

(No Model.)

W. J. ANDREWS.  
STOVE GRATE.

No. 411,317.

Patented Sept. 17, 1889.

Fig. 1.

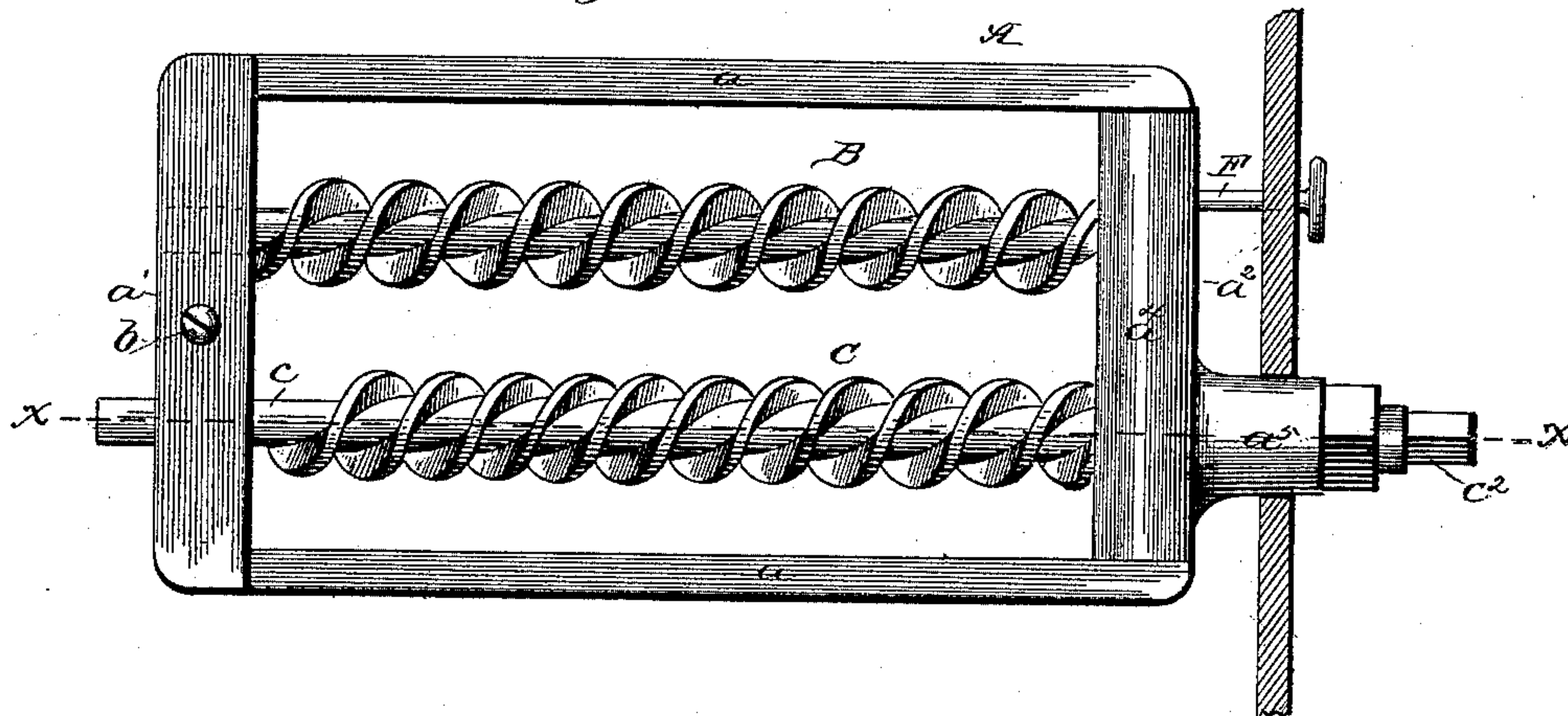


Fig. 2.

