F. GIRTANNER.

CHAIN GRATE.

APPLICATION FILED JAN. 8, 1910.

1,001,385.

Patented Aug. 22, 1911.

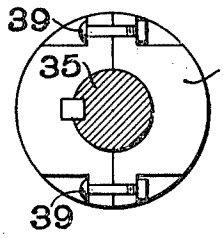

Fig. 6.

Fig. 1.

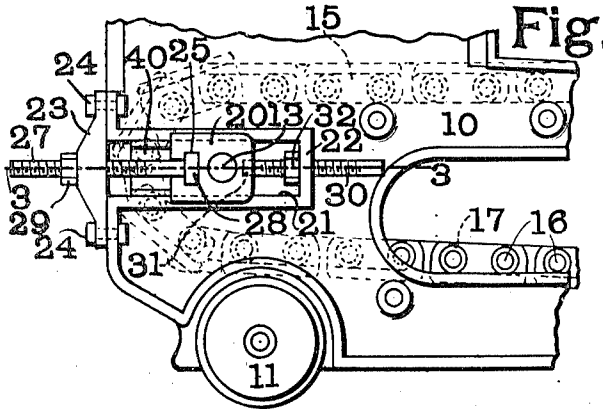

Fig. 2.

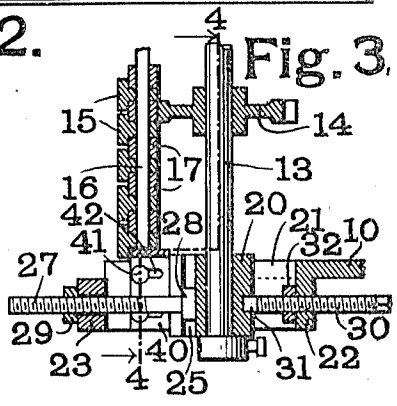

Fig. 3.

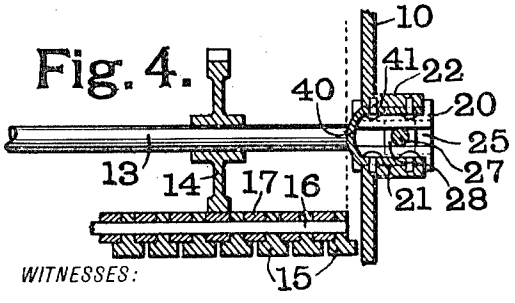

Fig. 4.

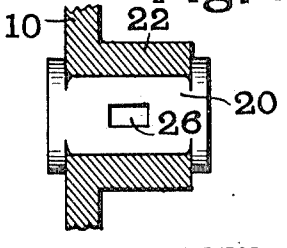

Fig. 5.

WITNESSES:

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UNITED STATES PATENT OFFICE.

FREDERICK GIRTANNER, OF ST. LOUIS, MISSOURI, ASSIGNOR TO LACLEDE-CHRISTY CLAY PRODUCTS COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

CHAIN-GRATE.

1,001,385. Specification of Letters Patent. Patented Aug. 22, 1911.

Application filed January 8, 1910. Serial No. 537,036.

To all whom it may concern:

Be it known that I, FREDERICK GIRTANNER, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Chain-Grate, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a chain grate and more particularly to mechanism for taking up the slack in the chain when the chain wears.

Heretofore, as far as I am aware, chain grates have either been without means for taking up the slack in the chain or where such means are provided they are applied to the rear shaft over which the chain runs and consequently the fire must be drawn in the furnace and the grate removed therefrom before the adjustment for slack can be made.

The object of my invention is to provide means whereby the slack of the chain can be taken up by adjustment made at the forward end of the grate so that it is not necessary to remove the grate from the furnace in order to make the adjustment.

In the accompanying drawings which illustrate so much of the chain grate as is necessary to set forth my invention, Figure 1 is a side elevation of the front end of the grate mechanism; Fig. 2 is a view similar to Fig. 1 but looking from the opposite side; Fig. 3 is a section on the line 3—3 of Fig. 2; Fig. 4 is a section on the line 4—4 of Fig. 3; Fig. 5 is a sectional view showing a detail of construction, and Fig. 6 is an enlarged view showing a modified form of collar for the worm.

Like marks of reference refer to similar parts in the several views in the drawings.

10 represents the frame of the grate mechanism. This frame 10 is provided with wheels 11 running on a track 12. Carried in the forward end of the frame 10 is a driving shaft 13 on which is mounted sprocket wheels 14 driving the chain which forms the grate proper. The chain is composed of links 15 passing laterally through which are rods 16 forming pivots for the links of the chain. The links 15 are separated by distance pieces 17 surrounding the rods 16, as shown in Figs. 3 and 4. All the above parts may be of any usual and well known construction.

