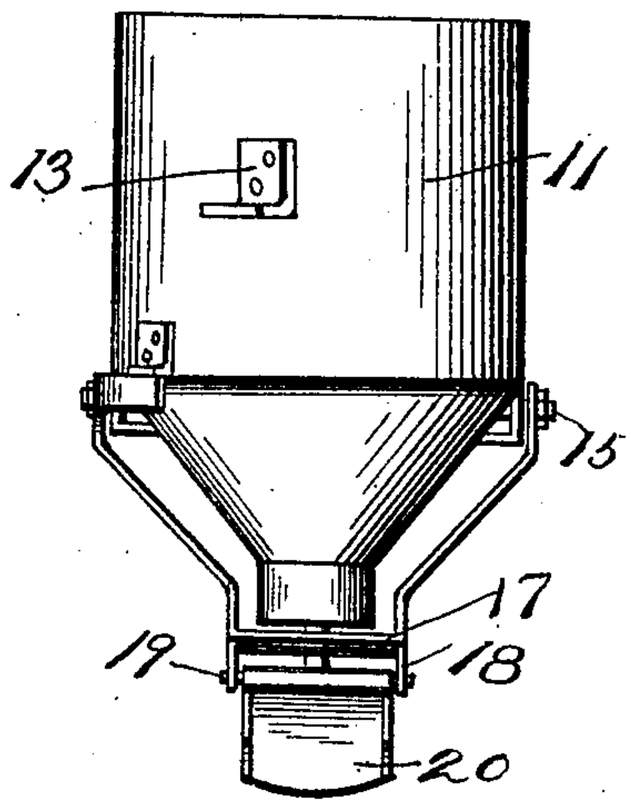


Fig. 5.



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UNITED STATES PATENT OFFICE.

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ACETYLENE-GAS GENERATOR.

No. 795,478. Specification of Letters Patent. Patented July 25, 1905.

Application filed February 21, 1905. Serial No. 246,718.

To all whom it may concern:

Be it known that we, CHARLES EDMUND BLACKBURN and FRANKLIN C. NICKEL, citizens of the United States, residing at Jacksonville, in the county of Morgan and State of Illinois, have invented certain new and useful Improvements in Acetylene-Gas Generators; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to acetylene-gas machines, and more especially to a carbid-feeding appliance or attachment whereby a uniform predetermined quantity of carbid will be released from a receptacle containing the same, so that the portion thus released will be deposited in the water and the gas generated therefrom; and our invention consists of certain novel features of construction and combination of parts, the preferred form whereof will be hereinafter clearly set forth, and pointed out in the claims hereunto appended.

The main object of our invention, among many others, is to provide an acetylene-gas machine of great simplicity in construction and which may be as a consequence very cheaply manufactured and sold at a minimum price.

A further object is to provide a carbid-feeding attachment for our gas-generating machine which will deliver only the exact predetermined quantity of the carbid or other substance relied upon to produce the gas and which shall be absolutely reliable and safe in character under all conditions and circumstances.

Other objects and advantages will be hereinafter made clearly apparent, reference being had to the accompanying drawings, which are considered a part of this application, and in which—

Figure 1 shows a perspective view of the top portion of our gas-machine in its complete condition ready for use. Fig. 2 is a longitudinal or vertical section of our gas-machine as taken on dotted line 2 2 of Fig. 3. Fig. 3 is a sectional view of Fig. 2 on line 3 3 of said view. Fig. 4 is a sectional view as taken on dotted line 4 4 of Fig. 3. Fig. 5 is a detail in side elevation of the carbid-receptacle. Figs. 6 and 7 show another view thereof, taken from a point at right angles to the view presented in Fig. 5 and showing the carbid-discharging mechanism in an open and closed position.

