

S. E. Crow,

Burning Hydrocarbon.

N^o 82,925.

Patented Oct. 13, 1868.

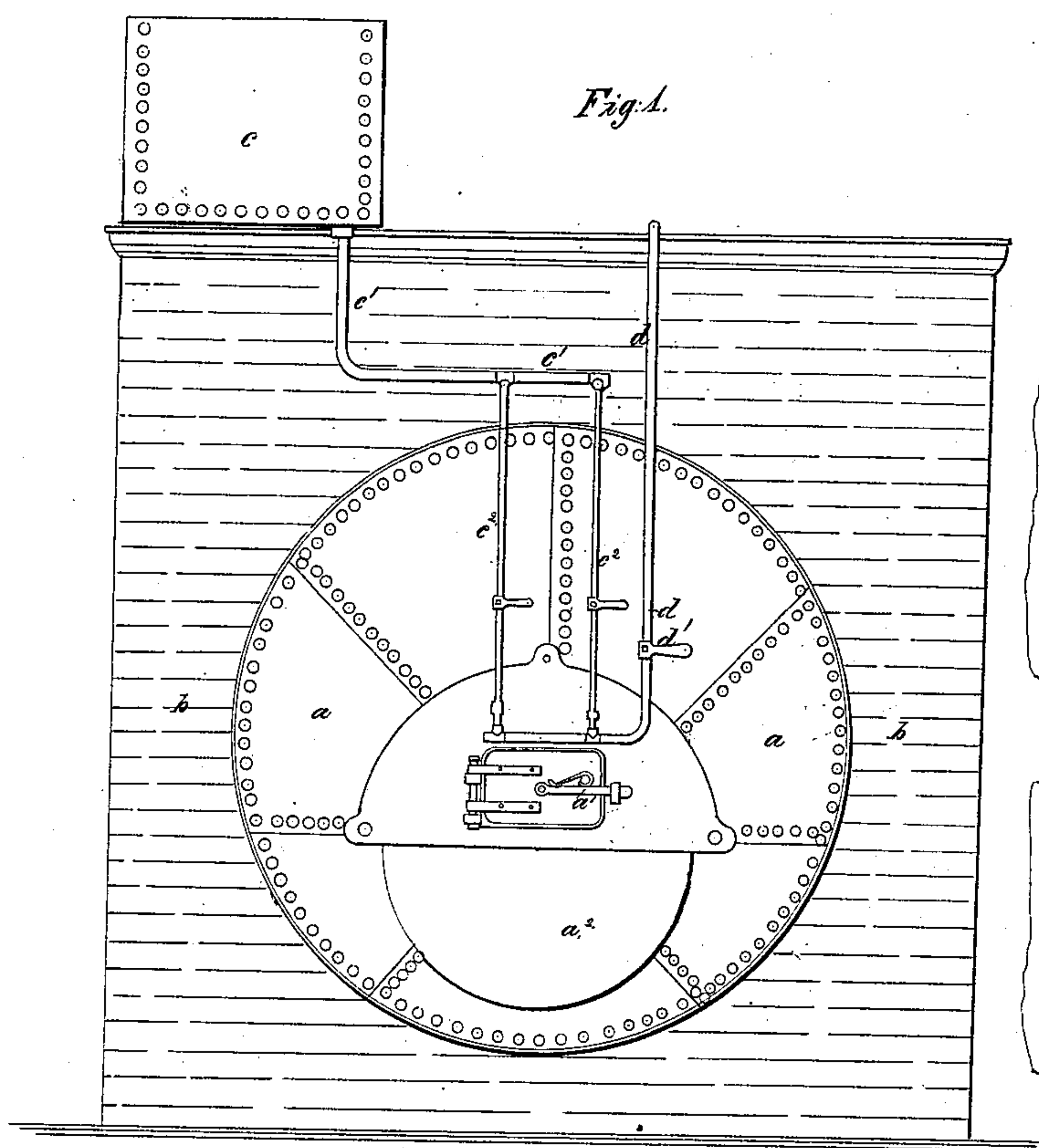


Fig. 1.

Fig. 3.

