

No. 879,908.

PATENTED FEB. 25, 1908.

W. O. ROOT.  
FURNACE GRATE.

APPLICATION FILED JULY 28, 1906.

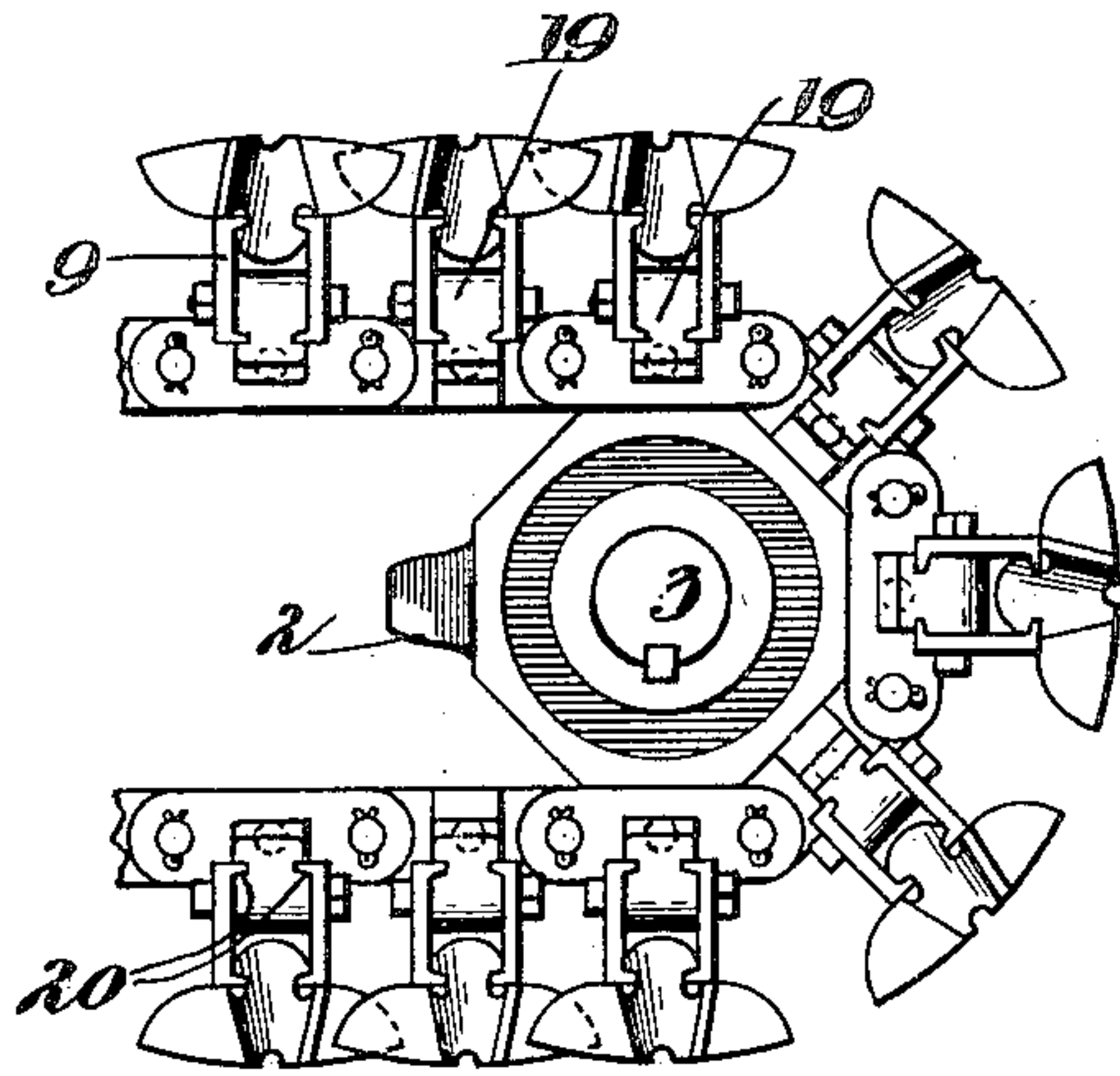
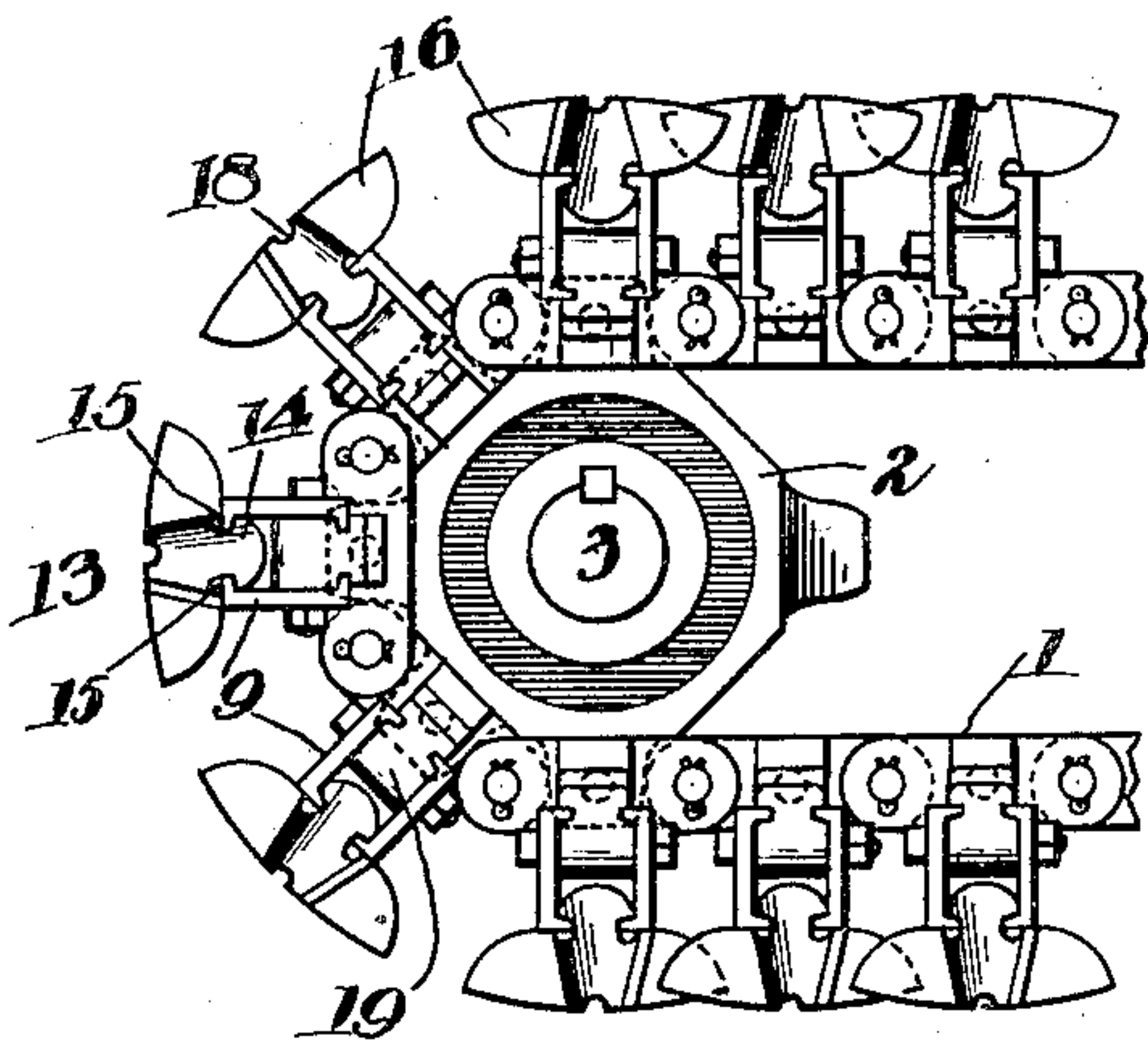


