

JOHN M. SCHRAMM.

Improvement in Steam Boiler Flues.

No. 122,971.

Patented Jan. 23, 1872.

Fig. 1.

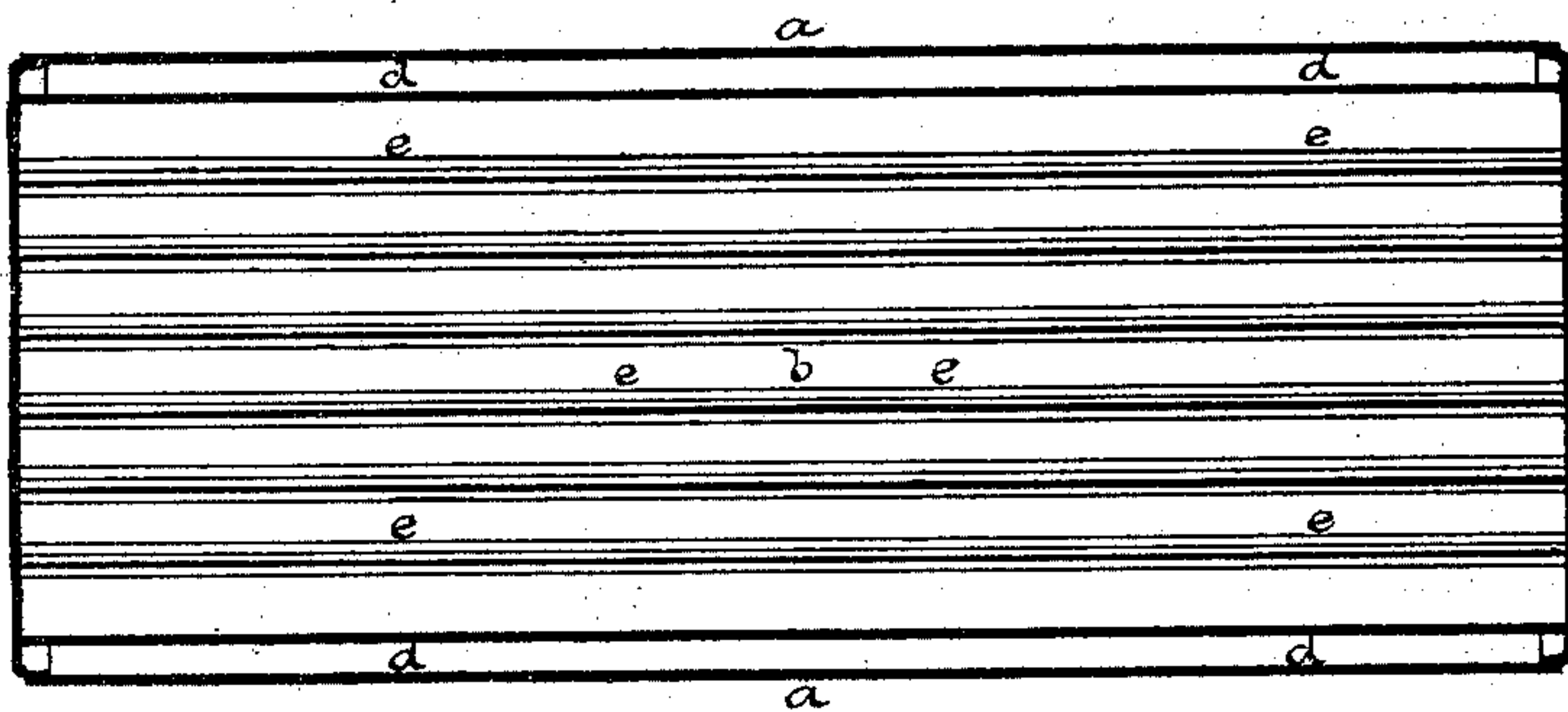


Fig. 2.