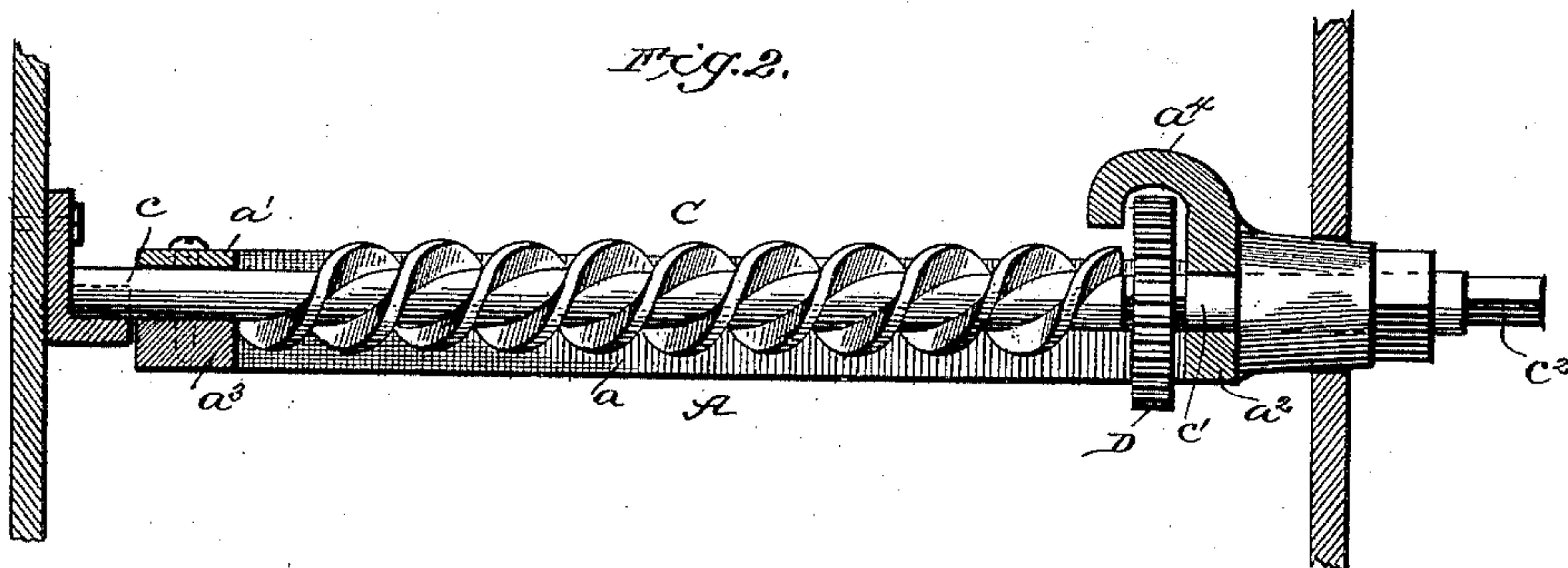


Fig. 3.

