3 Sheets—Sheet 1.

M. L. WOOD.

Stove.

No. 214,799. Patented April 29, 1879

Fig. 1.

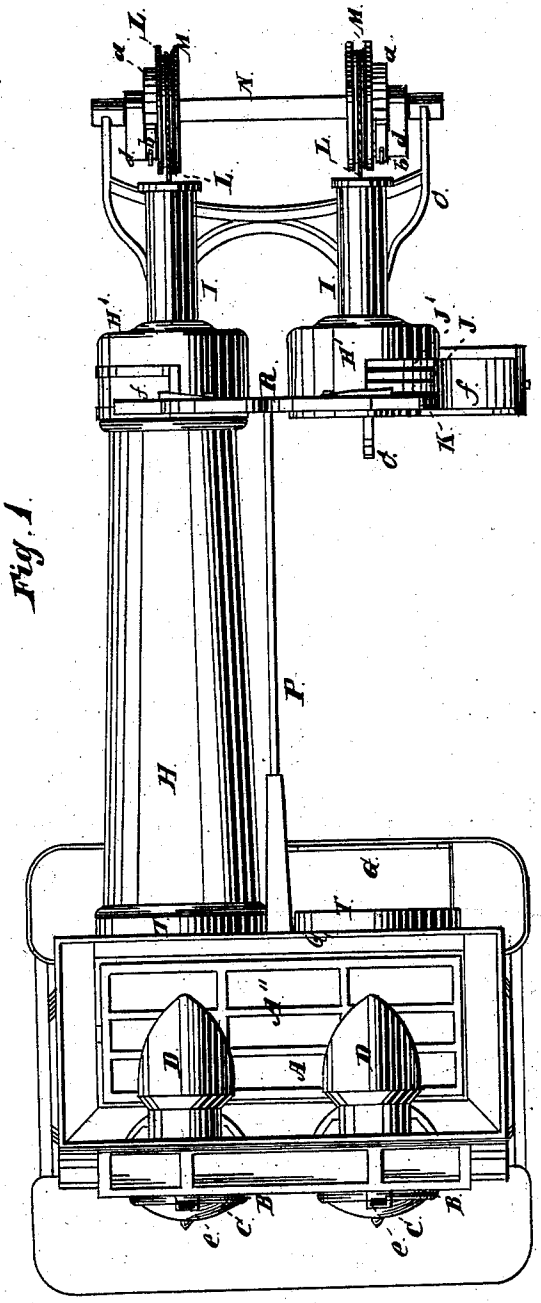


Fig. 11.

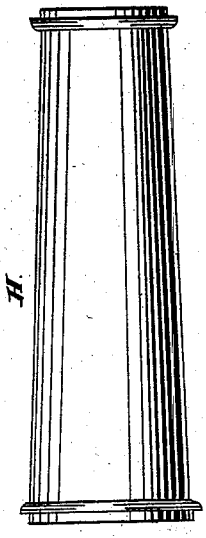
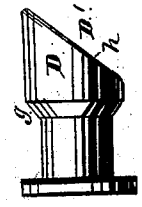


Fig. 10.



Witnesses:

H. L. Bruns.

A. W. Bond.

Inventor:

