

May 27, 1924.

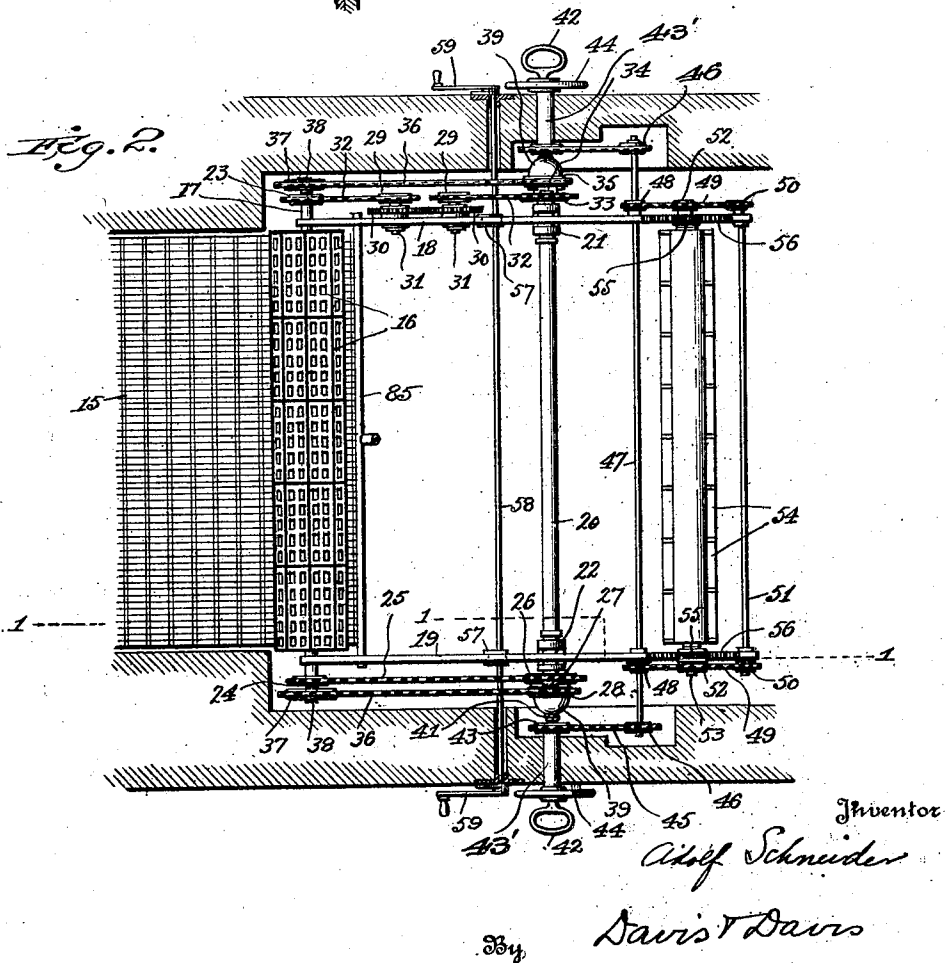
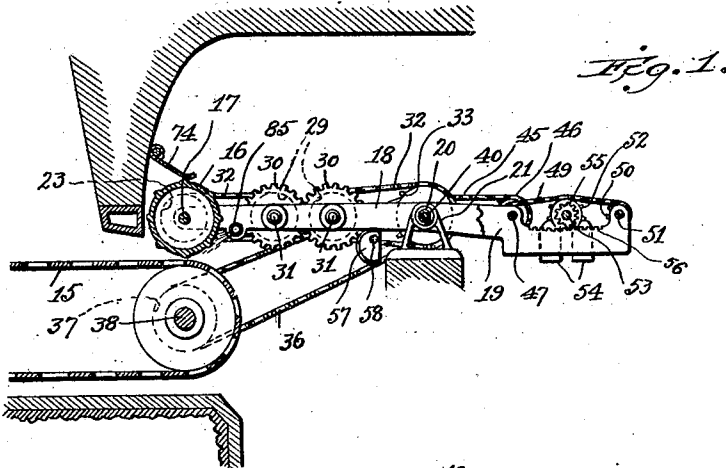
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A. SCHNEIDER

