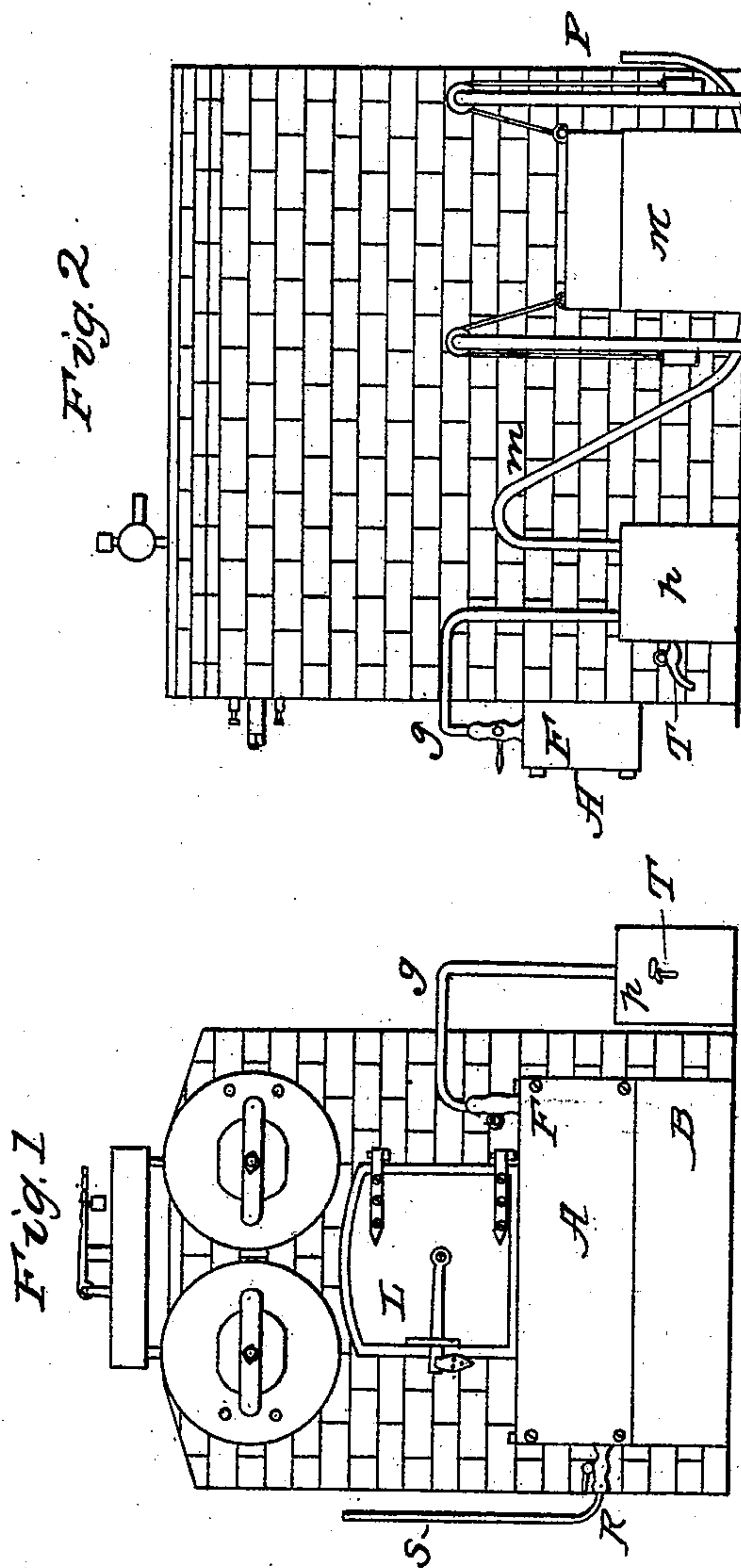