In order to provide means for adjusting the driving shaft 13 relative to the frame 10 in order to take up the slack of the chain I mount the said shaft 13 in boxes 20 sliding in guide-ways 21 formed in the forward end of the frame 10. These guide-ways 21 are open at their forward ends and are surrounded upon the other three sides by flanges 22. The forward open end of each of the slots 21 is closed by means of a yoke 23 held in position by bolts 24. Each of the bearing blocks 20 is provided at one side with a T-shaped slot 25 and at the other with an angular opening 26. A bolt 27 has a head 28 which is inserted in the T-shaped slot 25 while the stem of the bolt passes through an opening in the yoke 23 and is provided with a nut 29 by means of which the bolt and consequently the bearing block 20 may be drawn toward the forward end of the frame.

In order to provide additional means for holding the block 20, a bolt 30 having a square end 31 passes through the flange 22 and has the square end 31 inserted into the angular opening 26 in the block 20. A nut 32 is placed around the bolt between the block and the flange 22 so as to bear against the flange. By adjusting this nut 32 the bolt 30 assists the bolt 27 in holding the block 20 in its adjusted position. At one side of the frame 10 the shaft 13 is provided with a worm wheel 33. This worm wheel 33 is driven by a worm 34 slidingly mounted upon a shaft 35. This shaft 35 is journaled in bearings 36 and is driven by a ratchet mechanism 37 as shown in Fig. 1. When the shaft 13 is adjusted in the frame 10 it is necessary to also adjust the worm 34 longitudinally of the shaft 35 in order to have the worm properly coöperate with the worm wheel 33. In order to do this I place around the shaft 35 at each end of the worm 34 and between the said worm and the bearings 36 a number of short collars 38. When the shaft 13 is adjusted to take up the slack the shaft 35 may be removed from the bearings 36 and one or more of the collars 38 shifted from one end of the worm 34 to the

other so as to move the worm longitudinally of the shaft 35 and bring it in proper position to coöperate with the worm wheel 33. The collars 38 however, may be split as shown in Fig. 6 and the two halves secured around the shaft 35 by means of bolts 39 so that the collars may be transferred from one side of the worm 34 to the other without removing the shaft from the bearings.

The rods 16 which pass laterally through the chain are not positively fastened but are held against longitudinal movement by the frame 10. These rods, however, must pass the slot 21 formed in the frame and in order that they may not move laterally into the slot and thus stop the chain it is necessary to provide each of the slots with a guard-plate 40, as best shown in Figs. 3 and 4. This guard-plate 40 is slightly curved as shown in Fig. 4 so that if any of the rods 16 move laterally they will be guided back into their proper position by the plate. The plate 40 is held in position by means of screws 41 which pass through slots 42 in the plate 40 so that the plate may move along the slot when the boxes 20 are adjusted.

It will be seen that by my arrangement the slack in the chain may be taken up from the front end of the grate so that it is not necessary to withdraw the grate from the furnace and at the same time the driving mechanism for the grate is not interfered with.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is:

1. The combination with a frame, of boxes adjustably carried by said frame, a shaft journaled in said boxes, a chain grate on said shaft, a worm wheel on said shaft, a worm engaging with said worm wheel, and collars arranged at each end of said worm, said collars being adapted to be shifted from one end of the worm to the other to adjust said worm in the direction of the length of its shaft.

2. The combination with a frame provided with guide-ways open at one end and having flanges at the other, of boxes slidingly mounted in said guide-ways and each provided at one side with a T-shaped slot and at the other with an angular opening, yokes closing the open ends of said guide-ways, bolts engaging said slots and passing through said yokes, other bolts passing through said flanges and engaging said angular openings, nuts engaging said bolts, a shaft journaled in said boxes, and a chain grate carried on said shaft.

3. The combination with a frame provided with guide-ways, of boxes adjustably mounted in said guide-ways, a shaft journaled in said boxes, a chain grate carried by said shaft, and a guard-plate in each of said guide-ways, said guard plate being arranged adjacent to the path of the ends of the cross rods of said chain, whereby said cross rods are prevented from entering said guide-ways.

4. The combination with a frame provided with guide-ways, of boxes adjustably mounted in said guide-ways, a shaft journaled in said boxes, a chain grate carried by said shaft, and a guard-plate adjustably mounted in each of said guide-ways, said guard plates being arranged adjacent to the path of the ends of the cross rods of said chain, whereby said cross rods are prevented from entering said guide-ways.

In testimony whereof, I have hereunto set my hand and affixed my seal in the presence of the two subscribing witnesses.

FREDERICK GIRTANNER. [L. S.]

Witnesses:
W. A. ALEXANDER,
ELIZABETH BAILEY.