TRAVELING CHAIN GRATE

Filed Aug. 14, 1920

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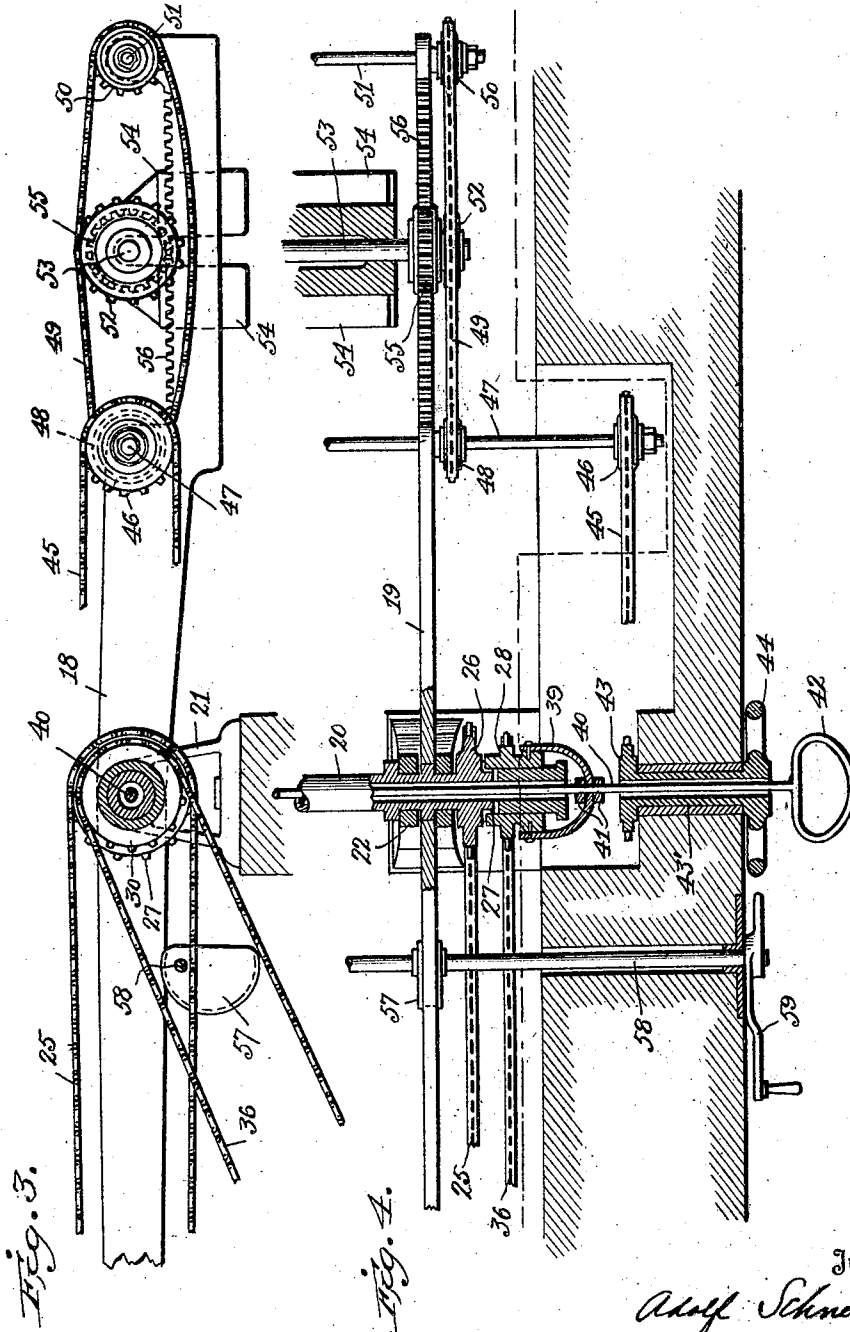
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By