Merritt L. Wood

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

3 Sheets—Sheet 2.

M. L. WOOD.

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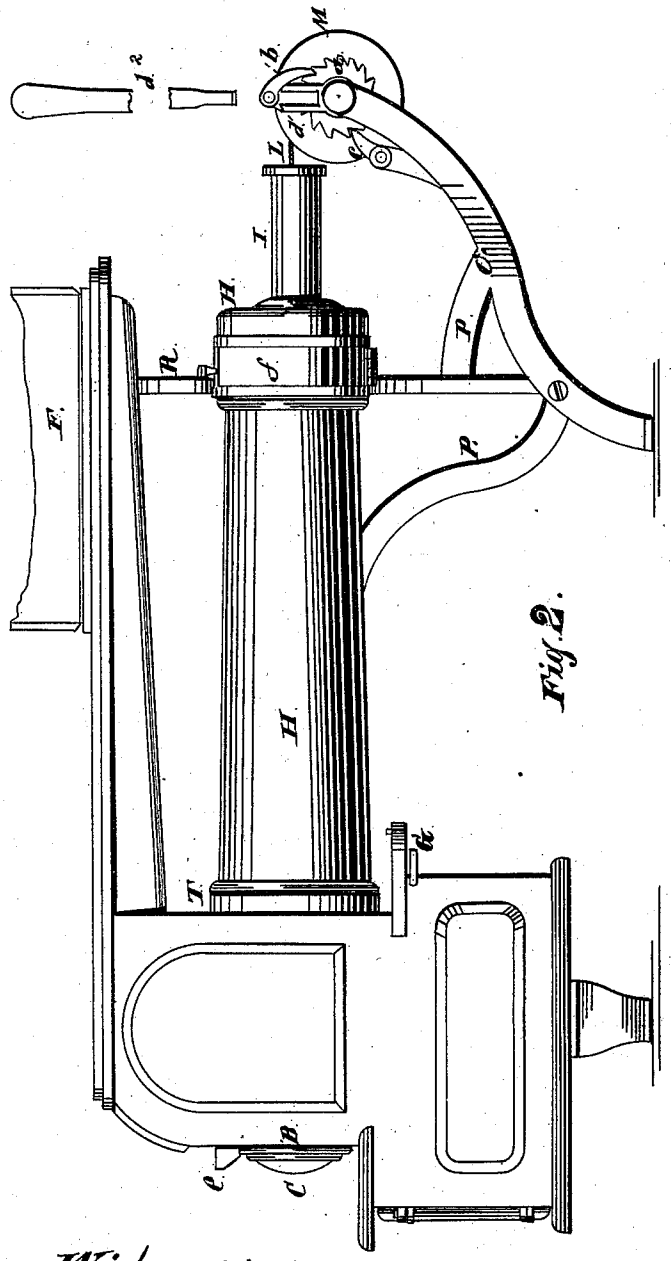
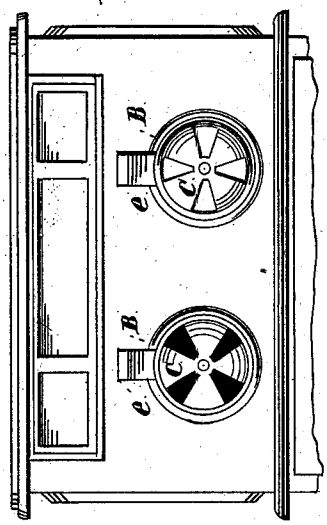


Fig. 2.

Fig. 3.



Witnesses:

H. J. Brunn.

A. W. Bond.

Inventor:

Munto L. Wood

3 Sheets—Sheet 3.

M. L. WOOD.

Stove.

