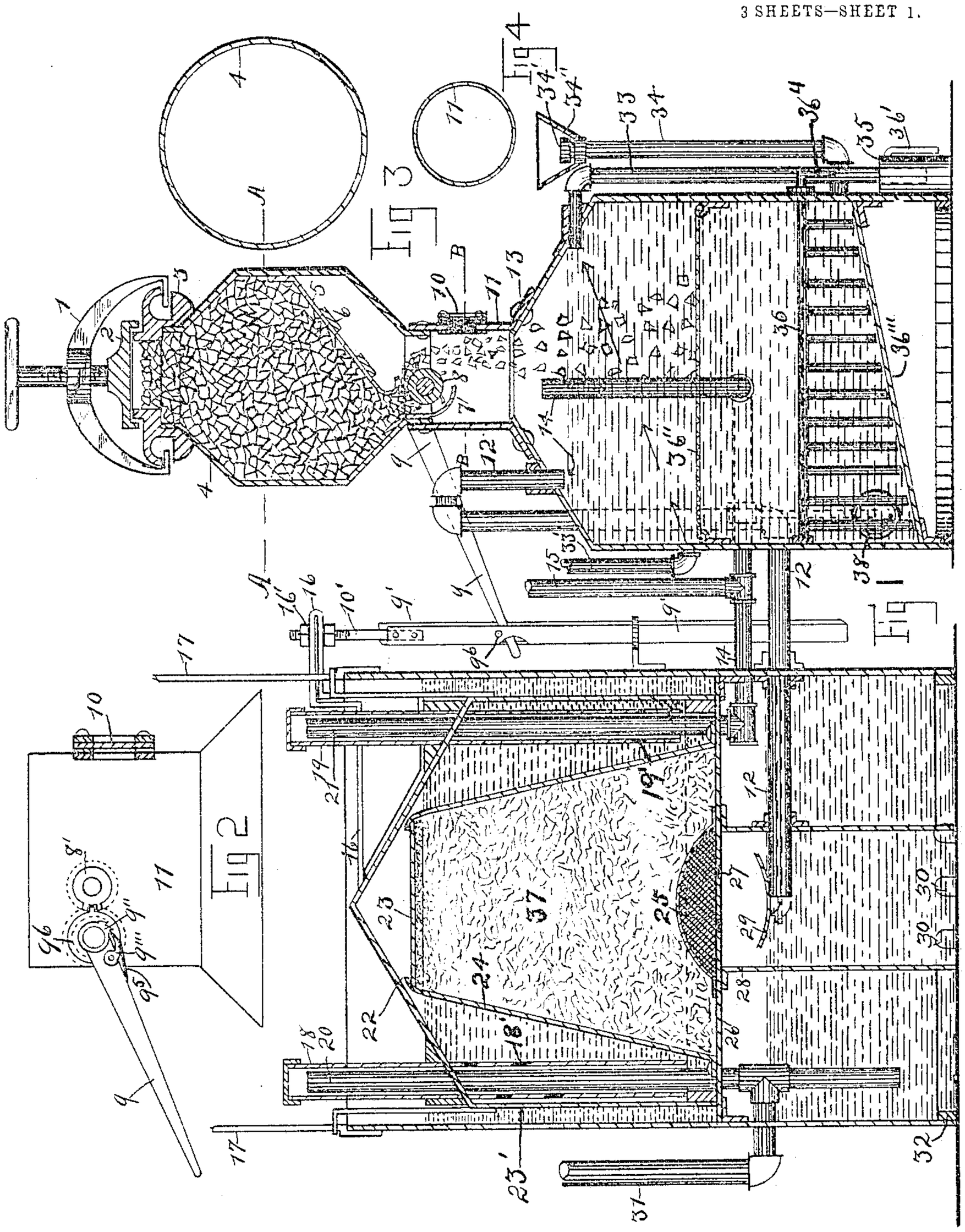
No. 793,144. PATENTED JUNE 27, 1905.

M. F. McNELLY.

ACETYLENE GAS GENERATOR.

APPLICATION FILED MAY 25, 1904.

3 SHEETS—SHEET 1.



Witnesses:
J. A. Sheffler
John A. Weidman

Inventor:
M. Frank McNelly

No. 793,144. PATENTED JUNE 27, 1905.

M. F. McNELLY.

ACETYLENE GAS GENERATOR.

APPLICATION FILED MAY 25, 1904.