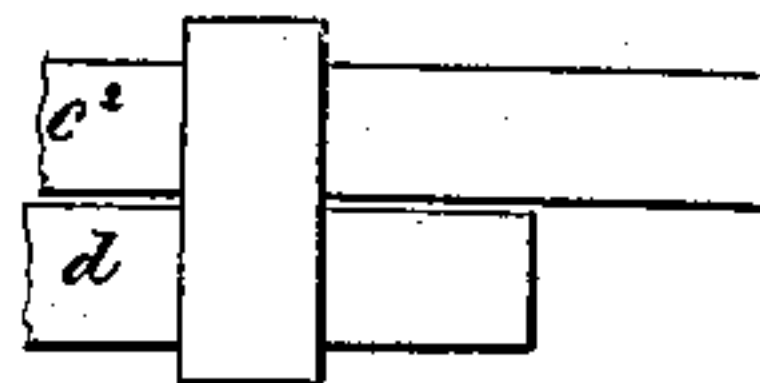


Fig. 5.

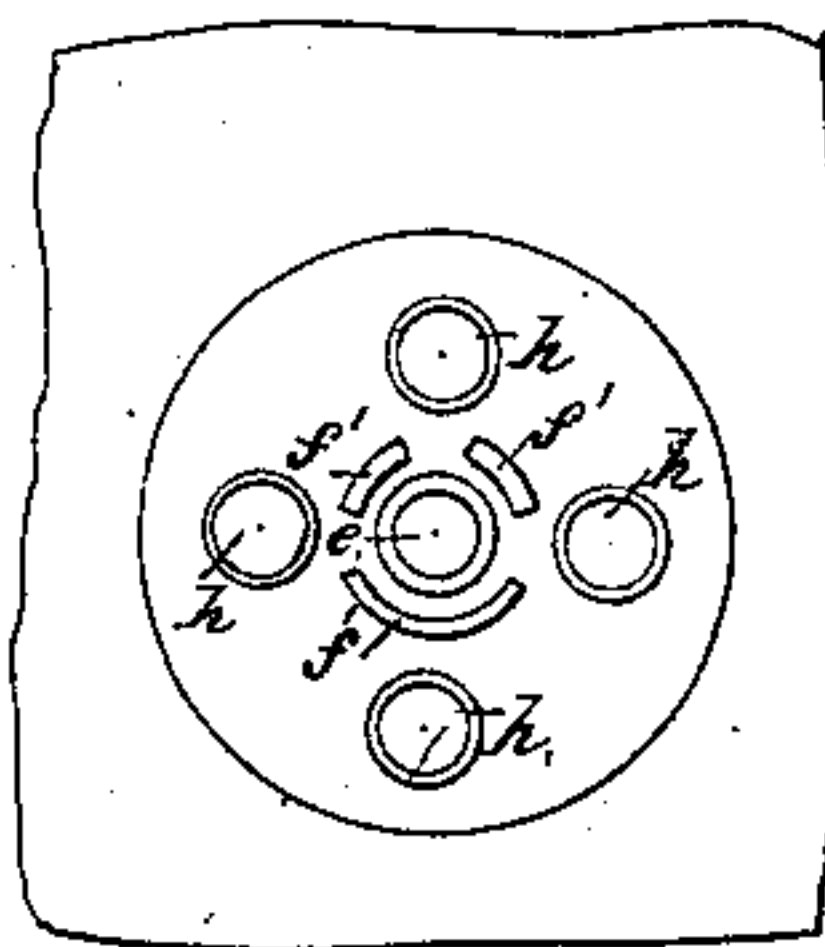


Fig. 7.

