

H. CLOUSTON.
AUTOMATIC STOKER.
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908,747.

Patented Jan. 5, 1909.

Fig. 1

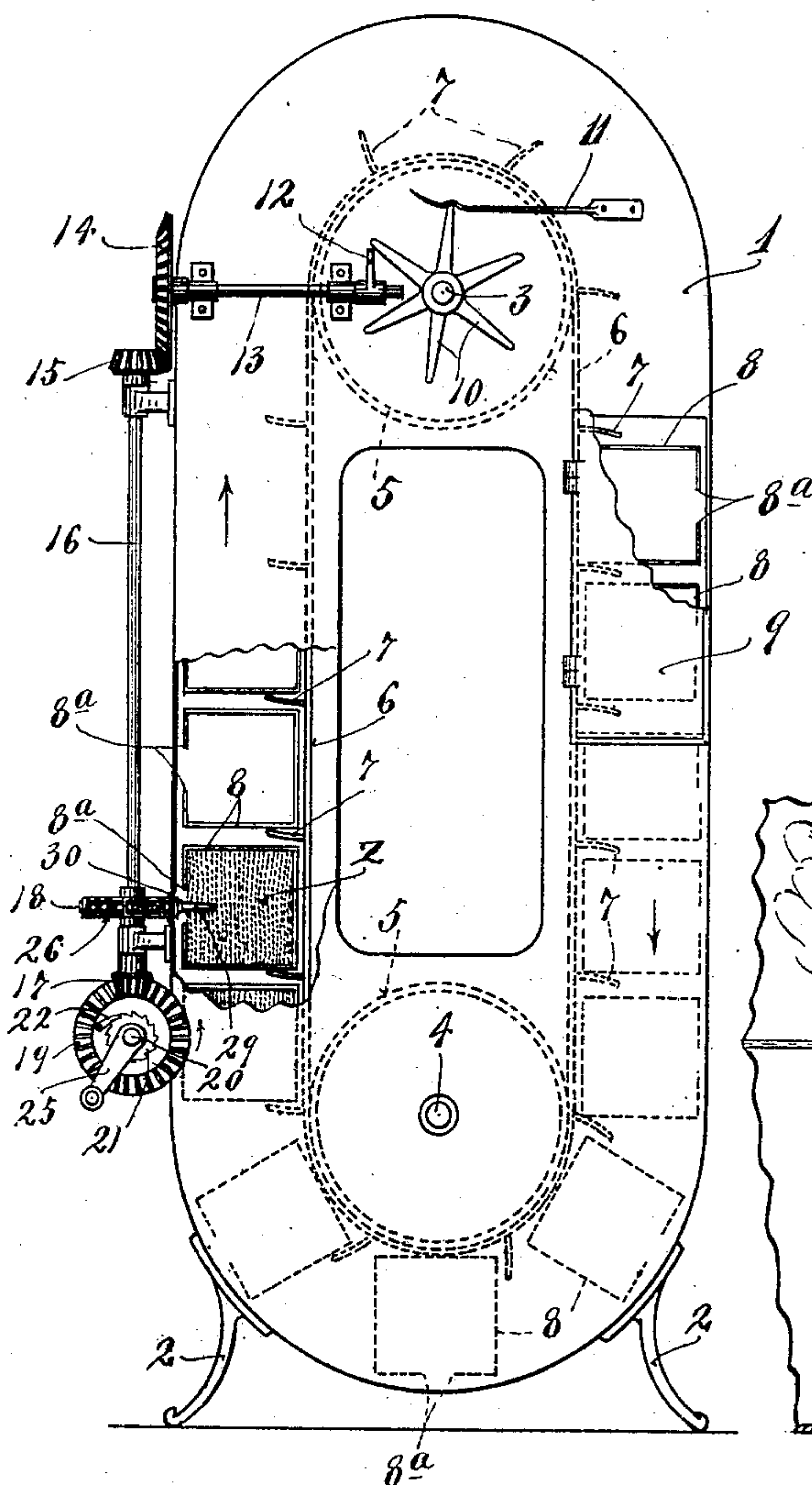


Fig. 2.