3 SHEETS—SHEET 2.

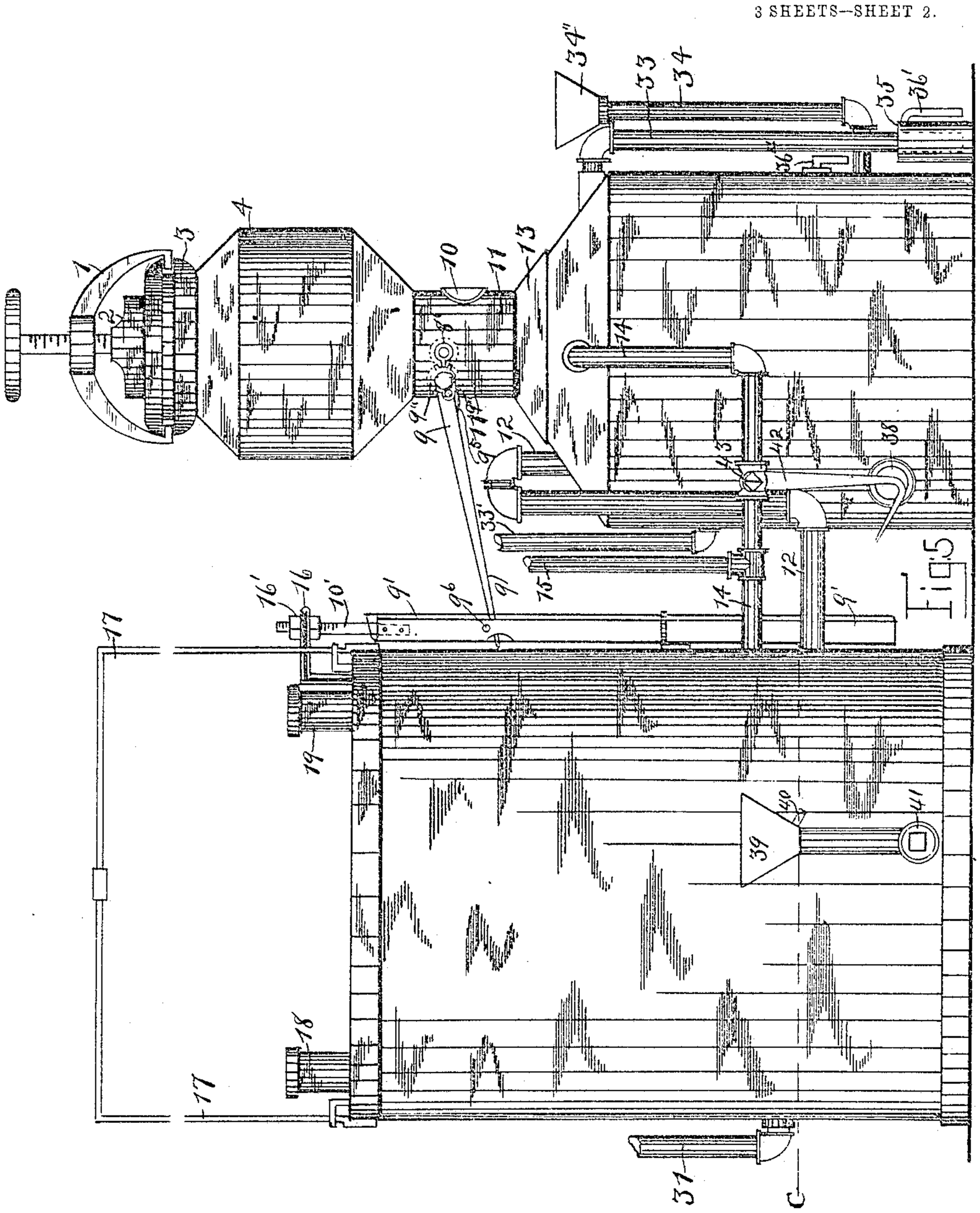


Fig. 5

Witnesses:
J. A. Sheffer
John A. Weidmen

Inventor:
M. Frank McNelly

No. 793,144. PATENTED JUNE 27, 1905.

M. F. McNELLY.

ACETYLENE GAS GENERATOR.

APPLICATION FILED MAY 25, 1904.

