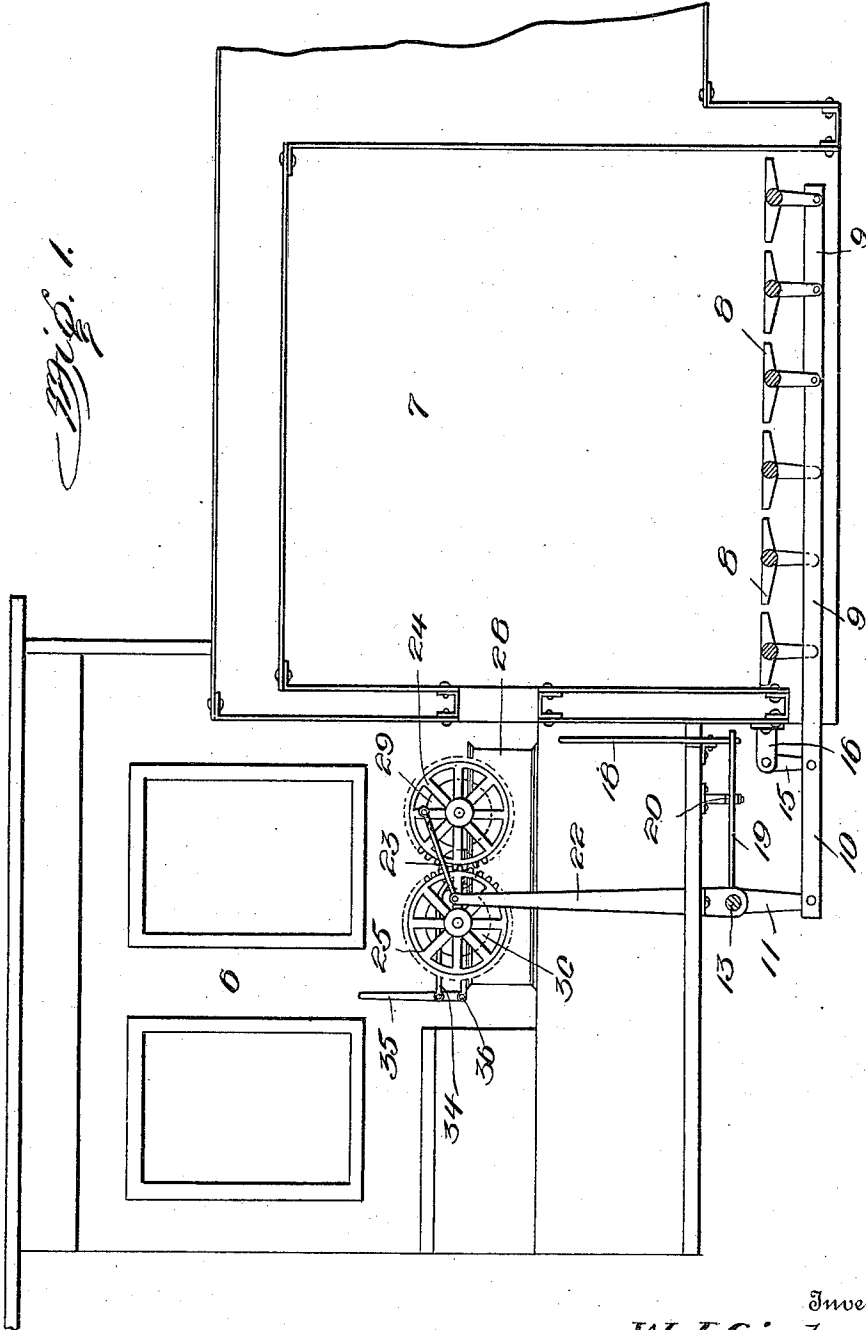


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W. J. SIMPSON.
SHAKER FOR GRATES.
APPLICATION FILED APR. 6, 1910.

Patented Mar. 28, 1911.

