No. 816,775. PATENTED APR. 3, 1906.

O. M. BRAUER.

ACETYLENE GAS GENERATOR.

APPLICATION FILED FEB. 28, 1905.

2 SHEETS—SHEET 1.

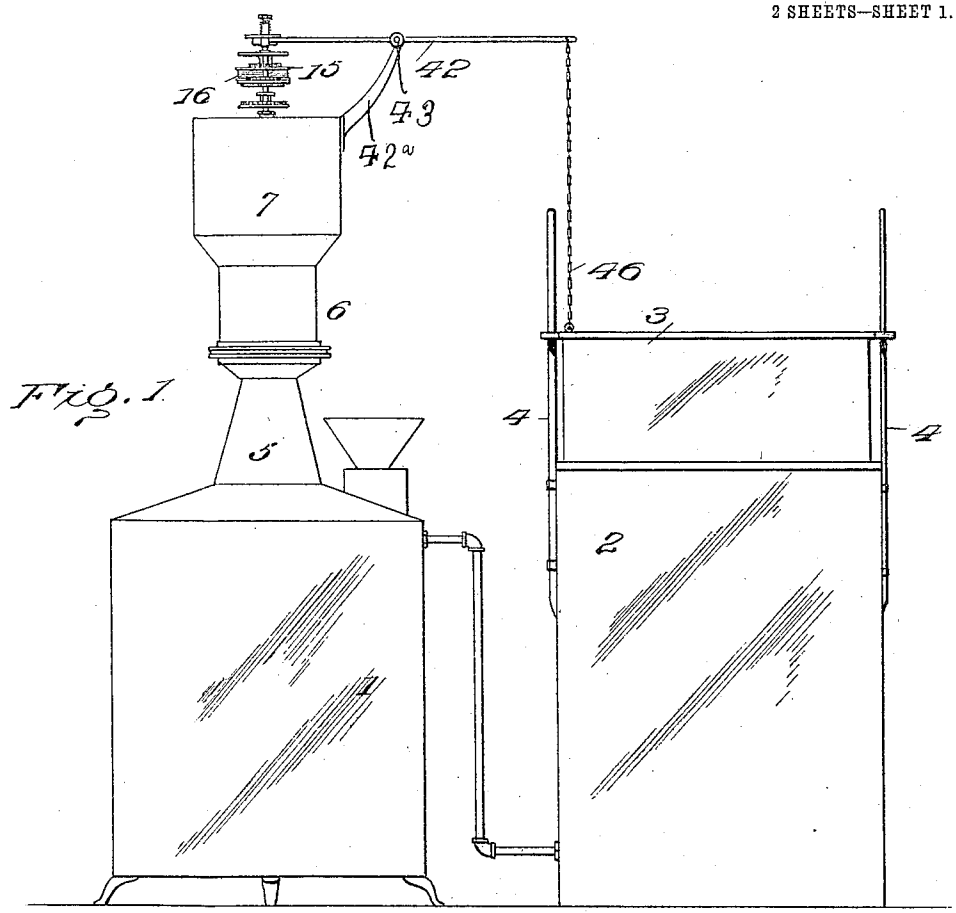
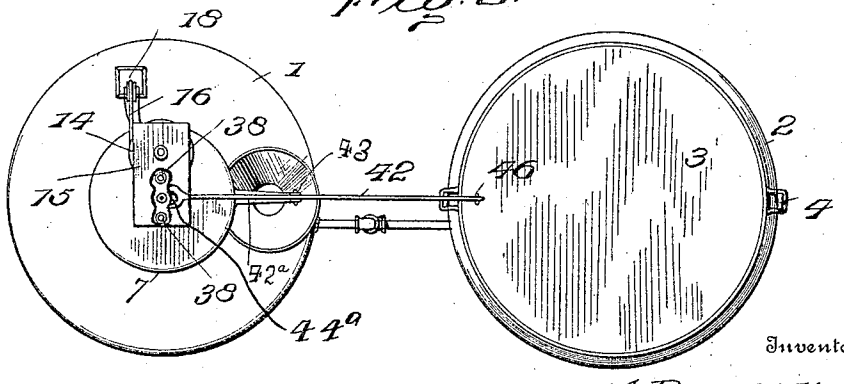


Fig. 1.

Fig. 2.



