A. HAMILTON.

Method of Burning Hay, Straw, Leaves, &c.

No. 164,993. Patented June 29, 1875.

Fig. 1.

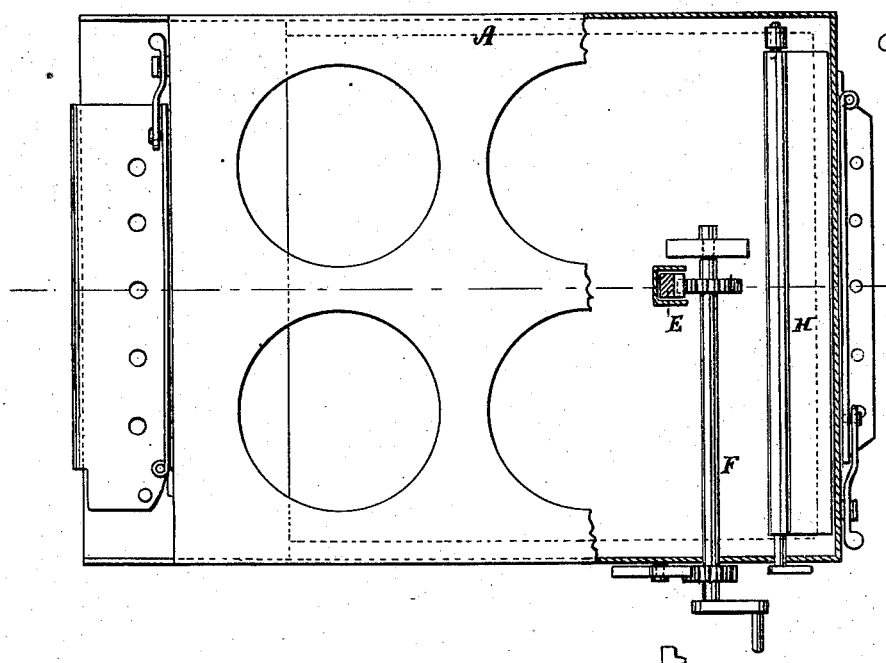
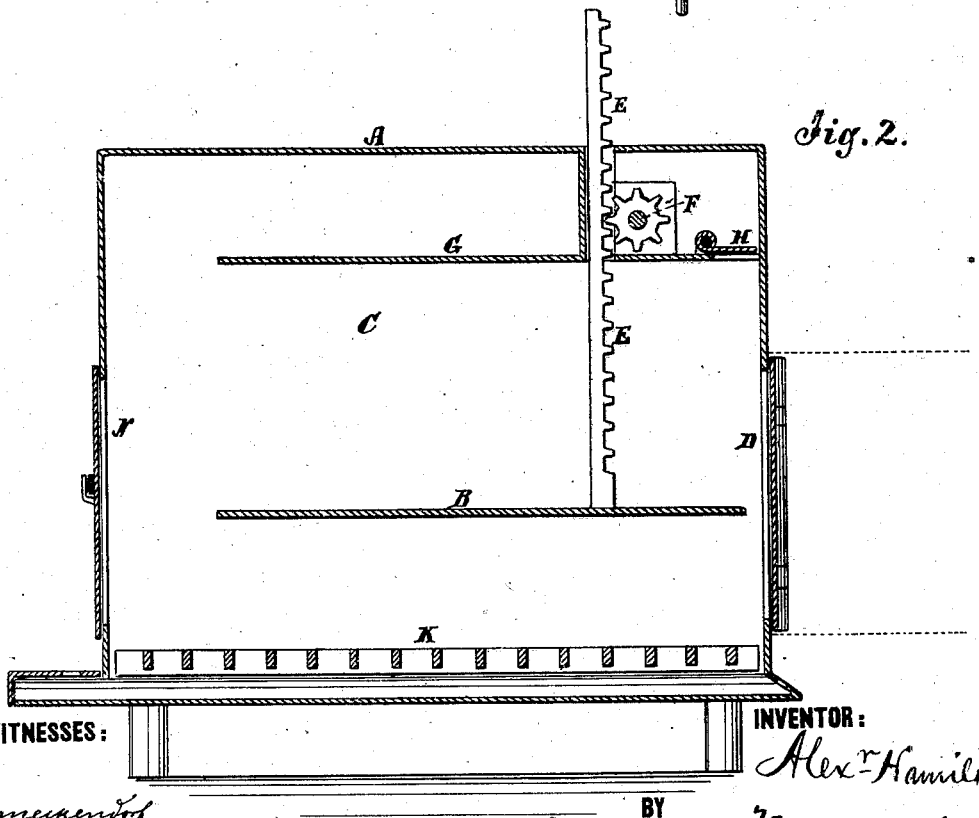


Fig. 2.



