

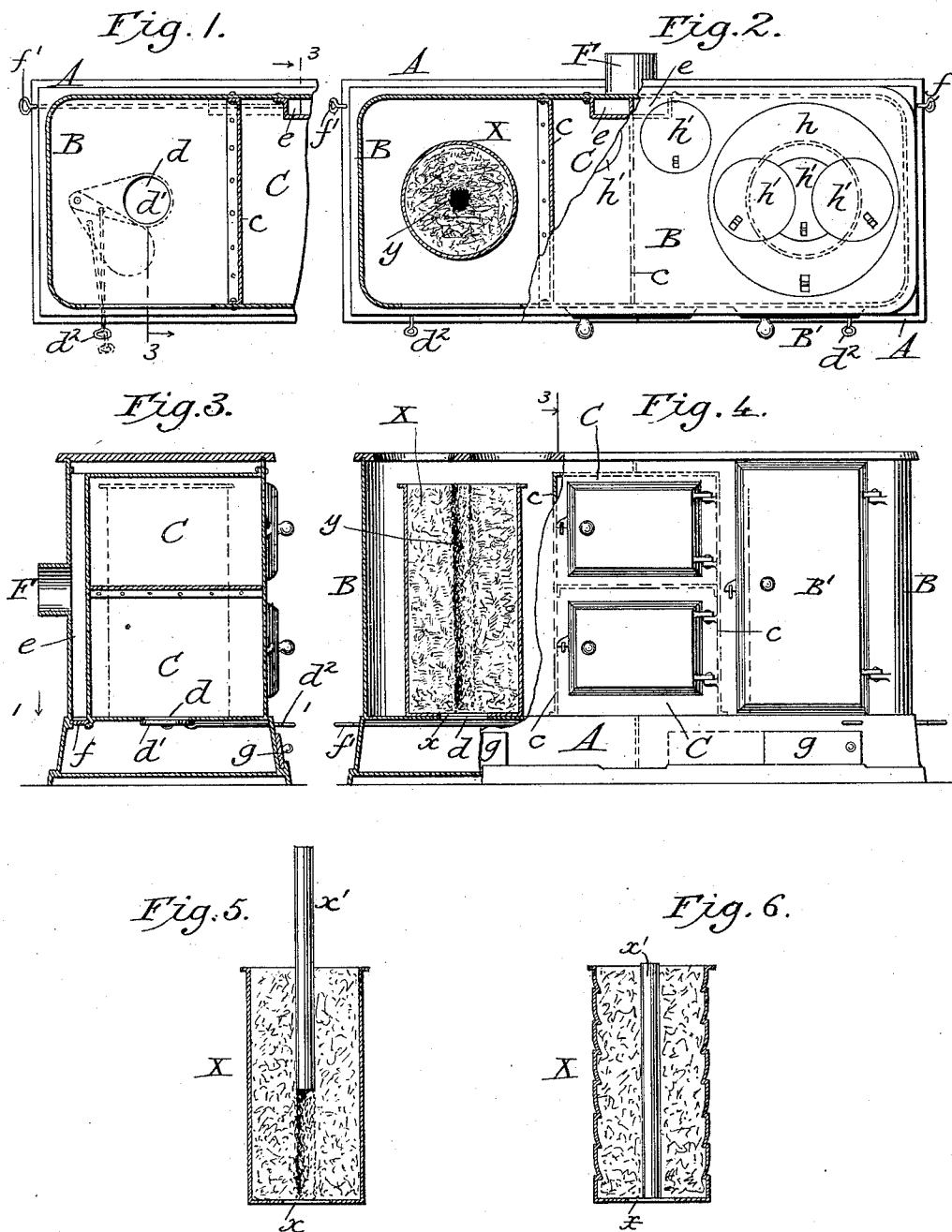
(No Model.)

G. B. FIELD.

MEANS FOR BURNING STRAW, CORNSTALKS, &c.

No. 463,249.

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UNITED STATES PATENT OFFICE.

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MEANS FOR BURNING STRAW, CORNSTALKS, &c.

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To all whom it may concern:

Be it known that I, GEORGE B. FIELD, of New York, State of New York, have invented certain new and useful Improvements in Means for Burning Straw, Cornstalks, and Such Like Fuel, of which the following is a specification.