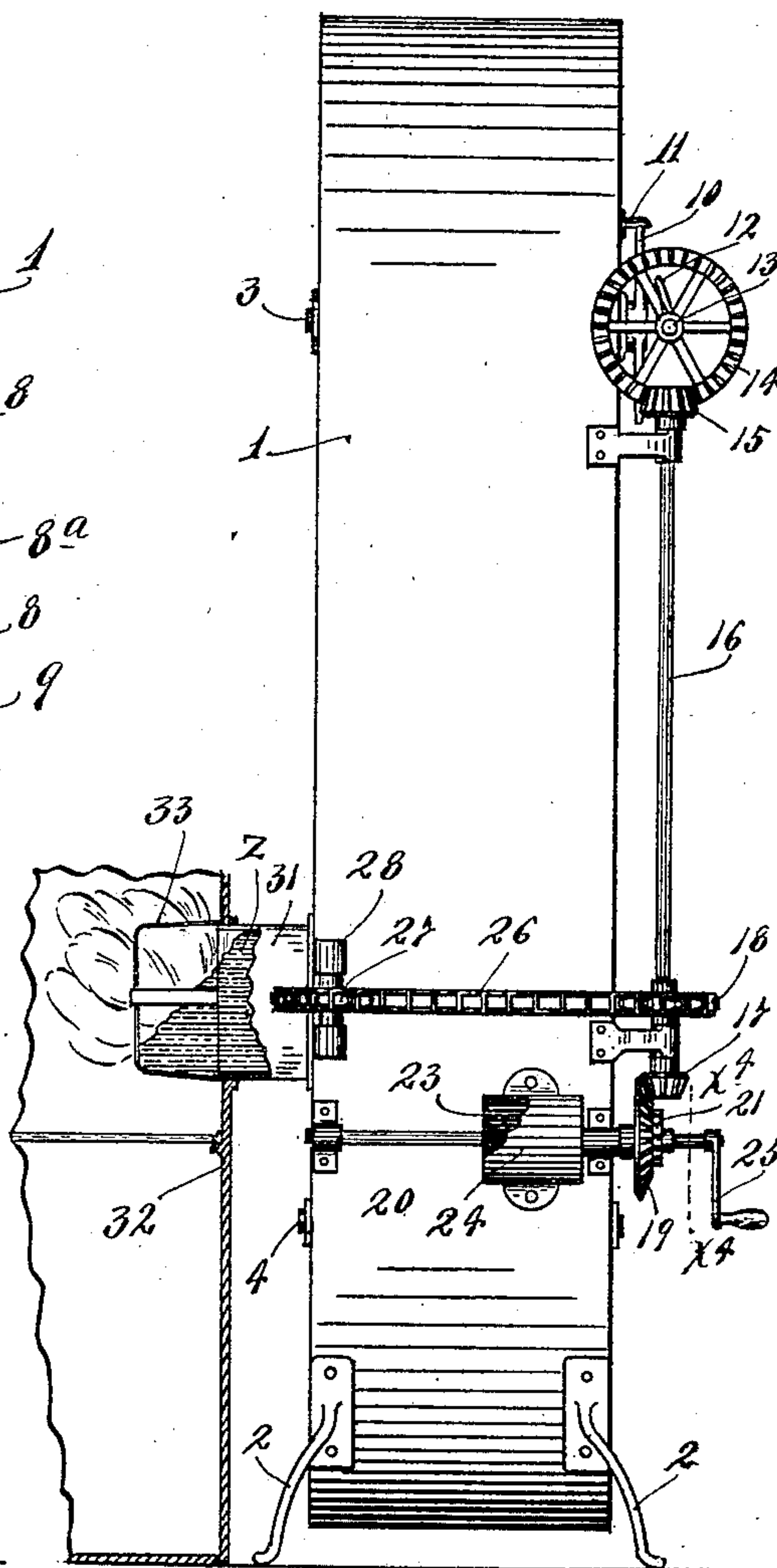


Fig. 3.