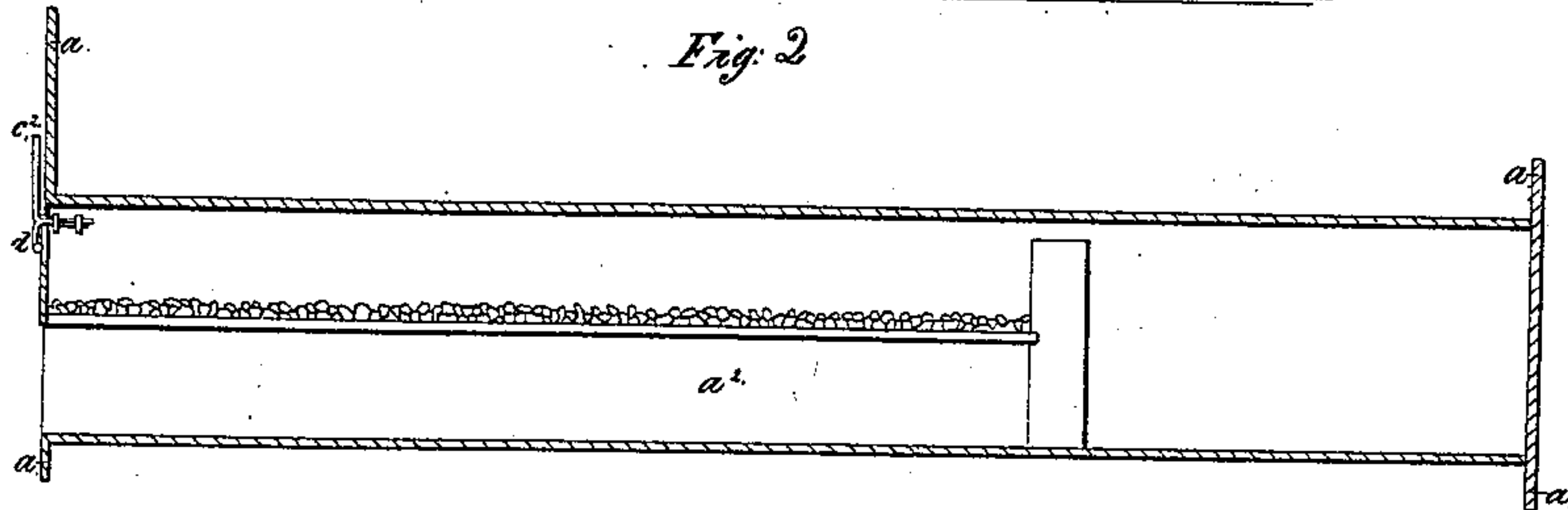
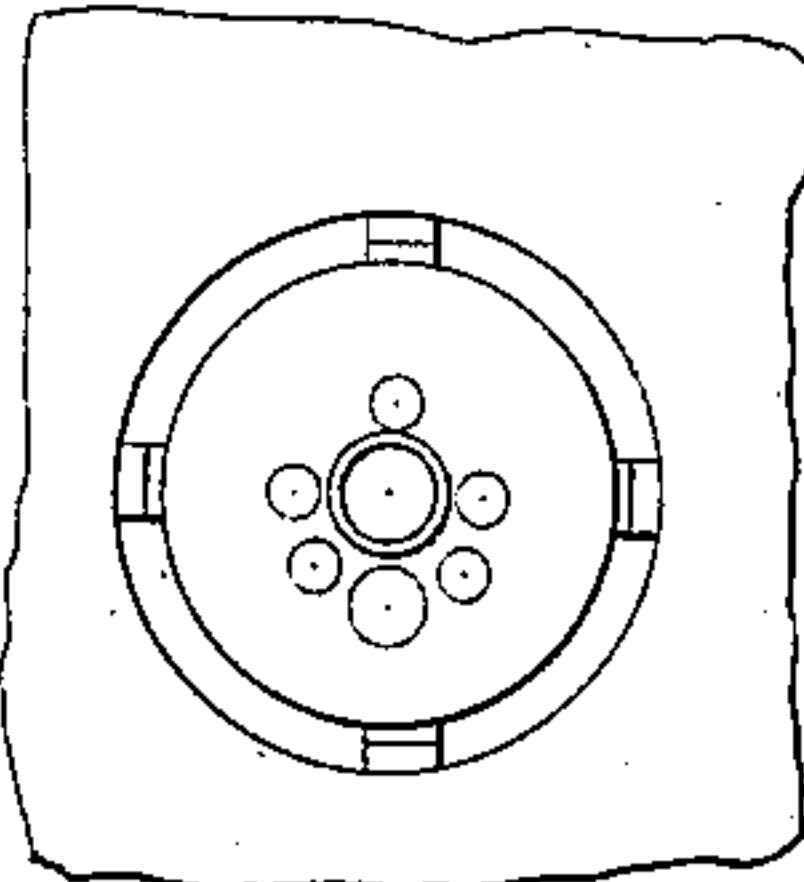


Fig. 2.

