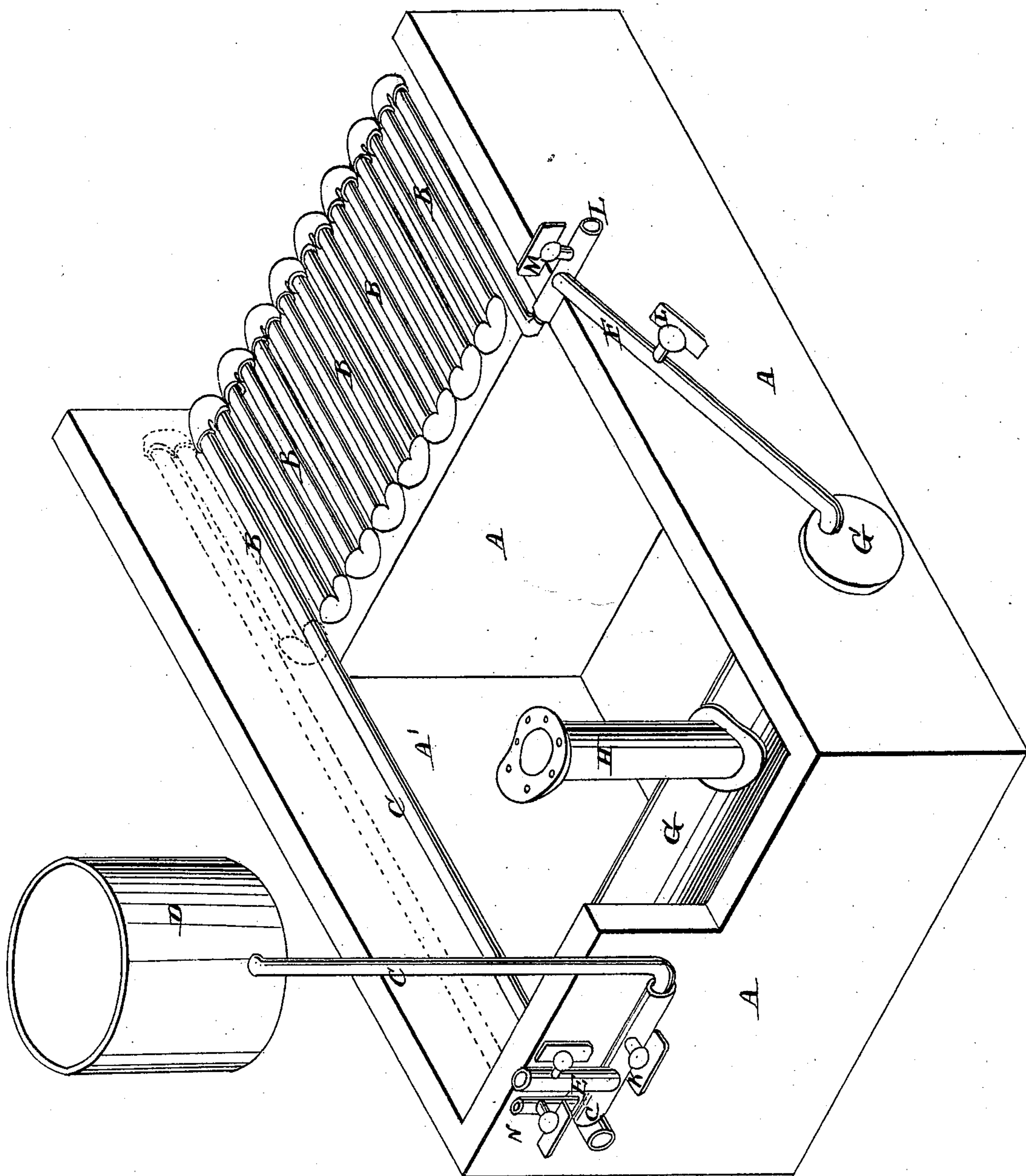


*J. Scanlan.*

*Boiler Grate Bars.*

*N<sup>o</sup> 96,354.*

*Patented Nov. 2, 1869.*



Witnesses;

*C. F. Mayhew*  
*Wm. H. Weeks*

Inventor;

*James Braden Administrator*  
*for James Scanlan*



# United States Patent Office.

JAMES BRADEN, OF INDIANAPOLIS, INDIANA, ADMINISTRATOR OF THE ESTATE OF JAMES SCANLAN, DECEASED.

*Letters Patent No. 96,354, dated November 2, 1869.*

## IMPROVEMENT IN CIRCULATING-GRATES FOR STEAM-GENERATORS.

The Schedule referred to in these Letters Patent and making part of the same.

Be it known that JAMES SCANLAN, of Indianapolis, in the county of Marion, and State of Indiana, did invent certain Improvements in Tubular Grate-Bars for Steam-Generators, of which the following is a specification.

The first part of the invention relates to the combination of a feeding-pump, feeding-pipes, tubular grate-bars, a waste-pipe, a feeding-pipe, and a steam-generator or mud-drum; in such a manner that said pump shall be capable of feeding the water to the generator or mud-drum, through such tubular grates, and, at the same time, permit a portion of the water to be discharged through a cock or valve, for the purpose of carrying off the sediment contained therein, so as to prevent its being deposited in said generator.

The second part of the invention relates to the combination of a reservoir with the feed-pipes, tubular water-grates, and waste-pipe, in such a manner, that when the fire is burning upon the grate, and the pump is not in operation, water may be passed through the grates, and thus any injury be prevented which otherwise might result from the overheating of said grate-bars.

