D. DEE.

GRATE BAR.

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1,064,820.

Patented June 17, 1913.

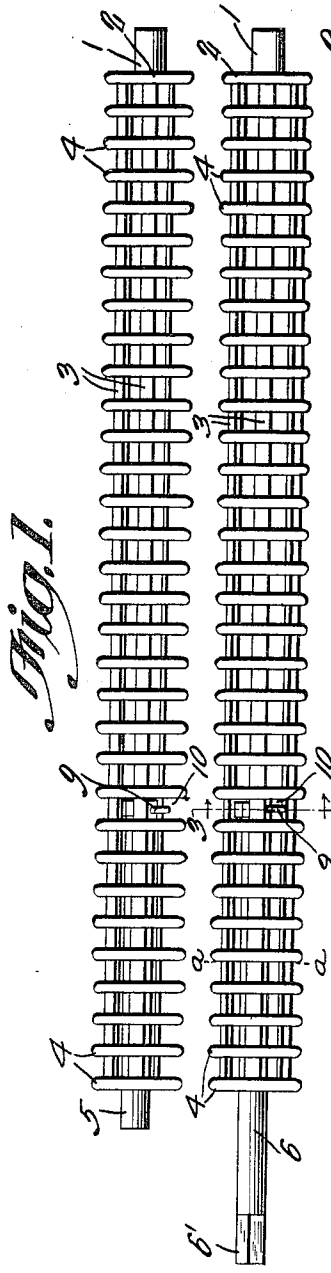

Fig. 1.

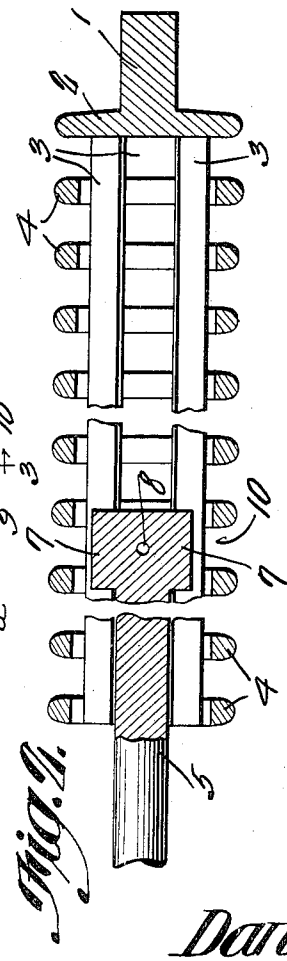

Fig. 2.

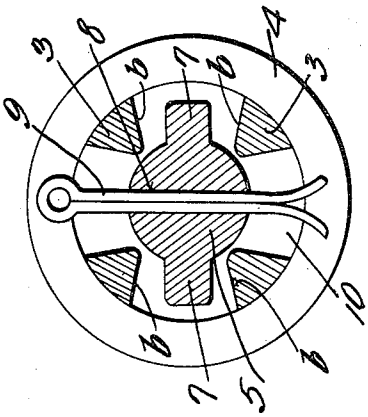

Fig. 3.

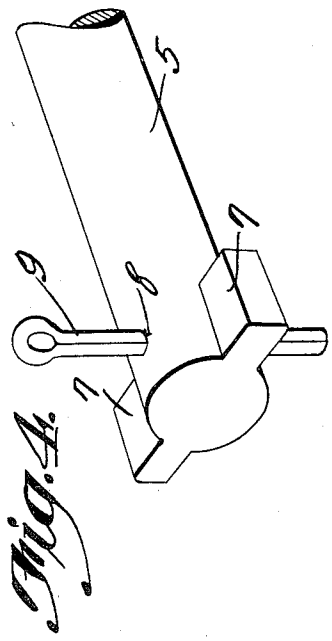

Fig. 4.

Witnesses

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UNITED STATES PATENT OFFICE.

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GRATE-BAR.

1,064,820. Specification of Letters Patent. Patented June 17, 1913.

Application filed November 9, 1912. Serial No. 730,450.

To all whom it may concern:

Be it known that I, DANIEL DEE, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented a new and useful Grate-Bar, of which the following is a specification.

The present invention relates to improvements in grate bars.