3 SHEETS—SHEET 3.

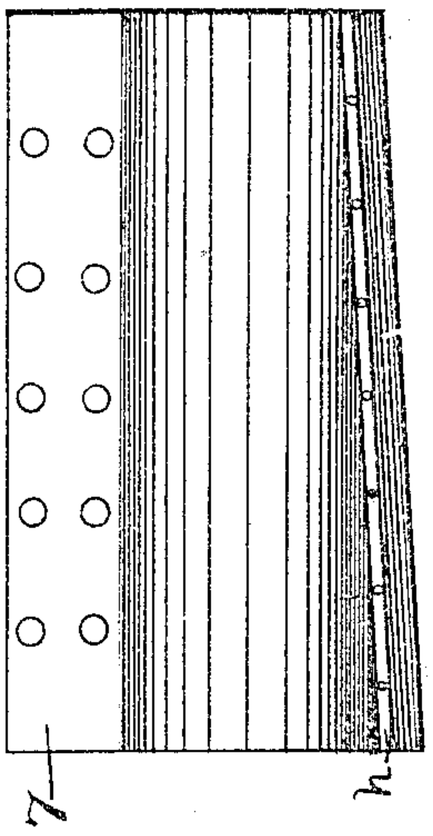


Fig. 8

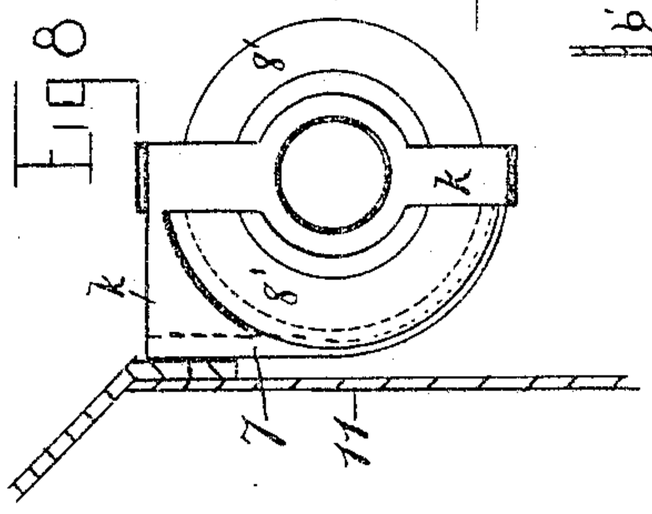


Fig. 11

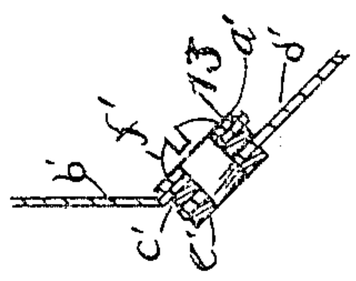


Fig. 15

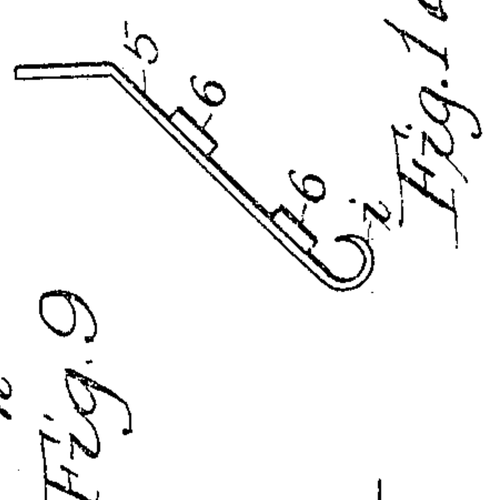


Fig. 12.