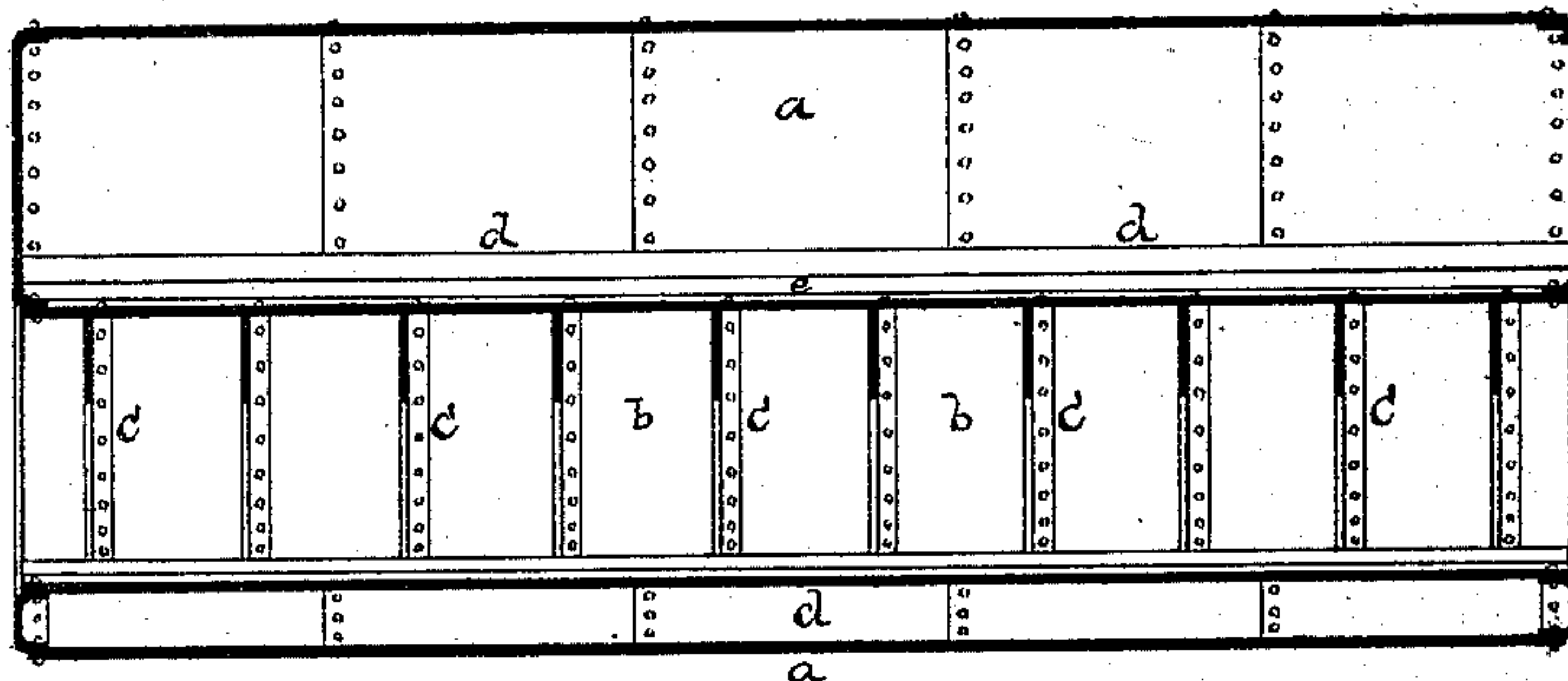


Fig. 4.

