W. W. BROWER.

LUBRICATOR FOR SEPARATING DEVICES.

APPLICATION FILED DEC. 23, 1903. RENEWED JULY 8, 1909.

950,201. Patented Feb. 22, 1910.

Fig. 1.

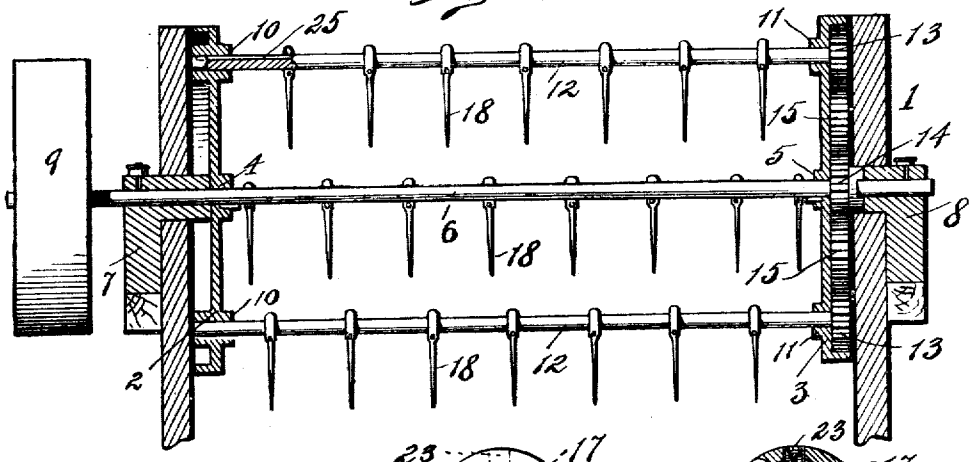


Fig. 2.

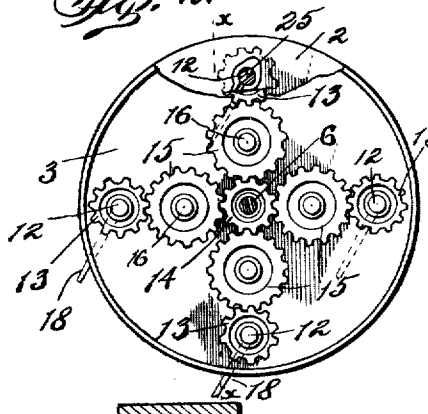


Fig. 4.

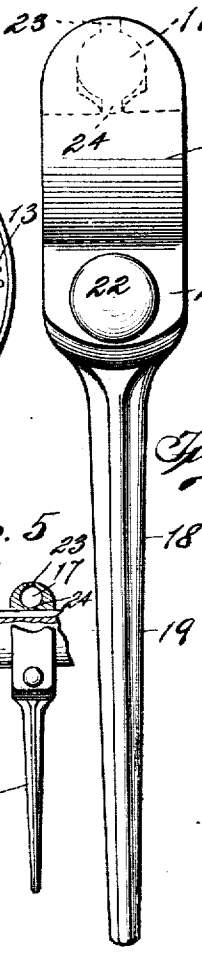


Fig. 3.

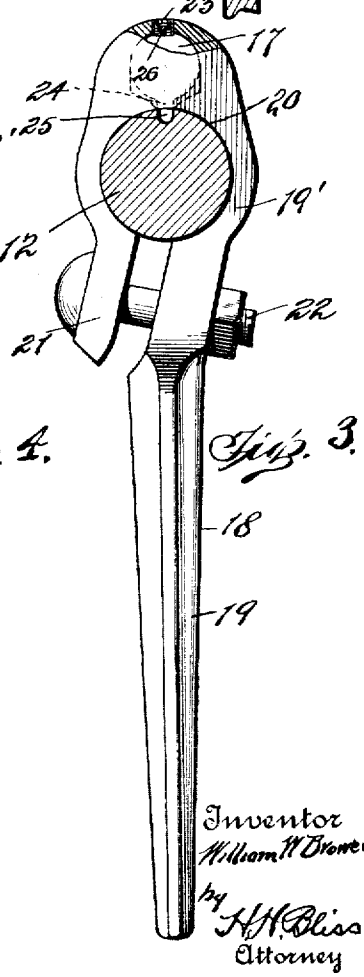
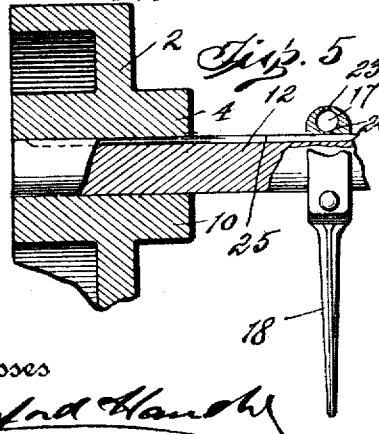


Fig. 5.