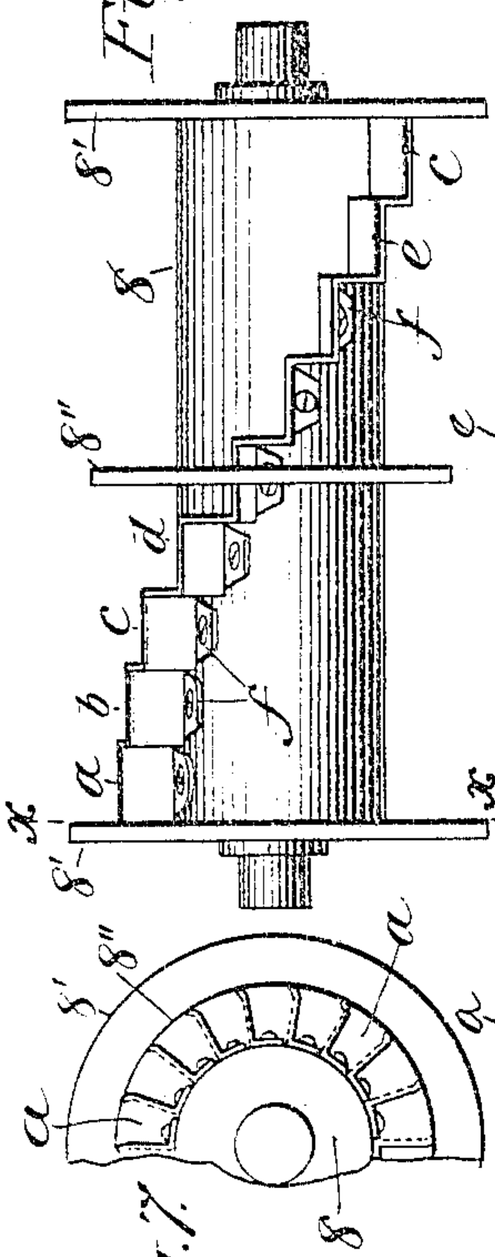


Fig. 7.

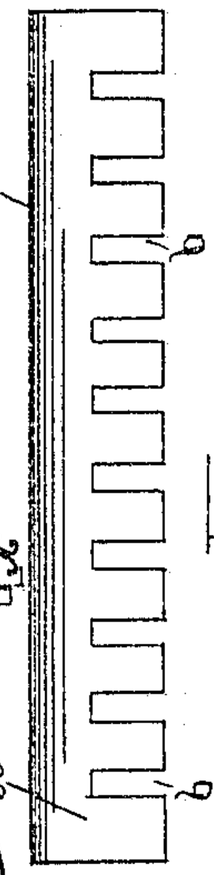


Fig. 10

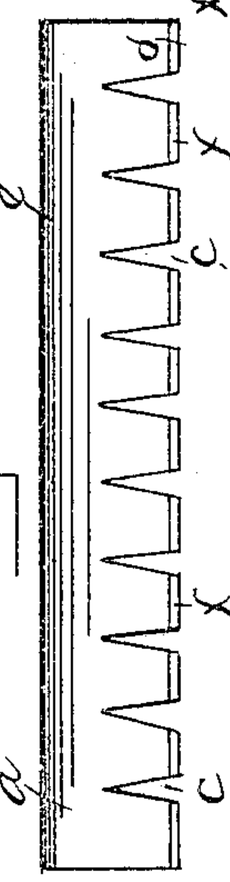


Fig. 13

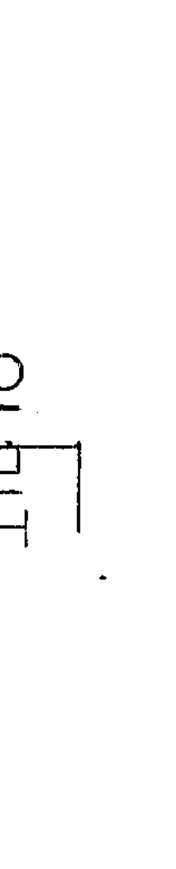


Fig. 14

Witnesses:
J. A. Sheffler.
John A. Weichman

Inventor:
M. Frank. McNelly

No. 793,144. Patented June 27, 1905.

UNITED STATES PATENT OFFICE.

MATHIAS FRANK McNELLY, OF CHICAGO, ILLINOIS.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 793,144, dated June 27, 1905.

Application filed May 25, 1904. Serial No. 209,759.

To all whom it may concern:

Be it known that I, MATHIAS FRANK McNELLY, a citizen of the United States, residing at Chicago, Illinois, have invented certain new and useful Improvements in Acetylene-Gas Machines; and I 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to acetylene-gas generators, and especially to two features therein—viz., the method of and mechanism for feeding the calcium carbid to the water and also to the gas-purifier.