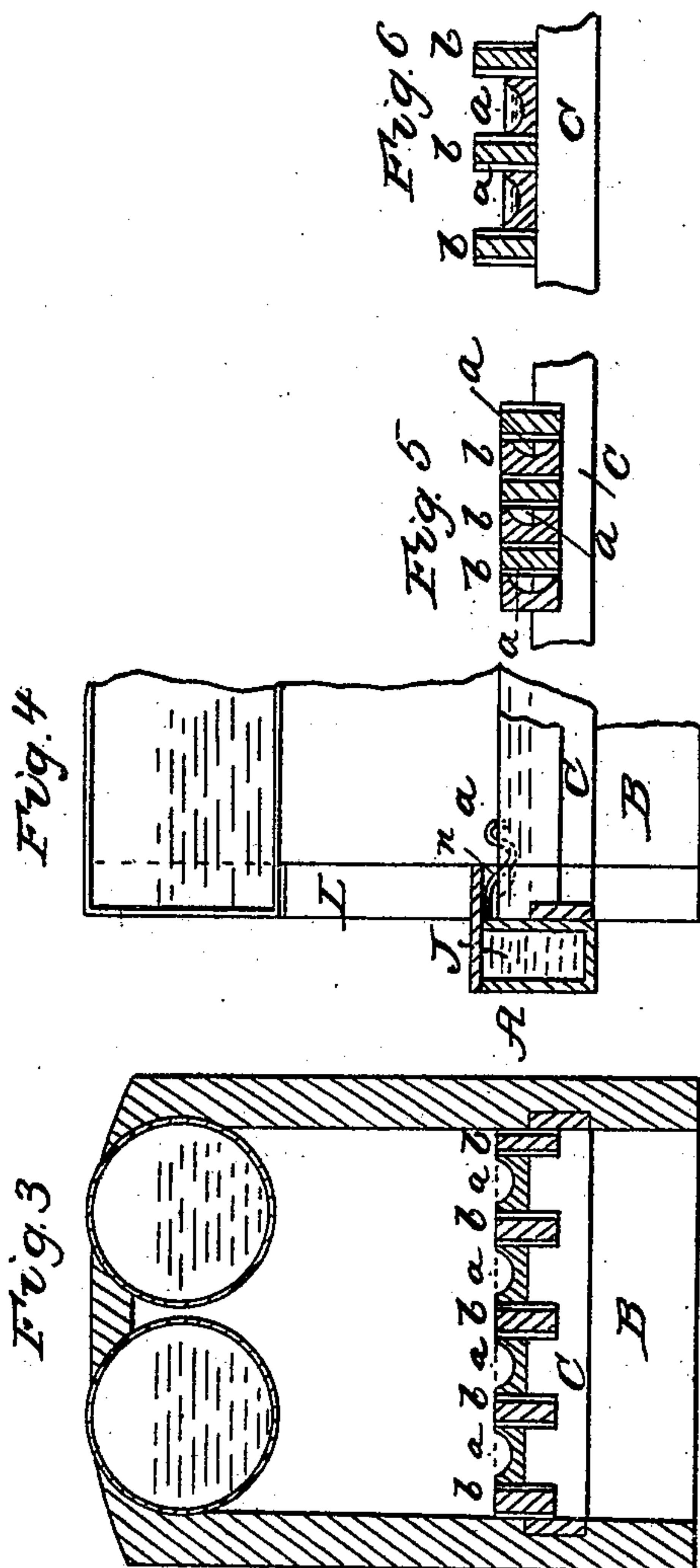