Witnesses

J. Inmire

G. R. Thomas

Inventor

O. M. Brauer

By R. A. B. Lacey. Attorneys

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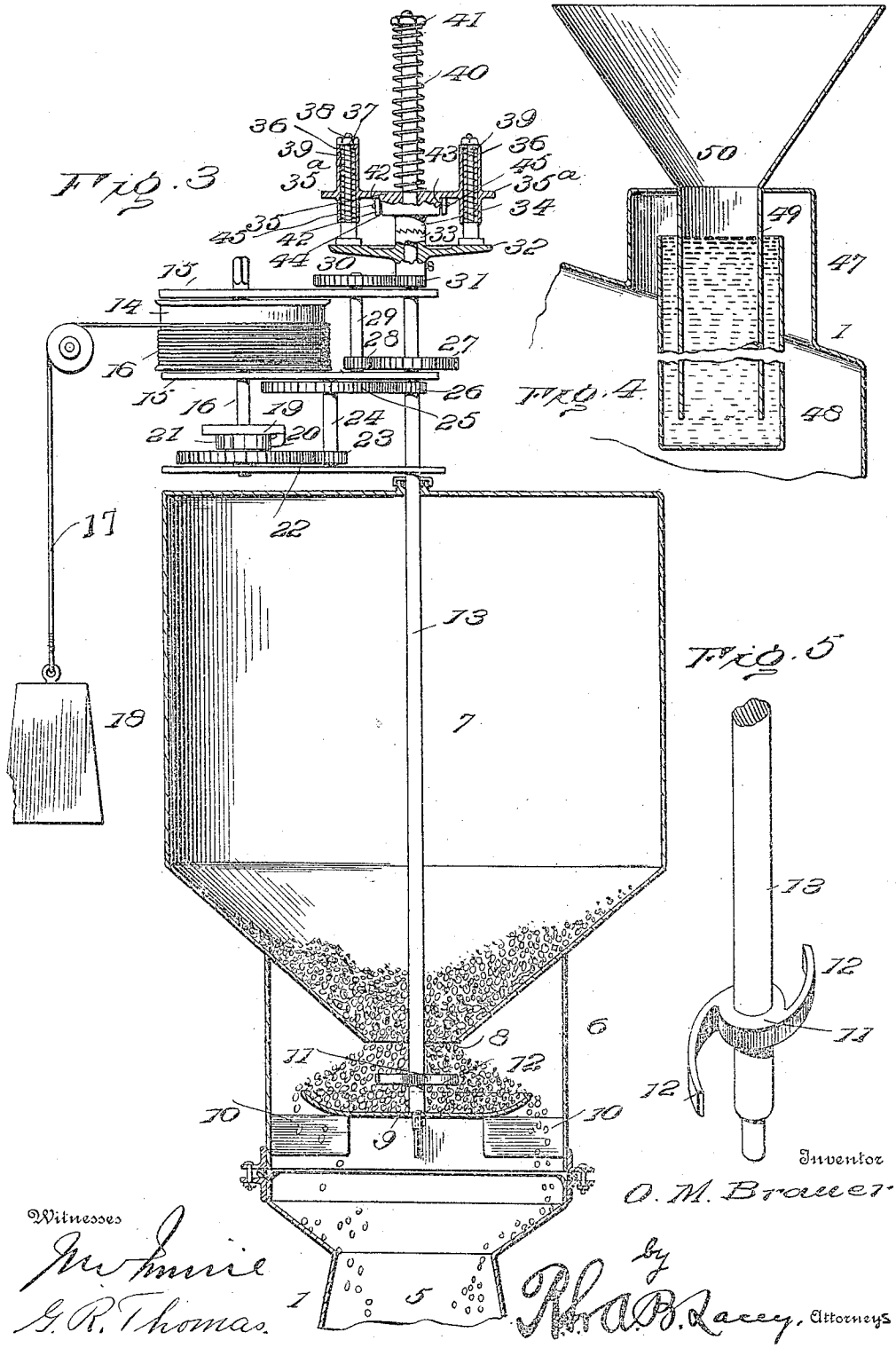

Witnesses

Jno. Imrie

G. R. Thomas.

Inventor

O. M. Brauer.

by

Rhodes, Racey, Attorneys

UNITED STATES PATENT OFFICE.

OTTO M. BRAUER, OF MARSHALLTOWN, IOWA.

ACETYLENE-GAS GENERATOR.

No. 816,775. Specification of Letters Patent. Patented April 3, 1906.

Application filed February 28, 1905. Serial No. 247,760.

To all whom it may concern:

Be it known that I, OTTO M. BRAUER, a citizen of the United States, residing at Marshalltown, in the county of Marshall and State of Iowa, have invented certain new and useful Improvements in Acetylene-Gas Generators, of which the following is a specification.