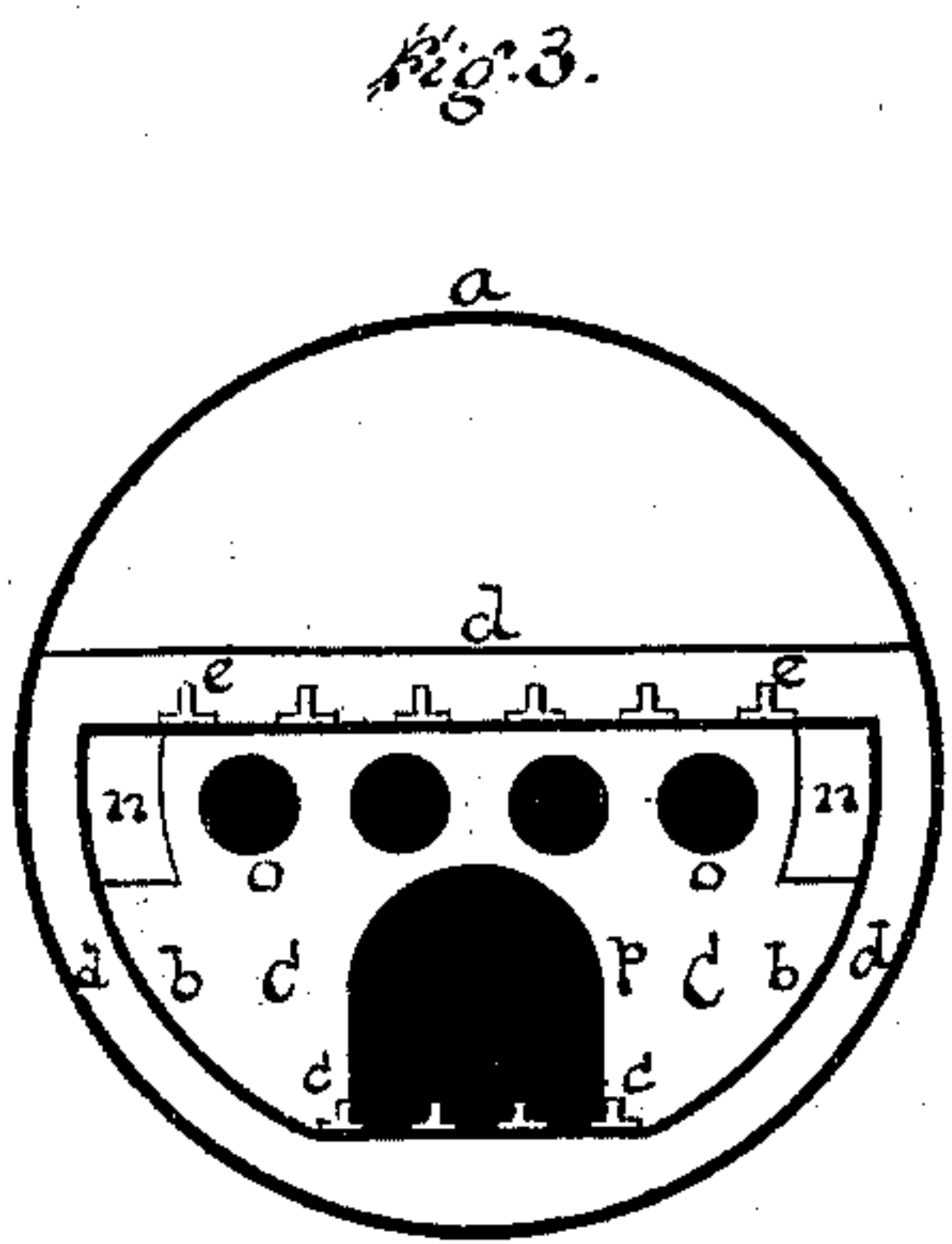
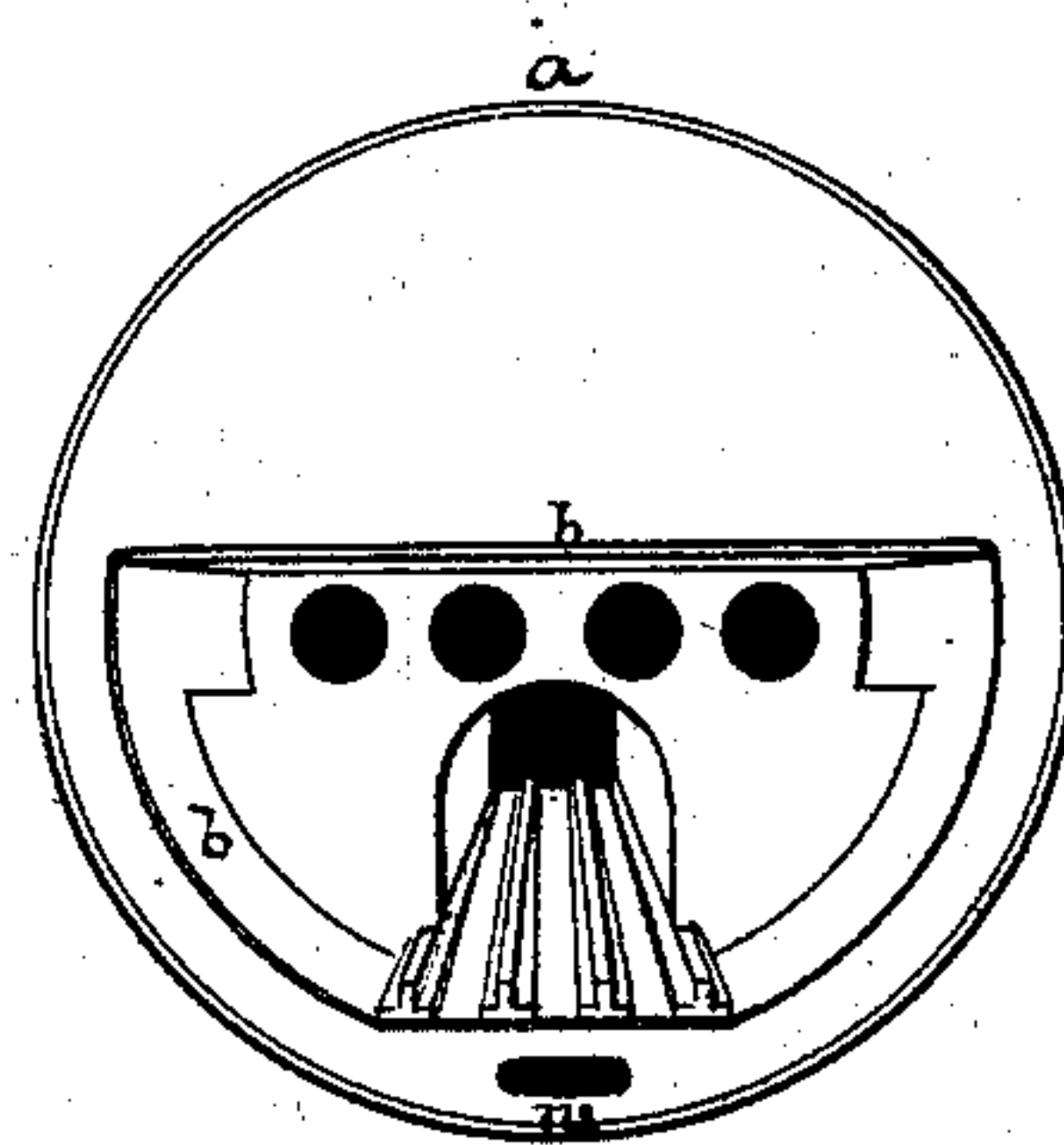


