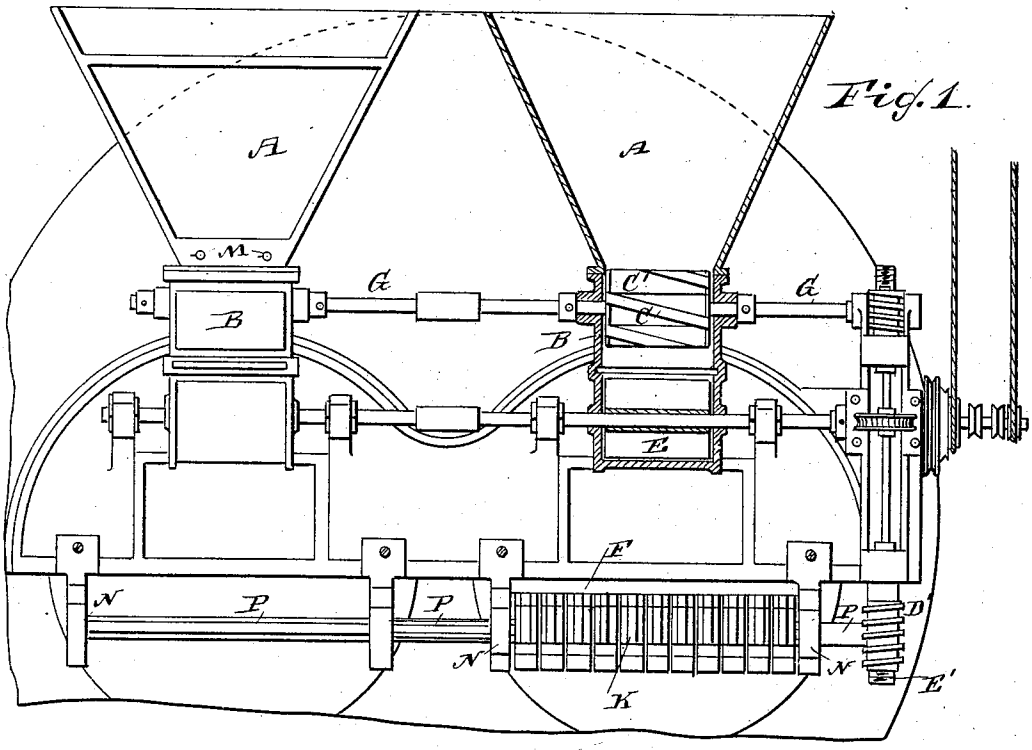
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J. HODGKINSON.

MECHANICAL STOKER.

No. 322,605. Patented July 21, 1885.

Fig. 1.



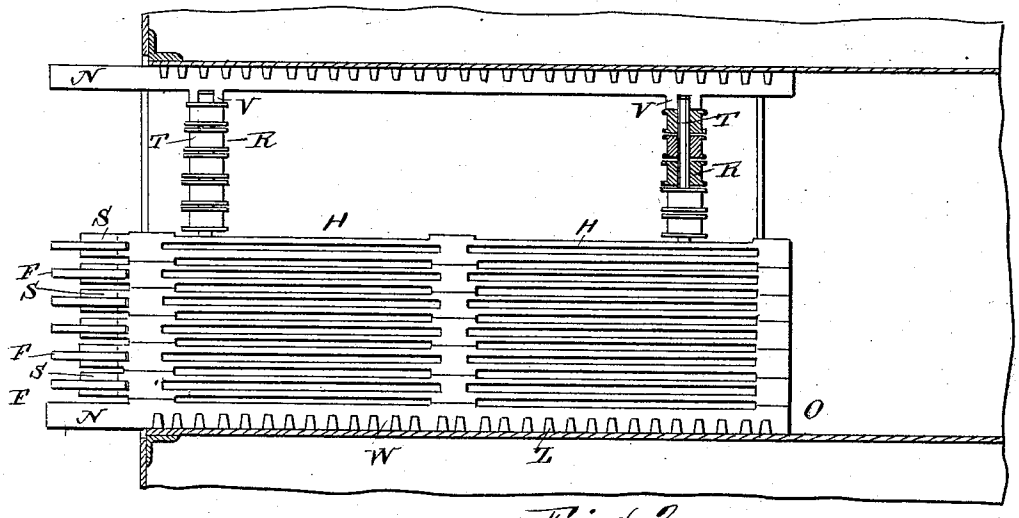


Fig. 2.