3 SHEETS—SHEET 1.



Witnesses
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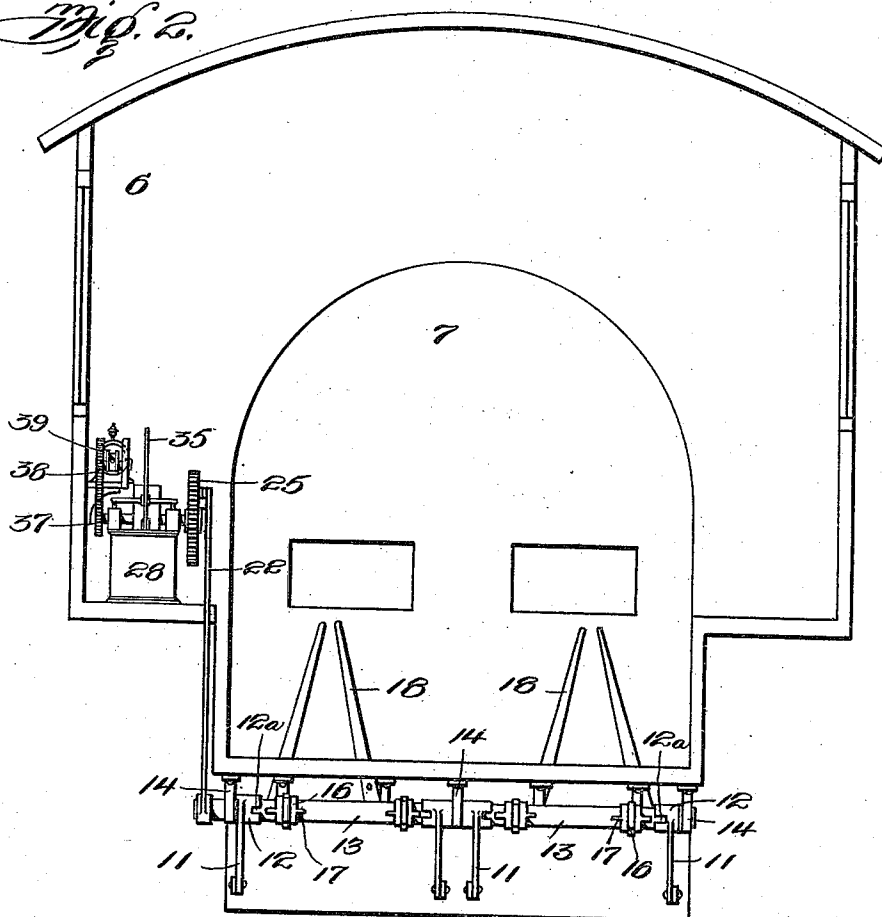
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3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 3.

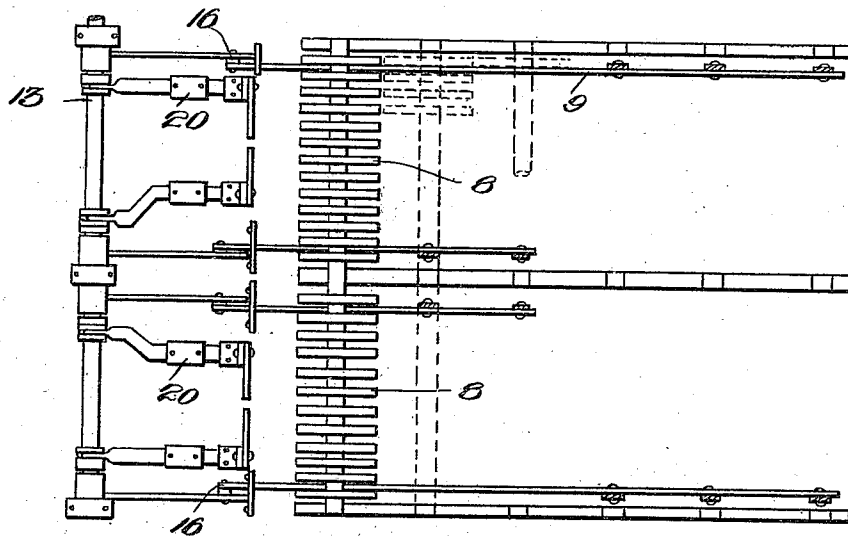


Fig. 4.

