J. MacPHERSON, Jr.

STOKER.

APPLICATION FILED APR. 29, 1921.

1,424,575. Patented Aug. 1, 1922.

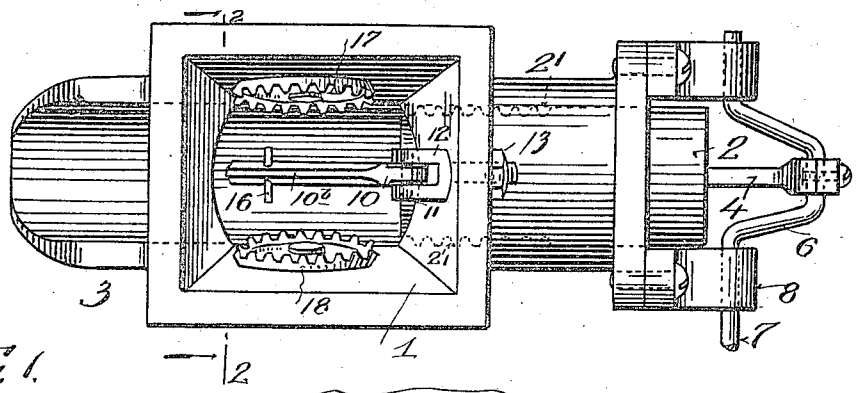


Fig. 1.

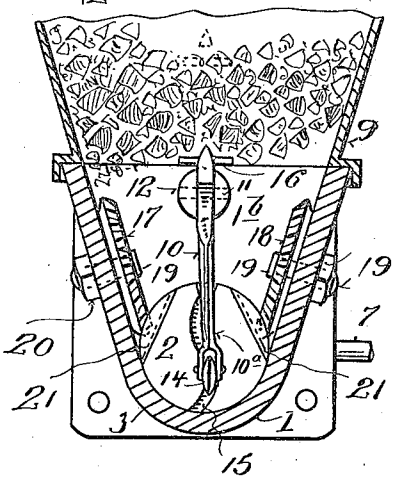


Fig. 2.

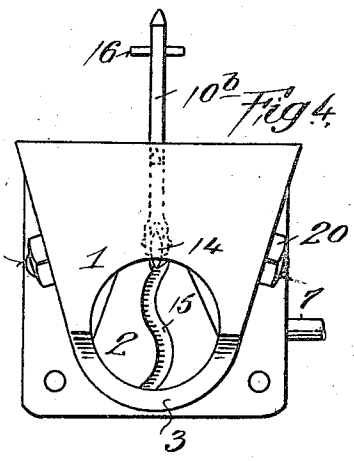


Fig. 4.

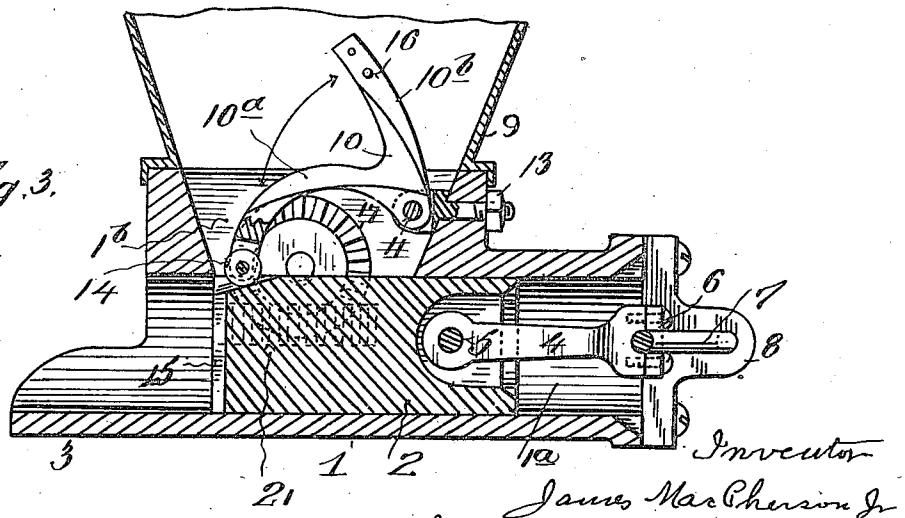


Fig. 3.

Inventor

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BY his ATTORNEY.

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# UNITED STATES PATENT OFFICE.

JAMES MACPHERSON, JR., OF NEW YORK, N. Y.

## STOKER.

1,424,575. Specification of Letters Patent. Patented Aug. 1, 1922.

Application filed April 29, 1921. Serial No. 465,365.

*To all whom it may concern:*

Be it known that I, JAMES MACPHERSON, Jr., a citizen of the United States, and resident of New York city, borough of Bronx, in the county of Bronx and State of New York, have invented certain new and useful Improvements in Stokers, of which the following is a specification.

My invention relates to the class of stokers in which a reciprocative ram or piston pushes the coal to the bed fire. In such stokers the coal is liable to become caked or hardened above the ram or piston with the result that the coal is not properly fed at times and the ram becomes more or less injured from the fire by reason of the absence of coal from in front of the piston.

The object of my invention is to provide means to stir or break the coal over the ram or piston, to prevent the coal from becoming caked or bridged to assure that the coal will descend in front of the ram to be pushed thereby to the fire.