WITNESSES:

Rhea G. Hostetter

C. Sedgwick

INVENTOR:

J. Hodgkinson

BY Munn & Co.

ATTORNEYS.

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.)

3 Sheets—Sheet 2.

J. HODGKINSON.

MECHANICAL STOKER.

No. 322,605. Patented July 21, 1885.

Fig. 3.

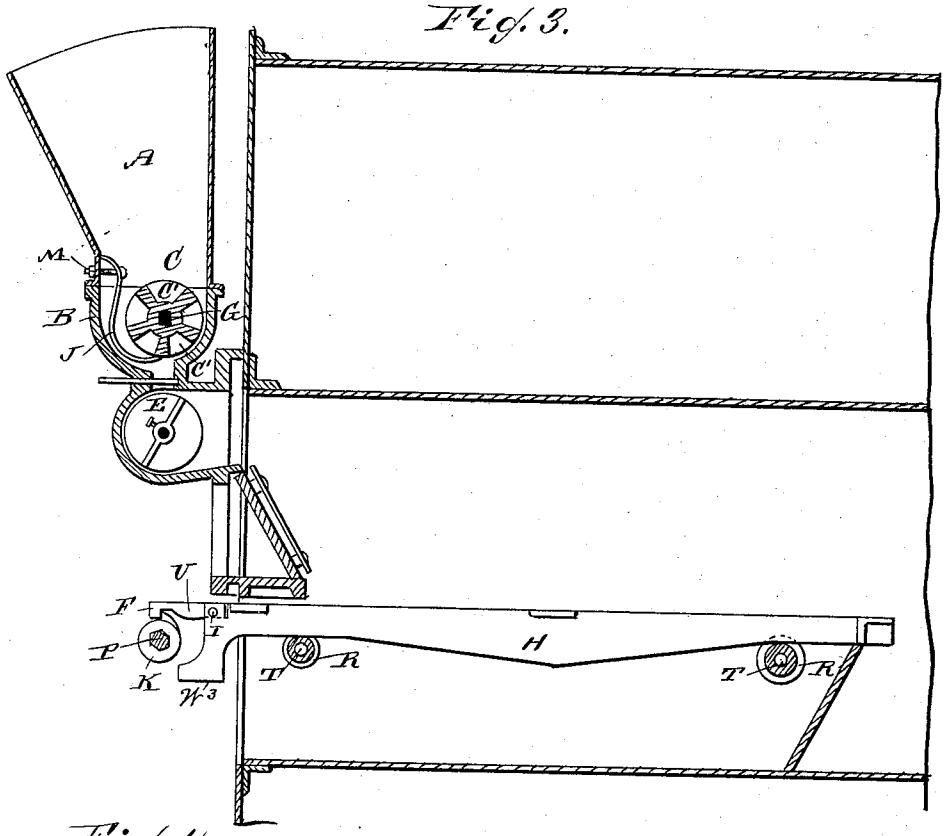
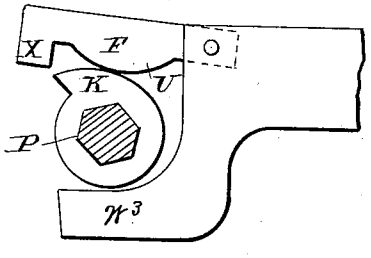


Fig. 4.



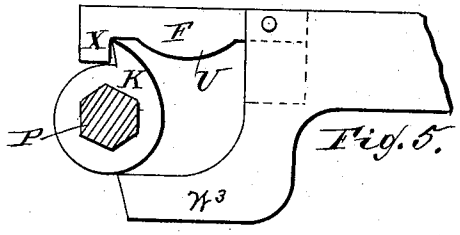
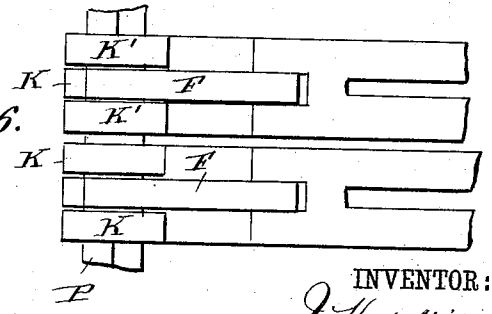


Fig. 5.

Fig. 6.



WITNESSES:

Theo. G. Hosher.

C. Sedgwick

INVENTOR:

J. Hodgkinson

BY Munn & Co

ATTORNEYS.

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.)