Fig. 1

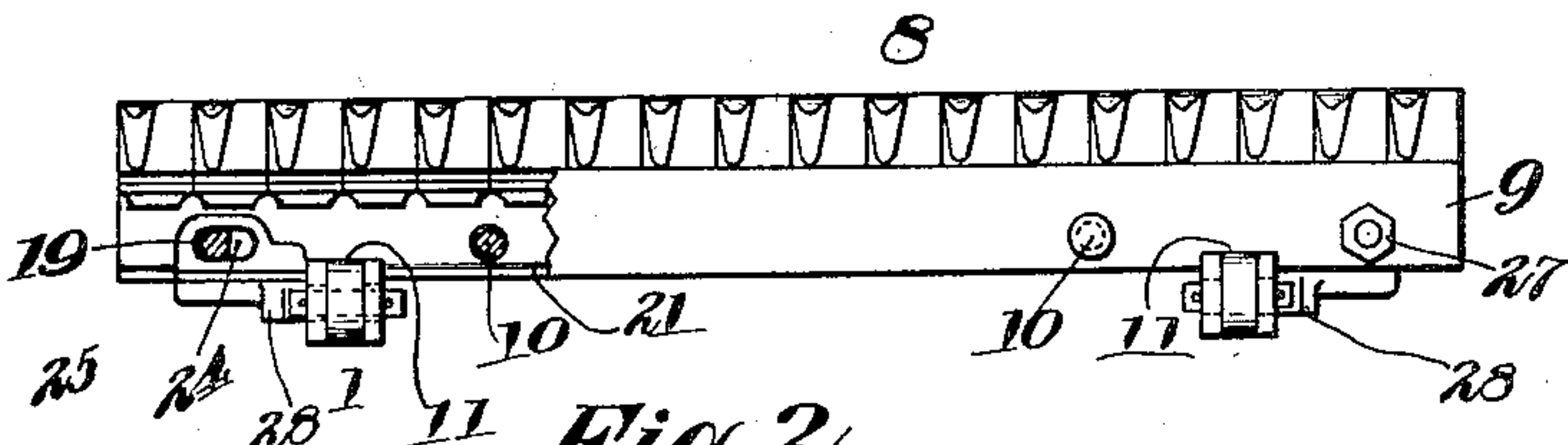


Fig. 2

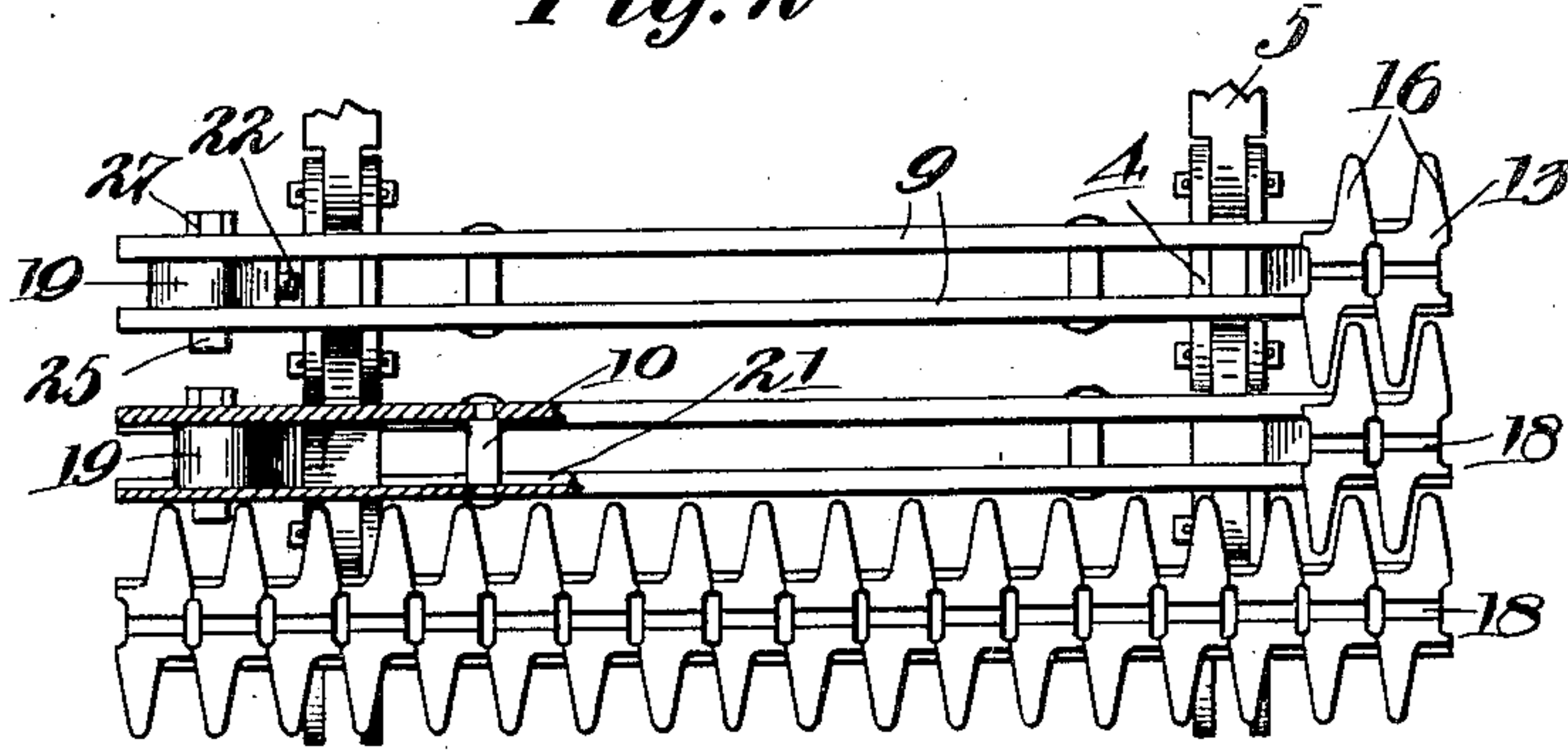


Fig. 3

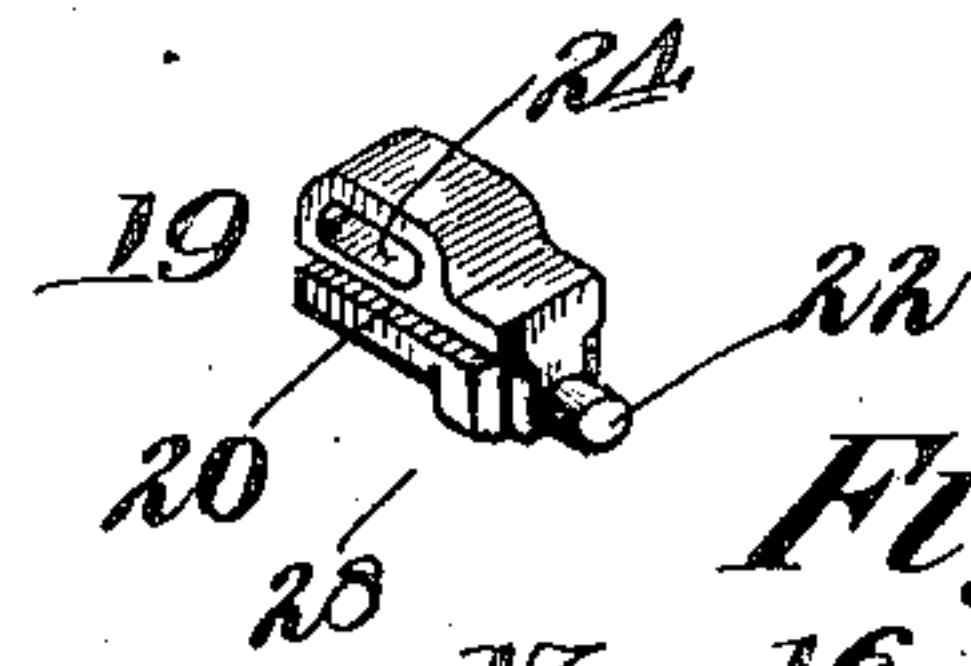


