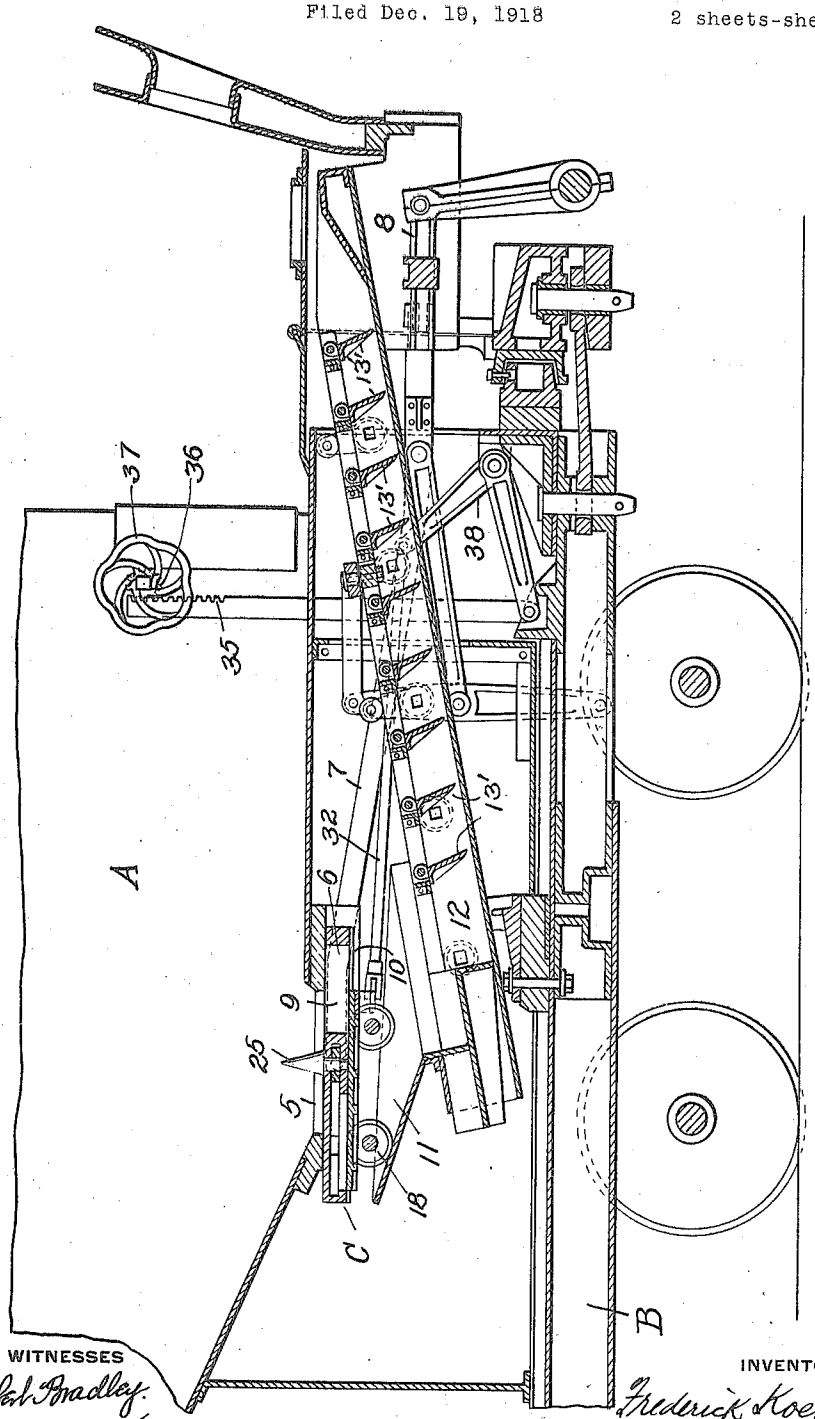
Feb. 20, 1923. 1,445,628

F. KOENIG

CRUSHER APPARATUS FOR LOCOMOTIVE STOKERS

Filed Dec. 19, 1918 2 sheets-sheet 1

FIG.1.