3 Sheets—Sheet 3.

J. HODGKINSON.

MECHANICAL STOKER.

No. 322,605. Patented July 21, 1885.

Fig. 7.

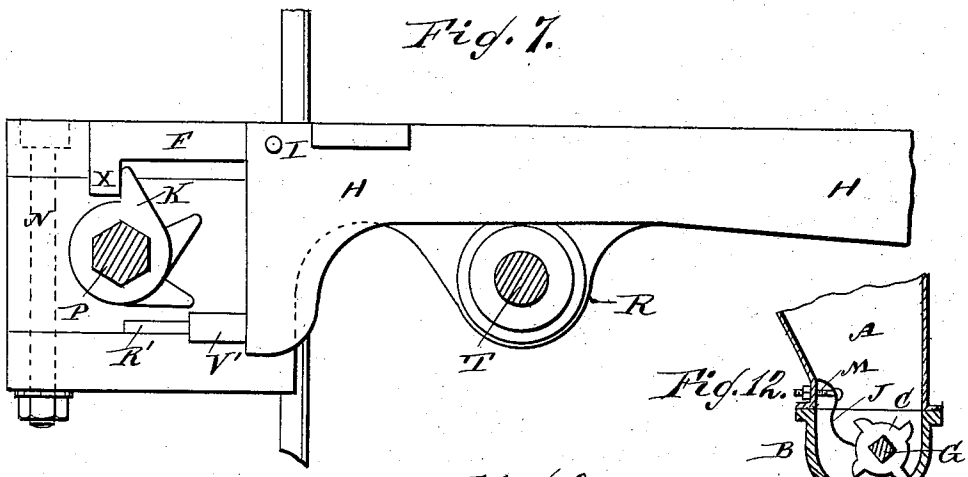


Fig. 12.

Fig. 8.

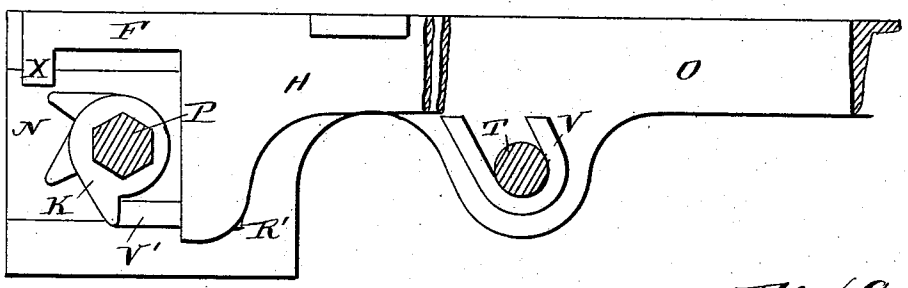


Fig. 9.

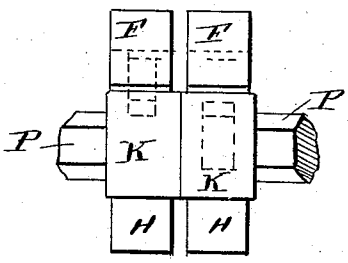


Fig. 11.

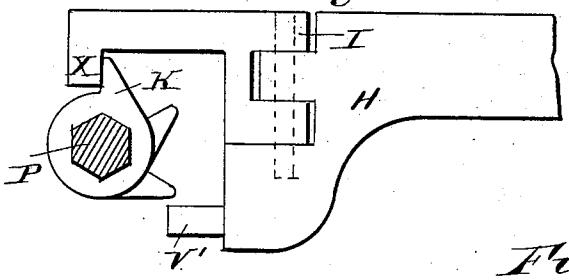
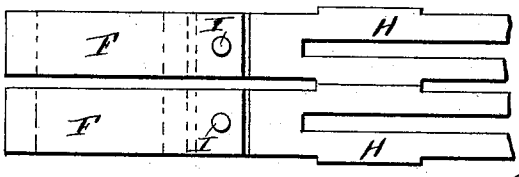


Fig. 10.



WITNESSES:

Fred. G. Hoster.

C. Sedgwick

INVENTOR:

J. Hodgkinson.

BY Munn & Co

ATTORNEYS.

N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

JAMES HODGKINSON, OF MANCHESTER, ENGLAND.

MECHANICAL STOKER.

SPECIFICATION forming part of Letters Patent No. 322,605, dated July 21, 1885.

Application filed March 6, 1885. (No model.) Patented in England December 23, 1884, No. 16,830.

