M. W. HAZELTON.

Device for Decomposing Water for Fuel.

No. 217,104. Patented July 1, 1879.

Fig. 1

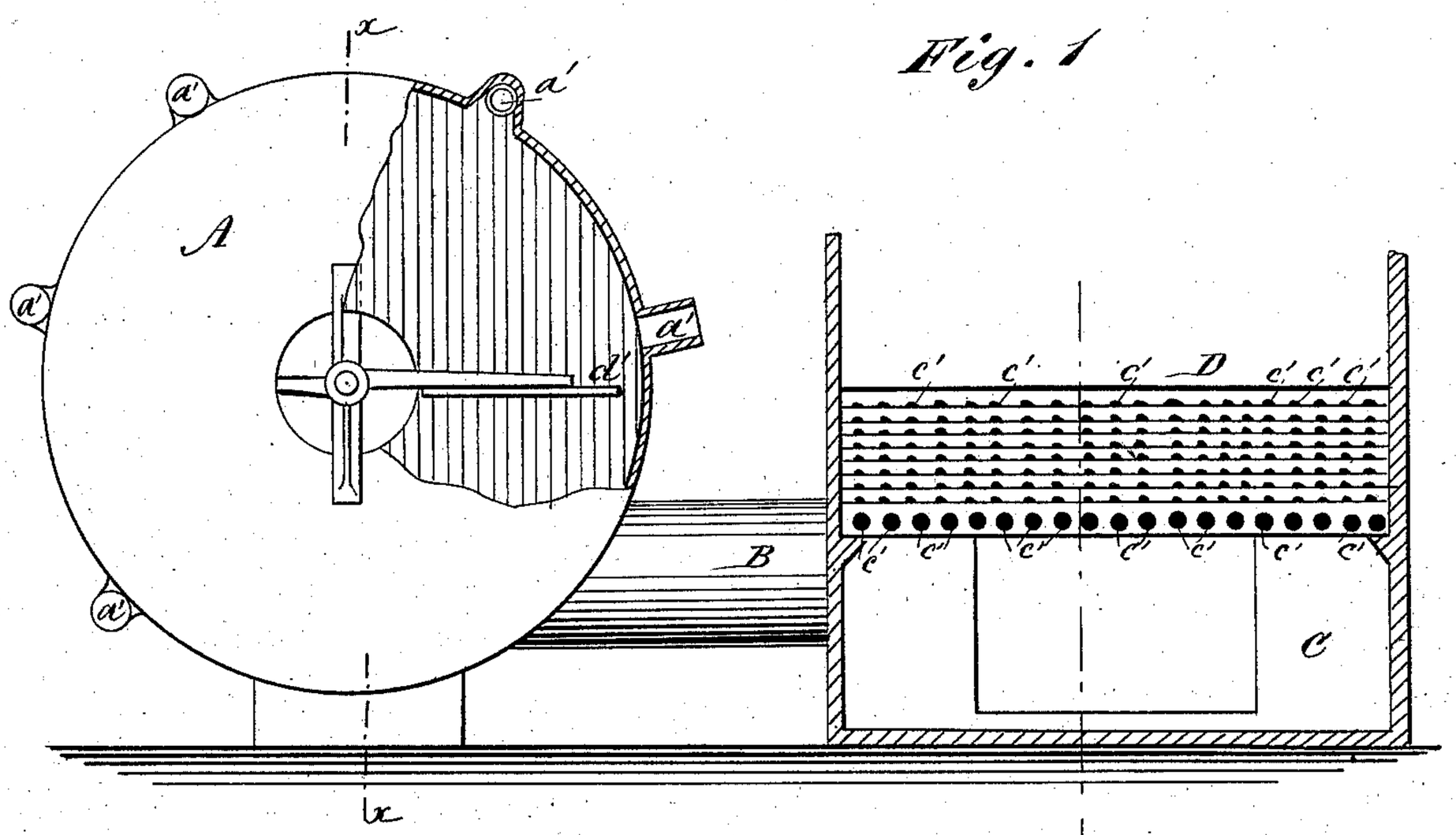