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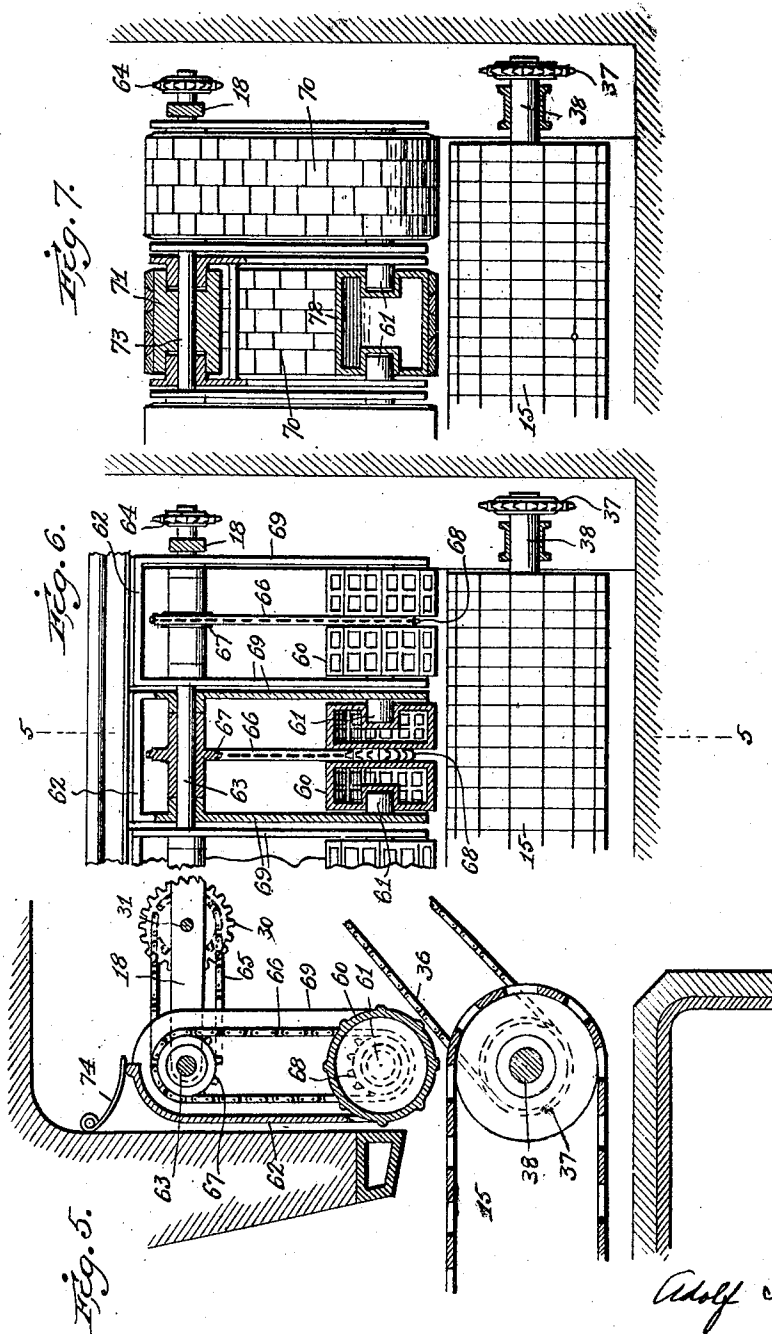
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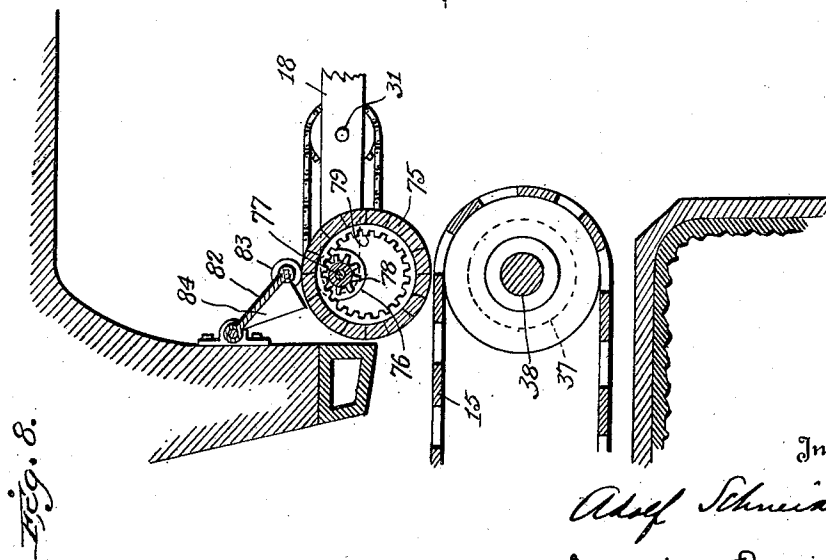
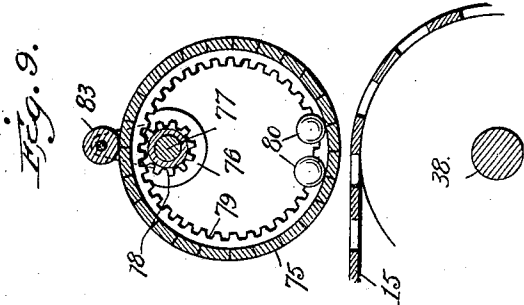
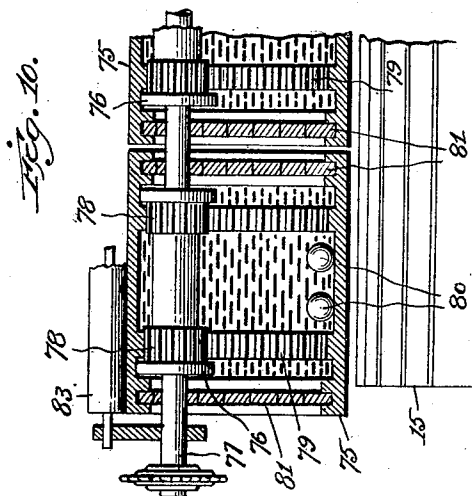
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A. SCHNEIDER

