(No Model.)

M. KANE.

KNOTTER OPERATING MECHANISM FOR GRAIN BINDERS.

No. 564,622. Patented July 28, 1896.

Fig. 2.

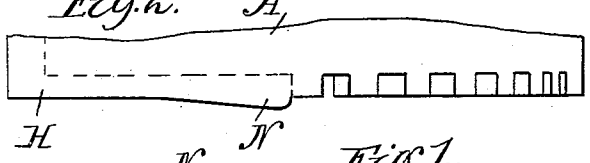


Fig. 1.

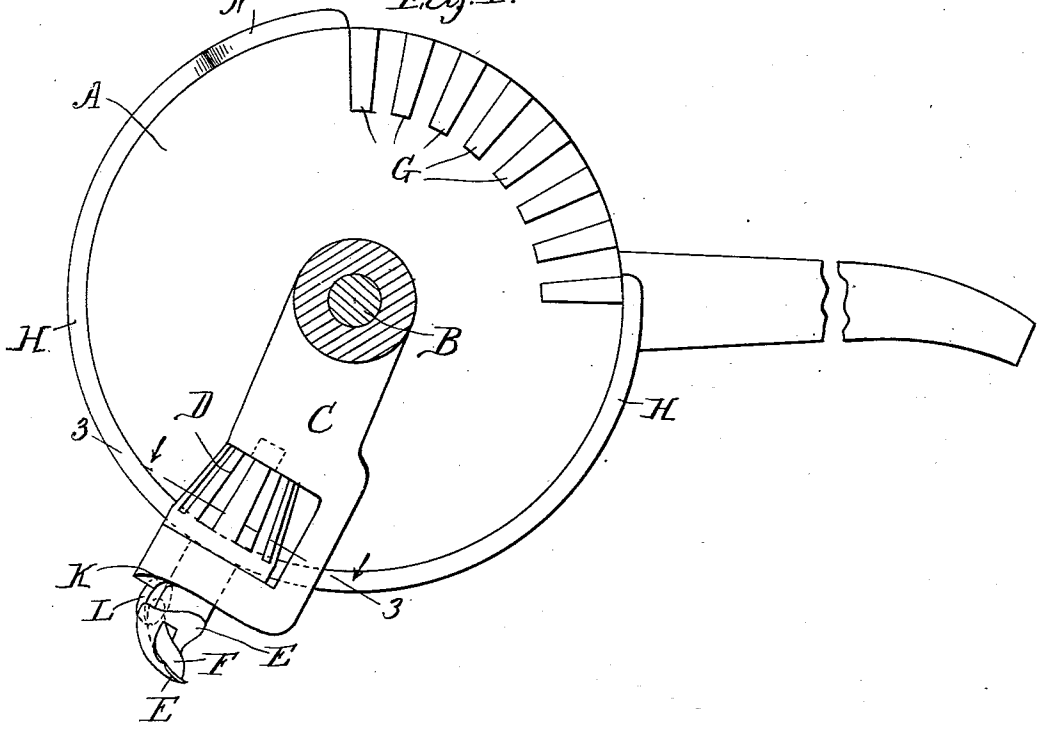


Fig. 5.

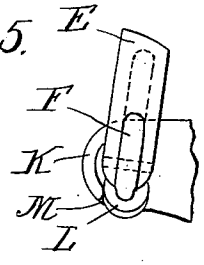


Fig. 3.

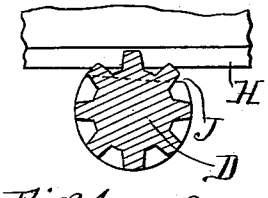
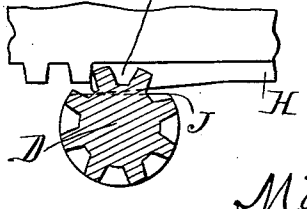


Fig. 4.



Witnesses.
Wm. N. Rheem.
Wm. L. Hemming

Inventor
Maurice Kane
by
Brown & Darby
Atty's

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

MAURICE KANE, OF AUSTIN, ILLINOIS.

KNOTTER-OPERATING MECHANISM FOR GRAIN-BINDERS.

SPECIFICATION forming part of Letters Patent No. 564,622, dated July 28, 1896.