My invention comprises novel details of improvement that will be more fully hereinafter set forth and then pointed out in the claims.

Reference is to be had to the accompanying drawings forming part hereof, wherein—

Fig. 1 is a plan view of a stoker embodying my invention; Fig. 2 is a cross section on line 2, 2, of Fig. 1; Fig. 3 is a longitudinal section of Fig. 1, showing the ram or piston in the forward position, and Fig. 4 is an end view of Fig. 3. In Figs. 1 and 4 the hopper 9 is omitted.

In the drawings the numeral 1 indicates the ram box having a cylindrical portion $1^a$ for the ram or piston 2 and the upper hopper-like portion $1^b$ with downwardly inclined walls to feed coal to a position in front of the ram. A coal outlet spout or chute 3 receives coal pushed by the ram. The ram may be reciprocated in bore $1^a$ by means of a connecting rod 4 pivotally connected with the ram at 5 and pivotally connected with a crank 6 on a shaft 7 carried in bearings 8 on the ram box. The shaft may be driven by a motor and transmission gearing in a usual way, (not shown). A hopper 9 over the hopper-like portion $1^b$ directs coal to the latter, as usual. The foregoing parts are generally of a well known construction illustrated in connection with my improvements.

My improvements comprise means operated by the ram or piston to stir or break the coal in the hoppers. A rockable member 10, shown somewhat in the form of a bell-crank, is pivotally supported at 11 to rock vertically within the hoppers. I have shown member 10 supported by pivot 11 in a jaw 12 secured by nut 13 on one wall of the ram box. The lower arm $10^a$ of member 10 is adapted to cooperate with the ram and the upper arm $10^b$ of said member is adapted to rise and descend in the coal in the hoppers. The free end of arm $10^a$ is shown provided with a roller 14 to bear against the inner end of the ram, and to ride on the upper edge of the ram when the latter is fully forward, (Fig. 3). The forward end of the ram is shown provided with a vertically disposed sinuous or irregular groove 15 to cooperate with arm $10^a$ of member 10, as with roller 14, to impart lateral motion to member 10 as it rises and descends. Said groove extends along the upper forward edge of the ram. Member 10 has sufficient freedom in jaw 12 for lateral wabble. By preference arm $10^b$ has one or more lateral projections 16 to engage the coal during the rise and descent of said arm.

To stir the coal at the sides of the hopper I provide gears 17, 18 pivotally supported by pivots 19 secured on the side wall of the hopper $1^b$ by nuts 20, the sides of the ram or piston having rack teeth 21 to engage said gears. As the ram is reciprocated its racks will engage and rock the gears 17, the teeth of which in the coal in hopper $1^b$ will stir the coal.

When the ram is withdrawn (Fig. 1) the member 10 will descend by its weight with arm $10^a$ in front of the ram and arm $10^b$ will be lowered. When the ram advances the member 10 will be rocked upwardly by the ram pushing on arm $10^c$, whereby arm $10^b$ will be forced into the coal above to stir the coal or break the coal if caked, the projections 16 aiding in the operation. The lateral motion or wabble imparted to member 10 will cause it to have a sort of zigzag motion in the coal. When the ram recedes the member 10 will descend in the coal. The action of member 10 will be to so stir and agitate the coal in the hoppers that it will descend in front of the ram to be pushed from the ram box through outlet 3 to the bed fire. The gears 17, when used, keep the coal from becoming packed at the sides of the ram. Since the coal is, by member 10,

kept from packing or bridging over the ram the feeding of the coal from the ram box will be assured, and since coal will be kept in front of the ram the latter will be protected by the coal from the heat from the bed fire in front, increasing the life of the ram over rams subject to heat from the fire.

Having now described my invention, what I claim is:—

1. A stoker having a movable ram, means to operate the ram, a member movably supported to be operated by the ram to engage coal over the ram, said ram having means to move said member sideways.

2. A stoker provided with a reciprocative ram and a hopper, and a member pivotally supported over the ram, said member having a lower arm in slidable engagement with the ram and an upper arm operative in the hopper to engage coal therein.

3. A stoker provided with a reciprocative ram and a hopper, a member movably supported over the ram to be engaged thereby to move the member within the hopper, said ram having a sinuous groove to operate the member sideways.

4. A stoker provided with a reciprocative ram and a hopper, and a member pivotally supported over the ram, said member having a lower arm operative by the ram and an upper arm operative in the hopper to engage coal therein, said ram having a sinuous groove to operate the member sideways.

5. A stoker having a reciprocative ram and a hopper-like portion over the ram, a member pivotally supported in said hopper-like portion over the ram, said member having a lower arm to extend in front of the ram to rock the member on its pivot and an upper arm operative vertically.

6. A stoker having a reciprocative ram and a hopper-like portion over the ram, a member pivotally supported in said hopper-like portion over the ram, said member having a lower arm to be operated by the ram and an upper arm operative vertically, said ram having an upwardly disposed sinuous groove to operate said member sideways.

7. A stoker having a reciprocative ram provided with a rack, and a gear pivotally supported at one side of the ram to be engaged by said rack.

Signed at New York city, in the county of New York, and State of New York, this 28th day of April, A. D. 1921.

JAMES MacPHERSON, Jr.