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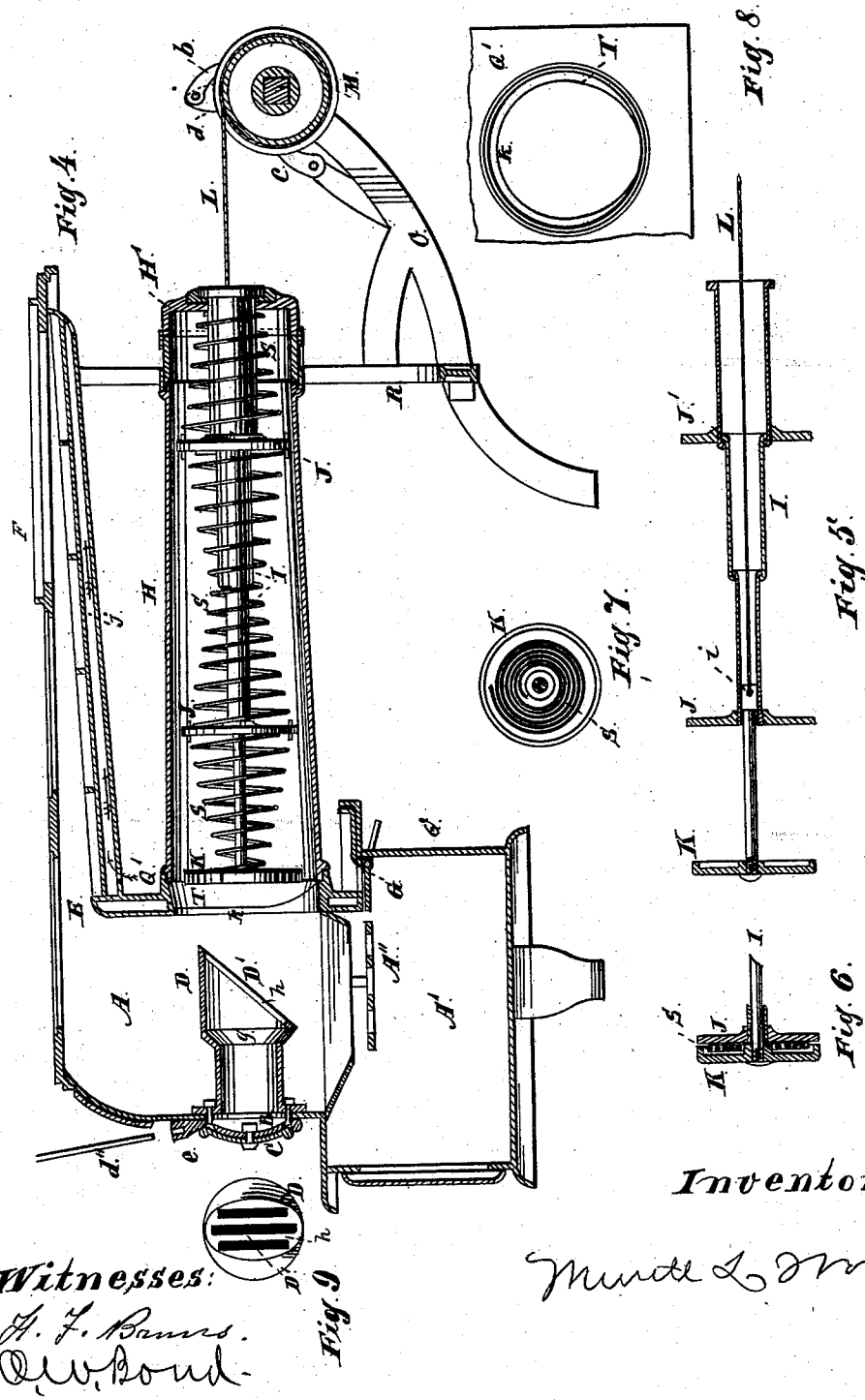


Fig. 4.

Fig. 8.

Fig. 7.

Fig. 5.

Fig. 6.

Fig. 9.

Witnesses:

H. F. Barnes.

C. W. Bond.

Inventor:

Myndt L. Wood

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

MERRETT L. WOOD, OF VALLEY SPRINGS, DAKOTA TERRITORY.

IMPROVEMENT IN STOVES.

Specification forming part of Letters Patent No. **214,799**, dated April 29, 1879; application filed September 18, 1878.

To all whom it may concern:

Be it known that I, MERRETT L. WOOD, of Valley Springs, Minnehaha county, Territory of Dakota, have invented new and useful Improvements in Stoves, of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is a top or plan view with the top plate removed, showing also the spring compressed and one of the magazines removed; Fig. 2, a side elevation with the oven broken away; Fig. 3, a front elevation of the fire-chamber with the ash-pit broken away; Fig. 4, a longitudinal section; Figs. 5, 6, and 7, details of the telescopic shaft and the feed-spring; Fig. 8, a detail of the receptacle for the front end of the magazine; Figs. 9 and 10, details of the tuyere; Fig. 11, an elevation of the magazine removed.