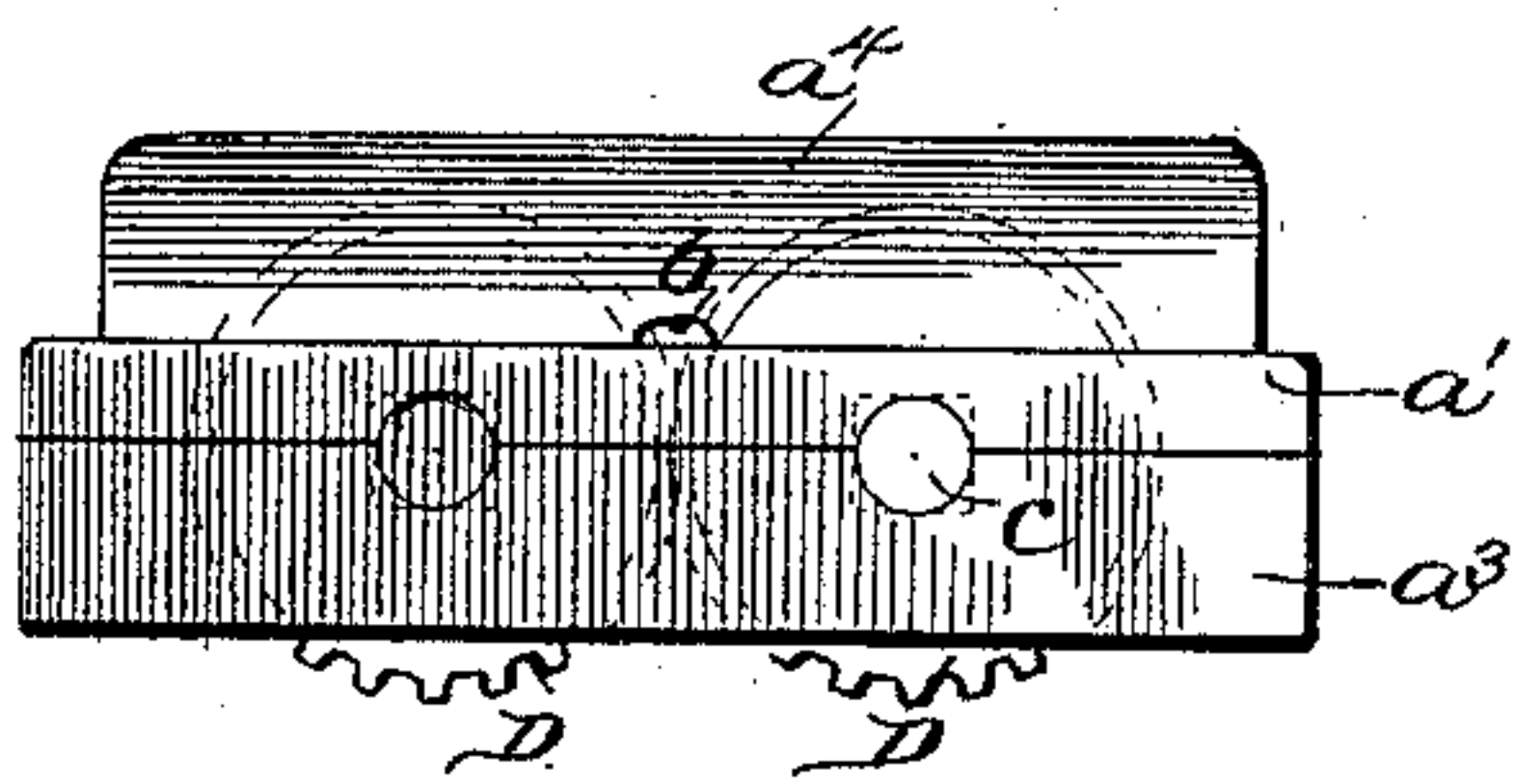
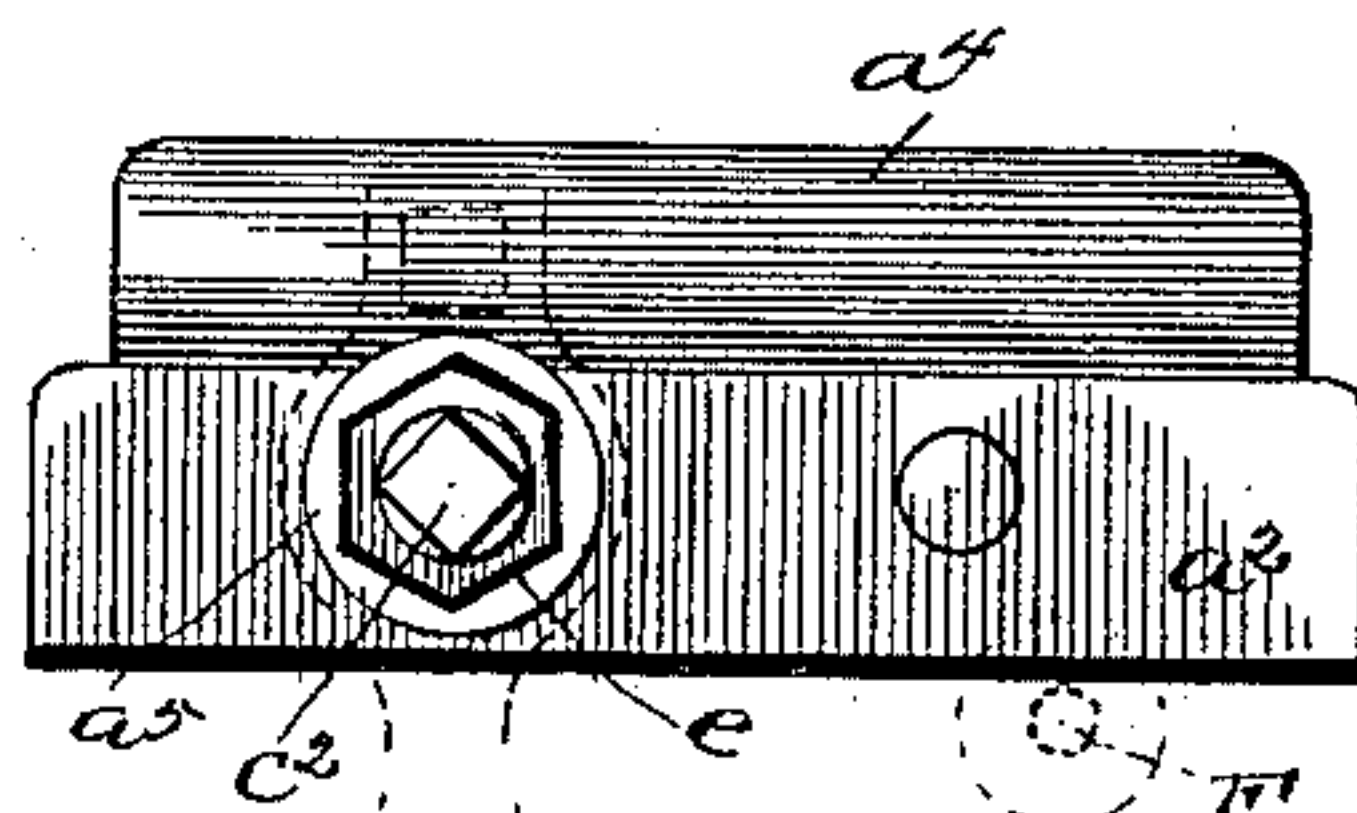