As is well known in many sections of considerable area in the United States and elsewhere, it is difficult, and at times impossible, to secure coal or wood for fuel, and even when it may be had its expense is such as to impose a heavy burden upon the consumer. Especially is this true with reference to farmers and other persons living at points removed from railroads, because in addition to the enhanced price of fuel the labor of transporting it from the railroad to the place of consumption is very great. It is well known that in some localities fuel famines have at times been so severe and transportation facilities so deficient that farmers have been compelled to burn corn for cooking and heating purposes. This extraordinary condition has been brought about partly by scarcity of fuel and partly by the fact that the rates of transportation of farm products were so high that there was no profit to the farmer in sending them to market. On all farms where wheat, oats, barley, rye, or corn is grown there is produced in weight as much or more straw or stalks as grain. The cornstalks may be used only to a limited extent for fodder, the straw has only a restricted use, and the supplies both are always largely in excess of the demands to which they may be usefully or economically applied. In the absence of sufficient quantities of straw or cornstalks, to be utilized as presently described, there is always an ample supply of weeds, which may be mowed, permitted to dry, and accumulated in stacks. This material, whether straw, cornstalks, weeds, or similar vegetable growth in a dried condition, forms the fuel which I purpose burning in the manner and in the improved apparatus herein described.

It is the purpose of my invention to provide an apparatus in which such fuel may be burned efficiently with little if any trouble to the users for all domestic purposes. On all farms there is an abundant supply of fuel of this character that ordinarily is not utilized

in any way and is a waste production; but when utilized in the manner proposed the farmer will not be required to make any expenditure either of cash or labor for obtaining coal or wood.

The invention consists in employing a magazine, in which the straw, &c., is packed in such manner that there is formed in the body of the fuel and passing through it a draft flue or orifice that is surrounded on all sides by the fuel. The magazine is open at each end of the flue, and is to be removably placed in any suitable holder, support, or stove-casing in such manner that the draft-flue therein is in an upright position, or substantially so, and so that the air to support combustion is admitted by means of suitable draft devices at the bottom and passes up through the flue in the fuel. The fuel may be lighted at the top and the products of combustion conducted off in any convenient way. All cooking operations may be conducted over the top of the magazine—such, for instance, as boiling, broiling, &c.—and, if it is desired to bake, a Dutch oven may be placed over the fuel-magazine or permanent ovens may be provided as part of the stove.

In carrying out my invention I compress the straw or other material into a cylinder, the package forming a magazine to be placed in a stove designed for the combustion of the material. In practice I prefer to compress the material in an iron cylinder by means of any suitable compressor, or it may be done by hand or trampled in with the feet. The cylinder in which the straw is compressed may have solid walls and be open entirely or partly at top and bottom, or the walls may have any desired number of perforations, openings, or apertures therein. The only requisite is that the holder, of whatever material or however constructed, should be of a proper character and of sufficient strength to retain the compressed straw or other material therein. I pack the material in the cylinder or holder around a core, which may subsequently be withdrawn, thus leaving a draft flue or orifice through the body of the fuel.

Figure 1 is a detail sectional view on the line 1 1 of Fig. 3, looking in the direction of the arrow; Fig. 2, a plan view, partly broken away and in section; Fig. 3, a vertical section

on the line 3 3 of Fig. 1; Fig. 4, a front elevation, with one side broken away and in section. Fig. 5 is a detail sectional view of one form of my improved fuel-cartridge, the core-piece around which the fuel is packed being shown partly withdrawn; Fig. 6, a detail view showing a circumferentially-corrugated magazine or cylinder.

I have shown a fully-organized cooking-stove. The base A of the stove, which may be cast, forms a flat chamber upon which the body B is mounted. The particular stove illustrated is formed with a magazine or combustion-chamber on each side of two ovens C C, arranged one above the other, which, together with the partitions c c, divide the stove-body transversely to form the two chambers. On each side of the ovens doors B' are provided for the insertion of the fuel-magazine X. The magazines are arranged in a vertical position, or nearly so, and rest upon the top of the base A and over draft-apertures therein. Each of these apertures d is provided with a slide-valve or damper d', operated by a handle d², extending through the base to the exterior of the stove, and by means of which the draft of air through the magazine may be regulated.

Flues e lead from the top of each combustion-chamber into the ash-pit or hollow base, and the smoke-outlet F communicates with both flues. The bottom of each flue may be opened or closed by a slide-valve or damper f, operated by a rod f', extending to the exterior of the stove.

