

B. J. MORRISON.

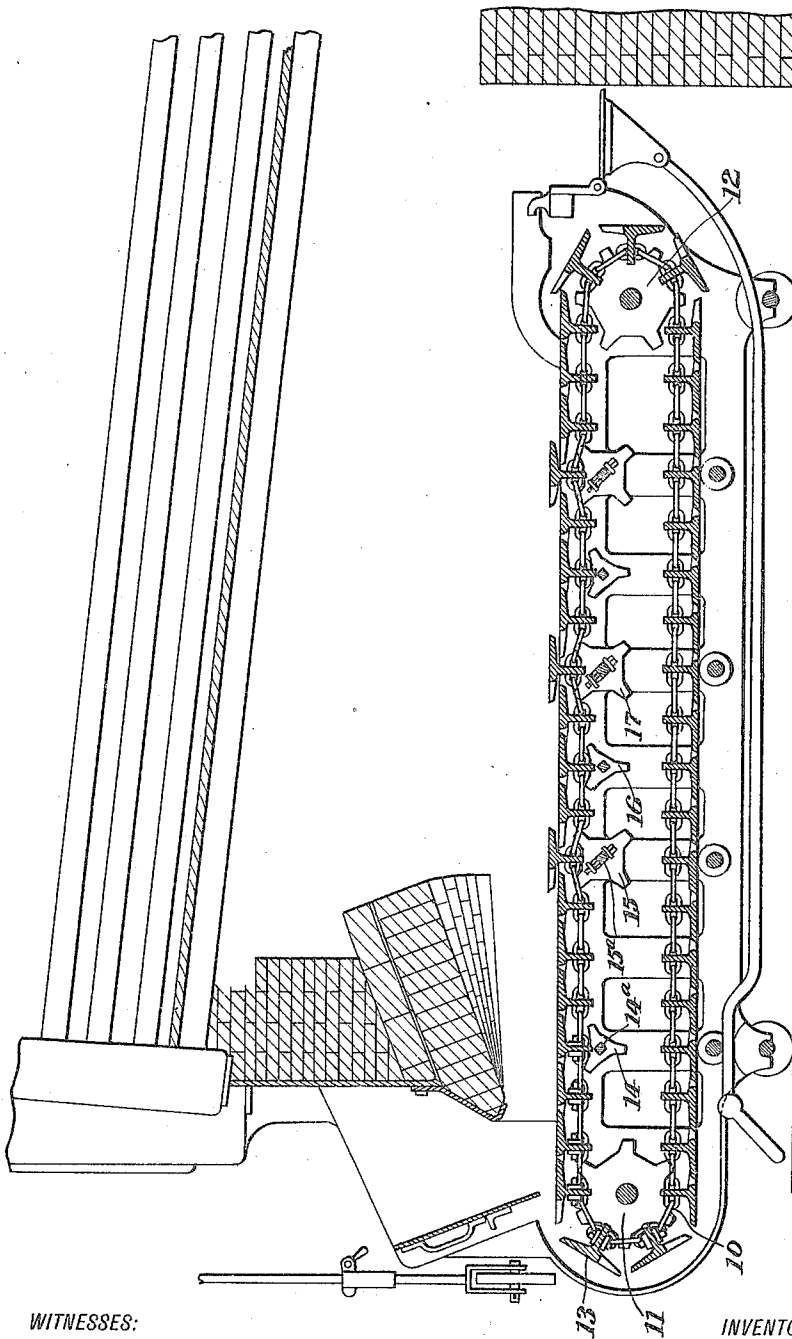
GRATE VIBRATING DEVICE FOR CHAIN GRATE STOKERS.

APPLICATION FILED MAR. 10, 1914.

Patented Apr. 20, 1915.

2 SHEETS—SHEET 1.

1,136,033.



WITNESSES:

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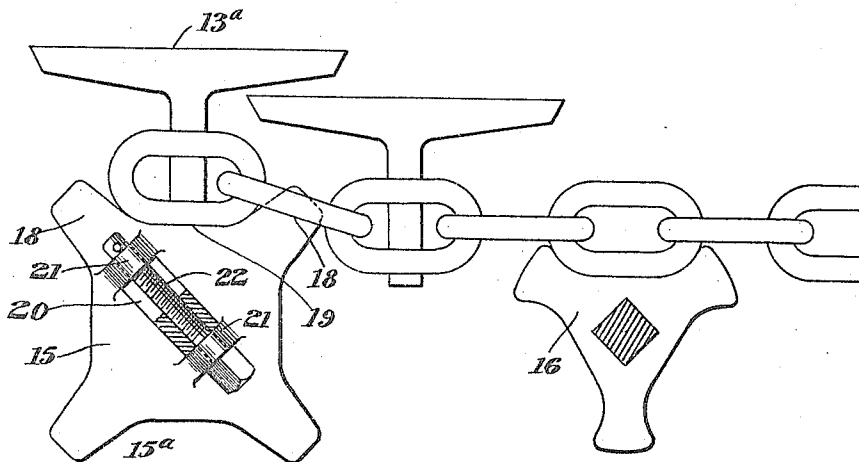


Fig. 2.