TRAVELING CHAIN GRATE

Filed Aug. 14, 1920

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UNITED STATES PATENT OFFICE.

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TRAVELING CHAIN GRATE.

Application filed August 14, 1920. Serial No. 403,504.

(GRANTED UNDER THE PROVISIONS OF THE ACT OF MARCH 3, 1921, 41 STAT. L., 1313.)

To all whom it may concern:

Be it known that I, ADOLF SCHNEIDER, a citizen of Germany, residing at Mannheim-Waldhof, Germany, have invented certain new and useful Improvements in Traveling Chain Grates (for which I have filed an application in Germany, June 11, 1918, Patent No. 351,526, April 8, 1922); and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in traveling-chain grates, and one of the objects is to provide means at the end of the grate to close the fire-place from the ash-pit to prevent air entering at this point. With this object in view, the invention consists in providing a movable damming member at the end of the grate which by its movement successively exposes cold parts to the heat of the fire-place and the coal on the grate, while the heated parts are removed to a place having a lower temperature, thereby reducing the wear of the damming member.

In one embodiment of the invention, the means for moving the damming member is constructed in a way to control the direction of travel of the damming member independently of the direction of travel of the traveling grate, so that the damming member may be moved either in one direction or another to shift unburnt coal back on the grate or to remove the slag from the grate.

Another object of the improvement is to so construct the damming means that it can be set at different distances from the surface of the grate; also so that it can be moved therefrom when necessary to remove large pieces of slag. To accomplish this, the damming member is constructed so that it can be moved upwardly, or rocked away from the grate, or moved in both ways simultaneously.

These and other objects are attained by the means illustrated in the accompanying drawings, in which—

Fig. 1 is a vertical longitudinal sectional view of a part of a grate and adjacent parts

of the fire-place and illustrating one form of the improved damming member;

Fig. 2 is a plan view of the structure shown in Fig. 1;

Fig. 3 is an enlarged side elevation of the rear portion of the damming means shown in Figs. 1 and 2 the parts being shown in section on the line 3—3 of Fig. 4;

Fig. 4 is a plan view of the structure shown in Fig. 3, part being shown in section;

Fig. 5 is a longitudinal sectional view of a modified form taken on the dotted line 5—5 of Fig. 6;

Fig. 6 is an end view partly in section of the form shown in Fig. 5;

Fig. 7 is a similar view to Fig. 6, showing a further modified form;

Fig. 8 is a vertical longitudinal sectional view of another modified form;

Fig. 9 is a view slightly modified from the form shown in Fig. 8; and

Fig. 10 is a vertical section of the Fig. 9 form taken longitudinally of the cylindrical damming member.