Below each door B' the base is provided with a suitable door g for the entrance of air and to permit the removal of ashes. The valve or damper d' being moved so as to uncover the opening d, over which the magazine stands, and the flue e being closed at the bottom of the valve f, air entering at g passes up through the draft-orifice in the fuel-magazine and by the flue e out through the smoke-pipe F. When it is desired to slow down the fire, the aperture d is closed and the bottom of the flue e opened. Such air as now enters the base will pass directly up the flues e and thence into the smoke-pipe without passing through the magazine.

The top of the stove may be provided with any desired number of stove-holes of standard size. In Fig. 2 I have shown a large ring-seated in the top of the stove, and in this ring the ordinary stove-lids h', of standard size, are seated. The magazine is indicated by the dotted circle. It is obvious that by lifting the ring h from its seat the magazine might be dropped into position through the top of the stove.

The casing in which fuel of the character described is to be compressed may, as before stated, be of any suitable shape or character adapted to accomplish the objects of my invention. I have shown a metal cylinder open at the top and having an opening x in the base of less diameter than the cylinder, so as to form

a seat or support for the compressed fuel. The fuel is compressed in this cylinder around a core x', Fig. 5, which may be subsequently withdrawn, thus leaving a draft opening or orifice y through the body of the fuel centrally with reference to the fuel, that equally surrounds it on all sides. The walls of the cylinder may be transversely corrugated, as in Fig. 6, so as to take hold of and retain the compressed fuel, preventing its expanding out of the top of the cylinder. The compressed fuel, considered without reference to a holder or cylinder into which it is compressed, may be considered a cartridge or magazine, because any means of binding the compressed fuel together may be employed. For instance, a wrapping of wire would be sufficient.

The operation is as follows: A fuel-magazine having been placed in position and the draft properly adjusted, the fuel may be lighted at either the top or bottom. The air supplied to the interior of the magazine maintains perfect combustion within the bore of the fuel, and more especially at or near its base, and the superincumbent mass of fuel gradually sinks. In practice I have burned a fuel-magazine containing ten pounds of straw during a period of four hours and have conducted with perfect facility various cooking operations. Bread, meat, fowls, &c., may be perfectly baked in the ovens, and boiling, frying, stewing, and broiling may be done over the stove-holes in the usual way. Where it is desired to maintain a fire in the stove over night, by proper regulation of the draft the fuel may be maintained in slow combustion and will last many hours.

I have shown my invention applied to cooking-stoves; but obviously such magazines may be burned in similar stoves for heating purposes. The cylinders may readily be removed when the fuel therein is exhausted and freshly-charged magazines introduced.

In order to facilitate the packing of the cornstalks in the cylinders, they may be crushed or mangled, as straw is in a thrashing-machine, or may be cut by being run through an ordinary straw-cutter.

I claim as my invention—

1. A portable fuel-magazine consisting of a holder having straw, cornstalks, or such like fuel therein, with a draft-flue formed in, extending through, and surrounded on all sides by the fuel, in combination with a holder or stove-casing adapted to receive and hold the magazine in an upright position and constructed to supply air to support combustion to the lower end of said draft-flue.

2. A portable fuel-magazine consisting of a metal cylinder open at both ends and having straw, cornstalks, or such like fuel therein, with a draft-flue formed centrally in and extending through the fuel, in combination with a holder or stove-casing adapted to receive and hold the magazine in an upright position and constructed to supply air to support combustion to the lower end of said draft-flue.

3. A portable fuel-magazine consisting of a metal cylinder circumferentially corrugated, open at both ends, and having straw, cornstalks, or such like fuel therein, with a draft-flue formed centrally in and extending through the fuel, in combination with a holder or stove-casing adapted to receive and hold the magazine in an upright position and constructed to supply air to support combustion to the lower end of said draft-flue.

4. The combination of a stove-casing, its base, a draft-aperture in or at the base, and a fuel magazine or charge consisting of a

mass of straw, cornstalks, or such like fuel suitably held together and having formed therein and extending therethrough a draft-flue, the stove-casing being adapted to receive the charge of fuel in an upright position with the draft-flue in the fuel over said draft-aperture.

In testimony whereof I have hereunto subscribed my name.

GEORGE B. FIELD.

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