It may be stated in this connection that it will be seen from the following specification we have provided a carbid-holder which is reliably operated in a very simple manner by a downward movement of the bell, each downward movement of the bell acting to cause the discharge of a predetermined quantity of carbid or other material relied upon to produce the gas. We also desire to state in this connection that in the present instance we have limited our showing in the drawings to the presentation of a gas-holding bell open at its lower end, as is common, and mechanism showing that the upward and downward movement of the bell is utilized to cause a discharge of the carbid material at the proper moment to replenish the exhausted gas in the bell, it being understood that only a predetermined or exactly-measured quantity of the carbid material shall be deposited at each operation, all of which we shall point out in detail in the following specification.

For convenience of description the various parts of our invention and coöperating accessories will be referred to by numerals, the same numeral applying to a similar part throughout the several views.

Referring to the numerals on the drawings, 1 represents the main base portion of our invention, which is hollow and air-tight and designed to contain a limited quantity of water, and upon the outer edge thereof is provided the upwardly-extending flange or wall 2, constituting the reservoir to be filled with water, whereby a water seal is provided, as will be hereinafter clearly set forth. Upon the top or diaphragm 3 of the base-section we erect the greater tubular member 4 and a pair of tubular members 5 and 6 of less size than the tubular member 4, as clearly shown in Fig. 2, and designed to telescope with the tubular member 4 is the housing or inverted-cup-like member 7, having at its upper end an air-tight closure 8 for a purpose hereinafter set forth, said cup or closure 7 being designed to wholly inclose the upper end of the tubular member 4 and parts carried thereby, as will be specifically pointed out. Upon the upper open end of the tubular member 4 we erect a plurality of standards 9, the upper ends of which are attached to the ring 10, and within said ring-like member 10 we mount the carbid holder or receptacle 11, said ring-like

member 10 being compressible into engagement with the receptacle 11 by means of the tension-bolt 12 or the equivalent thereof, as more clearly shown in Figs. 6 and 7. A suitable bracket or stud 13 is secured to the exterior of the receptacle 11, whereby said receptacle will be prevented from passing too far into the open end of the tubular member 4.

Inasmuch as the receptacle 11 is designed for holding a quantity of carbid material from which the gas is to be produced, it becomes desirable to provide means for automatically discharging or delivering from said receptacle a desired predetermined quantity of the material, and with this purpose in view we provide the receptacle with a tapered neck or funnel-like discharging-terminal 14, and we pivotally secure to the lower end of the receptacle, as by means of the journals or lugs 15, the depending arms 16, connected at their lower ends to the closure 17, which is normally held by said arms, controlled beneath the discharging-orifice 14, as shown in Figs. 2 and 7. Each of the arms 16 is also provided with a depending ear 18, each of which is provided with an aperture to receive a lug 19 upon each edge of the upper end of the carbid-discharging member 20, which latter is controlled by means of the depending arm or bracket 21, attached to the carbid-receptacle, whereby the free end of said arm will engage the discharging member 20 and bring it into a horizontal position to receive a quantity of the carbid material which it is desired shall be discharged at one time. When, however, it is desired to deliver a predetermined quantity of gas-forming material, the depending arms 16 are so moved as to force the member 20 off of the supporting-arm 21, thereby discharging the material upon the member 20 by gravity, inasmuch as said member will drop downward into the position illustrated in Fig. 7 when said arms 16 are moved laterally, which movement we accomplish in the following manner: It will be observed that one of the arms 16 is provided with the ear or extension 22, and we pivotally connect to said ear the upper end of the vertically-moving bar 23, which is mounted in the brackets 24, attached to a contiguous part of the wall of the tubular member 4, so that said bar may be freely reciprocated in said brackets. It will be further observed that the vertically-movable bar 23 is an integral part of the upwardly-extending branch or member 25, said members 23 and 25 being substantially U-shaped, inasmuch as they may be formed of a single piece of strap metal, rod, or the like bent upon itself, as indicated by the numeral 26, whereby the free end or branch 25 may be brought upward parallel with the member 23 and provided with a recess or notch within which is designed to rest a contiguous part of the lever 27, which latter is pivotally mounted at its outer end to the standard 28, connected to the edge of the wall 2, while the other end of the lever is pivotally attached to the upper end of the bell 29, which is open at its upper end and telescopes with the two tubular members 5 and 6, as clearly shown in Fig. 2, said bell being designed, as is common, for holding the generated gas until used. It will thus be observed that we utilize the upward and downward movement of the bell for the control of the lever 27, said lever being held normally downward both by gravity and by the operation of the spring 30 or equivalent means.

