March 4, 1930. H. C. WOODBRIDGE 1,749,458

GRATE SHAKER

Filed June 1, 1926

Fig. 1

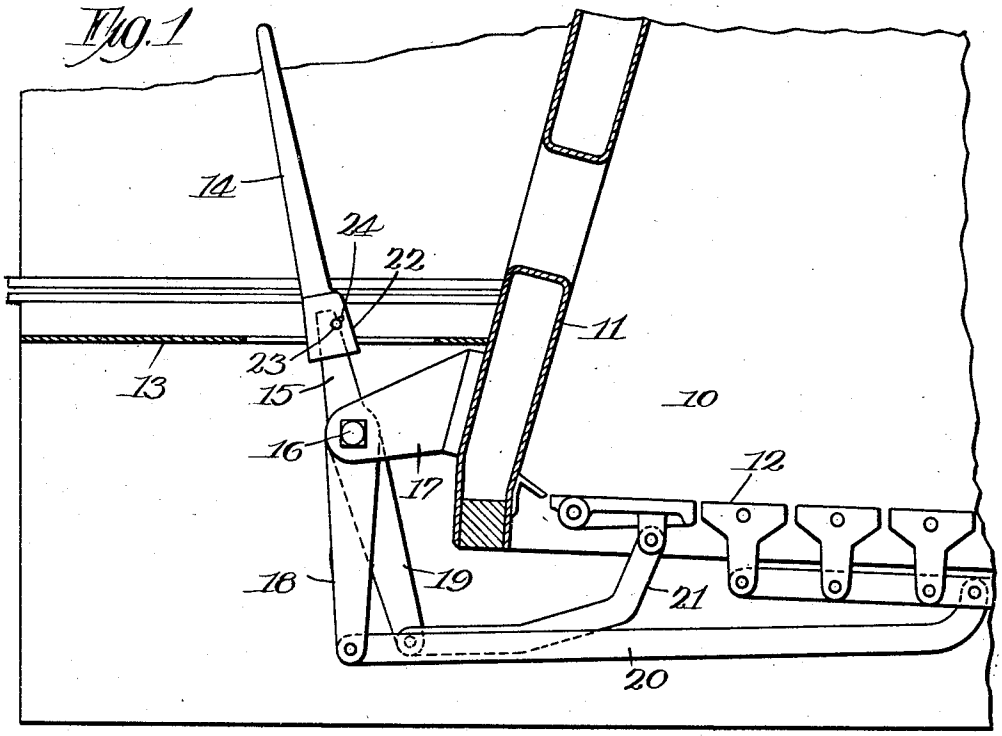



Fig. 2

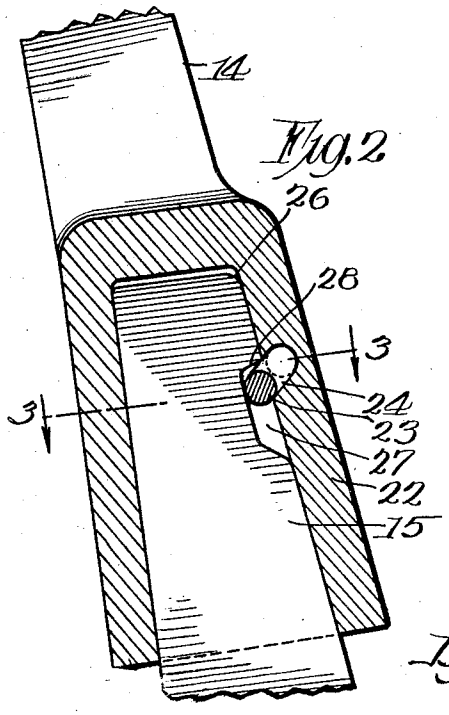
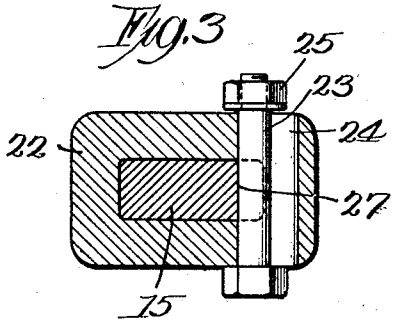



Fig. 3




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Patented Mar. 4, 1930 1,749,458

# UNITED STATES PATENT OFFICE

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## GRATE SHAKER

Application filed June 1, 1926. Serial No. 112,768.

