(Model.)

W. H. BUTTERWORTH & J. BUTTERWORTH, Jr.

TOOTH FOR THE CYLINDERS OF THRASHING MACHINES.

No. 415,136. Patented Nov. 12, 1889.

Fig. 1.

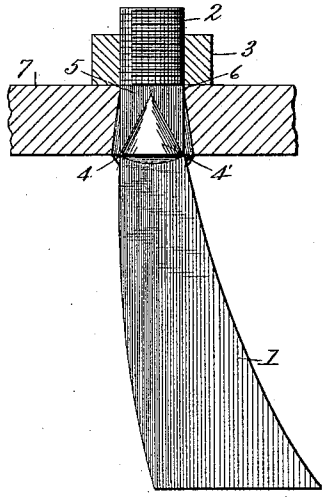


Fig. 2.

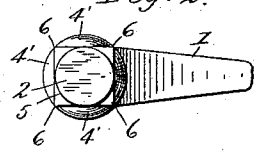


Fig. 3.

Fig. 4.

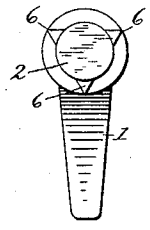


Fig. 5.

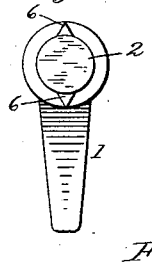


Fig. 6.

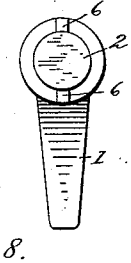


Fig. 7.

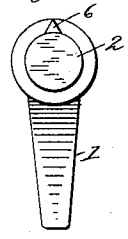
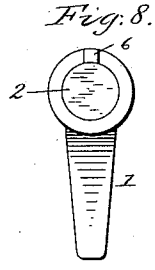


Fig. 8.



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UNITED STATES PATENT OFFICE.

WILLIAM H. BUTTERWORTH AND JOHN BUTTERWORTH, JR., OF TRENTON, NEW JERSEY.

TOOTH FOR THE CYLINDERS OF THRASHING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 415,136, dated November 12, 1889.

Application filed May 23, 1889. Serial No. 311,776. (Model.)

To all whom it may concern:

Be it known that we, WILLIAM H. BUTTERWORTH and JOHN BUTTERWORTH, Jr., citizens of the United States, residing at Trenton, in the county of Mercer and State of New Jersey, have invented certain new and useful Improvements in Teeth for the Cylinders of Thrashing-Machines; and we 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.

Our invention relates to improvements in spikes or teeth for the cylinders of thrashing-machines, the object being to provide teeth which shall be accurately or perfectly fitted or seated in the openings in the cylinder-bars, which shall always be held in an upright position, and which shall be able to withstand the severe strains to which they are always subjected during the operation of thrashing.

As now ordinarily constructed, thrasher-teeth are provided with nearly-square shoulders intermediate of the blades and shanks; but owing to inherent faults of manufacture they have a slight taper, which results in imperfect seating in the cylinder-bars; besides, as the flanges of said shoulders are small and only on the concaved sides of the teeth, the latter, when screwed tightly in the openings in the bars, are drawn downward, which often results in curving their cylindrical screw-threaded shanks; also, as the full force of the power applied for doing the thrashing comes almost wholly upon the convex sides of the teeth, immense strain is produced upon their shanks, binding-nuts, and flanges, which in a short time causes said binding-nuts to become loose, work off the shanks, and permit the teeth to be shot or violently thrown out of the cylinder by centrifugal force, thus endangering the lives of the workmen and often seriously damaging or injuring the machine.

Our invention is designed to remedy these and other defects; and it consists, first, of a thrasher-tooth composed of a blade, a screw-threaded shank for receiving a binding-nut, and a conical seat having a series of plano-conical shoulders arranged intermediate of said shank and blade, and adapted to fit in corresponding recesses formed in the walls of the opening in the cylinder-bar; second, of a thrasher-tooth composed of a blade, a screw-threaded shank for receiving a binding-nut, and a conical seat having one or more angular corners or projections, and also a series of plano-conical shoulders arranged intermediate of said blade and shank, and adapted to seat or fit in corresponding recesses formed in the walls of the opening in the cylinder-bar; third, of the combination, with a thrasher-tooth composed of a blade, a screw-threaded shank for receiving a binding-nut, and a conical seat having one or more angles or projections, and a series of plano-conical shoulders arranged intermediate of said blade and shank, of a cylinder-bar having an opening for receiving said shank, and a series of recesses corresponding to said angles and plano-conical shoulders of the tooth, and, fourth, of certain other novel features of construction and arrangement or combinations of parts, as will be hereinafter fully described, and then definitely pointed out in the claims.

In the accompanying drawings, forming part of this specification, in which the same reference-numerals designate the same or corresponding parts, Figure 1 represents a side elevation of a thrasher-tooth constructed according to our invention and applied to a cylinder-bar, the latter and the binding-nut being shown in section; Fig. 2, a rear end view of said tooth; Fig. 3, a sectional view of the cylinder-bar through the opening; and Figs. 4, 5, 6, 7, and 8, rear end views of modified forms of said tooth.