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UNITED STATES PATENT OFFICE.

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LUBRICATOR FOR SEPARATING DEVICES.

950,201. Specification of Letters Patent. Patented Feb. 22, 1910.

Application filed December 23, 1903, Serial No. 186,372. Renewed July 8, 1909. Serial No. 506,615.

To all whom it may concern:

Be it known that I, WILLIAM W. BROWER, a citizen of the United States, residing at Meservey, in the county of Cerro Gordo and State of Iowa, have invented certain new and useful Improvements in Lubricators for Separating Devices, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in separating devices for threshing machines.

It pertains particularly to means for lubricating the shafts of separating cylinders of the construction shown in United States Letters Patent No. 696,336, in which a rotating cylinder is provided with a series of shafts carrying arms or teeth which are adapted to maintain a fixed relation with reference to the main driving shaft of the cylinder or to the horizontal throughout its rotation and are adapted to coöperate with other parts of the separator, such as the shaking or vibrating table, in order to insure a thorough separation of the grain from the straw.

My invention also relates to an improved form of teeth or arms to be used in such a separating device.

In the drawings—Figure 1 represents a side view of a separating device for threshing machines comprising my improvements. Fig. 2 is an end view of the driving end of said separating device, parts of the same being broken away. Fig. 3 is a side view, and Fig. 4 is a rear view of one of my improved teeth or straw engaging arms. Fig. 5 is a section on the line 5—5, Fig. 4.

1 indicates the separating device as an entirety. It may be mounted at any desired point within the side walls A of the thresher frame in the straw passage formed by such walls and above the shaking or grain agitating table or tables. This threshing device may be of any of the well known types in which a series of shafts provided with downwardly inclined teeth is carried by a revolving cylinder and the said shafts are so driven as to maintain the teeth thereon at a constant fixed angle or inclination to the horizontal.

In the drawings I have shown such a device comprising the cylinder heads 2, 3 having the central hubs or bosses 4, 5, respectively, for the cylinder driving shaft 6. This shaft is transversely mounted in bearings 7, 8 carried by the thresher frame. 9 is a belt pulley secured to one end of said shaft through which power may be applied to drive the cylinder or separating device.

10, 11 indicate inwardly projecting bearings on the cylinder heads 2, 3, respectively. Preferably there are four of these bosses or bearings on each cylinder head. The tooth carrying shafts 12 are mounted in said bosses or bearings, each shaft having an end extending through the cylinder head 3 and provided on the outside thereof with a gear wheel 13 which is rigidly secured to the shaft.

14 is a gear wheel loose on the main shaft 6 and held from rotating therewith in any well known manner and 15 are gear wheels meshing with said gear wheel 14 on the main shaft and with a gear wheel 13 on one of the teeth carrying shafts. The gears 15 are mounted on pivots or stub shafts 16 carried by the cylinder head 3.

The head 3 is formed with a flange 3′ extending outward into close proximity to the casing wall A and, together with such wall, inclosing the gearing above described and preventing the access of threshed material thereto. The head 2 also is provided with a flange 2′ which prevents straw from being wound and collected on the elongated bosses of the bearings 10.

18 18′ are forks or teeth secured upon the shafts 12 and so arranged and cor-related with each other as to practically include within their working area the entire distance between the two cylinder heads. The forks or teeth 18 are made as shown in Figs. 3 and 4, having the arm or shank 19 and the enlarged divided or split head end 19′ having an oil recess or chamber 17 of any desired form. 20 is an aperture in the head 19′ adapted to receive the shaft 12. The lip or projection 21 of the head is adapted to be drawn toward the shank or arm 19 by the bolt 22 in order to clamp the tooth or fork to the shaft. 23 is a duct leading to the oil chamber in the tooth and 24 is a duct leading from said chamber to the periphery of the shaft.

The teeth of the above construction each containing an oil chamber are only used in proximity to the cylinder heads. The intermediate teeth 18′ are or may be con-

structed in other respects as above described.