J. C. LOVE.  
Making Oil Gas.

No. 39,057.

Patented June 30, 1863.



S. W. Ellis.  
Engr.

John C. Love.



# UNITED STATES PATENT OFFICE.

JOHN C. LOVE, OF PITTSBURG, PENNSYLVANIA.

## IMPROVED FURNACE FOR BURNING AS FUEL TAR, OIL, &c.

Specification forming part of Letters Patent No. 39,057, dated June 30, 1863.

*To all whom it may concern.*

Be it known that I, JOHN C. LOVE, of the city of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful improvement in tar-burning and gas generating apparatus; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification, and to the letters of reference marked thereon, in which—

Figure 1 represents a front elevation of my apparatus. Fig. 2 is a side elevation of the same. Fig. 3 represents a vertical transverse section of Fig. 1. Fig. 4 shows a longitudinal section of Fig. 2. Fig. 5 represents the end view of the grate-bars when burning coal. Fig. 6 is a cross-section of the same, representing them in position when used for burning tar and wood.

All the parts are lettered, and similar letters indicate like parts on all the figures.

The nature of my invention consists in burning tar or crude oil in an ordinary furnace by the application and use of a series of long shallow troughs or trays placed between the grate-bars, preserving sufficient width between them to admit of a free passage for the air, and combining therewith a box or heater for supplying tar or oil through a series of small pipes leading to the troughs or trays aforesaid; and also placing said supply box or heater in such close proximity to the furnace as that the tar or oil shall become (though outside of the furnace) heated and liquefied before passing into the troughs or trays; also, combining with said box or heater a secondary box or vessel for the purpose of receiving and purifying the gas that may be generated by heating the tar or crude oil in the heater attached to the furnace before passing into the troughs or trays, and for this purpose I have constructed the heater perfectly tight and of sufficient strength to resist the pressure.

Another part of my invention consists in constructing the shallow troughs or trays of such shape as will enable them, when turned upon their edges, to be used with the grate-bars for the purpose of burning coal, or by retaining the trays in position for burning oil or tar, and, turning the grate-bars upside down, they form an excellent arrangement for burn-

ing tar and wood, as may be found most convenient.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation by reference to the accompanying drawings.

I construct my furnace in any of the well-known forms, and with all the appendages of such furnaces; but in order to burn tar, oil, coal, or wood with equal facility, I construct a series of shallow troughs or trays, *a a a a*, Fig. 3, which are placed between an equal number of grate-bars, *b b b b*, Fig. 3, always allowing sufficient space between them to admit of a free passage for the air. Directly in front of these trays and bars (outside of the furnace) is placed a heavy cast-iron box or heater, *A*, into which water, *J*, Fig. 3, and oil or tar are conveyed from an outside reservoir through a small pipe, *S*, having a properly-constructed faucet, *R*, Fig. 1, to regulate the supply. The heater *A* being filled mostly with water, the tar, when admitted, floats to the surface near the top, beneath which there is a small space for the gas to accumulate, which rises when heated and passes off through the pipe *g* into the receiver, *p*, and from thence through pipe *m* to the gasometer *M*, Fig. 2, and from which it is conveyed to any place that is desirable through the exhaust-pipe *P*, Fig. 2.

When the object is to burn tar or crude oil alone, the trays and bars *a a a a* and *b b b b* are set as shown in Fig. 3, which is found in practice to create a very hot fire, requiring little or no attention, the tar or oil passing from the heater *A* through the small pipes *n*, Fig. 4, the flow being regulated by the faucet *R*, Fig. 1, and in order to prevent the gas from escaping into the fire under the furnace, each of these pipes *n* is bent so as to form a "trap," admitting a full flow of oil, and yet, owing to the bend in the pipes, retains the gas in the heater, until the pressure becomes great, when it passes into the receiver, as hereinbefore stated. If a sufficient quantity of tar or oil cannot be had, and it becomes necessary to burn coal, this can be accomplished by turning the troughs or trays *a a a* upon their edges, as represented at Fig. 5, a perfect coal-burning grate being produced. If coal cannot be had, and wood being plenty, by arranging the trays in their original posi-



tion and turning the grate-bars *b b b b* upside down wood can be burned, or tar, oil, and wood, as may be found most desirable or profitable. The grate-bars *b b b b* and troughs or trays *a a a* rest with their ends on a strong frame, *C*, sufficiently high above the ash-pit *B* to allow of their easy adjustment, while the furnace-door *L*, opening just at top of the heater *A* and close to the bars, enables them to be arranged from the outside while hot. If the gas generated is not required for other purposes, by closing the faucet *F* it can be made to pass into the furnace and be consumed, all smell and appearance of tar being wholly avoided and the objects of this invention carried out with perfect success.

I wish it distinctly understood that I lay no claim to the hollow or trough-shaped bars as found in the patent granted to S. G. Clark, dated April 1, 1862; but

What I do claim is—

1. The use and combination of a series of long shallow troughs or trays with a box or heater used for supplying tar or oil to said troughs through a series of pipes leading to the troughs or trays aforesaid, and placing said box or heater in such close proximity to the furnace as that the tar or oil shall become heated so as to generate gas before passing into the troughs or trays, for the purposes herein shown and set forth.

2. Constructing the grate-bars and trays so that they may be reversed, for the purposes herein shown and set forth.

JOHN C. LOVE.

Witnesses:

J. W. ELLS,  
E. I. PETERS.