

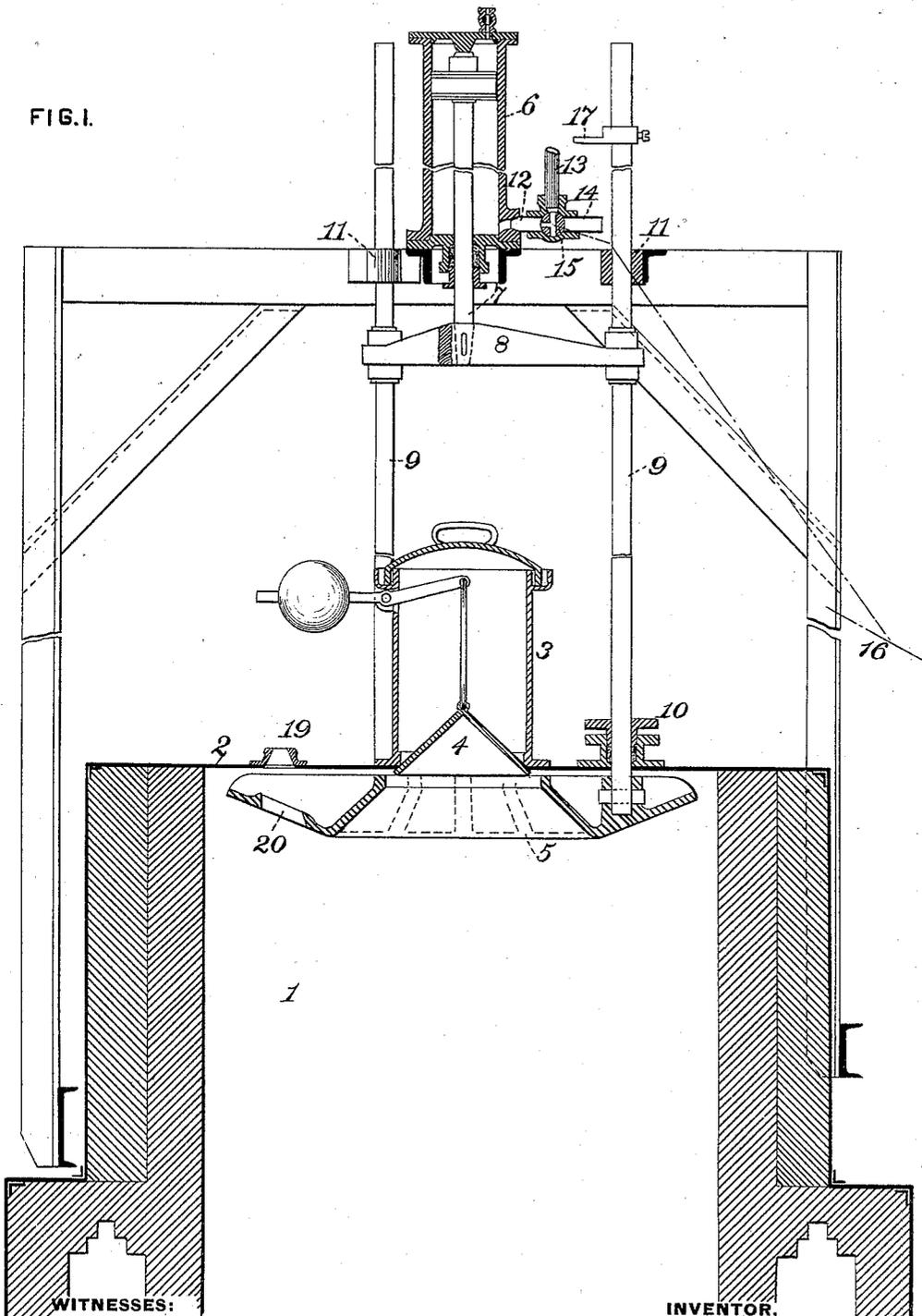
S. T. WELLMAN.

APPARATUS FOR COMPACTING FUEL IN GAS FURNACES.

No. 395,676.

Patented Jan. 1, 1889.

FIG. 1.



WITNESSES:

*R. H. Whittelsey*  
*D. E. Gaither,*

INVENTOR,

*Samuel J. Wellman*  
 by *Darwin S. Wolcott*  
 Att'y.