Fig. 4

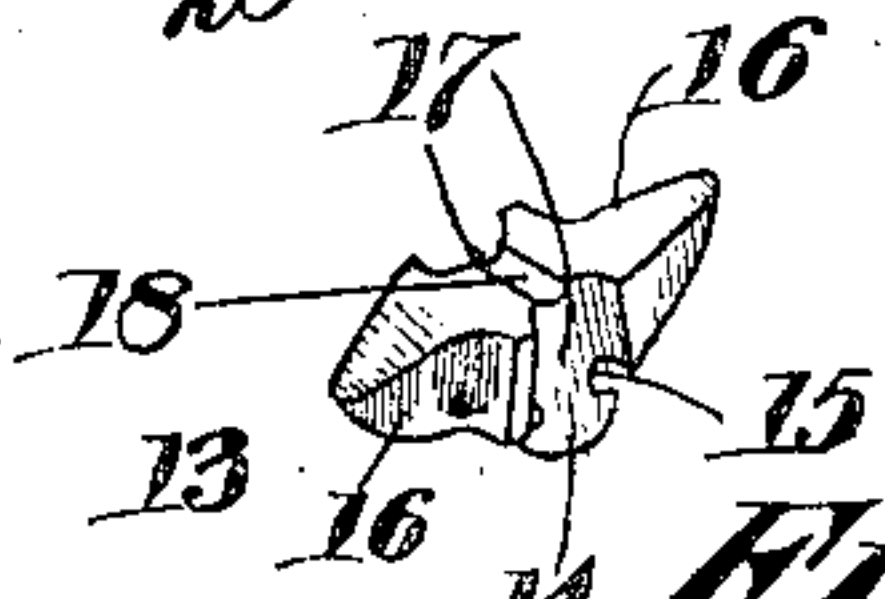


Fig. 5

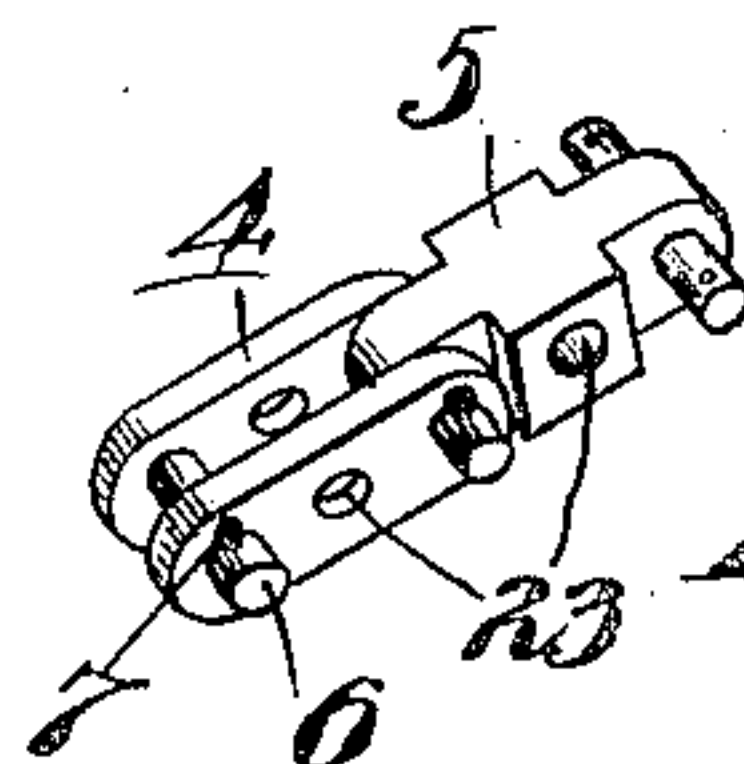


Fig. 6

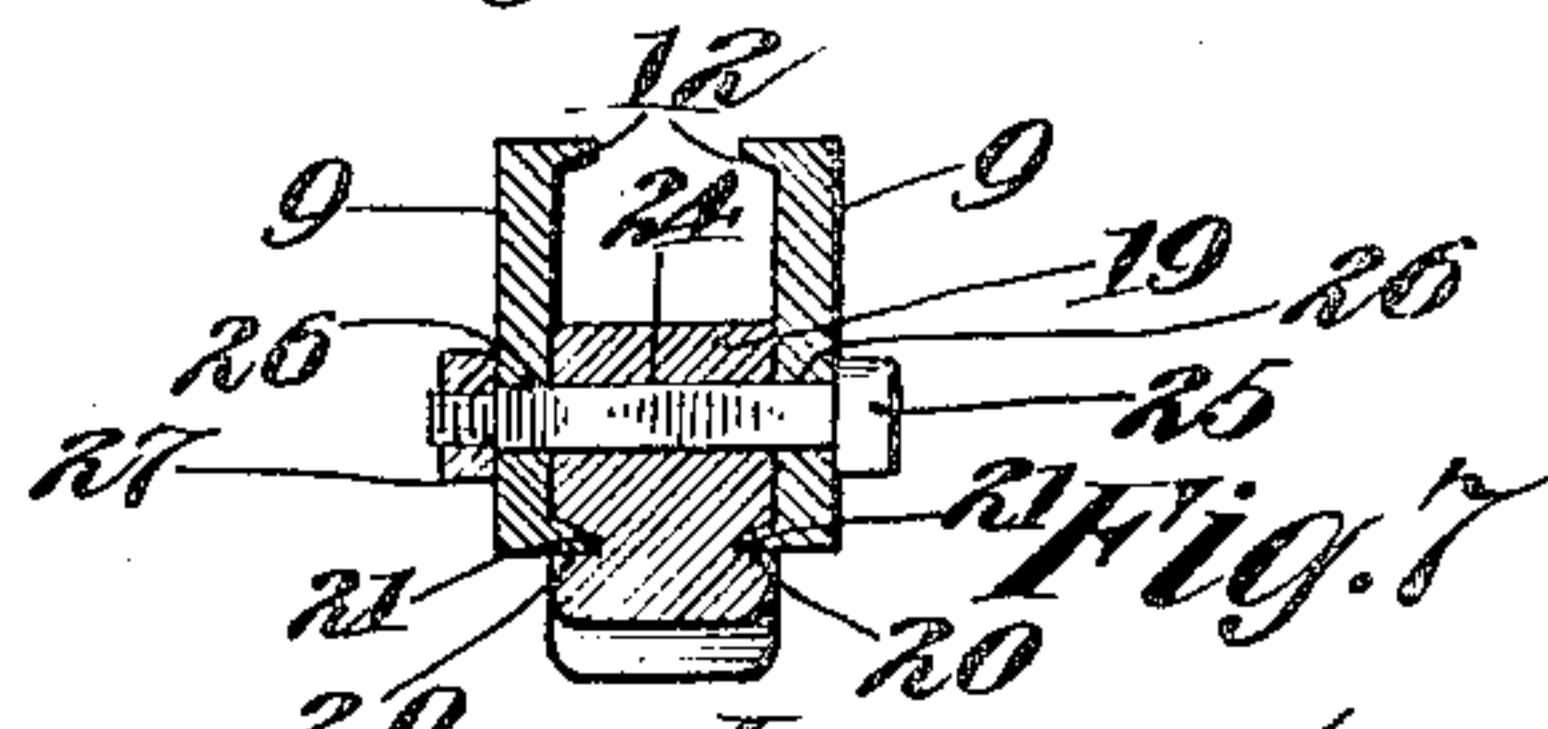


Fig. 7

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# UNITED STATES PATENT OFFICE.

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## FURNACE-GRATE.

No. 879,908.

Specification of Letters Patent.

Patented Feb. 25, 1908.

Application filed July 28, 1906. Serial No. 328,253.

