3 Sheets—Sheet 1.

D. SHIELDS.

OIL-STOVE.

No. 188,424. Patented March 13, 1877.

Fig. 1.

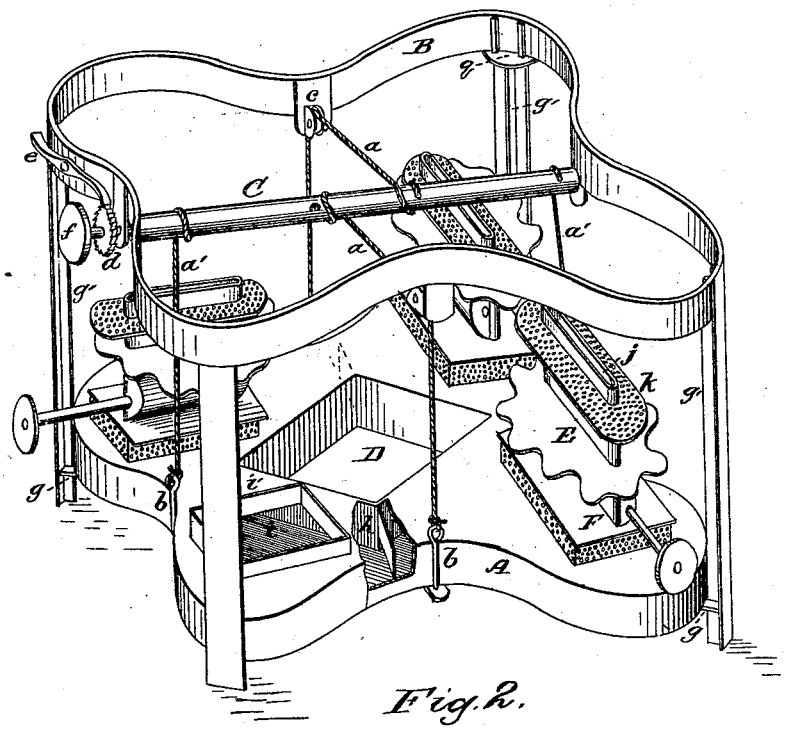
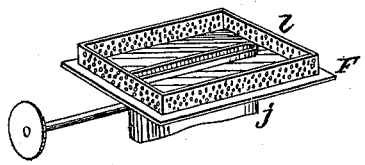


Fig. 2.



WITNESSES

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3 Sheets—Sheet 2.

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Fig. 3.

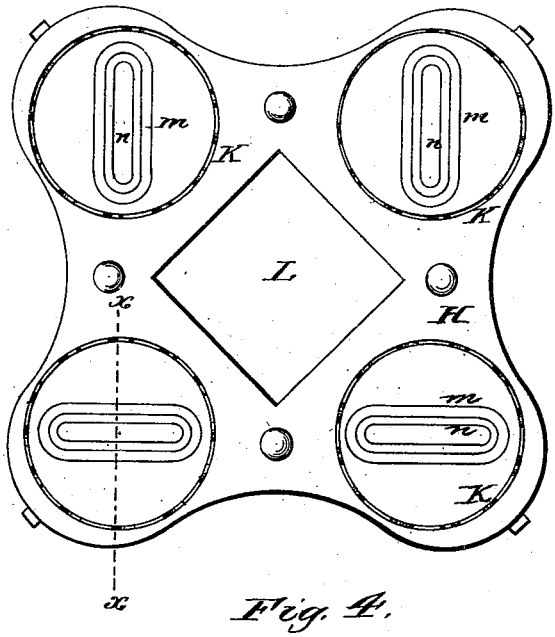


Fig. 4.

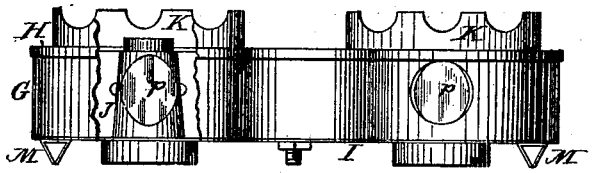


Fig. 5

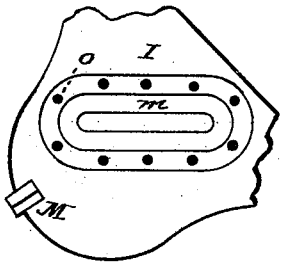
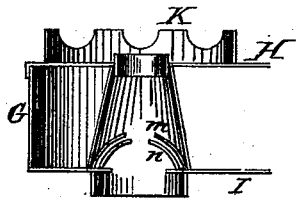


Fig. 7.