The object of my invention is to provide such attachments, devices, and combination and arrangement of devices with a stove as shall adapt it to the use of straw, hay, weeds, and other light substances as fuel; and its nature consists in providing the stove with a tuyere or device for taking the air from the outside of the stove, and directing it to or upon the central parts or portions of the fuel; in controlling such passing air current or currents by a register; in combining a central air-current with the surrounding air-currents, admitted in the ordinary manner, so as to insure a full supply of oxygen for the combustion of the fuel; in making the feed-springs of the reservoir-cylinders in sections; in interposing supporting-disks between such sections; in providing a central telescopic tube or shaft for supporting the feed-springs, and shortening the rear projection of such shaft or tube when drawn back for the purpose of compressing the springs; in providing the stove with apparatus for withdrawing the feed disk or plate from the fuel cylinder or reservoir, and compressing the feed-spring; in an improved method of discharging ashes or dirt from the rear hearth; in providing an air or ventilated space, to prevent any undue heating of the fuel-cylinders; in providing the receptacle for the inner or front end of the fuel-cylinder with a flange or contraction, to prevent a too rapid inflow of the fuel; and in the several parts and combination of parts hereinafter described and claimed as new.

In the drawings, A represents the fire-chamber; A′, the ash-pit; A″, the grate; B, the register; C, the register-cap; D, the tuyere; E, the heating-space, through which the products of combustion pass; F, the oven; G, the dumping or tilting hearth; H, the magazines or fuel-cylinders; H′, the rear receiving-heads for the magazines; I, the central telescopic tube; J J′, the disks or plates by which the tube I is supported in its extended position and the feed-spring divided into sections and supported; K, the feed-disk; L, the wire rope or cord for compressing the feed-spring and withdrawing it and the disks back into the cap or head H′; M, the wheel or windlass upon which the cord L is wound; N, the rod or shaft upon which the wheels or windlasses M are supported and revolved; O, the rear supporting legs or frame for the stove and winding apparatus; P, the bar or brace for preserving the distance between the back plate, Q′, and the fixed or permanent heads or caps H′ of the removable magazines; Q Q′, the back plates; R, the supporting-frame for the heads or caps H′; S, the feed-spring; T, the receptacles for the inner or front ends of the magazines or reservoirs H.

a is the ratchet-teeth or cogs on the side of the sheave or wheel M; *b*, the pawl engaging with the teeth *a* in winding the wire cord L; *c*, the detent or locking-pawl; *d*, the socket or groove to receive the operating lever or handle; *d′*, the lever or handle; *d″*, the cover-lifter or handle; *e*, the socket for inserting a cover-lifter or handle, *d″*, by means of which the tuyere D is agitated or revolved; *f*, a hinged side or door of the head H′; *g*, the shoulder or contraction within the tuyere to prevent ashes or dirt from working out through the register; *h*, the slits or air-openings on the inner and inclined end of the tuyere; *i*, the screw-cap on the rear end of the smallest or front section of the telescopic tube, by means of which the wire cord is attached thereto; *j*, an air or ventilated space between the plates above the magazines, to shield them from the heat of the flue above; *k*, an inward projection or contraction at the inner ends of the receptacles T.

For burning grass or herbaceous fuel the

form of stove shown, with its deep and narrow (front and back) fire-chamber, will be found most convenient and economical.

The fuel is introduced into the fire-chamber A, of any suitable construction, through the receptacle T, which receives and supports the inner or front end of a magazine. This receptacle is made tapering toward its discharge end, as shown, and its inner end is provided with a flange or projection, *k*, which prevents a too rapid ingress of the fuel, and also prevents the fuel from burning back in the magazine or reservoir. This flange *k* may be cast on the receptacle, or, when the back of the stove is made double, it may be formed by reducing the size of the opening through the inner back plate; or the desired result can be produced by contracting the inner or discharge end of the receptacle in any suitable manner. This projection or contraction is, by preference, omitted at the bottom of the opening, as shown at Fig. 8.

The magazines or reservoirs H are made of sheet metal, or other suitable light metal, and are made slightly tapering, as shown, so as not to require too much power to force the hay, straw, weeds, or other light fuel placed therein, out of them into the fire-chamber.

The heads H′ are made of a sufficient diameter to receive the outer or rear ends of the magazines, and deep enough to receive the disks and feed-spring when drawn back, so as to be out of the way when inserting or withdrawing a magazine. These heads H′ are also provided with a hinged section or door, *f*, to allow of the insertion of the end of the magazine, and when inserted locking it in position, for which purpose a suitable latch or catch is provided to hold the section or door *f* when closed.