This invention relates to novel improvements in acetylene-gas-generating machines of the type embodying, essentially, a suitable generator and gasometer and carbid-feed mechanism operable by variation in the pressure in the gasometer for regulating the quantity of gas generated. The carbid-feed mechanism is an important feature of the invention, the same admitting of gradual feeding of the carbid to the water in the generator in very small quantities and almost without interruption of the feeding operation, this being very essential in this class of machines for securing pure and cool generation of the acetylene gas. The feeding mechanism is also constructed with a view to compactness in the general structure of the generator, the air-space in the generating-receptacle being of minimum size to reduce the air mixture in the generator when refilling or first setting up the machine to the greatest extent possible.

A further novel feature of the invention resides in the provision of novel means for filling the generator with water, obviating likelihood of clogging thereof with the residuum incident to the formation of the gas in the generator.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and accompanying drawings.

While the invention may be adapted to different forms and conditions by changes in the structure and minor details without departing from the spirit or essential features thereof, still the preferred embodiment thereof is shown in the accompanying drawings, in which—

Figure 1 is a side elevation of a machine embodying the essential features of the invention. Fig. 2 is a plan view. Fig. 3 is a transverse vertical sectional view, bringing out clearly the arrangement and construction of the parts comprising the carbid-feed mechanism. Fig. 4 is a broken detail section of the means for supplying water to the generator. Fig. 5 is a broken perspective view of the motor-shaft and agitating means thereon.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The generator 1, generally speaking, is of substantially the same construction as many of those at present in use and consists of a suitable receptacle for receiving the water, the carbid-feed mechanism being carried by the upper portion of this receptacle. The generator is connected with a gasometer 2, and the latter is of any approved form which it may be desirable to use, the exact construction of the gasometer being immaterial within the contemplation of the invention. The gasometer 2 includes the usual gas-bell 3, which is vertically movable in the main receptacle of the gasometer, being guided in its movement by means of suitable guide-rods 4. The bell 3 is connected with the carbid-feed mechanism for regulating the operation of the latter, according to the variation of the pressure in the gasometer caused by the increase or decrease in the quantity of gas generated by the machine. The upper portion of the generating-receptacle 1 is reduced or tapered, as shown at 5, and secured to this portion of the generator is a shell of casing 6, which directly carries the carbid-receptacle 7. The receptacle 7 is of a size to receive the necessary quantity of carbid, and the lower extremity of the receptacle 7 is reduced and provided with a feed-opening 8, through which the carbid passes as it is fed into the generator 1. The reduced form of the lower portion of the receptacle 7 obviates the formation of any dead space and admits of ready feed of the material therefrom.

In the casing 6 and located a short distance below the opening 8 of the receptacle 7 is a feed-pan 9, which is supported by substantial braces 10, extending from the sides of the casing 6. The pan 9 receives the carbid thereon as the latter is fed from the carbid-chamber, and the upper side of the pan 9 is concaved in form, the exact construction of this member being advantageous in spreading material fed from the receptacle 7, so that the same will be gradually fed in minute quantities, if necessary, to supply the chamber. The arrangement of the part 9 also promotes the continuity of the feeding operation with advantages which will be apparent to those versed in this art.

The carbid-feed mechanism proper includes a feeding device, preferably in the form of a hub 11, having lateral curved wings 12, said hub operating in the space between the lower extremity of the receptacle 7 and the feed-pan 9 just below the same. The hub 11 is rotated by a motor-shaft 13, which has a suitable bearing at its lower end in the pan 9, the upper portion of the motor-shaft extending through a packing-box on the upper portion of the receptacle 7 and thence upwardly from the part 7 aforesaid. The hub 11, with its wings 12, constitutes an agitating or feeding device, movement of which will readily effect the necessary feeding action in supplying the carbid to the generator 1.