The third part of the invention relates to the combination of a waste-cock or valve in the waste-pipe, with a series of tubular grate-bars, the object being to provide a means for the discharge of any earthy matter which may have been precipitated from the water during its passage through the grates, in consequence of the heat imparted to it therein, and thus prevent its passage to the generator or the mud-drum connected therewith.

The accompanying drawing is a perspective view of so much of a steam generator and its appendages as is necessary to illustrate the combination of the improvements therewith,

A, in the drawings, represents the walls of the arch or surroundings of the generator, which may be of brick, stone, iron, or any other suitable material.

A' represents the chamber or flue in rear of the grates, and leading to the rear end of the generator.

B B represent the tubular grates, which consist of a series of pipes, placed parallel to each other, and at suitable distances apart, to admit of the passage of air for the support of combustion, and of the passage of the ashes, resulting from the burning of the fuel thereon. The ends of the pipes, of which the grate is in part composed, are held in position, and have their distances from each other regulated by cast-iron connections, consisting of half turns, their ends being provided with female-screw threads for the reception of male screws upon the ends of the pipes or tubes. These half turns have an aperture through them for

the passage of the water, and thus a continuous passage is formed from the induction-pipe on one side to the eduction-pipe upon the other, through which the water passes from the pump to the generator. The fact that there is a constant current of water passing through the grate-bars, prevents the deposition of any scale upon the interior surface of such bars, and, at the same time, prevents the burning away of the same, while the fact that their temperature is lower than that of solid grate-bars, effectually prevents the formation of clinker upon their outer surfaces, notwithstanding the great heat to which they are subjected, the heat in this case being taken up by the water within the pipes, and carried to the generator, thus aiding very materially in the generation of steam, instead of being radiated into the ash-pit, and thus lost, as in the case of the solid grate.

C represents a pipe, which may lead directly from the feed-pump to the induction-end of the grate-bars, or it may be connected with another pipe, with which the discharge-pipe from such pump is also connected, as shown in the drawings. In either case there should be a check-valve in this pipe, just outside of the point where the discharge-pipe from the pump is joined to it, for the purpose of preventing the return of the water from the grate through such pipe, such an arrangement of valve being necessary to the proper working of the pump.

D represents a reservoir for water, which is to be placed in any convenient and elevated position, and is to be provided with a pipe, which is to enter it near its bottom, and extend from thence to and connect with the feed-pipe, or with such pipe as it may be connected with.

This pipe is to be provided with a cock or valve, K, so arranged, that when the pump is in operation, it may be closed, and thus communication between the reservoir and feed-pipe be cut off, but so, that when the pump is not in operation, this cock or valve may be opened, and the cock or valve in the pump-pipe closed, and thus a communication between the reservoir and the grates be established.

As a consequence of this arrangement, a stream of water may be caused to circulate through the grates, when the pump is not in operation, by opening the cock or valve M in the discharge-pipe I, and closing the cock or valve L in feed-pipe F, as shown in the drawings.

As a consequence of the above-described combination of devices, a current may be established through the grates when steam is being raised, or after the engine has been stopped, or at any other time, when the pump is not in operation; and thus the heat, which



would otherwise destroy the grates, will be carried off, and, at the same time, the deposition of sediment upon the interior surfaces of the grates will be effectually prevented.

E represents the lower portion of the pump, or a pipe, which connects it with the feed-pipe C. This pipe is to be supplied with a cock or valve for the purpose of closing the communication between the pump and the feed-pipe, when the grate is being supplied with water from the reservoir.

F represents a pipe which conducts the water from the discharge-pipe I, after it has passed through the grates, to the mud-drum or generator. This pipe is to be supplied with a valve or cock for the purpose of shutting off communication with the generator, as above described.

G represents a cylindrical vessel, which is termed the mud-drum. It is to be placed in the setting of the generator, substantially as shown in the drawings. To the outer end of this drum, the feed-pipe F is attached. It is apparent, however, that this drum may be dispensed with, and the feed-pipe be connected directly to the generator, as, when these combinations are used, the matter usually collected in such drums is discharged through the pipe I, as will soon be described.

H represents the pipe which connects the generator to the mud-drum, the generator resting at its rear end upon such pipe and drum.

I represents a pipe which is to be attached to the outer end of the grate-bar, or that end from which the water escapes after it has passed through such grate.

It is to be supplied with a cock or valve, which, in practice, and when the pump is in operation, is to be left in such a position as to permit a portion of the water to waste at that point, and thus a large portion of the earthy matter, which would be carried forward to the generator, will be discharged at that point. This pipe and its valve or cock are also to be used when the pump is not in operation, the cock or valve at such times being sufficiently opened to admit of the passage of a sufficient amount of water to prevent the injury of the tubes or grates.

Having thus described this invention,

What I claim as the invention of the said JAMES SCANLAN, and desire to secure by Letters Patent, is—

1. The combination of the feeding-pump or the pipe connected therewith, the pipe which conducts the water to the grate, the tubular grates, the waste-pipe, and the mud-drum or generator, substantially as shown and described.

2. The combination of a reservoir, feed-pipe, tubular grates, and waste-pipe, substantially as and for the purpose set forth.

3. The combination of a waste-pipe, having in it a cock or valve for permitting a portion of the water to be wasted through such valve or cock, and a series of tubular grates, when the feed-water is passed through such grates previous to its entering the generator, substantially as and for the purpose specified.

JAMES BRADEN.

Witnesses:

F. H. SPRAGUE,  
C. F. CLAUSEN.