The disks and springs are drawn back into the heads H′, as shown, by the wire cord L, the inner end of which is secured to the cap *i* and the other end to the sheave or wheel M, upon which the cord is wound, and when drawn back these parts are held within the head by the detent or pawl *c*, which engages with the ratchet *a* and locks the wheel or windlass M.

The wheels M are operated by inserting a lever or handle or cover-lifter, *d*″, in the socket *d*, to the upper end of which is pivoted the pawl *b*, which engages with the ratchet *a* and turns the wheel M part way around as the socket is moved by the lever, and the wheel is held by the detent *c* until the lever or other device, and with it the socket, is brought back to give the wheel M another movement, and such back and forth movements of the socket and its operating device are continued until the spring and disks are drawn back into the cap or head H′, out of the way.

The socket *d* and pawl *b* might be omitted, and a crank or some other suitable device might be used in place thereof to wind the cord on the wheel or windlass; or some other means might be employed for the purpose of withdrawing the spring and disks from the magazine; but I prefer the method shown, as there is liability to accidents by leaving the detent *c* turned back, as by this method the springs cannot be compressed unless the detent *c* is in its proper position for holding them.

The frame R and the legs or frame O may be made in the form shown, or in any other suitable form that will provide a support for the rear end of the stove and magazines and the winding apparatus.

The brace P connects the rear supporting-frame, R, with the back plate, Q′, so as to preserve the distance between the receptacles T and the heads H′, which receive the magazines or reservoirs H, and prevent any spreading of the parts, so as to disturb the position or operation of the magazines; and it may also serve as a guide or help in inserting the magazines, as it is so located, as shown, as to prevent the magazines from being pushed inward beyond the line of the receptacles T.

The head K is secured to the front section of the sliding tube, and the disks J J′ are attached to the other sections, as shown, so as to divide the feed-spring S into sections; and by making this spring in sections it is less liable to get out of order, and will be found more uniform and efficient in action.

The shaft I is made in sections, which slide one within the other, and with this form of construction but little space is required between the head H′ and the wheel M for compressing or winding back the spring.

For heating-furnaces or furnaces for generating steam, or in other positions where economy of space is not desired, the telescopic feature of the shaft I may be dispensed with and the shaft made single or in one picce; but for stoves for domestic uses the telescopic feature of the shaft is valuable and important.

The disks J J′ also serve the purpose of supporting the telescopic tube or shaft when extended, and act as guides therefor when being forced out by the action of the spring.

The tuyere D is made of an irregular hollow cylinder of cast-iron. It is secured to the front plate of the stove by means of a flange and an outer disk, having suitable openings to form a register, B, connected together by bolts, so arranged as to support the tuyere in position and permit it to be rotated or agitated, the register or outer disk, B, being provided with a socket, *e*, to receive a lever or handle for operating the tuyere. This register or disk is also provided with a cap or damper, C, for regulating the draft.

The inner end of the tuyere is provided with slits or openings *h*, for the passage of air to the central parts or portions of the fuel, and the face D′ of this inner end is made inclined, which serves two purposes. It prevents the clogging or non-action of the air-openings *h*, and it leaves a point at one side of its center of rotation, by means of which the central

parts of the fuel may be stirred up and the fire enlivened at will.

The fuel presses slightly against this tuyere, so that its point is always embedded therein, so that by agitating it a more rapid advance of the fuel is had or obtained.

The tuyere is provided with a shoulder or projection, *g*, which will prevent any dirt or ashes that may enter it from working out through the register.

I do not confine myself to the form of tuyere shown, as its form may be varied.

The ash-pit A′ is located beneath the fire-chamber, as usual, and extends back a sufficient distance, in the form shown, to project beneath the receptacles T; and its upper rear portion is provided with a plate, suitable to receive the tilting hearth or dumper G, which may be made of a single piece or in two parts, as desired.

This hearth is so located as to receive any dust or dirt in removing the magazines and deposit it in the ash-pit.

The rear portion of this tilting hearth is provided with an upward-projecting flange, with which the magazine comes in contact when in place and keeps the hearth closed.