Fig. 6.



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3 Sheets—Sheet 3.

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Fig. 8.

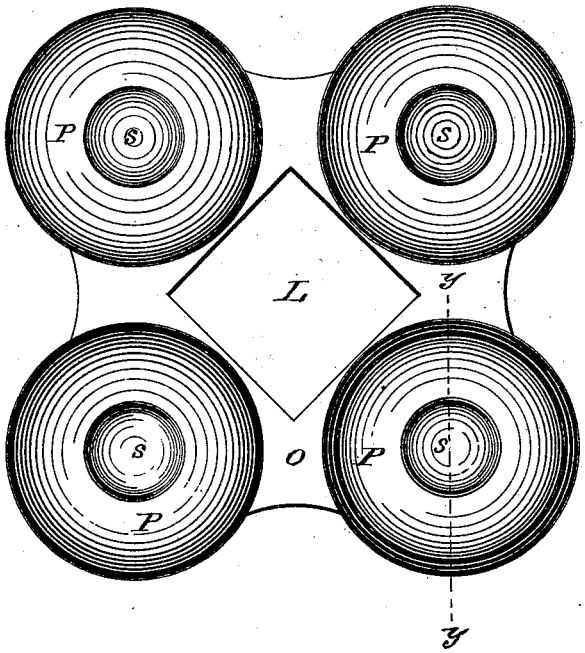


Fig. 9.

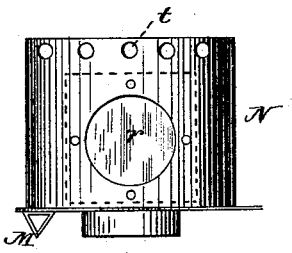
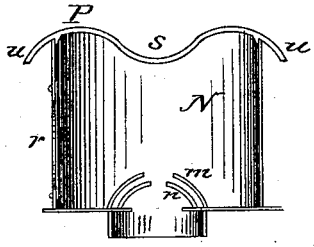


Fig. 10.



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UNITED STATES PATENT OFFICE.

DAVID SHIELDS, OF FLORENCE, MASSACHUSETTS.

IMPROVEMENT IN OIL-STOVES.

Specification forming part of Letters Patent No. **188,424**, dated March 13, 1877; application filed October 20, 1876.

To all whom it may concern:

Be it known that I, DAVID SHIELDS, of Florence, in the county of Hampshire and State of Massachusetts, have invented a new and valuable Improvement in Oil-Stoves; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawing is a representation of the frame, the oil-reservoir, and its connecting parts. Fig. 2 is a perspective view of the under side of one of the burners. Fig. 3 is a top plan view of the cooking-drums. Fig. 4 is an end view of the same. Fig. 5 is a detailed view, showing the under side and one of the ends of the cooking-drums. Fig. 6 is a vertical longitudinal section taken on the line *x x* of Fig. 3. Fig. 7 is a view, on an enlarged scale, of one of the V-shaped projections for supporting the cooking or heating drums upon the frame. Fig. 8 is a top plan view of heating-drums. Fig. 9 is a detached view of one of the heating-drums, with the cap removed; and Fig. 10, a longitudinal vertical section taken on line *y y* of Fig. 8.

This invention has relation more particularly to that class of stoves in which are used hydrocarbon oils as fuel for heating, cooking, and other purposes to which it may be adapted.