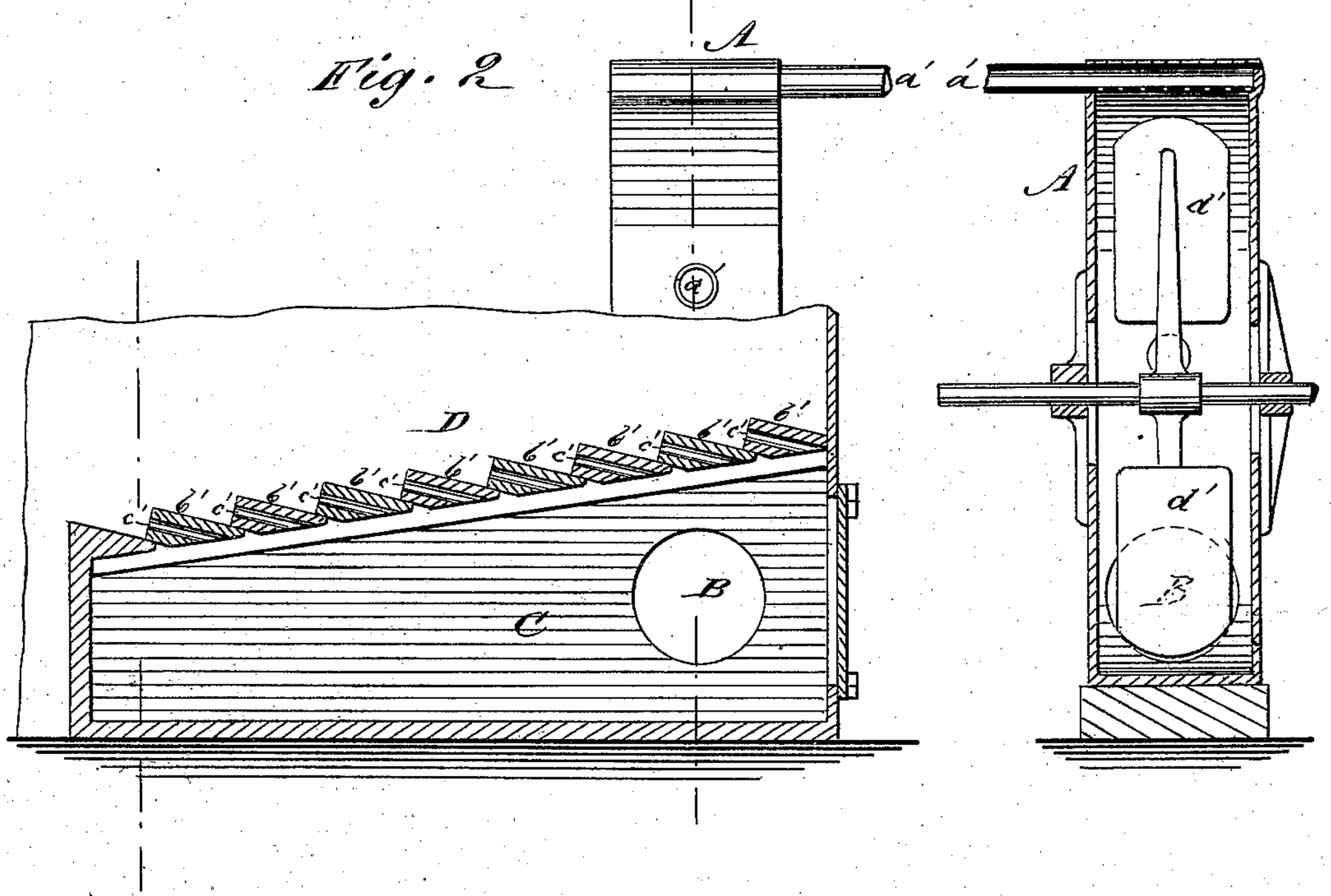



Fig. 3

Fig. 2

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MILTON W. HAZELTON, OF CHICAGO, ILLINOIS.