It is thought that best results will be attained by connecting the lever 27 to the bell through the mediation of the link 31, designed to compensate for the upward movement of the bell incident to the filling thereof of gas. Inasmuch as the receptacle 2 is normally filled with water, the cup-like member 7 serves to provide a seal against the escape of generated gas, it being understood that the member 8 is to be normally tightly closed, but may be removed to facilitate the introduction of the new supply of carbid or gas-forming material for the receptacle 11.

It will be observed that the tubular member 6 is provided near its bottom with an outlet-pipe 32, to the outer end of which is connected the pipe 33, leading to the burners or other place of combustion, and we deem it unnecessary to show but a limited section of said piping.

The tubular members 5 and 6 may, if deemed necessary, be properly reinforced and strengthened, as by the braces 34 or equivalent thereof. It will be seen that the pipe or tubular member 5 is open at its lower end, and therefore communicates with the generating-chamber 1 and also with the upper portion of the bell 29 through a side opening 5^a, covered by a hood 5^b, open at the bottom, thereby providing means for delivering the gas from the generating-chamber into the bell, from whence it is drawn through the orifice 35 into the tubular member 6 and thence through the supply-pipes 32 and 33 to the place of combustion, as before explained. By providing the hood the escaping gas is directed downward under a portion of the water in the receptacle and is washed. Inasmuch as the water filling the receptacle 2 completely surrounds the tubular members 5 and 6 and occupies the space between the lower end of the bell and said tubular members, it follows that the water thus completely seals the gas and prevents its escape except through the tubular member 6, as just explained. By raising the height of the water it will flow into the opening 5^a and into the lower tank 1.

The various parts of our invention may be cheaply and expeditiously manufactured and each assembled in its respective operating position, and while we have described the preferred construction and combination of ele-

ments we desire to comprehend in this application all such substantial equivalents and substitutes as may be regarded as falling fairly within the scope and purview of our invention.

Having thus described the construction of our invention, it is thought the operation thereof will be clearly apparent, though it may be stated that the operation is as follows: After the supply of carbid or gas-forming material has been placed in the receptacle 11 and the reservoir 2 properly furnished with a supply of water the bell 29 may be manually raised to a slight extent and allowed to lower by its own weight, and the result will be that the first charge of carbid from the receptacle will be delivered upon the holder or member 20 and thence delivered into the generating-chamber 1 by falling downward through the tubular member 4 into said chamber, and the result will be the formation of gas from said charge of material, and the gas thus formed cannot escape excepting upward through the tubular member 5 into the upper end of the bell, causing the latter to move upward and incidentally lifting the lever 27 off of the notched terminal of the branch 25, the result being that the force of the spring 30, which, as before explained, is connected to the branch 25 and the lever 27, will elevate the member 23 and incidentally bring the member 20 upon the upper side of the end of the bracket or arm 21 or into that position shown in Fig. 6, said member 20 thus receiving a new supply of the carbid material, so that when the gas in the bell shall have become exhausted, as by passing downward through the tubular member 6 and through the pipes 32 and 33, said bell will lower by its own weight until the lever comes in contact with the end of the member 25, thereby forcing said member downward and correspondingly moving the member 23 and causing another discharge of the material upon the member 20 at the instant said member is forced off of the end of the arm 21. When the member 20 has moved forward for discharging the carbid, the closure 17 is correspondingly moved to prevent any discharge of the carbid from the receptacle 11.