Fig. 5.



Witnesses.

Thos. Waldschmidt  
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# UNITED STATES PATENT OFFICE.

JOHN M. SCHRAMM, OF PONTOOSUC, ILLINOIS.

## IMPROVEMENT IN STEAM-BOILER FLUES.

Specification forming part of Letters Patent No. 122,971, dated January 23, 1872.

### SPECIFICATION.

I, JOHN M. SCHRAMM, of Pontoosuc, in the State of Illinois, have invented certain Improvements in Steam-Boilers, of which the following is a specification:

#### *Nature and Objects of the Invention.*

The chief object of my invention is economy in the use of fuel by abstracting a larger amount of heat from the products of combustion than is accomplished by other means. This effect is sought by providing the greatest practicable amount of fire-surface in the boilers and flues, and by checking the current of the draught as it returns through the flues, furnishing, at the same time, receptacles above that return current, into which the heated gases may rise until they have given off their intensest heat to the water above. Another object of my invention is to reduce, as far as practicable, the amount of water in the boiler in proportion to the fire-surface. This enables me to get up steam more speedily than could otherwise be done, and also diminishes the weight of water in the boilers. The third object of my invention is to obviate the danger that might otherwise result from laying bare any portion of the flues, which would be caused by the careening of the vessel or locomotive in which the boiler might be used.