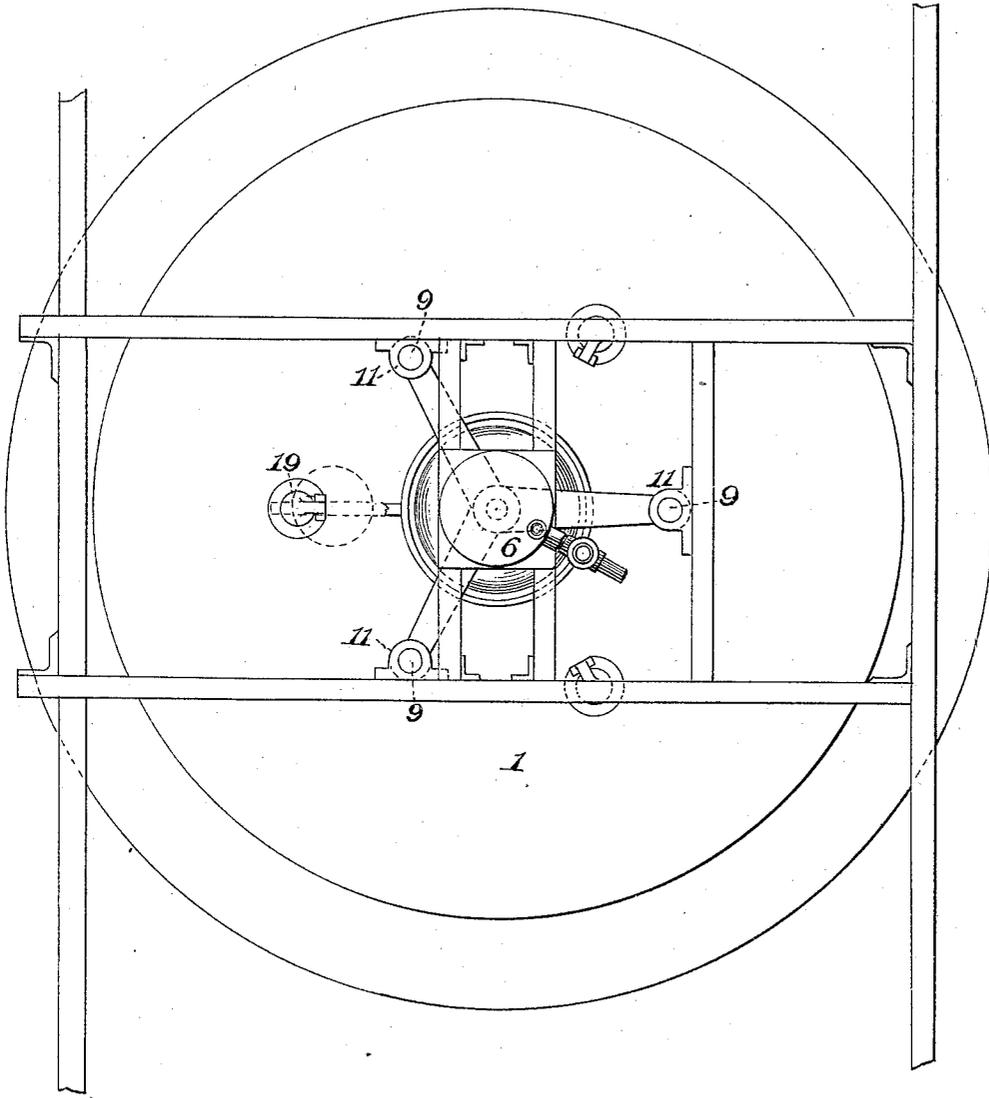
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FIG. 2.



WITNESSES:

*R. M. Whittlesy.*  
*F. E. Gaither.*

INVENTOR,

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by *Darius S. Wolcott*  
Att'y.

# UNITED STATES PATENT OFFICE.

SAMUEL T. WELLMAN, OF CLEVELAND, OHIO, ASSIGNOR TO THE FUEL GAS AND ELECTRIC ENGINEERING COMPANY, (LIMITED,) OF PITTSBURG, PENNSYLVANIA.

## APPARATUS FOR COMPACTING FUEL IN GAS-FURNACES.

SPECIFICATION forming part of Letters Patent No. 395,676, dated January 1, 1889.

Application filed May 22, 1888. Serial No. 274,695. (No model.)

### *To all whom it may concern:*

Be it known that I, SAMUEL T. WELLMAN, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented or discovered certain new and useful Improvements in Apparatus for Compacting Fuel in Gas-Furnaces, of which improvements the following is a specification.

Great difficulty has been experienced in operating gas-producers in preventing the fire from eating up into the fuel more rapidly in some places than others. While this unequal combustion is liable to and does, in fact, take place at different points, it most frequently occurs along the sides of the producer, the combustion being facilitated at such points by the highly-heated walls. This local combustion causes great inequality in the thickness of the generating-bed, and as a consequence thereof in the gas generated.