Fig. 4.



WITNESSES

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# UNITED STATES PATENT OFFICE.

WILLARD J. ANDREWS, OF ST. LOUIS, MISSOURI, ASSIGNOR TO JOHN URI MUSICK, OF SAME PLACE.

## STOVE-GRATE.

SPECIFICATION forming part of Letters Patent No. 411,317, dated September 17, 1889.

Application filed November 9, 1887. Serial No. 254,689. (No model.)

*To all whom it may concern:*

Be it known that I, WILLARD J. ANDREWS, a citizen of the United States, residing in St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Stove-Grates, of which the following is so full, clear, and exact a description as will enable others skilled in the art to which my invention appertains to make and use the same, reference being had to the accompanying drawings.

This invention relates to grates for stoves; and its object is to construct a grate capable of being dumped, yet which in its horizontal position will support the live coals in an irregular plane, and in which the fire may be easily shaken, the coals thereof agitated, or the clinkers therein ground and passed through the grate into the ash-pan.

To this end my invention consists in the construction and combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a plan view of my improved grate. Fig. 2 is a section on the line  $xx$  of Fig. 1, showing the grate-bar C, hollow trunnion, and squared-end sections in side view. Fig. 3 is an elevation of the inner end of the grate-frame. Fig. 4 is a similar elevation of the outer end thereof, the shaker and supporting-pin being shown in dotted lines in position to support the grate-frame and ready to dump it.

Similar letters of reference indicate similar parts in the several figures.

In the drawings, A designates a frame, in this instance rectangular in shape, comprising two side bars  $a$ , an inner end piece  $a'$ , and an outer end piece  $a^2$ . The inner end piece comprises a lower member  $a^3$ , integral with the two sides and the other end piece, which lower member is provided with approximately-semicircular depressions in its upper face, and a removable upper member  $a'$ , having registering and corresponding depressions and secured to said lower member by a bolt  $b$ . The outer end is cast in one piece integral with the sides, has holes opposite to and in alignment with those formed by the depressions in the meeting faces of the two members of the other end piece, a hood  $a^4$ , and a hollow projecting journal  $a^5$ , opposite