WITNESSES

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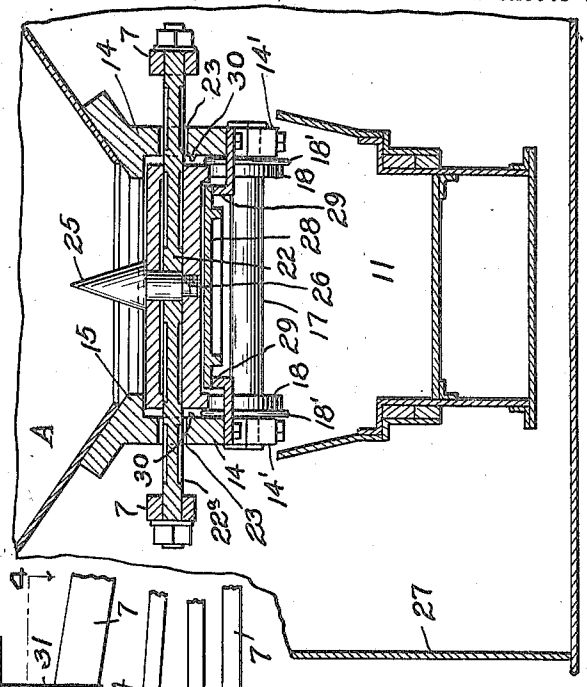


FIG. 3.

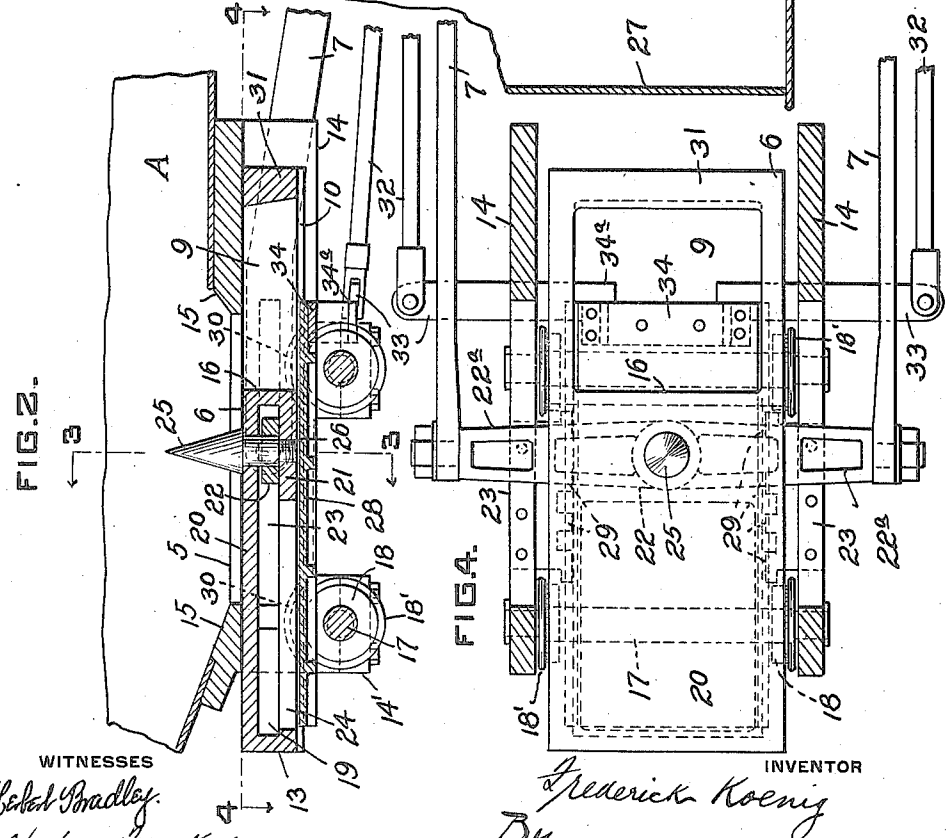


FIG. 2.

FIG. 4.

WITNESSES

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UNITED STATES PATENT OFFICE.