The primary object of the present invention is the provision of a rotatable grate bar, composed of a plurality of longitudinally spaced members which provide a proper supporting and yet grinding surface for the coal and ash, each of the respective grate bars being so constructed that the same may be shortened to accommodate the fire box in which they are to be mounted, there being a peculiar construction of removable journal adapted to be held in place by means of the respective longitudinally spaced members of the bar, the same being held against both independent longitudinal and rotary movement with relation to the grate bar.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings Figure 1 is a top plan view of two of the tubular grate bars disposed in coöperative relation without the necessary support. Fig. 2 is a horizontal sectional view through one of the bars, the same being foreshortened. Fig. 3 is a section taken on line 3—3 of Fig. 1. Fig. 4 is a perspective view of the grate bar engaging portion of the removable journal.

Referring to the drawings, each bar is cast integral and consists of the stationary or fixed stud or journaling pin 1 carried by the outer disk 2 of each bar and forming the support for the grate bar. This stud is mounted in any desired manner within the fire box so that the respective grate bars may be rotated. A plurality of longitudinal spaced members or ribs 3 which are formed preferably triangular in cross section as illustrated in Fig. 3, there being four of these ribs, are extended from the inner face of the disk 2 and at equi-distances throughout the length of the bar and formed integral with the ribs 3 are the longitudinally spaced rings 4, the opposite end of each bar being opened as clearly illustrated in Fig. 2.

When it is necessary to shorten any of the bars to fit them in the fire box, the ribs 3 are cut upon the line *a—a* of Fig. 1 near any one of the desired rings 4, thus shortening the grate bar as necessary, while in order to provide a journaling support for the open end of the bar, the respective pins 5 and 6, are provided. The pin 6 is provided with the shaker bar receiving end 6′, while the end of the rod or bar 5 is simply for journaling in the wall of the fire box.

Upon the inner end of the respective bars or rods 5 and 6 is provided the pair of oppositely disposed lugs 7, which are slidable into the open end of its respective grate bar and between the adjacent faces *b* of the four ribs 3, as clearly shown in Fig. 3, this positioning preventing the rotation of the respective rods 5 or 6 independently of the grate bar, and permitting rotation to be imparted to the grate bar when the rod 5 or 6 is rotated.

In order to retain the respective rods 5 or 6 against longitudinal movement relatively to its respective grate bar, an aperture 8 is formed in the end of the rod adjacent to the cross head formed by the lug 7, and when such aperture is disposed in alinement with the respective openings 10 formed between the ribs 3 and the adjacent rings 4 of the bar, a cotter pin 9 is disposed through the aperture 8, and projects to abut adjacent faces of the rings 4 and thus holds the rod 5 or 6 against longitudinal sliding movement.

From the foregoing description, taken in connection with the drawings it is evident that the respective grate bars may be cast in one regular length, and that it is only necessary to carry a single size in stock, and when the same are adapted to be fitted into the necessary fire boxes, the individual grate bars are shortened by cutting on any of the respective lines *a—a* of Fig. 1, so as to constitute the adjacent ring 4 of the end ring at the open end of the grate bar. The bars are all the same and therefore it is simply necessary to use the respective journaling and operating studs 5 or 6 which are mount-

ed as indicated in Figs. 1 and 3 and by reason of the cross head and the cotter pin are prevented both independent rotary and longitudinal movements relative to the bar so that when the operating rod 6 is actuated by a shaker crank, the respective grate bar is properly rotated, the rings 4 and ribs 3 constituting a means for assisting in grinding the ash to precipitate the same into the ash pit, while the apertures 10 formed throughout the bar provides a means for the proper introduction of the air draft which will assist in the combustion of the fuel.

What is claimed is:

1. A grate bar, composed of a plurality of spaced rings and a plurality of longitudinal ribs connected to and holding such rings in spaced relation, one end of the bar being provided with a solid disk having a centrally disposed journaling stud, a removable journaling stud mounted in the opposite open end of the bar, and means carried upon the inner end of the removable journaling stud for engagement with the ribs and rings to retain the journaling stud against longitudinal and circumferential movement independently of the grate bar.

2. A grate bar, composed of a plurality of integral longitudinally spaced rings and circumferentially disposed ribs, one end being sealed by a disk carrying a centrally disposed journaling stud; a removable journaling stud for the opposite end of the grate bar, insertible in said end, said stud being provided with a cross head to fit between the longitudinal ribs to retain the stud against independent rotation; and means carried by the stud for disposition between adjacent rings to prevent independent longitudinal movement of the stud.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

DANIEL DEE.

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