#### *Description of the Accompanying Drawing.*

Figure 1 is a plan of the boiler from which the top shell has been removed. Fig. 2 is a vertical longitudinal section of the boiler and its appurtenances. Fig. 3 is a vertical cross-section of the same. Fig. 4 is a front view of the same; and Fig. 5 is intended to show a perspective view of the interior of the flue.

#### *General Description.*

The shell of the boiler is shown at *a a*; the flue at *b b*; while *c c* are braces. These, together with the other portions of the whole construction, will be explained presently. The boiler is constructed in the usual manner. The flue is made flat upon its upper surface. A small portion of its lower surface may also be flattened, as shown in the drawing, but this is not indispensable; and if constructed in that manner it must be strengthened so as to pre-

vent the danger of collapsing. The space *d* above the flue and in the boiler is for water, which should be kept of such a height in the boiler as to cover the upper flat surface of the flue. This water-space may be made as narrow as is desirable. The narrower it is the less weight of water will be needed in the boiler, and the more rapidly can it be converted into steam. The braces *c c* may be of cast or of wrought iron. I prefer the latter, and to make them of about the thickness of boiler-iron. A flange may be turned at each of their upper edges, through which they may be riveted to the flat portion of the flue, and by means of occasional flanges on their circular edges they may be riveted to the cylindrical portion of the flue. The distances by which they should be separated from each other will depend mainly upon the degree of pressure to which it is intended to subject the boiler. In ordinary cases I propose to make this distance about one foot. They may extend downward at different points so as to serve as braces to the flattened portion of the bottom of the flue; but, as it is desirable to have some means for readily removing ashes and other substances which may become deposited in the bottom of the flue, care must be taken not to obstruct this space in too great a degree. Apertures *n o p* should be left through these braces, through which the products of combustion may pass outward. These apertures may be made in various forms, and placed nearer or more remote from the upper edges of the respective braces. I prefer placing them somewhat further from that upper edge than is shown in the drawing, in order to leave deeper receptacles beneath the flat surface of the flue and between the braces, into which the most highly-heated of the gases may rise and give off their caloric to the water above. The ledges *e e e*, which run longitudinally along the flat surface of the flue, are intended in part to strengthen that flue. They are made of angle-iron, about the thickness of boiler-iron, and may project upward some two or three inches, being riveted fast to the flat surface of the flue through their lower flanges. But these ledges are also intended to retain the water between them when the boiler from any cause is made to careen. Holes should be formed in all these ledges as low down to-



ward the flue as is convenient, for the purpose of letting the water in the boiler flow over the flat surface of the flue before it is sufficiently high to rise over the upper edges of these ledges. The aperture *m* is intended to facilitate the removal of mud or other loose substances that may at any time become deposited in the bottom of the boiler.

I place the grate below the boiler, so that the fire shall heat the water in the boiler from beneath, and after passing the entire length of the boiler on the under side the products of combustion shall return through the flue and pass out of the smoke-stack which is over the front end of the boiler.

I am aware that crown-sheets for fire-boxes have been made flat, as in English patent 2,574 of the year 1802, and therefore do not claim anything that is shown in said patent.

*Claims.*

1. The boiler-flue with a flattened top or

crown-sheet, constructed as and for the purpose described.

2. The braces *c c*, in combination with the flattened top or crown-sheet, as and for the purpose described.

3. I claim the partitions *C C* in the flue of a steam-boiler, with apertures through the same, in combination with a flattened top or crown-sheet, in the manner and for the purpose above shown.

4. I claim the longitudinal ledges *e e*, not only for the purpose of strengthening the flue, but also to serve as a means of keeping the upper surface of the flue covered with water when the boiler is made to careen laterally from its horizontal position.

JOHN M. SCHRAMM.

Witnesses:

THEO. WALDSCHMIDT,  
FRED. SCHMIER.