The object of the invention described herein is to prevent such inequality of combustion by compacting the fuel, thereby retarding the passage of air, &c., through the fuel at points where the combustion is most rapid.

To this end the invention consists, in general terms, in the construction and combination of mechanical devices or elements, all as more fully hereinafter described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a sectional elevation of the upper portion of a producer having my improved apparatus applied thereto, and Fig. 2 is a top plan view of the same.

The producer 1 is of any suitable construction, having a top, 2, charging-hopper 3, and distributing-bell 4. Within the producer is arranged a rammer, 5, preferably formed of cast-iron and consisting of a hollow truncated cone and an upwardly-inclined flange projecting outwardly from the lower edge of said cone, the diameter of said rammer being a little less than the internal diameter of the producer. The diameter of the opening through the cone is a little greater than the largest diameter of the bell 4, so as to permit

of the lowering of the bell through the rammer when charging the producer.

A fluid-pressure cylinder, 6, provided with a piston is supported a suitable distance above the top of the producer by a frame-work formed of channel-bars or any other suitable material, and to the piston-rod 7 is attached a cross-head, 8, to which are attached the bars 9, said bars extending down through suitable stuffing-boxes, 10, on the top of the furnace, and having their lower ends connected to the rammer 5, as shown in Fig. 1. These bars or rods 9 are preferably made of such a length above the cross-heads as to be in engagement with the guide-loops 11 during the full movements of the bars, as hereinafter described, said guide-loops being secured to suitable parts of the supporting frame-work.

Fluid under pressure enters and escapes from the cylinder 6 through the pipe 12, which is connected to the inlet and escape pipes 13 and 14, a three-way valve, 15, being located at the point of junction of the pipes 12, 13, and 14. This valve can be operated by a lever, 16, so located as to be readily accessible to an operator on top of the furnace. In order to prevent the piston striking the lower cylinder-head, I provide a stop, 17, on one of the bars 9, said stop being so adjusted as to shift the valve 15, thereby stopping the escape of fluid from the cylinder and forming a cushion for the piston. At the upper end of the cylinder is placed a relief-valve, 18, to permit of the escape of air or other fluid from the cylinder as the piston rises.

Coal, coke, or other material is charged into the hopper 3, and then distributed into the producer by lowering the bell 4, the charge passing through the conical opening in the rammer 5. After the charge has been distributed as above stated, the bell is drawn up and the cover placed on the hopper, and the valve 15 is so moved as to permit of the escape of fluid from the cylinder, thereby permitting the rammer and the devices connected therewith to drop upon the coal. As soon as the rammer has dropped, fluid under pressure is again admitted, thereby raising the rammer,

and is thereafter released, permitting the rammer to drop. These operations are repeated until the coal has been sufficiently compacted, when the rammer is raised and held at the top of the furnace until again needed.

It will be observed that in the use of a rammer constructed as above stated the material around the sides of the producer is affected to a greater extent by the blows of the rammer than other parts of the charge. The material in other parts of the producer can, however, be compacted to a greater extent by merely altering the shape of the lower face of the rammer, such alterations being within the skill of an ordinary mechanic.

Any suitable motive power may be used for raising the rammer, as above described, and, if desired, the rammer may be operated in both directions by the motive power.

In order to allow of the usual stoking operations, openings provided with suitable covers, 19, are formed in the top of the producer, correspondingly-located openings, 20, being formed through the rammer, as shown in Fig. 1.

I am aware that the employment of mechanical pressure upon the charge of material in a coke-oven for the production of pressed coke or coke-bricks has been heretofore proposed, and I therefore disclaim, broadly, a rammer or pressure-plate.

I claim herein as my invention—

1. The combination of a gas-producer and a reciprocating rammer for compacting the fuel within the producer, said rammer being provided with an opening therethrough for the passage of the fuel, substantially as set forth.

2. The combination of a gas-producer and a rammer fitted to reciprocate therein, said rammer having a downwardly and outwardly tapered open-ended body and an upwardly-inclined circumferential flange of slightly less diameter than the producer connected to the lower end of the body, substantially as set forth.

3. The combination of a gas-producer, a rammer fitted to reciprocate therein, a fluid-pressure cylinder fixed above the top of the producer, a piston fitting said cylinder, and bars or rods passing freely through stuffing-boxes in the top of the producer and connecting the rammer with said piston, substantially as set forth.

In testimony whereof I have hereunto set my hand.

SAMUEL T. WELLMAN.

Witnesses:

T. H. BROOKS,  
N. COTABISH.