In the drawings, Figure 1 shows a vertical sectional view of my generator and gasometer as they are set up and connected for use; Fig. 2, an enlarged plan view of the neck of the machine; Fig. 3, a cross-section of the carbid-holder, taken on line A A of Fig. 1; Fig. 4, a cross-section of the neck, taken on line B B of Fig. 1; Fig. 5, a side elevation of my generator and gasometer and their connections; Fig. 6, a plan view of my feeding-cylinder, showing one row of my scoop-like receptacles arranged in step-like succession and preferably spirally on the face of the cylinder; Fig. 7, an end view of one-half of the said cylinder or body, showing the scoop-like receptacles carried by it and rounded at their upper ends; Fig. 8, a plan view of the guard; Fig. 9, an end view of Fig. 8; Fig. 10, a plan view of the scoop-like receptacles as they appear in the blank before they are bent into shape; Fig. 11, an end view of the cylinder or body, showing the cap therefor for holding it steadily in place; Fig. 12, an end view of the floor or partition 5 in the carbid-chamber; Fig. 13, a plan view of the scoop-like receptacles, showing another form of openings in them; Fig. 14, an end view of Fig. 13, and Fig. 15 a vertical section of a form of joint I use in connecting the neck with the body of the generator.

My apparatus consists of a clamp 1, arranged to clamp down the cover 2 over the mouth of the carbid-holder in the casting 3, said casting having, preferably, a groove all around it to take the prongs of the clamp in order that the clamp may be allowed to swing like a pail-bail without parting from the casting.

4 is the carbid-holder, and 5 an inclined shelf or partition forming a floor, slanting so as to allow of the chunk carbid sliding down it to an opening on one side of the upper end of the neck, and 6 stays or supports, upon which this slanting floor rests. In Fig. 1 I show this floor ending in a curve or curl having resilience; but any other resilient form for this edge may be used, and in Fig. 12 I show in an end view how this curved edge or portion *i* may be made, if desired, by simply rolling over the edge of the floor and thinning it down gradually toward its extreme edge. Whatever way it is made or formed it is to have sufficient resilience to allow the passage of such chunks of carbid as would otherwise be likely to catch against an abrupt or stiff edge of the floor 5. It is resilient, so that when a lump of carbid comes in contact with it it springs backward, so as to let the chunk pass without stopping the machine or producing unnecessary friction, and it is thinned down sufficiently, so that when a chunk of carbid which is larger than the others passing under it is forced under it by the feeding device the resilience is sufficient, so that the larger chunk springs up that portion of the resilient edge against which the larger chunk presses without causing the entire resilient edge throughout its whole length springing up, and therefore it enlarges only that portion of the area of the throat through which the larger chunk must pass, and having passed it automatically resumes its normal position; but I do not confine myself to this method of producing this result. The end of this floor preferably ends in proximity to the cylinder and preferably over the top thereof; but there is no exact position for it, as it will operate when varied from one position to another within certain limits. The cylinder 8 revolves on a journal and has scoop-like receptacles running in step-like order preferably, each receptacle preferably having an

