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R. S. RILEY ET AL

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COAL FEEDING MECHANISM FOR AUTOMATIC STOKERS

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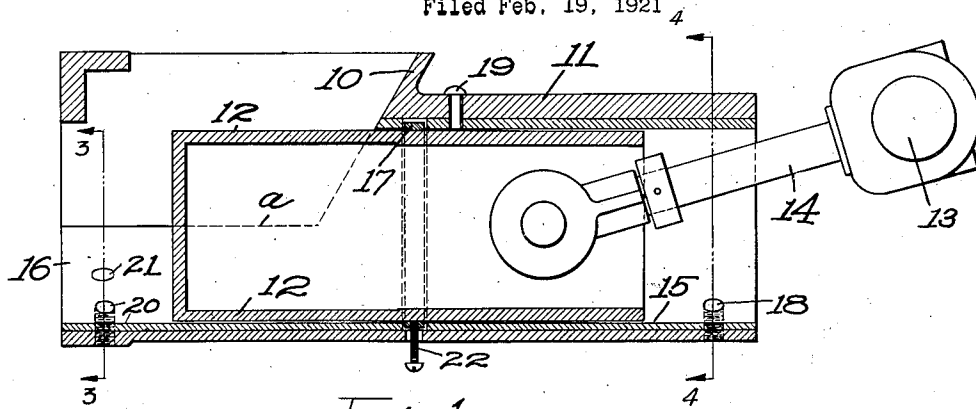


Fig. 1

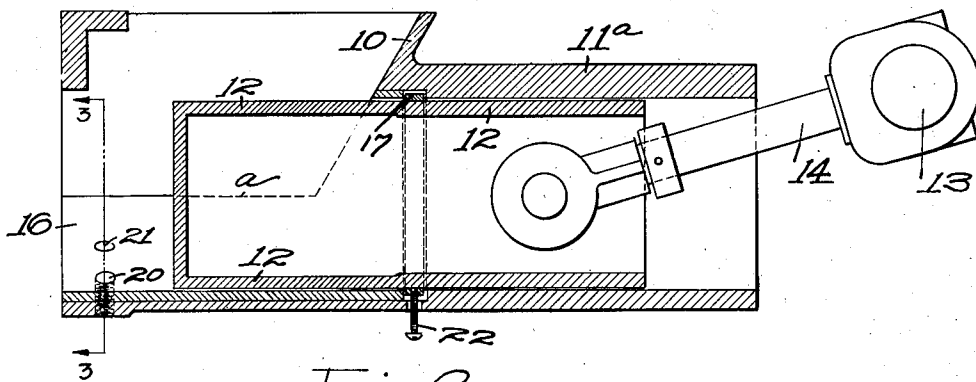


Fig. 2

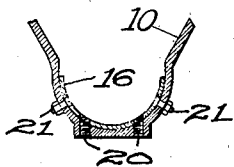


Fig. 3

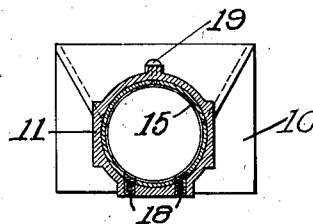


Fig. 4

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COAL-FEEDING MECHANISM FOR AUTOMATIC STOKERS.

Application filed February 19, 1921. Serial No. 446,285.

To all whom it may concern:

Be it known that we, ROBERT SANFORD RILEY and IRVING A. TAYLOR, citizens of the United States, both residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Coal-Feeding Mechanism for Automatic Stokers, of which the following is a specification.

This invention relates to the coal feeding mechanism of an automatic stoker and particularly to certain features of construction by which the expense occasioned by wear and corrosion of the parts may be materially reduced.

In the usual automatic stoker, particularly of the underfeed type, the coal is fed from the bottom of a magazine or hopper by means of a slowly reciprocating ram or piston. The sliding movement of the piston over the bottom of the hopper causes relatively rapid wear of the parts. The sharp particles of coal caught under the piston scrape and cut the metal surfaces which are then easily corroded by the dilute acids always found in moist coal and which are forced out of the coal during the feeding operation by the pressure of the piston thereon.

It is one object of our invention to provide a construction in which the worn parts may be easily and cheaply replaced.

Another object is to provide a convenient and efficient construction for retaining a piston packing ring in position in the cylinder which supports and guides the piston.

In one form of our invention we also provide a removable lining sleeve for the cylinder as well as a lining plate for the bottom of the hopper.

Our invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

Two forms of our invention are shown in the drawings in which

Fig. 1 is a vertical sectional view of a coal hopper and cylinder showing one form of our invention;

Fig. 2 is a similar view showing a modification thereof;

Fig. 3 is a partial sectional elevation taken along the line 3—3 in Figs. 1 or 2; and

Fig. 4 is a transverse sectional elevation taken along the line 4—4 in Fig. 1.