*To all whom it may concern:*

Be it known that I, WESLEY O. ROOT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Furnace-Grates, of which the following is a specification.

This invention relates to furnace grates and more particularly to the traveling chain grates used in connection with mechanical stokers.

One of the objects of this invention is the provision of a sectional grate bar for traveling chain grates, adapted to permit of readily replacing a damaged section with a new section.

Another object of the invention is to make all of the sections of the grate bar interchangeable.

A further object of the invention is to make each grate bar as a whole readily removable from the grate.

The invention also relates to the other improvements in furnace grates hereinafter set forth.

In the accompanying drawings, Figure 1 is a fragmental side elevation of a furnace grate embodying the features of my invention. Fig. 2 is a transverse vertical section through said grate. Fig. 3 is a fragmental top plan view of the grate. Fig. 4 is a detail perspective view of one of the parts by means of which the grate bars are attached to the traveling chains. Fig. 5 is a perspective view of one of the grate-bar sections. Fig. 6 is a detail perspective view of two links of one of the chains comprised in the grate. Fig. 7 is a transverse section through one of the grate bars.

I have herein illustrated my invention as applied to a traveling chain grate, and have omitted from the drawings the furnace walls and other parts usual in furnaces. The grate comprises two endless chains 1 supported upon sprocket wheels 2 fixed upon shafts 3, one of which shafts is arranged to be rotated by any suitable or convenient means (not herein shown). Each of the chains 1 is made up of links 4 and 5 connected by means of pivot pins 6, said pins being held in place by cotters 7. It will thus be seen that the chains may be taken apart at any point in their lengths for the removal of a broken or injured link and the substitution of a new link. To each of these links is detachably secured a grate bar 8, said grate bar compris-

ing two channel bars 9 spaced apart and secured together in parallel position by means of shouldered rivets 10. (Fig. 3).

The edges of the channel bars 9 at one side are notched, as at 11, to fit over the chains 1. The channel bars 9 are arranged with their flanged sides facing each other, and between the flanges 12 at one side of the grate bar formed by said channel bars is secured a plurality of grate-bar sections 13, each of said sections comprising a securing shank 14 having grooves 15 at its opposite sides to receive the flanges 12 of the channel bars 9. Each grate-bar section 13 further comprises two wings 16, each located slightly to one side of the longitudinal central line of the section and on opposite sides of said line. In its opposite sides each grate-bar section has recesses 17, and in its upper surface is formed a transverse groove 18. The grate-bar sections 13 are put in place upon the channel bars 9 by sliding said sections onto the flanges 12 from either end of said channel bars. By referring to Fig. 3, it will be seen that when the grate-bar sections 13 are assembled upon the channel bars 9, the wings 16 intermesh loosely with the similar wings of the sections 13 of adjacent grate-bars. The spaces between the adjacent wings 16, the recesses 17 and the grooves 18 form air spaces for the passage of air to the fire, but said spaces are sufficiently small to prevent any considerable quantity of fuel from falling through the grate. As the grate-bar 8 consists substantially of the two channel bars 9 spaced apart, air is permitted to circulate freely through said grate bar to support combustion and to prevent the grate bar from becoming unduly heated. It will be seen that the two longitudinal halves of each grate-bar section are similar, thus permitting of placing the grate-bar section upon the channel bars 9 with either side toward said channel bars.

The means for securing the grate bars 8 to the chains 1 comprises blocks 19 having grooves 20 in their opposite sides to receive the flanges 21 of the channel bars 9. Each block 19 has a stud 22 at one end adapted to enter an opening 23 formed in each of the links 4 and 5 of the chains 1. In the portion of the block 19 lying between the channel bars 9 is formed an elongated opening 24 adapted to receive a bolt 25 extending through registering square openings 26 in



said channel bars (Fig. 7). The bolt 25 except at the threaded portion is square in cross-section to prevent its rotation when the nut 27 is turned upon said threaded end.