one of the said holes. Longitudinally disposed within this rectangular grate-frame is a series of grate-bars (preferably two in number) B and C, whose bodies are round in section and have deeply-cut spiral grooves running around them from end to end, as shown, the direction of said spirals being parallel, and whose ends have reduced trunnions. The trunnions of the bar B fit, respectively, in the oppositely-disposed holes in the two ends at one side of the frame and preferably extend through such ends to a point flush with the outer faces thereof. The inner trunnion  $c$  of the other bar C extends through the hole in the inner end piece of the grate-frame and projects beyond the face of such end piece, while the outer trunnion  $c'$  of said bar extends through and beyond said hollow journal  $a^5$  of the outer end piece, and is squared, as at  $c^2$ . Each of the bars B and C (and all of them if more than two be used) is squared between its outer end trunnion and its body proper, and upon such squared portions are fitted gear-wheels D, which intermesh with each other and are protected by the hood  $a^4$  from the fire, thus causing the bars to revolve in opposite directions when a shaker E is fitted over the squared outer end  $c^2$  of the bar C and rotary motion imparted thereto.

The upper faces of the sides of the grate-frame and of the removable end piece  $a'$  lie in one horizontal plane, the hood  $a^4$ , however, being raised above such plane; but the upper faces of the bars B and C lie above the level of the grate-frame, whereby the coals of the fire are supported in an irregular plane, the spiral grooves facilitating the burning thereof by creating a draft.

When it is desired to shake the grate, the shaker E is slipped over the squared outer end  $c^2$  of the bar C, as above described. A complete revolution of the shaker to the right—that is, in such a direction that the adjacent spiral flukes of the two bars will turn downwardly and toward each other—will crush the clinkers in the fire and pass them through into the ash-pan. A complete revolution of the shaker in the other direction will upheave the bottom center of the



fire and pass it outwardly over the bars toward the sides, and an oscillating motion of the shaker will merely effect the shaking of the fire and separation therefrom of the ashes therein.

The inner trunnion *c* of the bar *C* rests in a suitable socket or journal in the body of the stove at the rear of the fire-pot, and thus pivotally supports the inner end of the grate-frame, while the outer trunnion *c'* passes loosely through the hollow journal *a<sup>5</sup>*, which latter in turn passes loosely through the side of the stove and thus pivotally supports the outer end of the grate-frame. The frame is held in horizontal position by a pin *F*, passing through a hole in the side of the stove beneath the other edge of said frame, and when the grate is to be dumped said pin is withdrawn. The entire frame then swings downwardly, turning on the trunnion *c* and hollow journal *a<sup>5</sup>* as pivots, and may be returned to its normal position by placing the larger hole *e* of the shaker *E* over the squared outer end of the hollow journal *a<sup>5</sup>* and turning the shaker down in the necessary direction.

Three or more grate-bars may be used, if desired, and the general shape of the grate-frame changed at will without departing from the spirit of my invention, and other alterations which would naturally suggest themselves to the skilled mechanic may be made at pleasure.

Having now set forth the advantages, uses, and preferred method of constructing my invention, what I believe to be new, and desire

to secure by Letters Patent, and what I therefore claim, is—

1. In a stove-grate, a frame having oppositely-disposed holes near its opposite ends and formed with a hollow journal near one of its sides, in combination with grate-bars within said frame and geared together, the trunnions of one of which bars project through said hollow journal and beyond the outer surface of the main frame, respectively, and the trunnions of the other of which bars end substantially flush with the outer surfaces of said frame, substantially as shown and described, whereby said frame will be pivoted to a stove on one side of its median line, and a catch for retaining the grate in a practically horizontal position.

2. In a stove-grate, a main frame having a hollow journal near one of its sides, for the purpose set forth, the said journal being formed with a square end, in combination with grate-bars pivoted in said main frame and geared together, one of the trunnions of one of which bars extends through and beyond said hollow journal, and also is formed with a squared extremity, and the opposite trunnion of which bar extends beyond the outer surface of said main frame, substantially as shown, and for the purposes set forth.

In testimony whereof I affix my signature in the presence of two witnesses.

WILLARD J. ANDREWS.

Witnesses:

JAMES W. ALLEN,  
WM. H. MUSICK.