To all whom it may concern:

Be it known that I, JAMES HODGKINSON, of the firm of Hodgkinson and Company (limited,) Ordsall Machine Works, Woden street, Salford, Manchester, England, engineer, have invented a new and useful Improvement in Mechanical Stokers and in Apparatus Connected therewith, of which the following is a full, clear, and exact description.

This invention consists in arrangements and constructions of the several parts necessary in the cycle of operation whereby more certain and efficient actions are obtained in mechanical stokers and self-cleaning furnaces employed in steam-boilers, parts of which may be adapted with advantage to other furnaces.

The machine or mechanical stoker is composed of the ordinary hopper opening into a crusher-box, in which is placed an improved rotating helical crusher and adjustable flexible spring-plate for the purpose of crushing, measuring, and delivering fuel periodically to the distributer, from whence it is automatically distributed or scattered over the surface of the fire.

My improvements in self-cleaning fire-bars, which are used in connection or otherwise with my improved distributer-machine or mechanical stoker, consist in a certain novel method of constructing, arranging, and moving the bars which constitute furnace-grate bars. The fire-bars resemble in form those in ordinary use in coal-burning fire-grates, and are disposed or placed in a horizontal or nearly horizontal position and parallel to each other. The flues in a boiler are provided longitudinally on each side with side bars provided with distance-pieces and air-spaces as well as pockets. In the latter are placed bars or bearers provided with rollers or guides. On the latter the longitudinal bars are placed and provided with the usual distance pieces for the purpose of forming air-spaces between each bar. The side bars project outside the flue at the front or firing end of the boiler or furnace, on the ends of which are bearings for supporting suitable shafts employed for operating the bars. The part of the shafts operating them are constructed in suitable or convenient forms—such as square or other polygonal section—on which are mounted loosely a number of uniform cams or tappets, disposed thereon like the helix of a screw or otherwise, so that as the cams or tappets revolve with the shafts they come in contact with pivoted latches or levers or other equivalents attached to the outer ends of the bars, and move the latter singly one after the other from back to front of the furnace; or several bars can be taken at a time, care being taken that the bars on both sides of each shall remain stationary during that time or otherwise. I prefer to move only one bar in a place at a time when being drawn out, or two or three bars at a time in a flue, and so on during the half-revolution or otherwise of the cam-shaft for the purpose of leaving the fuel on the stationary bars. If desired, one or more bars next each other can be moved at one and the same time. The cams operate on the pivoted latches or other equivalents on the outer ends of the bars, by which the latter are drawn out separately or in sets. After they have all been drawn out they are, for the purpose of carrying the fire backward, all driven back together by separate cams operating on a projection on the under side of the front end of the said bars.

To insure the latches clearing the cams, the former are provided with convexed or other suitable projections for the purpose of lifting them by the revolving action of the tappets or cams after the bars are drawn out, by which the bars are free when in position to be moved backward for the purpose of carrying the fire. For this purpose I arrange the mechanical movements and arrangements in the manner I will describe, referring to the accompanying drawings, in which like letters of reference indicate like parts, and in which—

Figure 1 is a partial front and sectional elevation of my improved mechanical stoker and its improvements. Fig. 2 is a plan view of a furnace, showing part of the self-cleaning fire-bars. Fig. 3 is a longitudinal sectional elevation of my improved mechanical stoker and its improvements. Figs. 4 and 5 are side views of the end parts of the grate-bars, and side views of the cams in different positions. Fig. 6 shows a plan of the front end parts of two grate-bars. Figs. 7 and 8 show side views of the front end parts of two different cross-sections of grate-bars, and also side views of modified cams in different positions. Fig. 9 is a

than the one it is intended for, as shown in Fig. 9.

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

1. The combination, with the helical crusher C, or other crusher, of the adjustable flexible spring-plate J, substantially as described and shown.

2. In a mechanical stoker, the bars H, provided with the lugs W^3, and the pivoted latch-levers F, having convex lower faces, N, in combination with the cams K and means for operating the same, substantially as herein shown and described.

3. In a mechanical stoker, the shaft P, the bars H, latch-levers F, having lip X, and means for revolving said shaft, in combination with the slide V′ and the cams K, substantially as herein shown and described.

The foregoing specification of my improvement in mechanical stokers, and in apparatus connected therewith, signed by me this 30th day of January, 1885.

JAMES HODGKINSON.

Witnesses:
S. G. DAVIDSON,
E. CHADWICK.