Referring to Figs. 1 to 4, inclusive, there is mounted above the end of the traveling grate 15 a damming member comprising drums 16 secured one beside the other on a dam-supporting shaft 17. This shaft 17 is rotatably mounted in rockers 18 and 19 which are supported on a transverse tubular supporting shaft 20 pivoted in bearings 21 and 22. To opposite ends of the shaft 17 are secured sprocket-wheels 23 and 24, and wheel 24 is connected by a chain 25 to a sprocket-wheel 26 on the shaft 20. Said sprocket-wheel 26 is provided with a clutch 27 adapted to be coupled with a coaxial sprocket-wheel 28.

A reversing mechanism for the damming member is provided, which consists of sprocket-wheels 29 and gear-wheels 30 in mesh with each other, mounted on stub-shafts 31 carried by the rocker 18, chains 32 connecting said sprocket-wheels 29 respectively with the sprocket-wheel 23 on shaft 17, and a sprocket-wheel 33 mounted on the shaft 20. Both of said sprocket-wheels 26 and 33 are provided with clutch-members 27 adapted to be coupled with the coaxial sprocket-wheels 28 and 35, which

are loosely mounted and longitudinally shiftable with respect to the shaft 20, and said sprocket-wheels 35 and 28 are connected by chains 36 to sprocket-wheels 37 mounted on opposite ends of a drive-shaft 38 of the adjacent part of the traveling grate. Sprocket-wheels 35 and 28 are adapted to be shifted in axial direction and alternately into and out of coupling engagement with the adjacent sprocket-wheels 26 and 33 by means of the caps 39, which are connected to said sprocket-wheels and rotatably connected to a shift-rod 40 by collars 41 (see Fig. 4). Said rod 40 is preferably extended through said tubular shaft 20 and is provided with handles 42 at its ends for manually operating the rod and sprocket-wheels 28 and 35 from either side of the apparatus. The sprocket-wheels 37 are also preferably mounted to slide axially on their shaft 34, so that the proper alinement of the chains 36 and sprockets 28 and 35 can be maintained when said sprockets are shifted.

An important feature of the invention resides in providing means for regulating the pressure of the damming member on the slag and grate 15, such means being preferably arranged to be adjustable from without. This pressure-regulating means preferably consists of adjustable weights carried by the rear ends of the rockers 18 and 19. As shown clearly in detail in Figs. 3 and 4, said adjustable means consist of sprocket-wheels 43 each of which is fixed to a tube-bearing 43' which is mounted on a suitable support in alinement with the axis of the shaft 20 and is adapted to be rotated by means of the hand-wheels 44, chains 45 connecting said sprocket-wheels 43 with another pair of sprocket-wheels 46 secured to the ends of a sprocket-wheel drive-shaft 47, sprocket-wheels 48 also keyed to shaft 47, and chains 49 extending from said sprocket-wheels 48 to and in engagement with sprocket-wheels 50 keyed to a sprocket-wheel driven shaft 51 also mounted in the rocker-arms adjacent their rear ends, said chains being also in engagement with other sprocket-wheels 52 keyed to a weight-shaft 53 which supports suitable weights 54. This shaft 53 is provided with gear-wheels 55 near its ends, and said gear-wheels 55 are supported upon and meshed with toothed racks 56 preferably formed on the top edges of the rear-ends of the rocker-arms 18 and 19. It will thus be seen that by turning either of the hand-wheels 44 in either direction, the weights 54 are shifted back or forth and thereby increase or decrease the counterbalance of the rockers 18 and 19. The weights are retained in their adjusted positions by the friction of the several gear and sprocket connections, and they can be shifted in any position of the rocker-arms. The ends of the rod 40 extend through the tube-bearing

ings 43' and sprocket-wheel 43 and hand-wheel 44.

For limiting the movement of the damming members toward the grate 15, there are provided cams 57 fixed to a shaft 58 having handles 59, said shaft being mounted in a suitable fixed support with its handles disposed on the outside thereof.

From the foregoing description, it will be understood that the pressure of the damming members on the grate and slag is regulated by shifting the weights 54 by the hand-wheels 44; also that the direction of movement of the damming members is controlled by manipulating the handles 42; that is, by coupling the sprocket-wheels 26 and 28 with each other (as shown in Fig. 2), the rotation is directly transmitted from the shaft of the grate to the damming member, and by coupling the sprocket-wheels 33 and 35, the rotation is transmitted through the intermediate reverse gearing 30—30.