A weight-motor is preferably utilized for actuating the shaft 13, and said motor comprises a suitable frame upon the upper portion of the carbid-receptacle 7. The frame of the motor consists of a plurality of superposed plates 15, substantially connected together to form the necessary rigidity. Three of the plates 15 may be utilized, and mounted in said plates is arranged a vertical shaft 16, the lower end of which has a bearing in the lowermost of the plates 15, said shaft passing through the other plates, as shown most clearly in Fig. 3 of the drawings. Between the uppermost and intermediate plates 15 and mounted upon the shaft 16 is a drum 14, about which is wrapped a cord or connection 17, which carries the weight 18 of the motor. The lower portion of the shaft 16 between the lowermost and intermediate plates 15 carries a wheel 19, having a pawl 20, adapted to engage a ratchet-wheel 21 upon the shaft 16. The ratchet-wheel 21 actuates a train of gears arranged to connect the shaft 16 with the motor-shaft 13. The above-mentioned train of gears consists, essentially, of a gear 22, directly operated by the ratchet-wheel 21 and in mesh with a pinion 23, carried by a short shaft 24, arranged between the two lower of the plates 15. The upper portion of the shaft 24 carries a gear 25, which meshes with a pinion 26 on the motor-shaft 13. Above the pinion 26 the motor-shaft 13 also carries a gear-wheel 27, in mesh with a pinion 28 upon another short shaft 29 between the uppermost and middle plates 15. The upper end of the shaft 29 projects from the uppermost plate 15 and carries a gear 30, in mesh with a pinion 31 upon the shaft 13, said pinion 31 having a friction-disk 32, which is likewise carried by the shaft 13. The parts 31 and 32 are loose upon the shaft 13. Above the disk 32 and arranged upon the shaft 13 are complementary clutch elements 33 and 34, the element 33 being keyed to the shaft 13 for rotation therewith, whereas the element 34 is loose upon the shaft and is non-rotative. The clutch elements 33 and 34 have teeth portions 35, whereby said elements are adapted to be interlocked for purposes which will be pointed out hereinafter. Projecting from the sides of the clutch elements 34 are lateral extensions 35^a, each of which is provided with a vertical tubular stem 36. The tubular stem 36 receives spring-actuated plungers 37, adapted for vertical movement in the stems or casings 36. The upper extremities of the plungers 37 have nuts 38 screwed thereon, securing the plungers to the element 34, and coil-springs 39 are interposed between the upper extremities of the casings or stems 36 and shoulders formed adjacent the lower portions of said plungers, the normal tendency of the springs 39 being to project the plungers 37 from the casings or stems in which they are mounted. The plungers 37 and adjacent parts constitute yielding pressure devices for coöperation with the friction-disk 32 to retard the movement of the latter or afford a brake which, influencing the friction-disk 32, will regulate the speed of the motor mechanism and the movement of the shaft 13 in such a manner as to affect the feeding of the carbid. The non-rotative clutch element 34 is adapted for movement longitudinally of the shaft 13 toward and from the part 33 and is normally held against the part 33 by means of a coil-spring 40, interposed between the element 34 and a nut 41 upon the upper extremity of the shaft 13. The element 34 being non-rotative as contradistinguished from the operation of the element 33, it will be noted that when the clutch parts 33 and 34 are interlocked the shaft 13 cannot rotate and the feeding device for the carbid will not be actuated. A shifting-lever 42 is utilized to actuate the clutch part 34, said lever being pivoted at 43 to a suitable standard 42^a, which may be projected upwardly from the receptacle 7. The lever 42 prevents rotation of the clutch element 34 and is bifurcate at one extremity, as shown at 44^a, to form spaced arms 44, each of which is connected to trunnions 45, projecting laterally from the member 34. Pivotal movement of the lever 42 will effect relative longitudinal movement of the clutch part 34 with regard to the part 33, so as to force the part 34 away from the part 33 against the tension of the spring 40, or permit the part 34 to remain interlocked with the part 33. The lever 42 is connected with the bell 3 of the gasometer 2 by a flexible connection, such as a chain 46 or the like, and the rise and fall of the gas-bell will impart pivotal movement to the lever 42 in a manner which will be readily appreciated.

At one side of the reduced portion 5 of the generator 1 and projecting upwardly from the said receptacle is a hollow boss 47. Disposed within the generator 1, with its upper portion received in the boss 47 and its lower portion immersed in the water in the generator 1, is an auxiliary receptacle 48. The receptacle 48 is also filled with water under normal condi-

tions, and the generator is filled by increasing the quantity of water in the receptacle 48, so as to cause the latter to overflow in the generating-chamber of the machine. To supply water to the receptacle 48, a suitable tube or pipe 49 is utilized, said tube passing from the upper portion of the boss 47, being hermetically or otherwise sealed with reference thereto, and the lower portion of the tube 49 is submerged in the water in the receptacle 48, the upper portion of the tube 49 having a funnel-shaped extension 50, which admits of ease in filling the generator. The object of the peculiar form of feeding device provided with the generator 1 is to secure a water seal for the tube 49, by which the receptacle 1 is supplied. It will be noted that the tube 49 has no direct connection with the water in the generator and cannot possibly become clogged with the residuum which always collects in the generator. The receptacle 48 being submerged, of course establishes the water seal in connection with the submerged arrangement of the tube 49.