5 At each side of the block 19 near the stud 22 is a lug 28 for a purpose to appear hereinafter.

In use, when a grate-bar section 13 has become injured by reason of the intense heat of the furnace or from any other cause, 10 said section may be removed from the grate-bar of which it is a part when said grate-bar, in the travel of the grate, arrives at the outer side of one of the sprocket wheels 2. At such time the radial position of the grate 15 bar with relation to the sprocket wheel separates the grate-bar sections 13 of said grate bar from the sections 13 of the adjacent grate-bars, and permits of sliding the damaged grate-section and the sections to 20 one side of said damaged section toward one end of the grate bar until the injured section can be removed. A new section is then substituted for the damaged one and the other sections replaced. Should it be desirable to remove the entire grate bar, the 25 nuts 27 are slackened until the blocks 19 by means of which the grate bar is attached to the chains 1 can be slid in opposite directions toward the end of the grate bar to withdraw 30 the studs 22 from the openings 23. The blocks 19 may be so slid by means of a pinch-bar or other suitable implement inserted beneath the lugs 28 and fulcrumed upon the adjacent link of the chain. When the studs 22 35 have been separated from the chains 1 the grate-bar 8 may be lifted bodily from the chains 1. In replacing the grate-bar the bar is fitted on the chains, the blocks 19 moved inward until the studs 22 enter the openings 40 23, and the nuts 27 tightened to hold said blocks in engagement with the chains.

It is obvious that various changes in the construction and arrangement of the parts of the present embodiment may be made without departing from the spirit of the invention. I, therefore, desire not to limit myself to the precise details herein set forth.

I claim as my invention:

1. A grate bar comprising two bars; means 50 for securing said bars together in parallel position and spaced apart, said bars having flanges at their lower edges; means adapted to slidably engage said flanges for securing the grate bar in place in the grate; and means 55 for releasably clamping said securing means and said grate bar together.

2. A grate bar comprising two bars; shouldered rivets for securing said bars together in parallel position and for spacing 60 them apart, said bars having flanges at their lower edges; means adapted to slidably engage said flanges for securing the grate bar in place in the grate; and means for releasably clamping said securing means and said 65 grate bar together.

3. A grate bar comprising two channel bars, means engaging the flanges at one side of said bars for securing the grate bar in place in the grate, means for releasably clamping 70 said engaging means and said channel bars together; and members forming the grate surface, and provided with shanks adapted to lie between the other flanges of said channel bars.

4. A grate comprising two traveling 75 chains, a plurality of grate bars, blocks adapted to releasably engage said chains and means for releasably securing said blocks to said grate bars.

5. In a grate, in combination, two chains 80 having openings therein; a grate bar; and two blocks adapted to be movably secured to said grate bar, said blocks having studs thereon adapted to lie in said openings.

6. In a grate, in combination, two chains 85 having openings therein; a grate bar; and two blocks adapted to be movably secured to said grate bar, said blocks having oppositely extending studs thereon adapted to lie in said openings, said studs entering said 90 chains from opposite sides of said chains.

7. In a grate, in combination, two chains having openings therein; a grate bar; two blocks having studs thereon adapted to lie in the openings in said chains, said blocks 95 having elongated openings extending there-through; and a bolt extending through said grate bar and the elongated opening in each of said blocks.

8. In a grate, in combination, two chains; 100 a grate bar comprising two bars having flanges thereon; blocks having grooves therein adapted to receive said flanges, said blocks being adapted to engage said chains; and means for securing said blocks with relation 105 to said grate bar.

9. In a grate, in combination, two chains; a grate bar comprising two bars having flanges thereon; two blocks adapted to lie 110 between said bars, said blocks having grooves in their sides to receive said flanges; a bolt extending through said bars and each of said blocks; and means for attaching said blocks to said chains.

10. In a grate, in combination, two chains 115 having openings therein; a grate bar comprising two bars having flanges thereon; two blocks adapted to lie between said bars, having grooves in their sides to receive said flanges, each block having an elongated opening 120 therethrough; a bolt extending through said bars and the elongated opening in each of said blocks; and a stud on each of said blocks adapted to enter one of the openings in each of said chains.

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