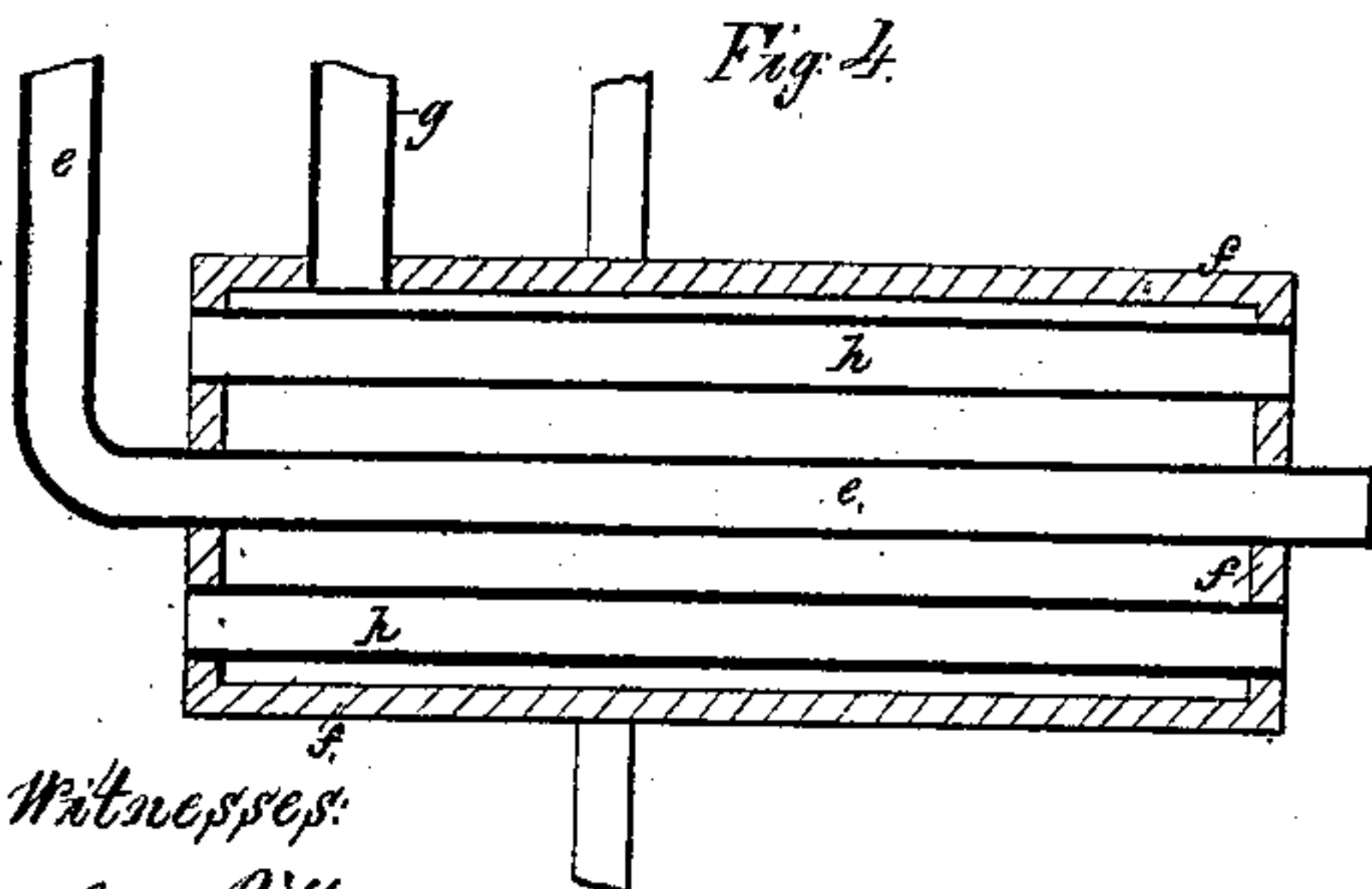


Fig. 4.