Heretofore the great difficulty experienced was in keeping the oil in the reservoir cool, in order to prevent the generation of gases and insure perfect safety in their use; also, of allowing the gases means of egress, so as to prevent the possibility of explosion. A perfect combustion is of the utmost importance to realize the greatest amount of heat from the oil consumed, and it is also generally essential that the stove should be so constructed as to prevent the transmission of heat from the several parts that become heated by the flame to the reservoir or tank which holds the oil; and therefore to overcome the above-named difficulties, and to insure perfect combustion, are among the most important features of my invention, as well as to construct a stove of the character named, that may be easily operated and handled, and effective in its several operating parts; and my invention, therefore, consists in so suspending the reservoir which contains the oil that it may be adjusted to or from the heating or cooking drums for the purpose of lighting or trimming the wick of the burner, or removing the same to replenish the oil in the reservoir, or to recover the wick when turned below the ratchet and dropped in the reservoir, and also admitting of it being elevated when the stove is required to be used, the construction and arrangement of the several parts whereby these results are obtained being hereinafter described and pointed out in the claims.

My invention also consists, in connection with the adjustable oil-reservoir formed with a central air-opening, of the heating or cooking drums, with a similar opening, so that when either drum is placed upon the frame over the reservoir an unobstructed passage is obtained, for the purpose of allowing the air to circulate through the same, and thereby keep the oil within the reservoir cool.

My invention also consists of a metal plate, in which the lower end of the wick-tube is secured, said plate having a downwardly-projecting perforated flange, to allow the air to pass underneath the end of the wick-tube and through the wick, thereby preventing the transmission of heat down the wick into the oil.

My invention also consists in providing the heating and cooking drums with V-shaped projections, secured to the under side of the same, the sharp edges of which rest upon the frame supporting the oil-reservoir, thereby preventing the transmission of heat from the heated part of the stove to the frame and its connections.

My invention also consists in providing the heating and cooking drums with a supplemental cone placed over and around the inner cone, leaving a space between the two, in connection with perforations or suitable openings through the plate upon which the cones rest, for the purpose of conducting air through the space between the cones directly to the flame, thereby greatly increasing combustion, and burning the gases and smoke.

My invention further consists in a cap to the

heating-drum, convex in form, and having a central depression, for the purpose of forming a curve upon the inside, against which the gases and smoke strike, follow the curve, and rotate downward, and are consumed by the flame, while the heat passes out through perforations or suitable openings around the top of the drum, and are deflected downward by the projecting edges of the cap.

In the accompanying drawings, A represents the oil-reservoir, of cast-iron or other suitable metal, suspended on a frame, B, by cords or chains *a a'*, connected thereto by eyes or hooks *b*, or other convenient means. The cords *a* pass over grooved pulleys *c*, secured to the frame, and connect to a horizontal shaft, C, near its center, said shaft having its bearings in the frame B, and the cords or chains *a'* are connected to the shaft near its ends.

Upon one end of the shaft is a ratchet-wheel, *d*, and to the frame B is secured a pawl, *e*, to prevent the shaft from slipping back when rotated in raising the oil-reservoir A. A hand-wheel, *f*, crank, or other suitable means, may be employed to operate the shaft C. Recessed plates *g* project from the corners of the reservoir and travel upon vertical guides *g'*, upon the frame, to guide and steady the reservoir in its movements.

It will be seen that, from the reservoir being independent of the frame, and from the manner of its suspension, it admits of its ready adjustment to or from the drums, or in other words, lowered therefrom when required to light, trim the wick of the burner, or to remove the same for the purpose of filling the reservoir, or to recover the wick when, by accident, it may have been turned below the ratchet and fallen into the reservoir; also, of the ready elevation of said reservoir when the stove is required for use.

The reservoir A has a central opening, D, for the purpose of allowing the air to circulate, and thereby keep the oil cool, as well as to enlarge the surface of the reservoir without enlarging its capacity, so that the burners may be placed far enough apart to give room for large utensils, and thereby admit of their more convenient removal. The reservoir A has vertical partitions *h* secured to the upper part and sides of the same, which are made slightly less in their depth than the depth of the interior of the reservoir, in order to form a space for the oil to pass underneath said partitions to all parts of the reservoir, the purpose of the partitions being to prevent the oil from splashing by any sudden motion of said reservoir. The reservoir has formed therein openings *i*, around which are projecting flanges *i'*, for the purpose of preventing the oil within the reservoir from overflowing, and also to securely hold the burners in place. The wick-tubes *j* of the burners have secured, near their tops, the ordinary air-strainer *k*. Below this air-strainer, and secured directly to and around the wick-tube, is a plate, E, of copper, brass, or other metal of good heat-conducting qualities, the purpose of which is to draw the heat from the wick-tube and radiate it from the stove, whereby the heat is prevented from passing down said tube and heating the oil within the reservoir. A metal plate, F, is employed, through which the lower end of the wick-tube *j* passes, and is secured thereto by soldering or other suitable means. This plate F has a downwardly-projecting perforated flange, *l*, made somewhat deeper than the flange *i'*, upon the oil-reservoir, so that when the perforated flange is placed over the flange *i'* the perforations will not be entirely covered, but allow a sufficient number of the perforations to be exposed to form an inlet for the air, which passes through and underneath the end of the wick-tube, and through the wick into the oil. The flange *i'*, over which the perforated flange *l* is secured, admits of the ready removal or replacing of the burner when desired. The wick within the tube is lowered or raised in the ordinary manner.