The cup-like member 7 is held in its operative position by any preferred means, as by a bracket 36, connected to a corresponding bracket or lip 37 upon the contiguous part of the reservoir 2, and in like manner the bell 29 is held against rotation, but permitted to freely move longitudinally incident to its operation by the arm 40, located in telescopic relationship with the stationary tube or socket 41, attached to a contiguous part of the receptacle 2.

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

1. In a machine of the character described, the combination with a hollow base-section constituting a generating-chamber, a water-receptacle on the base-section, a tubular member connected with the generating-chamber and extending through the water-receptacle, and a bell extending over said member; of a carbid-receptacle having an outlet in the bottom thereof opening into the generating-chamber, a pivoted closure adapted to move into position beneath the outlet, a discharge device pivoted to the closure, and means for supporting the discharge device beneath the outlet when the closure is removed therefrom.

2. In a gas-generating machine the combination with a gas-receiving bell; of a water-receptacle and a generating-chamber, a carbid-receptacle having an outlet in the bottom thereof and communicating with the generating-chamber, a swinging closure connected to the receptacle and adapted to extend under the outlet, a discharge device pivoted at one end to the closure, means for supporting the discharge device below the outlet when the closure is removed therefrom, and mechanism actuated by the bell for operating the closure and discharge device.

3. In a gas-generating machine the combination with a generating-chamber and a water-receptacle; of a gas-receiving bell, a carbid-receptacle having an outlet opening into the generating-chamber, arms pivoted to opposite sides of the receptacle, a closure connecting the arms and adapted to swinging into a position beneath the outlet, a discharge device pivoted at one end to the arms, means for supporting said device to close the outlet when the closure is removed therefrom, and mechanism actuated by the bell for operating the closure and discharge device.

4. In a gas-generating machine the combination with a water-receptacle and a gas-generating chamber; of a gas-receiving bell, a carbid-receptacle having an outlet opening into the generating-chamber, a bracket extending under the outlet, a swinging closure interposed between the bracket and outlet, a discharge device pivoted at one end to the closure and adapted to assume a position upon the bracket to close the outlet, and means actuated by the bell for operating the closure and discharge device.

5. In a gas-generating machine the combination with a water-receptacle and a gas-generating chamber; of a gas-receiving bell, a carbid-receptacle having an outlet opening into the generating-chamber, a bracket below the outlet, a swinging closure interposed between the outlet and the bracket, a discharge device pivoted at one end to the closure and adapted to assume a position upon the bracket to close the outlet, a sliding member pivotally connected to and adapted to actuate the closure, a spring-controlled operating-lever pivoted to the water-receptacle and bell and

bearing upon and adapted to operate the sliding member.

6. In a gas-generating machine a carbid-feed comprising a receptacle having an outlet, a swinging closure disposed below the outlet, a discharge device pivoted at one end to one end of the closure, means for supporting the discharge device below the outlet to close the same when the closure is removed therefrom, and mechanism adapted to be actuated by a gas-receiving bell for actuating the closure and discharge device.

7. In a gas-generating machine a carbid-feed comprising a receptacle having an outlet, swinging arms pivoted to opposite sides of the receptacle, a closure connecting the arms, a discharge device pivoted at one end to one end of the arms, a bracket for supporting the discharge device below the outlet to close the same when the closure is removed therefrom, and mechanism connected to one of the arms adapted to be operated by a gas-receiving bell.

8. In a gas-generating machine the combination with a carbid-receptacle having an outlet; of a swinging closure for the outlet, a discharge device pivoted at one end to the closure and means for causing the closure and the discharge device to alternately assume positions below the outlet.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

CHARLES EDMUND BLACKBURN.
F. C. NICKEL.

Witnesses:
J. E. WHORTEN,
JOHN N. ERIXON.