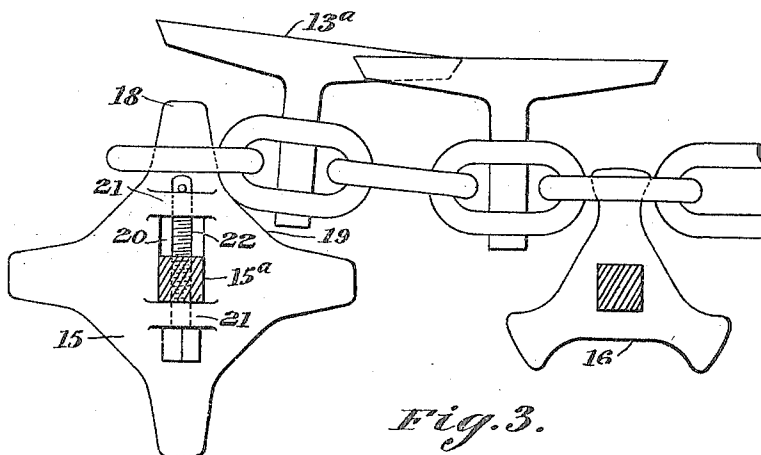


Fig. 3.

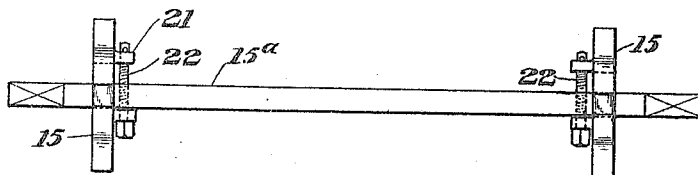


Fig. 4.

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UNITED STATES PATENT OFFICE.

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GRATE-VIBRATING DEVICE FOR CHAIN-GRATE STOKERS.

1,136,033.

Specification of Letters Patent.

Patented Apr. 20, 1915.

Application filed March 10, 1914. Serial No. 823,662.

To all whom it may concern:

Be it known that I, BARTHOLOMEW J. MORRISON, a citizen of the United States, and a resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Grate-Vibrating Devices for Chain-Grate Stokers, of which the following is a specification.

This invention relates to mechanical stokers, particularly of the chain grate type.

In the course of operation of a chain grate stoker, especially with a finely comminuted fuel such as buckwheat coal or the like, it is found that the fuel will cake and form a crust which effectually prevents the progressive movement of the fuel necessary in a mechanical stoker. In many cases, the grate will move along free of the fuel and the latter remain clogged and stationary above the grate. To overcome this, attempt has hitherto been made to leave some slack in the chain for the purpose of forming a series of catenary waves between the usual rollers supporting the upper run. This has not been found satisfactory for the reason that the slack is taken up to a large extent by the driving-sprocket wheel and as a result, little or no vertical motion of the grate bar would be obtained.

The present invention has for its principal object to provide positively acting means whereby the grate bars are given substantially vertical vibratory motion, whereby the fuel is broken up and the possibility of clogging is eliminated.

A further object is to provide adjusting means whereby the extent of the vibratory motion of the grate bars may be varied.

Another object is to provide means engaging the grate bars to prevent their canting or skewing during their travel.

The various further objects and advantages will more fully appear from the detailed description and the features of novelty of the invention will be particularly pointed out in the claims.

In the drawings illustrating this invention, Figure 1 is a sectional elevation of a chain grate stoker located in the fire box of a steam boiler with the improved vibrating means applied thereto. Fig. 2 is a detail view illustrating the vibrating means in one position. Fig. 3 is a detail view illustrating the vibrating means in another position.

Fig. 4 is a detail view of the vibrating sprockets mounted on a common shaft.

Referring in detail to the drawings, the chains 10 driven by the sprocket wheels 11 and 12 carry the grate bars 13. For supporting the upper run of the grate bearing the fuel, I provide means which in addition to its function as a support serves also to positively vibrate the grate bars in a substantially vertical direction and thereby to break up the fuel so as to prevent its caking and clogging. These supports consist of a series of sprocket wheels 14, 15, 16, 17, etc., mounted in pairs upon shafts 14^a, 15^a, etc., carried in the side frames of the stoker. The supporting sprocket wheels are positively driven by the chains themselves, and in the course of their revolution, vibrate the links carrying the grate bars in a substantially vertical direction, so as to accomplish the object above explained. Certain of the sprocket wheels such as 15, 17, etc., may be of larger throw than the others and thus impart at the corresponding points, a greater degree of vibration to the grate bars.