opening *b*, or, if preferred, an opening *c* in or between them. (Not seen in Fig. 6.) Figs. 10 and 13 show the blanks for these receptacles, showing these openings as they appear before the blank is bent into step-like form, and their free ends are rounded over, as seen at *e* in Figs. 10, 13, and 14, in order that as they run very close to the surface of the guard 7 their sharp edge will act as a scraper to scrape or scoop the carbid along the surface of the guard. They are preferably set upon the cylinder spirally, as seen in Fig. 6, so that when they become filled with carbid as the cylinder 8 slowly revolves the receptacle first rolling with the cylinder to a position where gravity empties it will be the first to empty its charge and the rest will empty theirs in succession, one following the other. By the time the last receptacle in any one of the rows is emptied the first one in the next following row is in position to empty, as the first bucket or scoop *e* will fill with the carbid and the following one in the row will also fill in their order, and as the cylinder rotates the first filled scoop *e* will empty its load, when some of that carried by the second scoop *d* will fall upon scoop *e* and be emptied with it, leaving the balance on scoop *d* to empty its load as the cylinder turns, receiving a part of the load from scoop *c*, which will fall over the side of that scoop onto it, yet leaving the main part of its load to be emptied together when it comes into the proper position, and in the same manner all the scoops or buckets will empty one after the other, each spilling a part of its load upon the one preceding it, thus making a very near approach to a continuous-feeding apparatus. This cylinder is formed or made as follows, viz: The body of the cylinder is formed with its end flanges 8′ and center dividing-partition 8″ and is cylindrical by casting it, if made of metal, and dressing it down to size and form. It may be made of wood and turned, if desired. The scoops or buckets are first formed as seen in Figs. 10 or 13, which are simply blanks ready for bending into shape. The blanks are then bent into form, producing a series of steps of scoops, as seen at *a b c d e* in Fig. 6, or may be cast in one piece, if of cast metal, with the step-like scoops or buckets fully formed when cast. I preferably form them so as to run spirally on the cylinder and place as many rows thereon as I may determine is necessary for different sizes of the machines I may make. On some of the scoops I form a flange or foot *f*, having a screw-hole for the screw *g*, and I fasten the row of scoops to the face of the cylinder by this means. When fastened to the cylinder, as seen in Fig. 6, the scoops project from its face, as clearly seen at *a* and *e*, one side of scoops *b c d* being open and the sides of *a* and *c* being closed by the flanges 8′ of the cylinder, the scoops having also the appearance of shovels affixed to the cylinder, as seen in Fig. 6, in step-like succession, but joined together, forming a series of scoops or shovels set in step-like succession and preferably spirally on the face of the cylinder, the emptying of each scoop being as hereinbefore described. In Fig. 6 I show but one row of scoops or shovels, arranged spirally and but half-way around the cylinder. I arrange them on the cylinder in accordance with the size of the machine, and whether they are arranged to pass fully around it or only partly I prefer them to take a spiral course. The cylinder and the guard 7 are so set with relation to each other that two rows of these receptacles lie in the circular portion of the guard at all times, and thus is prevented any falling of any carbid into the water by passing between the edges of the receptacles *a* and the guard 7. In this manner I am enabled to feed small charges of carbid one at a time, yet as fast as may be desired, avoiding the difficulty found in some machines of feeding too large charges at once, and thereby generating gas faster than is desirable. By this arrangement it will be seen that when the machine needs more carbid the cylinder is automatically revolved, the receptacles scoop up their fill of carbid, the apron or circular ending to the floor *i* being resilient gives sufficiently to let any chunk of carbid pass and springs back into place, each receptacle *a* empties its load one after the other or in succession, and while it is never necessary to have a continuous feed, yet while the machine is being at intervals fed it is fed in small charges one after another, and too sudden feeding and in too large quantities is avoided. To facilitate the dumping action of the receptacles by reducing all possible friction, I make my guard wider at one end than at the other preferably; but it will do very good work when of equal widths at both ends. In attaching my receptacles *a* to the cylinder 8 I preferably make use of a flange *f* and a screw or bolt *g*, as seen in Figs. 13 and 14; but any other manner of attaching them may be employed. I divide my cylinder 8 into two portions by the partition 8″ when the cylinder is to be used in large machines. The use of the openings *b* or *c* is to allow all fine carbid-dust or small particles to escape, and thus not to accumulate sufficiently to clog the action of the cylinder. The ends of the journal are hung in a casting, preferably as seen at *k*, which has two arms, and its outer edge just covers the edge of the guard, leaving the end of the cylinder 8′ visible. This casting fills the gap between the upper end of the guard and the top of the cylinder and prevents the carbid from falling out at the ends and keeps the cylinder always central.

At 10 is seen a manhole or hand-hole through the neck 11 in order to be able to get at the feeder in case of need and for cleaning and oiling purposes. The joint connecting the lower end of the neck with the body of the

generator I have shown in Fig. 1 as a simple riveted joint, but in Fig. 15 I show it as consisting of the ring a', the flange of the neck, the gasket c', the sloping side of the generator, and a ring threaded to receive a threaded bolt or a rivet f', which being turned home or riveted down will make the joint I consider preferable for the uses it is put to.

33 is an overflow-pipe entering the generator at the water-line, its lower end dipping into the can 35, which can has a discharge-pipe 36′, which seals the lower end of the pipe, and in case of city water or having a tank of water under pressure, a pipe 33′, as an intake-pipe, the water flowing continuously in a small stream, keeping the water always at a level and discharging said water out of the overflow-pipe 33 into the can 35, and from thence to the sewer or elsewhere. This keeps the water always cool and fresh.