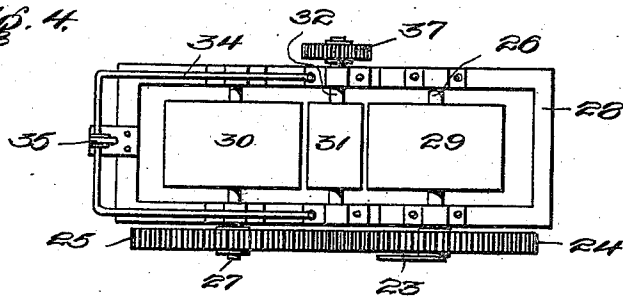
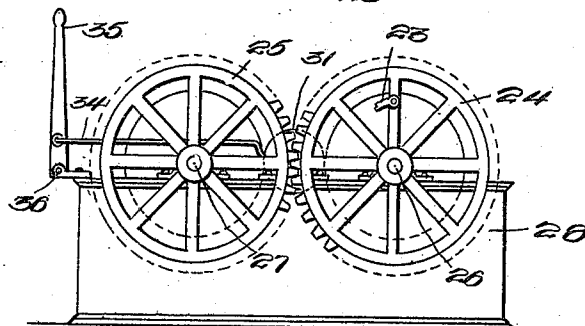


Fig. 5.



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UNITED STATES PATENT OFFICE.

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SHAKER FOR GRATES.

987,754.

Specification of Letters Patent.

Patented Mar. 28, 1911.

Application filed April 6, 1910. Serial No. 553,817.

To all whom it may concern:

Be it known that I, WILLIAM J. SIMPSON, a citizen of the United States, residing at Hope, in the county of Bonner and State of Idaho, have invented certain new and useful Improvements in Shakers for Grates, of which the following is a specification.

This invention relates to shakers for grates, and it is especially adapted for use in connection with the grates of locomotive fire boxes, although capable of use elsewhere if desired.

The object of the invention is to provide improved means for shaking the grate by the use of power devices, the mechanism comprising a small engine or the like arranged to drive a friction roller which can be moved to engagement with either of a pair of cooperating friction rollers which are connected by suitable transmission devices to a rock shaft. This rock shaft may be operatively connected by means of clutches and other parts to the grate sections, and the arrangement is such that various sets of grate bars may be individually operated, so that, for example, the bars at the front or back or either side of the grate may be individually operated, to clear the fire at various places or sections, according to local conditions.

The details of the invention, and the manner of operation, will be more fully evident from the following description and the accompanying drawings in which—

Figure 1 is a side elevation, partly in section, of a locomotive fire box and cab, showing the grate shaker in position. Fig. 2 is an elevation thereof, looking into the cab from the rear. Fig. 3 is a plan view of the shaking mechanism and the grate. Figs. 4 and 5 are details in plan and side elevation of the friction rollers and associated devices.

Referring specifically to the drawings, 6 indicates the cab of a locomotive, and 7 the fire box provided with rocking grate bars 8 of any desired or suitable type. As shown, the grate bars are arranged in four sections or sets, comprising two front and two rear sets each consisting of two sections one of which is at the right side of the fire box and the other at the left side. The number of sets or sections may be varied as desired. The grate bars of each set are operatively connected to an ordinary reciprocating bar

9 located under the grate bars and extending under the cab floor. Four bars are shown connected to the respective sets of the grate and individually controlling said sets. The outer end of each bar is connected by a link 10 to an arm 11 depending from a cuff 12 which is loose on a rock shaft 13 which extends crosswise under the floor of the cab, where it is supported by hangers 14 at each end and at the middle. The link 11 and the outer end of the bar 9 are supported by a swinging hanger 15 from a bracket 16 fastened to the breast of the fire box.