FREDERICK KOENIG, OF PITTSBURGH, PENNSYLVANIA.

CRUSHER APPARATUS FOR LOCOMOTIVE STOKERS.

Application filed December 19, 1918. Serial No. 267,479.

To all whom it may concern:

Be it known that I, FREDERICK KOENIG, a citizen of the Republic of Switzerland, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Crusher Apparatus for Locomotive Stokers, of which the following is a specification.

My invention relates to coal crushing apparatus for locomotive-stokers, and is in the nature of an improvement in the device described and shown in Letters Patent of the United States No. 1,258,420, granted to me March 5th, 1918. It has for one of its primary objects to improve the construction and increase the efficiency and utility of devices of this character. Another object of the invention is to provide a construction of crusher wherein the single-tree is pivotally mounted and may be quickly and easily removed for replacement or repair upon the detachment of but a single member, namely, the agitator pin which in my invention normally serves to maintain the single-tree in its pivoted position.

My invention also contemplates certain novel details of construction, combination and arrangement of parts of the improved device, whereby certain important advantages are attained, as will be more fully described hereinafter, and pointed out in the claims.

These, together with such other objects as are incident to my invention, I attain by means of a construction illustrated in preferred form in the accompanying drawings, wherein:

Figure 1 represents a central longitudinal section through the front portion of a locomotive tender such as is used with automatic stoker mechanism for locomotives, and showing my invention as applied thereto just below the fuel discharge passage and above the hopper;

Figure 2 is a central vertical sectional view of the crusher shown in Figure 1 but somewhat enlarged;

Figure 3 represents a view in cross-section of the crusher taken on the line 3—3 of Figure 2; and,

Figure 4 is a top plan view of the crusher on the line 4—4 of Figure 2.

The general arrangement of the crusher and the coal conveying elements with which it co-operates is illustrated in Figure 1, and may be briefly described as follows. The reference character A denotes a fuel receptacle in the front end of the locomotive tender B, the base of which is provided with a discharge outlet 5. Disposed below this outlet is a crusher device C embodying a casing 6 and a crusher 13 which is adapted to be reciprocated in the casing transversely of the outlet 5 by means of the links 7 and driving rod 8 usually carried on the locomotive. The reference numeral 9 designates a forward passage in the crusher casing 6 into which the fuel from the receptacle A falls by gravity, from which it passes through a discharge opening 10 basally formed in the casing, then through the hopper 11, and from thence into a transfer chute 12 where the fuel is worked forward by the reciprocation of the pivoted vanes 13′. The crushed fuel is eventually discharged, in the well-known manner, from the chute 12 at the front end thereof into the stoker mechanism customarily carried by the locomotive.

In carrying out my invention, I provide the side walls 14 of the crusher casing 6 with an upper marginal flange 15 substantially co-incident with and immediately below the marginal boundary of the outlet 5, and also with bearing boxes 14′ affording bearings for the shafts 17 which carry the rollers 18 upon which the crusher 13 reciprocates under the influence of the links 7. During its reciprocation, the crusher is maintained in its proper avenue of travel by means of the roller flanges 18′ and the marginal flange 15 above it.

The crusher is transversely formed with a central opening or slot 19 intermediate its top wall 20 and its base 21, and in this slot is pivotally mounted a single-tree 22 whose

end portions 22ª extend in opposed directions through elongated slots 23 provided in the side walls 14 of the casing, the base 21 having an opening 24 leading downwardly and outwardly from the slotted opening 19. The pivotal axis of the single-tree 22 is embodied in the form of an agitator pin 25 whose shank 26 passes through the top wall 20 and the central body portion of the single-tree and is terminally screwed into the base 21 just rearwardly of the crushing face 16 of the crusher. To these end portions 22ª of the single-tree the links 7 are terminally connected.

One important advantage of my invention resides in the ease with which the single-tree may be removed from the crusher for the purpose of replacement or repair, since all that is required in this connection is to uncouple the agitator and single-tree pin 25 and the links 7 and then swing the single-tree in a rearward direction toward the wall 27 of the tender (Figure 3) and withdraw it out of the left hand slots 19 and 23. These slots, it ill be observed, are elongated sufficiently to permit of this swing withdrawing movement.