## IMPROVEMENT IN DEVICES FOR DECOMPOSING WATER FOR FUEL.

Specification forming part of Letters Patent No. **217,104**, dated July 1, 1879; application filed May 6, 1879.

*To all whom it may concern:*

Be it known that I, MILTON W. HAZELTON, of Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Device for Decomposing Water for Fuel, of which the following is a specification.

Figure 1 is an elevation, partly in section, giving a side view of the pulverizer or atomizer and a front view of the grate. Fig. 2 represents a side elevation of the grate and a front elevation of the pulverizer or atomizer. Fig. 3 is a vertical section on line *x x*, Fig. 1.

Similar letters of reference indicate corresponding parts.

The object of this invention is to atomize water, and force it by and with a current of hot or cold air up through the incandescent coal lying upon the grate of a furnace or boiler, so that the water shall thereby become decomposed and the oxygen thereof combine with the carbon of the solid fuel, while the combustion of the hydrogen will increase the volume of heat and flame.

The invention consists in connecting a fan-blower, A, by an exit-pipe, B, with the box or ash-pit C under a grate, D, and in providing the blower with one or more peripheral inlets, *a'*, for the admission of water, and in providing, especially for boiler service, grate-bars *b' b'*, of wedge-shaped cross-section, pierced with transverse holes *c' c'*, and set one upon another, or against each other, like a series of steps, as shown in Figs. 1 and 2.

To operate the device a fire is built upon the grate D, the blower is put in motion, and water is introduced therein through the peripheral openings *a' a'*. The action of the paddles or fans *d' d'* then reduces the water to a fine spray or mist and thoroughly mingles it with air that is drawn in at the central side openings of the fan. Heavily laden with moisture, the air is forced through the exit-pipe B into the ash-pit C, and up through the burning coals lying on the grate D. The larger drops or globules of water that are forced out by the fan fall in the ash-pit, and as they accumulate serve to assure sufficient moisture to the air passing over them from the fan, should the supply of water to the fan at any time fall below the requirements of successful operation. The effect upon the grate-bars by thus introducing mingled water and air is to keep them at a temperature too low for their burning, or for the formation of clinkers upon them. Their durability is thereby greatly increased. The water in this finely-comminuted condition becomes decomposed in passing through the burning coals, and yields its oxygen to the carbon in ample supply, while the hydrogen burning as a simple gas, or in combination with the air from the blower, adds volume to the flame, and causes it more surely to fill the flame-space, whether it be under a boiler or in a furnace.

It is found in practice that perfect combustion of the coal is thus assured, so that no smoke escapes from the boiler or furnace stack even when bituminous coal is being consumed, and that a very high temperature can be reached in this way. It is also found that the culms and waste coals can, by the application of this device, be made of as great practical value as the more costly lump coals, and that these waste coals can be used without difficulty, because the upward-moving current of air and water keeps the mass on the grates agitated and loose and prevents its caking.

To remove all objections to the use of a blower to a boiler-fire, I have designed as a part of my new device the grate-bars herein shown and the manner of setting them.

The chief objection above referred to is, that the crown-sheet of the boiler is injured by the upward-impinging jets of flame; but this device, it will be seen, removes such objection by directing the jets from the crown-sheet and toward the rear of the boiler.

This device may be applied to two or more boilers by branching the exit-pipe B to each ash-pit and introducing the necessary supply of water through or into such branches, if desirable.

In this matter I do not confine myself to any particular style of fan or grate, though I preferably use those herein shown and described, because the objects of the invention can be effected by fans or blowers and grates of other designs; but,

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

1. The combination of the blower A, provided with peripheral openings *a' a'*, pipe B, ash-pit C, and perforated grate D, substantially as and for the purpose described.

2. The wedge-shaped grate-bars *d' d'*, provided with transverse holes *c' c'*, and stepped upon or against each other, in combination with the blower A and the water-laden air forced by it into the ash-pit C, substantially as and for the purpose described.

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