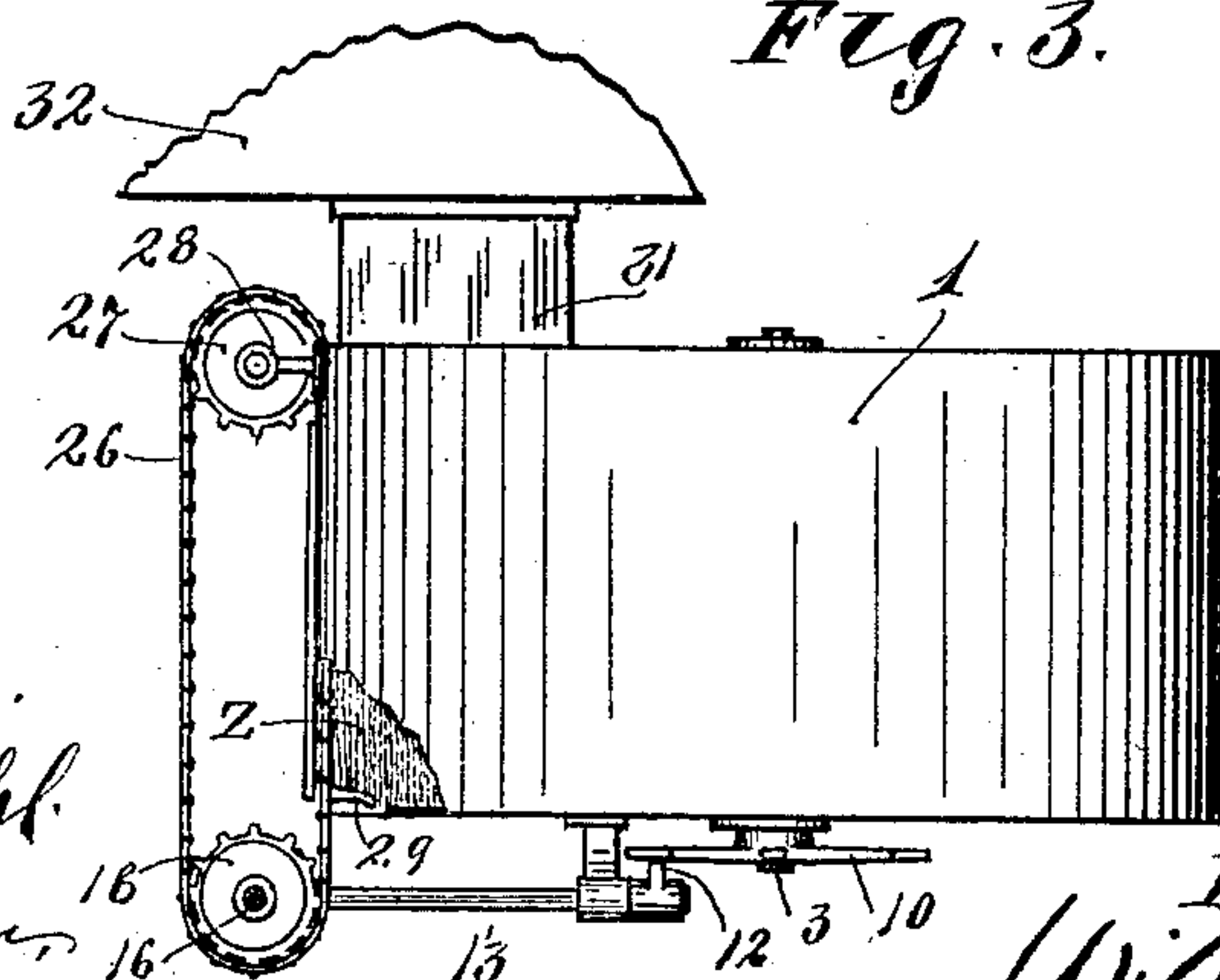
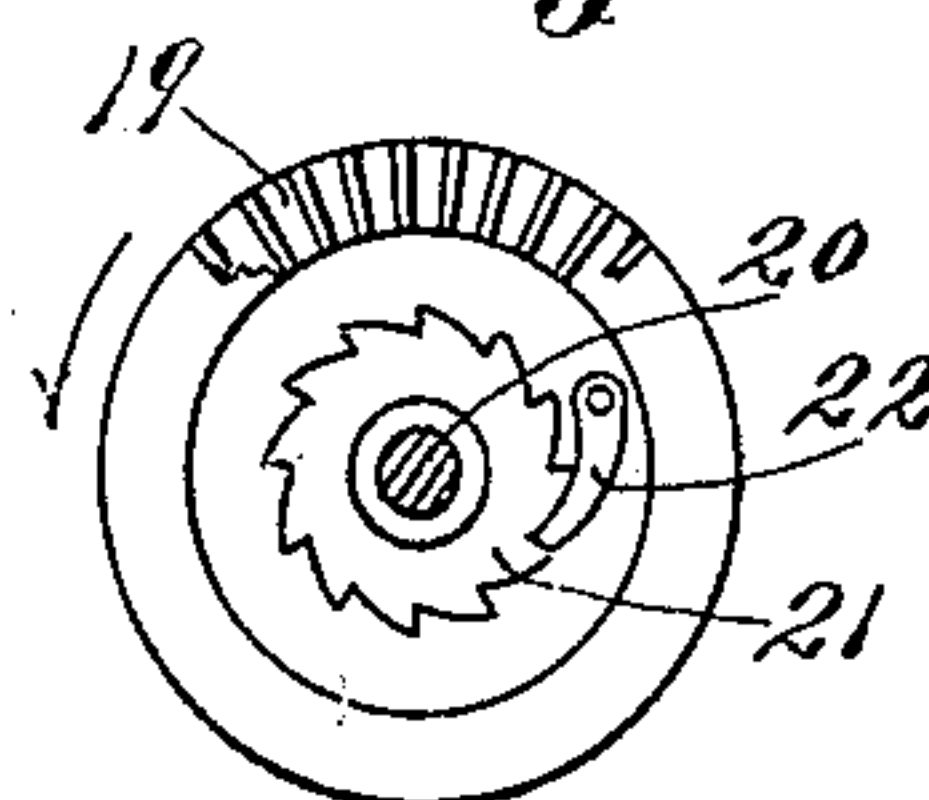