The invention relates to improvements in the lever mechanism for shaking furnace grates, and is designed primarily for use in connection with locomotives.

In locomotive practice it is usual to rock the grate bars by means of a hand lever or bar adjustably applied to a crank-arm of a rocker shaft, which carries one or more additional arms which are connected with the grate elements by means of links. The hand bar, when in use, projects through the floor or deck of the cab, and inasmuch as the cab space is limited it is made removable in order that when not in use it may be stored out of the way. The hand bar is socketed to receive the end of the crank-arm to which it is applied, and as great force is usually necessary in rocking the grate bars the hand bar is liable to slip off the end of the crank-arm and the operator is in danger of bodily injury.

The object of the present invention is to provide a secure lock to retain the hand bar in connection with the crank-arm, such lock, however, being readily releasable.

An efficient embodiment of the invention is hereinafter described, and is illustrated in the accompanying drawings, in which—

Fig. 1 is a detail longitudinal vertical section of a locomotive through its fire-box and cab;

Fig. 2 is a detail, partly in section, showing the hand bar applied to the crank-arm; and

Fig. 3 is a sectional view on the line 3—3 of Fig. 2.

The fire-box of a locomotive is indicated at 10; its back-head at 11; its grate bars at 12; and its cab floor or deck at 13. The grate bars are of the rocking type, and are turned by means of the hand bar 14, which fits upon a crank-arm 15, carried by a rocker shaft 16 journaled in suitable brackets, as 17, secured to the back-head 11. One or more crank arms, as 18, 19, depend from the shaft 16 and are connected directly or indirectly to the grate bars by means of links 20, 21. The upper end of the crank arm 15 is somewhat tapered, and the hand bar 14 is provided with a head 22, having a complementary socket for fitting upon the crank-arm.

As thus far described the parts are all of ordinary form.

The locking element consists of a rod 23, in the form of a headed bolt which sets through an oblique slot 24 in the head 22, and is loosely held in place by means of a nut 25, thereby permitting the bolt to freely slide laterally within the slot. The upper end of the slot 24 forms a recess within a side wall of the socket of the head 22, and said slot extends downwardly beyond the inner face of this wall.

The bolt 23 is carried by gravity to the lower end of the slot 24 when the bar 14 is raised to vertical position, thus crossing the socket of the head 22. As the head 22 is applied to the arm 15, the bolt is crowded back into the upper end of the slot 24, the upper corner 26 of the arm 15 being somewhat rounded to insure this action.

The arm 15 is laterally recessed, as shown at 27, to receive the bolt 23 when the hand bar has been properly adjusted to service position. The upper end of the recess 27 terminates in a somewhat abrupt shoulder 28, sufficiently inclined to permit the manual withdrawal of the bolt 24 but not of sufficient inclination to cause a camming action on the bolt.

When the parts have been assembled for service the bar 14 is securely locked against removal from the crank arm 15 either accidentally or intentionally, and the danger of separation of the parts, which has been a cause of not infrequent accidents, is effectually prevented.

When the shaking operation has been completed the operator by hand moves the bolt upwardly in the slot 24, thereby permitting the free removal of the hand bar 14. The lock is therefore automatic in application but requires manual release.

The construction illustrated and described is exceedingly simple and highly efficient, but the invention is capable of embodiment in other forms.

I claim as my invention—

In a grate shaking mechanism, in combination, a swinging lever having an instanding backwardly facing substantially abrupt

shoulder adjacent its outer end, an extension bar having an end socket for receiving the outer end of the lever and an oblique transverse slot opening through opposite walls of the socket and extending into a connecting wall to form a recess therein, the inner end of the slot being inclined toward the open end of the socket, and a pin laterally slidable in the slot into a position within said recess within said connecting wall or into a position engageable with said shoulder for preventing the removal of said lever when the parts are assembled.

In testimony whereof I affix my signature.

HOWARD C. WOODBRIDGE.