In its operation under normal conditions when the gasometer 2 has a maximum quantity of gas therein the parts are arranged substantially in the positions indicated in Fig. 3, the motor not being in operation. When the pressure of the gas in the gasometer, however, is reduced, the bell 3 of course falls according to the reduction in the pressure and the lever 42 is actuated so as to disengage the clutch part 34 from the part 33. The rotation of the shaft 13 is now regulated by the pressure devices 37, which are held normally in contact with the disk 32 by means of the springs 39. The gradual fall of the gas-bell will decrease the pressure of the parts 37 with relation to the disk 32, and the motor will now actuate the shaft 13 through the gear-train which has been before specifically described. If the bell 3 falls rapidly, the movement of the lever 42 will be greater in proportion, as well as that of the element 34, and the pressure devices 37 will be so reduced in proportion to the fall of the bell 3 as to permit a proportionate increase in the speed of the shaft 13, the latter actuating the hub 11 so as to gradually increase the feeding of the carbid from the receptacle 7. The pressure devices 37, which are provided with suitable friction material at the lower ends thereof to engage the disk 32, are so sensitive that they will respond readily to the slightest variation in the pressure of the bell 3 in their coaction with the disk 32 and permit under certain conditions of service rotative continuity of the shaft 13, which will afford a feeding action of the carbid in minutest quantities, so as to promote the cool and pure generation of the gas in the generator 1. When the gas-pressure is at a normal height, tension upon the lever 42 is entirely relieved, whereupon the spring 40 causes the part 34 to interlock with the part 33, thereby breaking the continuity of the operation of the shaft 13. The parts 33 and 34 thus afford a positive lock, after a manner, to prevent operation of the motor, whereas the yielding pressure devices which coöperate with the disk 32 afford a sensitive brake for the gear-train connecting the motor and the disk 32, which will regulate the proper action of the motor in a manner which has been fully pointed out hereinbefore.

Having thus described the invention, what is claimed as new is—

1. In an acetylene-gas-generating machine, the combination of a generator, a gasometer embodying a bell, carbid-feed mechanism for the generator including a motor-shaft, interlocking clutch elements mounted upon said motor-shaft, connections between one of said clutch elements and the bell, and coöperating friction devices carried by the respective clutch elements for the purpose specified.

2. In an acetylene-gas generator, the combination of a generator, a gasometer embodying a bell, carbid-feed mechanism for the generator including a motor-shaft, a motor operably connected with the motor-shaft, means connected with the bell for breaking the rotative continuity of the motor-shaft to cut off feeding of the carbid, and other means operated by the bell for securing differential rotative continuity of the motor-shaft to cause feeding of the carbid proportionate with the variation of pressure in the gasometer.

3. In an acetylene-gas generator, the combination of a generator, a gasometer embodying a bell, carbid-feed mechanism for the generator including a motor-shaft, a motor operably connected with the motor-shaft, a friction-disk operably connected with the motor, and yielding pressure devices coöperating with said friction-disk and operably connected with the gasometer-bell to cause feeding of the carbid proportionate with the variation of pressure in the gasometer.

4. In an acetylene-gas generator, the combination of a generator, a gasometer embodying a bell, carbid-feed mechanism for the generator including a motor-shaft, a motor operably connected with the motor-shaft, a friction-disk operably connected with the motor, yielding pressure devices coöperating with said friction-disk and operably connected with the gasometer-bell to cause feeding of the carbid proportionate with variation of pressure in the gasometer, and interlocking clutch elements, one carried by the motor-shaft and the other operably connected with the bell to cut off feeding of the carbid at a predetermined point in the movement of said bell.

5. In an acetylene-gas generator, a gasometer embodying a bell, carbid-feed mechanism including a motor-shaft, a friction-disk mounted upon the motor-shaft, a clutch ele-

ment keyed to the motor-shaft, a second clutch element loose upon the motor-shaft and adapted to interlock with the above-mentioned clutch element, yielding pressure devices carried by the second or loose clutch element, means for normally holding the clutch elements aforesaid in interlocking condition, and a shifting-lever for actuating the loosely-mounted clutch element and pressure devices and connected with the gas-bell of the gasometer.

6. In an acetylene-gas generator, the combination of a generator, a gasometer, carbid-feed mechanism for the generator including a motor, means operable by variation in pressure in the gasometer for positively locking the motor from operation to cut off feeding of the carbid, and other means also operable by the variation of pressure in the gasometer for securing differential action of the motor as specified, to cause feeding of the carbid proportionate with this variation.

In testimony whereof I affix my signature in presence of two witnesses.

OTTO M. BRAUER. [L. S.]

Witnesses:
C. F. SMITH,
W. L. PECKHAM.