The heating and cooking drums have a supplemental cone, *m*, surrounding the inner or central cone *n*, and leaving a space between for the purpose of conducting the air through said space, the air first passing through perforations or small holes *o* made through the plate I of the cooking-drum, and through the diaphragm O of the heating-drums, upon which the cones rest, to allow free passage of the air, which afterward passes through the space between the cones, as before described, and thence directly to the flame, thereby increasing combustion and burning the gases and smoke.

The side G of the cooking-drum I prefer to construct of sheet metal, while the top H and bottom I I prefer being cast metal. Around the cones of the cooking-drum are chimneys J, having an open front on a line with an opening in the side G, and over said opening in the chimney is secured a window, *p*, of mica for observing the light of the flame of the burner. Upon the top H of the drum is a round scalloped flange, K, to support vessels thereon, and allow the air to freely circulate underneath them.

Both the heating and cooking drums have openings L to correspond with the central opening D in the reservoir, for the purpose of allowing the circulation of air, as before described, and also have secured to the under side thereof V-shaped projections M, the sharp edges of which rest upon the upper part of the frame B or upon flanges *q* attached to the same, the object and purpose being to have as little bearing-surface as possible brought in contact with the frame, and thereby prevent to a great degree the transmission of heat from the heated parts of the stove to the frame and its connections.

I do not wish, however, to confine myself to the precise V-shape form of projection, as it is evident that any sharp or pointed projections may be used to obtain the above re-

sult without departing from the principle of my invention.

The heating-drums are placed in the same manner upon the frame as the cooking-drums, and have the cones and perforations, as previously described. The drums N have mica windows *r*, and are secured to a diaphragm, O. These drums have a convex cap, P, of suitable metal, placed over and secured to the top of the same, and are formed with a central recess or depression, *s*, for the purpose of forming a curve upon the inside of said caps, against which the gases and smoke strike, and, following the curve, rotate in a downward direction, and are consumed by the flame, while the heat passes out through perforations or suitable opening *t* around the upper edge of the drum, and is deflected in a downward direction by the projecting edges *u* of said caps.

It is evident that in place of the perforated plates thin wire-gauze may be used, and the number of heating-drums may be increased or diminished, as circumstances may require.

Having now fully described the construction and operation of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The reservoir A and frame B, in combination with the shaft C, cords or chains *a a'*, pulleys *c*, ratchet-wheel *d*, and pawl *e*, substantially as and for the purpose specified.

2. The combination, with the drums, of an oil-stove, having a central opening, L, of an adjustable oil-reservoir, A, formed with a similar opening, D, substantially as and for the purpose described.

3. The perforated flange *l* extending below the end of the wick-tube, and made somewhat deeper than the flange *i'*, so that when placed over the same an inlet for the air is formed to allow its passage to the wick, for the purpose set forth.

4. The removable drums, having sharp-edged projections M upon the under side thereof and resting upon suitable supports *q* of the frame B, substantially as and for the purpose specified.

5. The combination, with the cone *n* and perforations *o* of the supplemental cone *m*, substantially as and for the purpose set forth.

6. The combination, with the drum N, having near its upper edge perforations or holes *t*, of the convex cap P, with a central depression, *s*, substantially as and for the purpose described.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

DAVID SHIELDS.

Witnesses:
NAT. E. OLIPHANT,
GEO. R. PORTER.