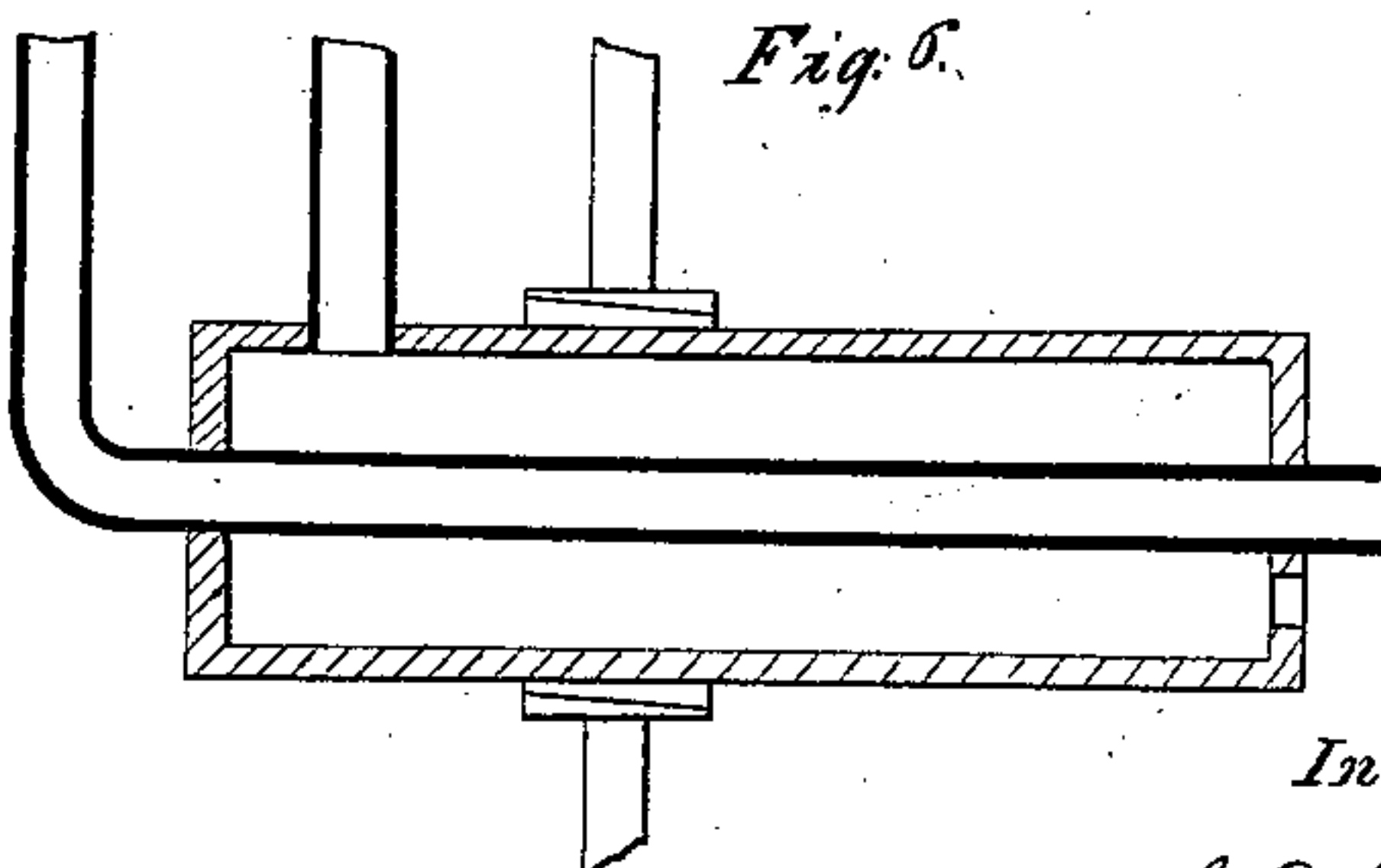


Fig. 6.

Witnesses:
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SUTTON EDWARD CROW, OF STRATFORD, ENGLAND.

Letters Patent No. 82,925, dated October 13, 1868; patented in England, June 14, 1867.

IMPROVEMENT IN HYDROCARBON-BURNERS.

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

To all to whom it may concern :

Be it known that I, SUTTON EDWARD CROW, of Stratford, in the county of Essex, England, a subject of the Queen of Great Britain, have invented or discovered new and useful "Improvements in Apparatus to be Used in Connection with Steam-Boiler and other Furnaces, to Adapt them for Burning Creosote and other Combustible Liquids;" and I, the said SUTTON EDWARD CROW, do hereby declare the nature of the said invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof; that is to say—

This invention has for its object improvements in apparatus to be used in connection with steam-boiler and other furnaces, to adapt them for burning creosote and other combustible liquids.

I apply to the furnace, at the front thereof, and at a point over the ordinary fire-bars, a pipe regulated by a tap, and connected with an elevated cistern, through which the creosote or tar-oil, or other combustible liquid, is conducted to the furnace, so that when the tap is open, the liquid flows from this pipe in a small stream.

Immediately below the mouth of the pipe already mentioned is the open end of another pipe, by which steam can be admitted to the furnace.

Both the pipes, at their open ends, are horizontal, or nearly so, and the jet of steam issuing from the steam-pipe strikes the stream of creosote or combustible liquid and scatters it in a spray throughout the furnace, and in this state it is, in great part, consumed, whilst the remainder falls upon the coals or other solid fuel or matter upon the fire-bars, and is there burnt.