Fig. 4.



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AUTOMATIC STOKER.

No. 908,747.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HERBERT CLOUSTON, a citizen of the United States, residing at Antler, in the county of Bottineau and State of North Dakota, have invented certain new and useful Improvements in Automatic Stokers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide an improved automatic stoker, and more particularly it has for its object to provide an improved straw feeding device for automatically feeding to stoves or furnaces small bales of straw.

To the above ends the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

In many parts of the country, and especially in the rural districts of the northwestern States, wood and coal are scarce, while there is a great abundance of straw which usually goes to waste, being frequently burned in the pile to get rid thereof. Straw, when pressed into bundles, makes a very good fuel but requires almost continuous feeding into a stove or furnace, and hence, when this is done by hand, requires an objectionable amount of personal attention.

My invention, as hereinafter described and as illustrated in the drawings, is especially designed to intermittently and automatically feed to a stove or furnace comparatively small well compacted bundles of straw.

In the accompanying drawings which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings, Figure 1 is a view in front elevation, showing my improved stoker or automatic straw feeding device, some parts being broken away. Fig. 2 shows the stoker in side elevation and shows, in section, a portion of a stove or furnace into which the straw is being fed. Fig. 3 is a plan view of the parts shown in Fig. 2, some parts being broken away; and Fig. 4 is a detail in enlarged section, taken on the line x^4-x^4 of Fig. 2.

The numeral 1 indicates an endless verti-

cally elongated casing, shown as supported by feet 2. The vertical leg portions of this casing 1 are rectangular in cross section and the upper and lower portions thereof are approximately semi-circular. The side plates of the casing 1 are extended to form bearings for short upper and lower shafts 3 and 4 that are located, respectively, at the axes of the upper and lower semi-circular portions of the said casing. Within the casing the shafts 3 and 4 are provided with pulleys 5 over which runs an endless belt 6. If desired, sprockets may be substituted for the pulleys 5 and sprocket chains for the belt 6 and, so far as this invention is concerned, it will be understood that this suggested construction would be the equivalent of that shown. At suitable intervals, the belt 6 is provided with projecting shelves or flanges 7.

The straw, which is compressed into small, tightly compacted bales Z, are placed in the open-ended rectangular metallic holders 8 which, at their outer faces, have their edges spaced apart to afford clearance passages 8^a. These holders, loaded with straw, are placed within the casing between the shelves 7 of the belt 6 and by the said shelves and the walls of the said casing are held in position and are adapted to be intermittently moved in the direction of the arrows marked on Fig. 1. To permit of the insertion of the filled holders and the removal of the emptied holders, the casing 1 is provided, as shown, in its front plate, with a hinged door 9. This door 9 may, when desired, be placed in the rear plate of the said casing, or it might be omitted and a simple opening provided.

On one end of the upper shaft 3 is a star wheel 10 which, as shown, is arranged to be yieldingly held in whatever position it may be set, by a leaf spring 11, one end of which is secured to the casing 1. This star wheel is adapted to be intermittently moved by one or more arms or tappets 12 carried by a short shaft 13 mounted in suitable bearings on the casing 1 and provided, at its upper end, with a bevel gear 14. The bevel gear 14 meshes with a pinion 15 carried by the upper end of a vertical shaft 16 mounted in suitable bearings on the casing 1 and, in turn, provided with a bevel pinion 17 at its lower end and just above said pinion with a sprocket 18.

The pinion 17 meshes with a bevel gear 19 that is loosely mounted on a horizontal shaft 20, mounted in suitable bearings on the casing 1. On the shaft 20, adjacent to the gear 19, is a ratchet wheel 21 that is engaged by a spring-pressed driving pawl 22 carried by the said gear. A coiled motor spring 23 is attached, at its inner end, to the said shaft 20 and, at its outer end, to an inclosing spring-box 24 that is secured to the casing 1. This motor spring 23 exerts a force which, through the pawl 22 and ratchet wheel 21, tends to rotate the shaft 20 in the direction of the arrow marked on Fig. 4. At one end, said shaft 20 is also provided with an operating crank 25.

