

R. EXCELL.

BOILER.

No. 191,326.

Patented May 29, 1877.

Fig: 1.

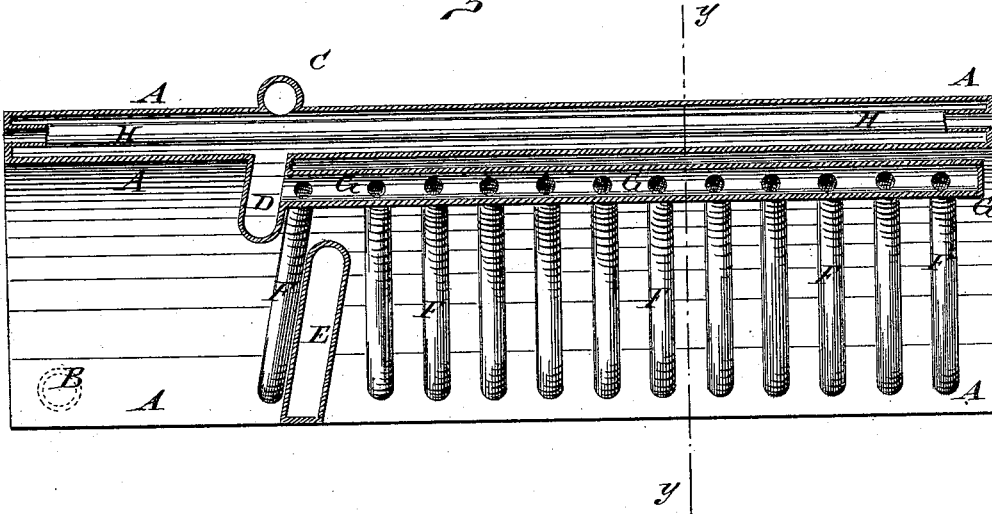
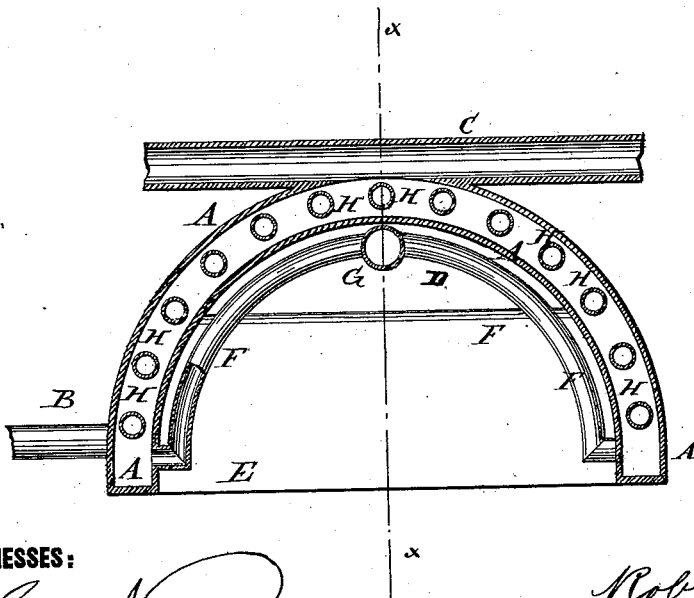


Fig: 2.



WITNESSES:

*Chas. Nida*  
*J. H. Scarborough*

INVENTOR:

*Robt. Excell*  
BY *Munn & Co*  
ATTORNEYS.

# UNITED STATES PATENT OFFICE.

ROBERT EXCELL, OF CHICAGO, ILLINOIS.

## IMPROVEMENT IN BOILERS.

Specification forming part of Letters Patent No. **191,326**, dated May 29, 1877; application filed March 24, 1877.

*To all whom it may concern:*

Be it known that I, ROBERT EXCELL, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Boilers, of which the following is a specification:

Figure 1 is a longitudinal section of my improved boiler, taken through the line *x x*, Fig. 2. Fig. 2 is a cross-section of the same, taken through the line *y y*, Fig. 1.

Similar letters of reference indicate corresponding parts.

The object of this invention is to furnish an improved boiler for heating green-houses, &c., which shall be so constructed as to develop the greatest possible amount of effective heat with the smallest possible quantity of fuel.

The invention consists in the combination of the arched pipes and the longitudinal pipe with the inner shell of the boiler, and with the circulator, as hereinafter fully described.

A is the body of the boiler, which is made in the form of a semi-cylindrical arch, provided with an inlet-pipe, B, and an outlet or circulation pipe, C. D is the circulator, which is connected with a cross-slot in the inner wall of the boiler, at the rear of the fire-grate. E is the generator or hollow fire-back, the ends

of which are connected with slots in the lower part of the opposite sides of the inner shell of the boiler A, and which is inclined to the rearward, and is extended upward until its top is about upon a level with the bottom of the circulator D. F are arched pipes, the lower ends of which are connected with holes in the lower parts of the inner wall of the boiler A. The pipes F pass up along the inner wall of the boiler A, and their upper ends are connected with the larger pipe G, passing longitudinally along the crown-arch of the inner wall of the boiler A, and its forward end is connected with the circulator D.

The general construction and operation of my boiler devices are fully described in my Patent No. 186,083.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

The combination of the arched pipes F and the longitudinal pipe G with the inner shell of the boiler A, and with the circulator D, substantially as herein shown and described.

ROBT. EXCELL.

Witnesses:

WM. FANCOURT,  
CHAS. HAUCK.