Referring to Figs. 1, 2, and 3 of the drawings, which show our preferred construction of thrasher-tooth, the reference-numeral 1 designates the blade of said tooth, which is substantially the same as in the ordinary construction, 2 the screw-threaded shank for receiving the binding-nut 3, and 4 the conical seat having four plano-conical shoulders 4′, which fit in corresponding recesses formed in the walls of the opening in the cylinder-bar. The conical seat 4, intermediate of the shank and blade of the tooth, is formed along its rear end with a squared portion 5, which has four corners or angular projections 6. This squared portion fits into a correspondingly-shaped aperture formed in the rear portion

of the opening in the cylinder-bar, the corners or angular projections thereon preventing the tooth from turning in said aperture. It is obvious that the part or portion 5, instead of being square or four-sided, may be made hexagonal, octagonal, or of any other angular configuration, in which case the number of corners or angular projections 6 should correspond to the number of faces or sides of said portion.

The numeral 7 designates the cylinder-bar, which is formed with a number of openings corresponding to the number of teeth to be employed. Each opening is drilled through the bar and made of sufficient diameter to allow the cylindrical screw-threaded shank of the tooth to pass loosely therethrough. The bar is then countersunk around this opening with a drill shaped to perfectly correspond to the conical portion or seat 4 of the tooth and to the plano-conical shoulders 4′ formed thereon, and then the walls of said opening are punched to correspond to the corners or angular projections 6 of the tooth. In case a tooth is to be employed having corners or projections different in shape from those shown in Figs. 1 and 2, a corresponding punch is used for forming the recesses in the walls of the openings.

Figs. 4, 5, 6, 7, and 8 show modifications in the form of the tooth, which consists simply in the number and shape of the corners or angular projections 6, which prevent said tooth from turning in the opening in the bar. In Figs. 4, 5, and 7 are shown three, two, and one, respectively, of these corners or projections, which are substantially triangular in shape, but any desired or suitable number of them may be employed; also, in Figs. 6 and 8 are shown two and one, respectively, of these corners or projections having substantially rectangular shape; but their shape or configuration may be different. In all of these modifications the principle of the invention is not departed from, which consists, essentially, of the tooth provided with the conical seat having the plano-conical shoulders adapted to fit in a correspondingly-shaped opening formed in the cylinder-bar.

It is obvious that the corners or projections 6 of the tooth can be made to extend forward beyond the largest circumferential limit of the conical seat 4; but we prefer to make them so that they will not so extend, since without this a neater finish will result when the tooth is in the opening in the bar, as no recesses or slots will appear in the opening for said corners or projections. On the other hand, if said corners be made to project forward beyond the largest circumferential limit of said conical seat, said recesses or slots will not be covered by said conical seat, but will always appear unsightly when the tooth is in position in the bar; also, under this latter construction the recesses or slots have a greater tendency to weaken the bar, as the distance from the center of the tooth to the outsides of said recesses or slots is greater than it is when they do not extend beyond the largest circumferential limit of the conical seat. However, we regard either of these constructions and arrangements of parts and features as equally within the scope of our invention.

By our invention, owing to the conically-shaped seats of the teeth having the plano-conical shoulders and the perfect manner in which they fit in the correspondingly-shaped openings in the cylinder-bars, the serious and dangerous features which have always existed in this class of devices and been a source of anxiety to both manufacturers and users of thrashing-machines, arising from the liability of the teeth to work loose and fly out of the cylinders, are wholly obviated.

While the foregoing description of our invention only refers to the teeth as being improved for the cylinders of thrashing-machines, they are nevertheless equally improved for and applicable to the concaves of thrashing-machines, and therefore either use thereof is equally within the scope of our invention.

In order to apply these teeth to cast-iron concaves, it is only necessary to cast the holes in the latter to correspond to the shape of the seating portions of the former; or, if these teeth are to be applied to wrought-iron bars for concaves, the holes in said bars can be formed by punching them to conform to our improved shape or construction of the teeth.

Having thus fully described the construction and arrangement of the parts and features of our invention, the combinations based thereon, its operation, and advantages, what we claim as new is—

1. A thrasher-tooth provided with a blade, a screw-threaded shank, and a conical seat having a series of plano-conical shoulders arranged intermediate of said blade and shank, substantially as described.

2. A thrasher-tooth provided with a blade, a screw-threaded shank, and a conical seat formed with one or more angles, and a series of plano-conical shoulders arranged intermediate of said blade and shank, substantially as described.

3. A thrasher-tooth provided with a blade, a screw-threaded shank, and a conical seat having a squared portion with four corners along its rear end, and a plano-conical shoulder on each of the faces of said squared portion, substantially as described.

4. A thrasher-tooth provided with a blade, a screw-threaded shank, and a conical seat having a squared portion with corners or projections, which are arranged so as to not extend forward beyond the largest circumferential limit of said conical seat, substantially as and for the purpose described.

5. The combination, with a thrasher-tooth provided with a blade, a screw-threaded shank, and a conical seat having a series of plano-conical shoulders and one or more cor-

ners or projections, of a cylinder-bar formed with an opening corresponding in form or shape to said conical seat and its features, and a binding-nut fitted upon said screw-threaded shank, substantially as described.

6. The combination, with a thrasher-tooth provided with a blade, a screw-threaded shank, and a conical seat having one or more angular corners or projections and a series of plano-conical shoulders, of a cylinder-bar formed with an opening for receiving said conical seat and its angular projections and plano-conical shoulders, and a binding-nut fitted upon said screw-threaded shank, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM H. BUTTERWORTH.
JOHN BUTTERWORTH, JR.

Witnesses:
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