I have shown a stove with two magazines, and that is the best construction, as the fire may thus be kept continuous, for one magazine can be kept in operation while the other is being refilled; but the stove can be operated with a single magazine as a summer-stove.

I have described my improvements as applicable to stoves used for domestic purposes; but I do not confine myself to that class of stoves, as the improvements may be applied to heating-furnaces, furnaces for generating steam, &c., and a part of them will be found useful in stoves for burning coal and coke.

It will be seen that the hay, straw, or other light substances used for fuel is utilized, and its tendency to rapid combustion retarded by excluding the air from all but a small portion of its surface, and by keeping the unexposed portions in contact with metal, thereby avoiding the use of pressure for such purpose, the pressure of the spring being only used to advance the fuel and insure its delivery into the fire-chamber.

What I claim as new, and desire to secure by Letters Patent, is—

1. The revolving tuyere D, having an inner projecting point at one side of the axis of rotation for agitating the fuel, substantially as set forth.

2. The combination of a tuyere, receiving an independent supply of air from the outside, with a combustion-chamber, A, and a self-feeding fuel-magazine, H, substantially as specified.

3. The combination of a revolving tuyere, D, constructed and operating as described, with a revolving register, for controlling the passing currents of air, and a combustion-chamber, substantially as and for the purposes specified.

4. The receptacle T, having its exit provided with a shoulder or contraction, in combination with the feeding-tube or magazine H and a fire-chamber, whereby too rapid feeding and back-burning will be prevented, substantially as specified.

5. The receptacle T, having an inward taper, and feed-tube or magazine H, in combination with the fire-chamber A and revolving tuyere D, substantially as and for the purposes specified.

6. The receptacle T, provided with a shoulder or flange, *k*, located around the periphery of its opening, with part of the flange cut away, leaving the bottom of the opening free, in combination with the magazine or feed-tube H and a fire-chamber, substantially as and for the purposes specified.

7. The receptacles T and support or frame R, in combination with the bar or brace P, for preserving the distance between the magazine-supports and preventing spreading, substantially as specified.

8. The telescopic tube I, located in the magazine H, in combination with a surrounding spiral spring, S, for supporting the spring and facilitating the compression of the springs by winding up the cord, substantially as specified.

9. The spiral spring S, made up of sections of convenient length, in combination with a fuel-magazine, the telescopic tube I, and supporting disks or devices J J′, attached to the tube-sections, substantially as and for the purposes specified.

10. The magazine or feed-tube H, in combination with the telescopic tube I, disks J J′, feed-disk K, and coil-spring S, substantially as and for the purposes specified.

11. The head H′, provided with a hinged door or section, *f*, in combination with the magazine or feed-tube H, for the insertion and withdrawal of the outer ends of the feed-tubes, substantially as specified.

12. The frame R and heads H′, provided with the hinged door or section *f*, in combination with the magazines or feed-tubes H, for supporting the outer ends of the feed-tubes and the back portion of the stove, substantially as specified.

13. The tilting hearth G, located beneath the forward end of the magazine or feed-tube H, in combination with the receptacle T, for catching the dust and ashes when the magazine is withdrawn, substantially as specified.

14. The tilting hearth G, located beneath the inner end of the magazine or feed-tube H, in combination with the ash-pit A′, extending beneath the hearth G, for receiving the ashes and dust from the hearth, substantially as specified.

15. The wheel M, provided with the ratchet *a*, pawl *b*, detent *c*, socket *d*, and wire cord or rope L, in combination with a fuel-magazine, the telescopic tube I, and spring S, for com-

pressing the spring, substantially as and for the purposes specified.

16. The cap or head H′, in combination with the telescopic tube I, disks J J′, feed-disk K, spring S, and a suitable mechanism for compressing the spring and withdrawing the parts from the magazine into the cap or head, substantially as and for the purposes specified.

17. The heating-space E, provided with double plates, having an air-space, *j*, between them, and located above the magazine or feed-tube H, for preventing undue heating of the fuel-chambers, substantially as specified.

MERRETT L. WOOD.

Witnesses:
O. W. BOND,
H. F. BRUNS.