In the generator is the wire-screen diaphragm 36″ in order to catch the lumps of the carbid and hold it while it is disintegrating or slaking and keeping it from being smothered by falling into the residuum on the slanting bottom 36‴. The carbid as it slakes drops its fine particles through the diaphragm 36″, and it lands on the bottom 36‴. In order to be able to easily clean out the generator, I make use of the agitators 36 by partly revolving them by means of the handle 36^4, and when they are properly agitated I preferably run water down pipe 34 by means of funnel 34′ and wash out the generator 34″, containing a stopper for the pipe 34, and the end of that pipe also serves for an indicator of the water-line in the generator, and it may be filled by means of this pipe where running water is not to be had. In cleaning out I make use of the manhole 38 by opening it and allowing the sediment to flow out; but before the manhole can be opened the depending handle 42 must be moved to one side, as the manhole cannot be opened otherwise, and this moving of the handle 42 opens the plug-valve 43 and vents the device by allowing what gas there may be confined in it to escape through pipe 14 and out of pipe 15 into the open air. The inner end of the fitting on pipe 14 in the gasometer is open at its inner end and is never closed. As the gas generates in the generator it rises through pipe 12 and down its down-leg and into the gasometer, where it strikes plate 29 and is deflected outward and passes up and against the curved wire-netting 25 and into the purifier 37 through holes 27 in the bottom of the impervious floor 26. This purifier is especially charged with a lasting and pervious material practicably non-decayable and will last for years. It is pressed down closely, but cannot be pressed so much as to stop the gas rising through it. This purifier is composed of any material that is sufficiently porous—such as fibrous material, loose felt, or any substance that will let the gas pass through and clean or scrub it. The slanting sides of the purifier are turned inward, as at 22, and foraminous plate 23 is placed therein and held in position by the turned-over sides. At 25 is seen a wire screen through which the gas passes to the purifier and 30 openings through which the water enters the chamber 28 and rises to water-line therein.

32 shows a strengthening-strip.

23′ indicates the bell of the gasometer having the closed tubes 18 and 19 firmly attached to the bell and loosely inside. They contain the tubes 20 and 21. 20 passes through the floor 26, connects with a branch coupling with which is connected the main service-pipe 31, the depending leg of the pipe below the coupling dipping into the water, as seen, and sealed thereby. The openings 18′ in pipe 18 are so arranged that as the bell rises by the pressure of the gas therein pipe 18 rises until openings 18′ rise above the water-line, when the gas flows through them and down pipe 20 and passes out into the service-pipe 31. In case the bell 23′ should rise until openings 19′ in pipe 19 rise above the water-line then the gas will escape and pass into pipe 21 and pipe 14 and out into the atmosphere through pipe 15, thus being a safety-escape in case the gas moves the bell too high. The frame 16 is preferably made of strap-iron and attached to the bell, as seen, its outer end having the threaded bar 10′ passing through it adjustably by means of the nuts 16′, and to the lower end of the threaded bar is attached the trough-like member 9′, vertically movable as the bell rises. This trough 9′ has a pin 9^6, and the end of the lever 9 rests under it and through the opening in 9′, the pin 9^6 being used, so that if the end of the lever 9 should be drawn out of the opening it would catch the end of the lever and direct it into and through the opening again, which might be the case where the lever was too short. This lever has a dog 9‴, controlled by a spring 9^5, and is in operative connection with a ratchet-wheel 9″, said wheel being in operative connection with the gear 9^6 and that gear with the gear 8′, made fast to the journal of the cylinder of the feeder 8. By viewing Fig. 5 it will be seen that when the bell 23′ rises it carries the frame 16 and the member 9′ with it. This carries the lever 9′ upward, the ratchet-dog sliding over the ratchet-wheel teeth without moving the said wheel or the gear 9^6. As soon, however, as the gas is exhausted from the bell and it begins to fall the member 9′ falls with it and moves the lever downward, the ratchet-dog catching on the teeth of the ratchet-wheel and turning the feeding-cylinder, the scoop-like receptacles, which scoop up their charge of carbid and discharge it into the generator, as hereinbefore described. The operation of the feeding-cylinder is therefore automatic and dependent on the movement of the bell. At 17 is seen guide-rods to govern

the vertical movements of the bell. It will be seen that carbid is never fed to the generator except upon the downward movement of the bell, or, in other words, at such times as the carbid is needed to make fresh gas.

30 30 in Fig. 1 indicate openings in the bottom of the otherwise gas-tight chamber 28 in order that the water may enter and form a seal to the gas entering at the upper portion of the chamber through pipe 12.

The guard 7 is provided, so that the walls of the neck 11 shall not be bulged out or otherwise disturbed to make a rotundity in which the rotary feed-wheel may turn, and its lower edge is preferably wider at one end than at the other, and in order to increase or diminish this width, as may be desired, I rivet the strip *h* thereon, and by so doing I am enabled to widen or narrow either end, as I may desire, to fit any circumstance arising, as in case the guard 7 should be cast and be defective or it was found that any change might be desirable at any time in the slant of this edge.