Referring particularly to Figs. 2 and 3, it will be noted that the sprocket wheel 15 has the teeth 18 and the intermediate depressed faces 19 upon which the links of the chain are borne. When the sprocket wheel is rotated to the position shown in Fig. 2 and then to the position shown in Fig. 3, a substantially vertical vibratory motion is imparted to the grate bar 13^a. This motion is positive as the sprocket wheels are driven by the chains and in their rotation act as eccentrics to lift and lower the grate bars. It will be noted that the sprockets 16 having a smaller throw impart a smaller degree of movement to the grate bars than the larger sprockets 15.

For varying the degrees of vibratory motion of the grate bars, the sprocket wheels 15, 17, etc., may be adjusted upon their shafts 15^a, 17^a, etc., so as to shift the sprockets to varying degrees of eccentricity with respect to their shafts. Any form of adjustment will answer the purpose. I have illustrated the sprocket wheel 15 as formed with an extended slot 20 through which the square shaft 15^a passes. At the ends of the slot are disposed transverse lugs 21 through which passes a screw 22 threaded in the shaft 15^a. When this screw is turned, the sprocket wheel is shifted axially to the shaft,

thus increasing its throw and hence the degree of vibratory motion of the grate bars.

It will be clear, therefore, that I have provided means for vibrating the grate bars which is positive in its action and which may be adjusted to vary the extent of vibration. As the corresponding sprocket wheels are rigidly coupled by reason of their mounting upon the same shaft, they will hold the grate bars in proper transverse position and will prevent their canting or skewing during their course of vibratory motion.

Although I have described a preferred form in which my invention may be embodied, it will be understood that various changes within the skill of a mechanic may be resorted to without departing from the spirit of my invention and the scope of the appended claims.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A chain grate stoker comprising chains, grate bars carried thereby, means for actuating the chains, and means driven by the chains independently of the actuating means for imparting a substantially vertical vibratory motion to the grate bars.

2. A chain grate stoker comprising chains, grate bars carried thereby, means for actuating the chains, and sprocket wheels actuated by the chains independently of the actuating means for imparting a substantially vertical vibratory motion to the grate bars.

3. A chain grate stoker comprising chains, grate bars carried thereby, means for actuating the chains, a sprocket wheel engaging each chain and driven thereby independently of the actuating means for imparting a substantially vertical vibratory motion to the grate bars, and means for rigidly coupling the corresponding sprocket wheels together.

4. A chain grate stoker comprising chains, grate bars carried thereby, means for actuating the chains, rotary means positively driven by the chains only for imparting a substantially vertical vibratory motion to the grate bars, and means for varying the extent of the vibratory motion.

5. A chain grate stoker comprising chains, grate bars carried thereby, means for actuating the chains, sprocket wheels actuated by the chains but otherwise independent of

said actuating means for imparting a substantially vertical vibratory motion to the grate bars, and means for adjusting the sprocket wheels to vary the extent of vibratory motion of the grate bars.

6. A chain grate stoker comprising chains, grate bars carried thereby, means for actuating the chains, sprocket wheels actuated by the chains for imparting a substantially vertical vibratory motion to the grate bars, and means for shifting the sprocket wheels with reference to their axis of rotation for varying the extent of vibratory motion of the grate bars.

7. A chain grate stoker comprising chains, grate bars carried thereby, means for actuating the chains, a sprocket wheel engaging each chain and driven thereby for imparting a substantially vertical vibratory motion to the grate bars, means for rigidly coupling the corresponding sprocket wheels together, and means for shifting the sprocket wheels radially with respect to their rigid coupling for varying the extent of vibratory motion to the grate bars.

8. A chain grate stoker comprising chains, grate bars carried thereby, means for actuating the chains, a sprocket wheel engaging each chain and driven thereby for imparting a substantially vertical vibratory motion to the grate bars, a shaft on which the corresponding sprocket wheels are mounted, and means engaging the shaft for shifting the sprockets radially with respect thereto for varying the extent of vibration of the grate bars.

9. A chain grate stoker comprising a pair of chains, driving means therefor, grate bars carried by the chains, and means for imparting a substantially vertical vibratory motion to the grate bars comprising a series of sprocket wheels driven by the chains, the members of the series having varying extent of throw whereby a varying extent of substantially vertical vibratory motion is imparted to the grate bars during the course of their travel.

Signed at New York city, in the county of New York and State of New York, this 3rd day of March A. D. 1914.

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Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."