Each sleeve 12 is provided with notches 12^a to form one member of a clutch the other member of which consists of a collar 16 splined as at 17 on the rock shaft 13, and having projections to engage in said notches. Each collar may be shifted to engagement with or disengagement from the corresponding sleeve 12 by means of a hand lever 18 which projects up through an opening in the floor of the cab and is connected at its lower end to one end of a forked lever 19 which is pivoted to a bracket 20 on the under side of the cab floor and which has a fork 21 at its opposite end engaging in a groove in the collar 16, in order to shift said collar and to allow the same to turn with the rock shaft. As shown, the respective clutches are connected to corresponding hand levers in the manner described, so that the several grate sections may be severally or individually operated by appropriate movement of the corresponding lever 18, when the shaft is rocked.

For rocking the shaft 13, one end thereof is provided with a long arm 22 which projects up through the floor of the ledge or side platform of the cab and is connected by a pitman 23 to a gear wheel 24 which meshes with a similar gear wheel 25, so that when these gears are rotated the shaft 13 is rocked in consequence of the oscillation of the lever arm 22.

The shafts 26 and 27 of the gears 24 and 25 are supported in bearings on a base or frame 28 resting on the platform of the cab at one side thereof. The respective shafts are provided with rollers 29 and 30, fast thereon. These rollers are spaced apart, and located between the same is a small friction roller 31 mounted on the shaft 32 carried in sliding boxes 33 at opposite sides of the frame 28. These boxes are connected to a

bail or yoke 34 attached to a hand lever 35 fulcrumed at 36 on a bracket at the front end of the base. The shaft 32 of the intermediate roller is also provided at the outer side of the frame with a gear 37 in mesh with a pinion 38 driven by connection to a small engine 39 supported in convenient position in the cab. This engine may be a small steam engine receiving its steam from the main boiler, or it may be a small air motor driven by compressed air from the air brake tank. Or it may be a small electric motor on engines provided with dynamos; or any other kind of power or motor may be provided, no limitation in this respect being implied.

By means of the hand lever 35 the friction roller 31 may be shifted to engage the same with either of the rollers 29 or 30, or to a neutral position between the same. When so engaged the gears 24 and 25 will be driven in one direction or the other and the shaft 13 will be rocked accordingly. Then by manipulation of the levers 18 the corresponding grate sections will be shaken. The purpose of using two friction rollers 29 and 30 with either of which the driver 31 may be engaged, is to change the motion suddenly during any desired stroke, or to start the shaking action in either direction for the purpose of breaking up any clinkers which may be lodged between the grate bars.

The invention is not limited to the exact embodiment shown, but various modifications may be made within the scope of the invention.

What I claim as new is:—

1. The combination of a shaking grate divided into longitudinal sections each comprising separate front and rear sets of

rocking grate bars, reciprocating rods located under the grate and connected to the bars of said sets respectively, a rock shaft extending across in front of the grate, means to operate the shaft, clutches located on the shaft, and corresponding in number and position to the respective rods, one member of each clutch being loose on the shaft and having a depending arm connected to the front end of one of said rods, and the other member being shiftable on the shaft to engage or disengage the clutch.

2. The combination with a locomotive cab and firebox, of a shaking grate in the firebox, an operating rod connected thereto and projecting rearwardly under the cab, a rock shaft extending across under the cab and provided at one end with an operating lever extending upwardly through the floor of the cab, a connection between the rock shaft and rod, including clutch members on the shaft, and a controlling lever extending through the floor of the cab, and connected to the clutch.

3. The combination of a locomotive cab and firebox, a shaking grate in the firebox, a rock shaft extending across under the cab and connected to the grate the connections including a clutch, and motor driven means in the cab to operate the shaft, said means including friction transmission mechanism and a lever extending from the rock shaft through the cab floor.

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

WILLIAM J. SIMPSON.

Witnesses:

JOHN A. TIPTON,
SAMUEL OWEN.