Having now described my invention, so that those skilled in the art may know how to make and use the same, what I claim, and desire to secure by Letters Patent, is—

1. In an acetylene-gas machine a feeder for the calcium carbid consisting of a movable member having a plurality of rows of scoop-like receptacles thereon, arranged lengthwise of said member, each row of such receptacles having the scoop-like portions in step-like succession substantially as described.

2. In an acetylene-gas machine a feeder for the calcium carbid consisting of a movable member having a plurality of scoop-like receptacles thereon, arranged lengthwise of said member, their forward ends being formed at practically an angle with their main portion substantially as described.

3. In an acetylene-gas machine a feeder for the calcium carbid consisting of a movable member having a plurality of rows of pockets, each row arranged in step-like succession and arranged so that each pocket will scoop and deliver its load separately and in succession substantially as described.

4. In an acetylene-gas machine a feeder for the calcium carbid consisting of a plurality of rows of scoop-like receptacles running lengthwise of a movable member; a movable member carrying the said scoop-like receptacles; means for moving the movable member all arranged so that each scoop-like receptacle will fill and empty in succession substantially as described.

5. In an acetylene-gas machine a chamber for the carbid; a stationary inclined floor in said chamber arranged to direct the carbid to a predetermined feeding-point in the chamber, the free edge of said floor being arranged to have resilience in order that any piece of carbid being forced to pass said edge will spring that portion of the resilient free edge against which such piece of carbid presses and force it past the same; a movable feeding member arranged to force the pieces of carbid past the said resilient edge of said floor and means for operating said feeding member substantially as described.

6. In an acetylene-gas machine a chamber for the carbid; an inclined floor in said chamber upon which the charge of carbid rests and its weight is sustained and the carbid directed to a predetermined feeding-point, in proximity to a movable feeding device, the free or forward edge of said floor being arranged to have resilience and to automatically contract and expand the throat or space between the resilient edge of said floor and the feeding device in order that any chunks of carbid forced by the feeding device against the said resilient edge of the floor or device will spring said resilient device and pass the same without enlarging the full area of said space or throat; a feeding device arranged to feed the carbid past said resilient device to a predetermined point and means for operating the feeding device substantially as described.

7. In an acetylene-gas machine a feeder for the carbid consisting of a movable member having a plurality of receptacles the top or scooping edge being continuous and having openings therein below the continuous scraping edge that the carbid-dust and fine particles may escape through the openings substantially as described.

8. In an acetylene-gas machine a chamber for the carbid: means for delivering the carbid arranged to deliver the same to a predetermined feeding-point; a feeder arranged to feed the carbid consisting of a rotary body carrying vanes arranged in step-like order on said body their outer or free ends being webbed or joined; a throat or passage-way for the passage of the carbid being fed; a resilient member arranged in proximity to the said throat to widen the throat at such points as pressure is exerted on the resilient device without widening the whole throat, and to reduce the widened portion when the pressure is removed and means for operating the rotary body carrying the vanes, the free ends of the vanes being formed into scoop-like shape substantially as described.

9. In a feeding device for an acetylene-gas machine a movable member; a plurality of scoop-like receptacles set in step-like succession on the movable member; the scraping ends of said receptacles being joined or webbed together, the webbed ends being turned over to form a scraper-like edge substantially as described.

10. In a feeding device for an acetylene-gas machine a movable member; a plurality of rows of pockets set in step-like succession on said member, the upper ends of said pockets

being joined or webbed together and having openings in the walls of said pockets and means for operating the movable member substantially as described.

11. In a feeding device for acetylene-gas machines carriers set upon a movable body, the free ends of the carriers being joined together and arranged to scoop the carbid and carry the same to a predetermined point and empty; openings between the carriers and means for operating the movable body and the carriers substantially as described.

12. In an acetylene-gas machine a feeder for the carbid consisting of a movable member having a plurality of receptacles arranged to scoop the carbid and deliver it to the generator, said receptacles being webbed together at the top or scraping edge and having openings through them below the webbed top edge that the carbid-dust and small particles may escape substantially as described.

In witness whereof I have signed my name to this specification in the presence of two subscribing witnesses.

M. FRANK McNELLY.

Witnesses:
W. M. Brown,
Jacob S. Lang.