A sprocket chain 26 runs over the sprocket 18 and over an aligned sprocket 27 mounted in suitable bearings 28 on the casing 1. This sprocket chain 26 has an ejecting tooth 29 that is adapted to work through a transverse slot 30 in the casing 1 and through the clearance passage 8^a of the holder 8 that is positioned in horizontal line therewith. This tooth is thus brought into engagement with one end of the aligned straw bale Z and operates under the force of the motor spring 23 to force the said bale endwise out of its holder, which holder is then aligned with a delivery spout 31 secured to what is designated as the rear plate of the casing 1. This delivery chute 31 is rectangular in cross section and is of such size that while it will admit the bale Z it will not admit its holder 8. By the spout 31 the ejected bale is delivered through the receiving door of the stove or furnace 32 and into a skeleton or spider-like fuel rack or holder 33 that is secured within the fire-box of the said stove or furnace. This skeleton holder 33 acts as a stop to limit the inward movement of the delivered bale.

The motor spring 23 is adapted to be wound up by taking hold of the crank 25 and rotating the shaft 20 in a direction reverse from the direction of the arrow marked on Fig. 4, under which movement the gear 19 and parts driven therefrom remain stationary. As the bale delivered into the skeleton holder 33 burns away and the ashes drop therefrom, the said bale will be forced farther and farther into the fire-box until it is nearly burned up, whereupon the ejecting finger 29, being released, the motor spring will move the chain 26 until the said finger is carried back to its starting point, to-wit, into engagement with the outer end of a newly positioned bale, which latter was brought into position while the said finger was making its return movement. More definitely stated, the movement of the shaft 16 and connected parts required to impart the return movement to the said ejecting finger, operates through the pinion 15, bevel gear 14, shaft 13, tappet 12, star wheel 10

and pulleys 5 to impart a step of movement to the belt 6, sufficient to bring the next lower loaded holder 8 into line with the delivery spout 31.

This automatic stoker or feeding device, it will therefore be understood, is completely automatic in its action. When all of the holders 8 are loaded with straw bundles or bales, sufficient fuel will be provided to run a stove or furnace for a considerable length of time. Furthermore, the complete stoker or feeding device is of comparatively small cost and may be readily applied to almost any kind of stove, furnace or fire-box. For convenience the term "stove" is used in the claims in a sense broad enough to include an ordinary stove, a furnace, a boiler fire-box or similar fuel burning device. While especially designated for use to feed straw bales or bundles into such stoves, it may, nevertheless, be used for supplying fuel in other form. It might, for instance, be well adapted to automatically supply to a stove briquets made from peat or lignite.

What I claim is:

1. In an automatic stoker, the combination with a casing provided with a delivery opening, of an endless fuel carrier working therein, and having a forward feed movement, a multiplicity of independently removable fuel holders arranged to be fed to the delivery opening by said carrier, a fuel ejector, an endless support carrying said ejector, a motor, driving connections from said motor to said endless fuel carrier and to the endless ejector support, arranged to impart a step of intermittent movement to the former while the latter is given its return movement, substantially as described.

2. In an automatic stoker, the combination with an endless casing, an endless fuel belt and pulleys or wheels for guiding the same, mounted in said casing, of a multiplicity of removable fuel holders adapted to hold a fuel parcel and detachably carried by said belt, said fuel holders having open ends and clearance passages in their outer sides, an endless support provided with an ejecting finger adapted to engage a parcel of fuel and to move through the clearance passage of the holder containing the same, to force the parcel out of said holder, a motor spring, a drive from said motor spring to said belt and to the endless support for the ejector, arranged to move said belt a step forward while the ejector is given the return movement in its cycle, and means for winding said motor spring, substantially as described.

3. The combination with a stove having a fuel entrance passage and a skeleton fuel rack extending inward from said passage, of an automatic stoker comprising an endless fuel carrier arranged to loosely hold a multiplicity of fuel parcels, means for intermit-

tently moving said carrier to successively
position the fuel parcels in alinement with
the entrance passage and rack of said stove,
and a yieldingly and automatically driven
5 ejector operative to force the positioned fuel
parcel into the rack of said stove, substan-
tially as described.

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

HERBERT CLOUSTON.

Witnesses:

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