The modified form shown in Figs. 5 and 6 consists of a damming member formed of a series of individual cylindrical or prismatic drums 60 rotatably mounted on trunnions 61 provided on the lower ends of the frames or boxes 62 which are mounted to rock upon a shaft 63 which in turn is mounted to rotate in the front ends of the rockers 18 and 19. To rotate this shaft 63, a sprocket-wheel 64 is secured to the end of the shaft, and this in turn is operated by a chain 65 (similar to chain 32, Fig. 2) extending from the front sprocket-wheel 29 heretofore described in the Figs. 1 to 4 construction. The damming drums are rotated by the chains 66 driven by sprocket-wheels 67 secured to the shaft 63, one in each of the boxes 62, and extending downwardly to and engaging sprocket-wheels 68 connected to the drums. Each box 62 is preferably provided with side-walls 69 which are adapted to be in close relation to the side-walls of adjacent boxes to prevent air from passing between the same when one or more of the drums are rocked more or less out of alinement with each other and away from the grate. The shaft 63 and its driving means are similar in all respects to shaft 17 heretofore described. It will be understood that the damming member (shown in Figs. 5 and 6) has a double rocking movement; that is, one rocking movement on the shaft 63 and another on the shaft 20 (shown in Figs. 1 to 4) which supports the rocker-arms, not shown in Figs. 5 and 6.

In Fig. 7 is shown a modification which will be particularly useful in many cases. In this form, the damming member consists of a series of flexible screens 70, preferably formed of chains shown diagrammatically in the drawings, mounted to travel on drums 71 and 72. The drums 71 are keyed to the shaft 73 mounted in the front ends of the

rocker-members 18 and 19 and driven in the same manner as are shafts 63 and 17, heretofore described. An important feature of the Fig. 7 construction resides in the fact that only a small part of the damming screen is exposed to the heat of the fire at one time and only for a comparatively short period of its travel; and, as the heated part turns from the fire, it is cooled through the major part of its travel around its supporting drums. Through the narrow spaces formed between the several sections of the damming member and between said sections and the wall of the fire-place, and also through the foraminated wall of the drums 72, a small quantity of air flows to the fire-place, which draft has a cooling effect on the screens. It will be understood, however, that in some cases a means for preventing access of air is preferred, such as a pivoted plate 74 and the frame or box 62, which will cover the openings between the screens and between the drums 71 and 72. In addition, these frames serve to steady the damming screens.

In Figs. 8 to 10, inclusive, is shown a modified form in which the damming member consists of a series of cylindrical drums 75 supported on rollers 76 secured to a shaft 77, said shaft 77 and its driving-means being mounted on the rocker-arms and being in all respects similar to the corresponding parts shown in the forms heretofore described. To said shaft 77 are secured gear-wheels 78 which are in driving engagement with internal gears 79 fixed to the drums 75. The cylindrical walls of these drums 75 are preferably foraminated, while preferably within the drums there is placed a plurality of steel balls 80 to disintegrate any slag which might get into the drums. The ends of the drums 75 are preferably closed by foraminated disks 81 supported on the shaft 77 and loosely guided in suitable grooves formed around the inside of the drums.

In Fig. 8 is shown a modified form of the means for preventing the admission of air, consisting of a pivoted plate 82 (similar to plate 74, Fig. 5) carrying at its free end a pressure-roller 83 bearing on the drums 75. In Figs. 9 and 10, this pressure-roller 83 is shown supported upon the shaft 77. The pivoted plate 82 can also be provided with end-wings 84 to prevent excess of air entering the fire-box at the ends of the damming-member, as shown in Fig. 8.

In some cases, it is preferred to provide a spray-pipe 85 (Figs. 1 and 2), through which a cooling medium may be supplied to the damming-member.

What I claim is:

1. In combination with a traveling-chain grate, an endless traveling-surface dam pivoted on a rocking support above the rear end of the grate surface, and means for driving

said dam from the rear shaft of the grate.

2. In combination with a traveling-chain grate, an endless traveling-surface dam supported above the rear end of the grate surface, and means for driving said dam from the rear shaft of the grate, said driving means embodying devices whereby the direction of movement of the dam may be reversed.

3. In combination with a traveling-chain grate, an endless traveling-surface dam mounted above the rear end thereof, and means whereby the dam may be continuously driven in either direction.