25 are oil grooves in either end of the shaft 12 adapted to register with the oil ducts 24 in the teeth which are immediately adjacent to the cylinder head. These grooves lead from said oil chamber to points within the bearings 10, 11. The remaining teeth of the series on each shaft may be of similar construction to those at the ends of the shaft, but need not be provided with oil chambers.

When the cylinder is rotated the gear 14 coöperating with the pairs of gears 13 and 15 interposed between each tooth carrying shaft and the driving shaft will cause the said tooth carrying shafts to be held from rotating about their own axes and thus maintain a constant fixed inclination of the teeth thereon when the separating cylinder is rotating.

By providing lubricators for the said teeth carrying shafts which are always maintained in an upright position, I insure that the lubricant will be fed to the shaft bearings throughout the complete rotation of the separating cylinder.

To keep the dust and chaff out of the oil receptacles 17 spring controlled valve 26 may be seated in the oil inlet duct 23 as shown in Fig. 3. When it is desired to fill the receptacle or oil chamber with oil, the valve may be unseated by pressing it inwardly.

Where the oil ducts 25 are exposed to the atmosphere a cover may be provided for the shaft at these points of any of the styles now well known and adapted to protect oil ducts. We have found it desirable to use covers of the spring-clip variety, which fit snugly to the shaft and may be readily removed when desired.

It will be understood that I do not limit myself in the application of my invention to the use of lubricating devices or receptacles carried by the forks or teeth on the shafts of the separating device such as shown in the drawings. The lubricating chamber may be arranged on the said shafts independently of the teeth thereon if so desired.

I believe myself to be the first to have provided a lubricating device for the toothed shafts of a separating device of the class described which lubricating device is adapted to deliver oil to the shaft under the action of gravity throughout its rotation about the main driving shaft.

I am aware that it has been proposed to supply oil to a vehicle wheel by providing a recess or channel on a non-rotating axle, with a felt conductor interposed between such channel and the rotary part, and I do not wish my claim to be understood as comprising such a construction. But in separating devices of the character described peculiar difficulties exist as to oiling the bearings of the shafts of the separating cylinder. On acount of the presence and passage of the threshed material it is essential to inclose the devices which project outward from the heads of the cylinder close to the casing walls A, and said walls prevent access to the outer ends of the bearings to oil them from the outer sides of the machine. By my improvements the shafts are formed with ducts on their upper sides and are rotated relative to the rotary heads of the cylinder at such rates as to keep the ducts uppermost, by means which thus have the functions both of preventing the spilling of the oil and of maintaining the shaft forks vertical. Said ducts lead from points within the heads outward and thus effect the lubrication of the otherwise inaccessible parts.

Although the separating cylinder has a number of rotary shafts the oil holes of all of them are always kept upward, and when the cylinder has been brought to rest in any position all of the bearings may be lubricated without its being necessary to throw the belt of the cylinder and turn it to bring the various oil holes successively upward, as would be the case if the holes were formed in the bearings 10, 11 in a usual manner.

I claim—

1. The combination with the main driving shaft the cylinder heads thereon and the tooth carrying shafts mounted in bearings in said cylinder heads, of the lubricators secured to said tooth carrying shafts and adapted to deliver lubricant to their bearings while rotating with said shaft about the axis of said main driving shaft, substantially as set forth.

2. The combination in a mechanism of the class described with the main driving shafts, the cylinder heads thereon and the tooth carrying shafts mounted in bearings in said cylinder heads, of the teeth secured to the said tooth carrying shafts and having oil receptacles adapted to supply lubricant to the shaft to which they are secured, substantially as set forth.

3. The combination in a machine of the class described, with the main driving shaft, the cylinder heads thereon and a tooth carrying shaft mounted in bearings in said heads, of the teeth secured to the said tooth carrying shafts and having oil chambers arranged above the shaft and adapted to deliver oil thereto, substantially as set forth.

4. The combination in a machine of the class described, with the driving shaft, the cylinder heads thereon and the tooth carrying shafts mounted in bearings in said cylinder head, of the teeth arranged on said tooth carrying shafts adjacent to the bearings thereof and having in their upper ends

lubricant receptacles adapted to deliver lubricant to their respective shafts, substantially as set forth.