When creosote is used, it deposits so much solid matter, of a coke-like nature, on the fuel on the fire-bars, that this fire will seldom or never require to be replenished; but in other cases the fuel on the fire-bars, as it burns away, should be renewed with coke or other solid fuel, so that the fire-bars may always be covered with ignited fuel.

It is preferred that the steam admitted to the furnace should be superheated. In place of steam, a jet of air (by preference heated) may be applied in a similar manner, to disperse the steam of creosote or combustible liquid as spray, and to assist in its complete combustion.

And in order that my said invention may be most fully understood and readily carried into effect, I will proceed to describe the drawings hereunto annexed.

Description of the Drawings.

Figure 1 is a front view of a steam-boiler fitted with apparatus for burning creosote or other combustible liquid according to my invention.

a is the boiler, with its fire-door, *a*¹, and ash-pit, *a*²,

and *b* is the brick-work in which it is set. These parts are of ordinary construction.

c is a tank for containing the creosote or other combustible liquid. It is erected, as is shown, at some height above the boiler-furnace.

*c*¹ is a pipe descending from this tank, and connected with two or other number of smaller pipes, *c*² *c*². These should be about one-quarter inch internal diameter, and each pipe should have a stop-cock upon it, as is shown.

d is a steam-pipe coming from the boiler and supplied with steam. It should be of twenty pounds' pressure, or more. This pipe has a stop-cock upon it at *d*¹, and at the points where it comes opposite the oil-pipes, it is fitted with small nozzles or tubes, passing horizontally through the front plate of the furnace.

The oil-pipes *c*², also, are led round at their lower ends, so as to bring them parallel with the nozzles upon the steam-pipe. They both project a short distance into the furnace, as is clearly shown at Figure 2, which represents a longitudinal section of the fire-box of the steam-boiler.

Figure 3 shows, separately and full size, the ends of the pipes as they project into the fire-box.

It will be seen that the oil-pipes project somewhat beyond the end of the steam-pipe or nozzle, so that the creosote or liquid may be exposed to the full force of the steam-jet, which will effectually scatter it over the fire-box, and break it up sufficiently to insure the liquid being efficiently burnt.

I would remark that any combustible liquid can be employed in this manner, as far as the cost will admit. At the present time, I believe the use of creosote to be the most advantageous.

In working the apparatus, when a fire has been lighted, and the fire-bars are well covered, the steam or air is turned on, and then the creosote or liquid is admitted, at first in small quantity, and the flow is gradually increased, as may be required, but not to such a degree as to cause the production of an undue amount of smoke, or to cause the liquid to run through the fire-bars unburnt. If the solid fuel is found to burn away, it should be replenished, so that the fire-bars may not be left uncovered.

Figure 4 is a longitudinal section, and

Figure 5 is a transverse section of the apparatus, in a slightly modified form.

Here the oil-pipe *e* is surrounded by a casing, *f*, fitted into the front plate of the furnace. Steam is admitted by the pipe *g* into the casing, and it issues from the slots *f*¹, at the front of it, one of said orifices being below the oil-pipe. *h h* are air-pipes, to supply warm air into the furnace.

Figure 6 is a longitudinal section, and

Figure 7 is a transverse section of another arrangement, in which the air-pipes are not used, but an air-

space is left around the casing, where it passes through the front case of the furnace.

In place of steam, air under pressure may, as already mentioned, be similarly employed. The air-pipes or air-spaces around the pipes or the casing are not then required.

In all these several modifications of the apparatus, it will be observed that the jet or jets of steam, under pressure, (or, it may be, of air,) issue in a direction parallel, or nearly so, with the ends of the oil-pipe; and the orifice or orifices from which the said jet or jets issue are behind the orifice of the oil-pipe, and that one, at least, of the former is below the latter.

These conditions are essential to my invention, the object of the arrangements being to cause the jet or jets to carry the oil forward in a state of spray, into the hottest part of the furnace, where it is, for the

most part, burnt whilst held suspended; and I avoid, as much as possible, the so intermingling the oil with the steam as to cause it to become vaporized, and so diffused in the furnace, before it is ignited.

What I claim is—

The arranging the apparatus in such manner that a jet or jets of steam, under pressure, (or, it may be, of air,) issues into the furnace in a direction parallel, or nearly parallel, to a pipe or passage by which combustible liquid is led into the furnace, such jet being immediately in rear of and below the mouth of such pipe or passage, substantially as described.

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Witnesses:

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