Referring to the drawings, we have shown a portion of a coal hopper 10 and a cylinder 11 connected thereto or forming a projection therefrom. A piston 12 is mounted to slide in the cylinder 11 and may be actuated from a crank pin or eccentric 13 with which it is connected by a piston rod 14. The parts thus far described are of the usual type and in themselves form no part of our present invention.

The cylinder 11 in Fig. 1, however, is made of somewhat greater internal diameter than is usual and a lining sleeve 15 and lining plate 16 are removably mounted in the cylinder and hopper to support the sliding piston 12. The sleeve 15 and plate 16 may conveniently be formed as sections of standard size tubes or pipes which are sufficiently accurate in size for this purpose, particularly in view of the preferred use of a packing ring 17 which encircles the piston and is positioned between the adjacent ends of the sleeve 15 and the plate 16.

This packing ring 17 is preferably formed as a one-piece split metal ring closely engaging the piston and preventing the coal from working back into the cylinder bearing.

The sleeve 15 may be secured in the cylinder in any convenient manner, as by screws 18 at the bottom and a rivet or screw 19 at the top of the cylinder. The plate 16 may be similarly secured by screws 20 and bolts 21 either of which may be at times omitted. A screw 22 may also be used to prevent angular displacement of the ring 17.

The construction shown in Fig. 2 is substantially the same as that shown in Fig. 1, with the exception that the cylinder 11^a is made of the correct internal diameter to loosely fit the piston 12, so that the lining sleeve 15 may be omitted. The lining plate 16 is formed as previously described and serves the same purpose.

It will be noted that the lining plate 16 is cut away along the dotted line *a* so that the upper portion thereof is open to communicate freely with the hopper 10 and that only a small portion is of the full cylindrical form.

Having thus described our invention, the

uses and advantages thereof will be readily apparent. The lining plate 16 covers the bottom portion of the hopper 10 and receives the wear and corrosion due to the mechanical and chemical action of the coal thereon. When the plate becomes worn to an objectionable extent it is easily removed by loosening the screws 20 or bolts 21, and a new lining plate may be substituted therefor at slight expense, at the same time renewing the packing ring 17 if desirable. This form of our invention is found very satisfactory, as only a relatively small amount of wear occurs in the cylinder itself, particularly when the packing ring 17 is used, as this prevents the coal from working backward into the cylinder. Under certain conditions, however, it may be desirable to make use of the additional lining sleeve 15 which permits the entire supporting structure upon which the piston slides to be readily renewed at slight expense.

It is found in practice that the piston wears much less rapidly than the surface upon which it slides, but if such wear occurs the piston may be readily replaced at small expense.

Having thus described our invention, it will be evident that changes and modifications can be made therein by those skilled in the art within the spirit and scope thereof as set forth in the claims and we do not wish to be otherwise limited to the details herein disclosed but what we claim is:—

35 1. In a stoker, a coal hopper having a partially cylindrical bottom portion, a cylindrical coal feeding piston slidable over said cylindrical bottom portion, said hopper having an outwardly extended cylindrical sleeve forming a bearing for said piston, and a separate segmental removable lining plate covering the cylindrical bottom portion of said hopper and supporting the inner end of said piston as it is advanced into
45 said hopper.

2. In a stoker, a coal hopper having a partially cylindrical bottom portion, a cylin-

dricul coal feeding piston slidable over said cylindrical bottom portion, said hopper having an outwardly extended cylindrical sleeve 50 forming a bearing for said piston, and a separate segmental removable lining plate covering the cylindrical bottom portion of said hopper and supporting the inner end of said piston as it is advanced into said hopper, said plate being secured to and supported by the hopper bottom and being readily removable therefrom. 55

3. In a stoker, a coal hopper having a partially cylindrical bottom portion, a cylindrical coal feeding piston slidable over said cylindrical bottom portion, said hopper having an outwardly extended cylindrical sleeve forming a bearing for said piston, and a separate segmental removable lining plate covering the cylindrical bottom portion of said hopper and supporting the inner end of said piston as it is advanced into said hopper, said plate being cut from a section of pipe loosely fitting said piston and being secured to and directly supported by the hopper bottom. 70

4. In a stoker, a coal hopper, a cylinder communicating with the lower portion of said hopper, a piston slidable in said cylinder, a removable lining sleeve for said cylinder, a removable lining plate for the lower portion of said hopper, and a packing ring for said piston disposed between the adjacent ends of said lining sleeve and plate. 75

5. In a stoker, a coal hopper, a cylinder communicating with the lower portion of said hopper, a piston slidable in said cylinder, a removable lining plate loosely fitting said piston and covering the bottom of said hopper to protect the same from wear and corrosion, and a packing ring for said piston held from axial movement in said cylinder toward said hopper by said removable lining plate. 80

In testimony whereof we have hereunto affixed our signatures. 90

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