5. The combination in a machine of the class described with the main driving shaft, the cylinder heads carried thereby, and the tooth carrying shafts mounted in bearings in said cylinder heads and having oil grooves communicating with the bearing surfaces in said cylinder heads, of the lubricators secured to said shafts and adapted to deliver oil to the said oil grooves therein while rotating about the axis of said driving shaft, substantially as set forth.

6. The combination in a separating device of the class described of the main driving shaft, cylinder heads thereon, the tooth carrying shafts mounted in bearings in said cylinder heads and having oil grooves leading to the bearing surfaces for the shafts and the teeth secured to the said tooth carrying shafts and having oil receptacles adapted to deliver oil to the grooves in the said shafts, substantially as set forth.

7. A tooth for a separating device of the class described, comprising a shank 19, a split head 19′, a bolt for clamping the said head to the tooth carrying shaft and a lubricating receptacle in said head, substantially as set forth.

8. The combination of the casing having walls A forming a straw passage, a rotary separating cylinder mounted between said walls in such straw passage and having heads situated near to said walls, the heads being provided with bearings and flanges 2′, 3′ extending outward to said walls, shafts mounted in said bearings, means for rotating said shafts on their own axes relative to said heads equally and oppositely to the rotation of the cylinder, and separating teeth or forks carried by said shafts and constantly maintained at a constant angle to the horizontal, the shafts having ducts for conducting lubricant from points within said casing walls and cylinder heads to points within said bearings, substantially as set forth.

9. The combination of the casing having walls A forming a straw passage, a rotary separating cylinder mounted between such walls in said passage and having heads situated next to said walls, the heads being provided with bearings and one of said heads having a flange extending outward, shafts mounted in said bearings and extending into the space inclosed by said flange, gearing, within said flange between the head and the casing wall for rotating the shafts on their own axes relative to said heads equally and oppositely to the rotation of the cylinder, and separating teeth or forks carried by said shafts and constantly maintained at a fixed angle to the horizontal, the shafts having ducts for conducting lubricant from points within said casing walls and cylinder heads to points within said bearings, substantially as set forth.

10. The combination of the casing having walls A forming a straw passage, a rotary separating cylinder mounted between such walls in said passage and having heads situated next to said walls, the heads being provided with shaft bearings, shafts mounted in said bearings, means for rotating said shafts on their own axes relative to said heads equally and oppositely to the rotation of the cylinder, and separating teeth or forks carried by said shafts and maintained at a constant angle to the horizontal, certain of said teeth having heads formed with oil chambers and the shafts having oil ducts leading from such chambers to points within said shaft bearings, substantially as set forth.

11. The combination of the casing having walls forming a straw passage, a rotary separating cylinder mounted between said walls in said passage and having heads situated next to said walls, the heads being provided with bearings and one of said heads having a flange extending outward, shafts mounted in said bearings and extending into the space inclosed by said flange, gearing within said flange between the head and the casing wall for rotating the shafts relative to said heads equally and oppositely to the rotation of the cylinder, and separating teeth or forks carried by said shafts and maintained at a constant angle to the horizontal, certain of said teeth having heads formed with oil chambers and the shafts having ducts leading from such chambers to points within the said bearings, substantially as set forth.

12. The combination of the separating cylinder, rotary on a central axis and having shaft bearings arranged around said axis, shafts mounted in said bearings and bodily rotary around said axis of the cylinder, said shafts being provided at their upper sides with means for receiving a lubricant, and means for rotating said shafts relative to the cylinder equally and oppositely to the rotation of the cylinder to maintain such lubricant receiving means upward, substantially as set forth.

13. In a mechanism for engaging with and advancing or moving straw or similar material, the combination with the rotating shaft carriers, of a series of tooth carrying shafts journaled and rotating in said carriers on axes eccentric to the axis of said carriers, lubricating devices supported on said tooth carrying shafts and delivering lubricant to the journals thereof, and means for holding said tooth carrying shafts in substantially a fixed position relative to their axes, respectively.

14. In a mechanism for engaging with

and advancing or moving straw or similar material, the combination of a rotary driving shaft, a second shaft carrying means for engaging with the straw and mounted to revolve bodily around the rotary driving shaft and having a lubricant duct, bearings for the said second shaft, a lubricant holder carried by the second shaft and delivering lubricant to the said duct, and means for causing a relative rotation of the said second shaft in its bearings and for holding said shaft and lubricant holder in positions substantially fixed relative to the axis of said second shaft.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM W. BROWER.

Witnesses:
E. W. RUSSELL,
J. E. HILL.