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ALEXANDER HAMILTON, OF CRESCO, IOWA.

IMPROVEMENT IN METHODS OF BURNING HAY, STRAW, LEAVES, &c.

Specification forming part of Letters Patent No. **164,993**, dated June 29, 1875; application filed March 1, 1875.

To all whom it may concern:

Be it known that I, ALEXANDER HAMILTON, of Cresco, in the county of Howard and State of Iowa, have invented a new and Improved Method of Burning Hay, Straw, Leaves, &c., of which the following is a specification:

My invention consists of a method of burning hay, straw, leaves, and other similar substances, whereby they may be practically utilized in substitution for wood and coal as fuel.

Straw, hay, and leaves, in their natural state, cannot properly be called fuel with any more propriety than paper, cotton, or gunpowder. From their extreme porous, light, fibrous, and elastic nature, (igniting at a low temperature, say 500°,) they give such free access for oxygen to every part of their mass in burning that the carbon is almost immediately saturated, and their combustion partakes almost of the nature of explosion.

Now, I have made a new and useful discovery, viz., that if such material be properly compacted and compressed, and so kept during combustion, the pores, fibers, and elasticity of the mass are so modified that the too free access of oxygen is prevented, and the supply is so regulated that a pound of carbon in such form may be made to yield as much heat, as regularly and availably, as can the carbon contained in a pound of wood or coal.

This I consider to be new, as I do not know that any material has been burned under a continuous pressure to prevent the access of oxygen, and it is useful, as it makes available for fuel thousands of tons of material of which no use can now be made, and that, too, in countries where coal or wood are scarcely to be had.

Coal requires a high temperature to ignite it, say 1,000° or 1,200°. It will not burn in small masses, nor in large, without abundant supply of oxygen to saturate not only its carbon, but also the large quantity of hydrogen which it contains, and pressure applied to burning coal is only useful in keeping it massed and forcing out the accumulating ashes which obstruct the draft, and any further pressure that compacts the mass shuts off the air and extinguishes the fire.

Coal and wood are practical fuel, because the method of using them are known; but hay, straw, leaves, &c., are not such until they become so by some appliances not heretofore generally known, and such appliances I claim to have discovered.

Figure 1 is a sectional elevation of a stove that may be used for carrying out my invention, the section being taken on the line *x x* of Fig. 3. Fig. 2 is a cross-section taken on the line *y y* of Fig. 3, and Fig. 3 is a top view.

Similar letters of reference indicate corresponding parts.

A represents a box-stove, preferably of sheet-iron, in which is a press-follower, B, adapted to be raised up to the top of the fire-chamber C, and receive fuel of hay, straw, and the like under it, say from a tubular feeder at D, and then be forced down on the fuel to press it into a dense mass. In this case the follower is provided with a toothed bar, E, extending up through the top of the stove, and gearing with a cranked shaft, F, for working it; but it may be worked by a screw or any other approved means. The feeder may extend out through the side of the house, or through a partition into a room in which the fuel is stored. G represents a partition over the fire-chamber, and below the top plate, with dampers H, for causing the heat to pass up through different parts, as may be required. K is the bottom grate, which may be contrived so as to rise and fall, and be provided with arms and rock-shafts for operating it, the object being to adjust it relatively to the follower, according to the quantity of fuel required between them.

It will be readily understood that when the pressure is upon the fuel the flame cannot act upon the mass either at top or bottom. Combustion can only go on around the sides to which the heat and air have access, so that the consumption of fuel is very slow, and can be easily graduated by the draft supplied.

Besides hay, straw, and leaves, corn-stalks may be used, and, in fact, the growth of grains, grasses, and plants generally.

The mechanical means which have been described to illustrate my process form the subject-matter of Patent No. 156,730.

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

The process of burning in a stove straw, hay, leaves, and analogous material while under pressure, as set forth.

ALEXANDER HAMILTON.

Witnesses:
H. T. REED,
ALEX. MEADOWS.