In order to control and regulate the crusher discharge opening 10 in respect to its discharging capacity, a coal cut-off slide plate member 28 is provided to marginally rest upon the spaced supports 29 which are secured to the lower faces of the side walls 14 and constitute inwardly directed extensions thereof. While the upper face of this slide cut-off is substantially coincident with the lower face of the crusher base 21, there is no contact between them, as the crusher rides freely on the antifriction rollers 18. Above these latter are provided protecting bosses 30 for the roller bearings.

As shown in the drawing, the slide cut-off is in its extreme rear position with reference to the opening 10, whose area or size of outlet it is designed to regulate as occasion may require, and to effect this regulation the slide is adapted for movement transversely of this said opening toward or away from the front wall 31 of the crusher casing. The means provided in this connection contemplate a pair of coupling rods 32 whose rear end portions are terminally connected with the arms 33 of a cross-piece 34 which is bolted to the underface of the front portion of the cut-off slide 28, and also includes the rack 35, pinion 36 and handwheel 37, manipulation of which, as will be apparent, causes the regulating movement of the slide through the interposition of the bell-crank lever 38 whose ends are pivotally connected to the ends of the rack and the rods. It will be noted that the cross-piece 34 is offset at 34ª so as to position its arms 33 in advance of the rollers and bearings so as to clear the latter when the cut-off slide is in its extreme retracted position. The crusher device is, furthermore, self-clearing since any fuel collecting in its interior will discharge through the rear opening 24 provided in the base of the crusher casing, and being self-clearing any likelihood of crusher deflection is entirely obviated. Without some such provision the fuel thus collected would pack and tend to procure such a measure of deflection of the crusher in its casing as to materially effect its efficiency and utility. It will be understood that the edge of this opening 24 clears the slide when the crusher moves to its extreme retracted position from the intermediate position in the outlet 5 which it is shown as occupying in the drawings. The device has easy movement, is simple and efficient, is readily applied, and, as already indicated, the single-tree may be very quickly removed and replaced.

What I claim is:

1. In a combination with a fuel receptacle having a fuel outlet in its wall, of a fuel crushing device therefor comprising a casing disposed about said outlet and provided with slotted side wall portions and a discharge outlet, a reciprocating crusher having its body portion formed with a slot communicating with the slots of said portions, a regulating member controlling said discharge outlet, said crusher slidably supported in said casing independently of said regulating member, and a single-tree member removably positioned in said slots and having a pivot pin detachably connecting it with the body portion of said crusher, said pivot pin positioned in said fuel outlet.

2. In combination with a fuel receptacle having a fuel outlet in its wall, of a fuel crushing device therefor comprising a casing disposed about said outlet and provided with slotted side wall portions and a discharge opening, anti-friction means carried by said portions, a cut-off slide for said opening, a crusher slidably supported on said means independently of said slide and having its body portion formed with a slot extending laterally to said slotted side portions and opening downwardly past said slide, actuating means for said crusher including a single-tree member removably positioned in said slot and extending outwardly beyond said side portions, and an agitator pin in said fuel outlet pivotally connecting said member to the body portion of the crusher, substantially as and for the purpose set forth.

3. A fuel crushing apparatus to be applied to the outlet of a fuel receptacle comprising in combination, a casing provided with a fuel inlet and a fuel outlet, a slide mounted in said casing, removable actuating means for the slide, and a fuel agitating pin on the slide removably mounted therein

and adapted to act as the holding means for the actuating means.

4. A fuel crushing apparatus to be applied to the outlet of a fuel receptacle comprising in combination, a casing having slotted side walls and an inlet and an outlet, a slide mounted in said casing provided with an opening adapted to align with the slotted side walls of the casing, a single tree in the slide with its ends projecting through the slots in the side walls of the casing, a fuel agitating pin mounted on the slide and acting also as a positioning and holding means for the single tree, the single tree being removable upon detachment of the pin, and means adapted to be connected to the single tree whereby the slide is actuated.

FREDERICK KOENIG.