4. In combination with a traveling-chain grate, a rocking-frame mounted to the rear of said grate and carrying at its forward end an endless traveling-surface dam and at its rear end beyond its pivot an adjustable weight, and means for driving said dam from the grate-driving mechanism.

5. The combination with a traveling-chain grate, of a rocking-frame mounted to the rear of the grate, an endless traveling-surface dam mounted on the forward end of said rocking-frame and adapted to swing toward and from the grate, an adjustable weight at the rear end of said rocking-frame to counter-balance the dam, means whereby said rocking-frame may be raised or lowered at its forward end and supported in its adjusted position, and means for driving said dam from the grate-driving mechanism.

6. The combination with a traveling grate having a drive-shaft carrying sprocket-wheels, of a supporting-shaft mounted to the rear of said grate, a rocking-frame mounted on the said supporting-shaft carrying at its rear end an adjustable weight and at its forward end a dam-supporting shaft carrying sprocket-wheels and an endless traveling-surface dam supported immediately above the rear end of the grate, means for driving said dam from the rear drive-shaft of the traveling grate embodying sprocket-wheels on said supporting-shaft and sprocket-chains connecting said sprocket-wheels with the sprocket-wheels on the drive-shaft of the grate and also on the dam-supporting shaft, a reversing mechanism on said rocking-frame, and manually-operable means for putting the direct drive into action or the reversing drive into action.

7. In combination with a traveling-chain grate, an endless traveling-surface dam and means for yieldingly supporting it just above the rear end of said grate, means for adjusting the dam to various heights, means for varying the pressure of the dam toward the grate, and means for driving the dam from the grate-driving mechanism in all positions of the dam.

8. In combination with a traveling-chain grate, an endless traveling dam supported above the rear-end of the grate surface and

consisting of a flexible damming member and a driving support therefor.

9. In combination with a traveling-chain grate, an endless traveling dam supported above the rear-end of the grate surface and consisting of a pair of rotary drums and a flexible damming member mounted on said drums.

10. In combination with a traveling-chain grate, an endless traveling dam supported above the rear-end of the grate surface and consisting of a pair of rotary drums and chains mounted on said drums to provide a damming screen.

11. In combination with a traveling-chain grate an endless traveling dam supported above the rear-end of the grate surface, and pivoted means for supporting said endless traveling dam to permit it to be moved away from the grate surface, said dam embodying a pair of rotary drums and a flexible damming member mounted on said drums to provide a damming screen.

12. In combination with a traveling-chain grate, an endless traveling dam pivoted on a rocking frame above the rear end of the grate surface, and means for driving said dam from the rear shaft of the grate including a driving mechanism carried by said rocking frame.

13. In combination with a traveling-chain grate, an endless traveling dam pivoted on a rocking frame above the rear end of the grate surface, and means for driving said dam alternatively in opposite directions including a direct driving and a reversing mechanism carried by said rocking frame.

14. In combination with a traveling-chain grate, an endless traveling dam pivoted on a rocking frame above the rear end of the grate surface, means for driving said dam alternatively in opposite directions including a direct driving and a reversing mechanism

carried by said rocking frame, and a manual control means for shifting said direct driving mechanism into and out of connection with said reversing mechanism.

15. In combination with a traveling-chain grate, an endless traveling dam pivoted on a rocking frame above the rear end of the grate surface, means for driving said dam from the rear shaft of the grate including a driving mechanism carried by said rocking frame, and an adjustable stop means engaging said rocking frame for limiting the downward movement thereof toward the grate.

16. In combination with a traveling-chain grate, an endless traveling dam pivoted on a rocking frame above the rear end of the grate surface, means for driving said dam from the rear shaft of the grate including a driving mechanism carried by said rocking frame, and an adjustable stop means engaging said rocking frame for limiting the downward movement thereof toward the grate, said stop means comprising pivoted cams engaging the underside of a portion of the rocking frame.

17. In combination with a traveling-chain grate, a rocking frame mounted to the rear of said grate and carrying at its forward end an endless traveling dam and at its rear end beyond its pivot an adjustable counter-balancing means, means for driving said dam from the grate-driving mechanism, and means partly located on the pivotal axis of the rocking frame for controlling the adjustments of the counter-balancing means.

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

DR. ADOLF SCHNEIDER.

Witnesses:

JOSEF SCHRECKENBERGER,
STEFANIE SCHERER.