Application filed October 29, 1895. Serial No. 567,336. (No model.)

To all whom it may concern:

Be it known that I, MAURICE KANE, a citizen of the United States, residing at Austin, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Knotter-Operating Mechanism for Grain-Binders, of which the following is a specification.

This invention relates to knotter-operating mechanism for grain-binders.

The object of the invention is to simplify and improve the construction of mechanism of this character and to render the same more perfect, efficient, and economical.

The invention consists, substantially, in the construction, combination, location, and relative arrangement of parts, all as will be more fully hereinafter set forth, as shown in the accompanying drawings, and finally pointed out in the appended claims.

Referring to the accompanying drawings and to the various views appearing thereon, Figure 1 is a view in side elevation of an apparatus embodying my invention, the knotter-operating shaft being in section. Fig. 2 is a detailed broken view showing the relative arrangement of the raised part of the delay surface upon the knotter-wheel. Fig. 3 is a broken detailed sectional view taken on the line 3 3, Fig. 1. Fig. 4 is a view similar to Fig. 3, showing a different relative arrangement of the knotter-pinion and the knotter-wheel. Fig. 5 is a detailed view, in bottom plan, showing the relative arrangement of the knotter-bill, its friction-roller, and the cam-stop therefor.

The same part is designated by the same reference-sign wherever it occurs throughout the several views.

Reference-sign A designates the knotter-wheel, which is mounted upon and rotated by the knotter-operating shaft B. C designates an arm or casting, suitably sleeved or otherwise suitably mounted upon shaft B, and in which is journaled, to rotate in the usual manner, pinion D, carrying the knotter-bill E and the tongue F.

In knotter mechanisms as heretofore constructed the knotter-operating wheel A was provided with gear-teeth upon the face thereof, adapted, when said wheel is rotated, to engage the teeth upon pinion D, and in combination with delay surfaces on wheel A and pinion D to effect one revolution of pinion D to one revolution of the knotter-operating wheel A. To this end it was usual to provide pinion D with eight teeth and to provide the knotter-operating wheel A with seven teeth G. It was also the custom to provide wheel A with face-flange H, slightly raised above the ends of the gear-teeth G, and adapted to engage a planed-off section J, formed on the hub of pinion D, to lock said pinion against rotation after the gear-teeth G have passed it. It was also common to provide the casting or arm C with a cam-surface K, adapted to act upon the end of the knotter-tongue F, to open and close said tongue upon the knotter-bill, in order to grasp the twine or cord to be tied, it being usual to mount a small friction-roller L upon said tongue to form antifriction-bearing against the cam-surface K, and shoulder M being formed in the cam-surface K, into which roller L may drop to permit the tongue to close down and grasp the twine and clamp it against the knotter-bill.

The construction as above described has been found in practice to be seriously defective, for the reason that the pull of the cord or twine upon the knotter-bill during that portion of rotation of the knotter-wheel A, when the delay surface H is in contact with the planed or cut-away surface J of the pinion D, is in a direction tending to constantly rotate pinion D and to press the rear corner of the planed surface J of the pinion at the rear corner of such surface, causes said corner to be rapidly worn away, and thereby not only prevent the roller E of the tongue F from completely passing by cam-surface K after the partial revolution of the pinion D, and hence causing a disarrangement of the relative location of the gear-teeth upon pinion D and the gear-teeth G upon the operating-wheel A, thereby resulting in a breaking off of either the teeth G or the teeth upon pinion J.

The objection above noted with respect to the failure of roller L to completely pass cam-surface K prevents the tongue F from being tightly closed, thereby resulting in a failure to grasp the cord or twine between the tongue F and the bill E.

I will now describe the construction and arrangement which I have devised and whereby the objections above noted are entirely avoided.

Instead of providing the knotter-operating wheel A with a tooth less than the number of teeth upon the pinion D, I provide said knotter-operating wheel A with the same number of teeth as the pinion, thereby effecting a rotation of pinion D beyond a complete revolution thereof after every revolution of wheel A. For instance, in the particular form shown, I provide eight teeth upon the pinion, and also eight teeth upon the operating-wheel, thereby effecting nearly one and one-eighth revolutions of the pinion for every revolution of the wheel A. By this construction and arrangement of parts, the roller L will be surely carried beyond the shoulder M, the pull of the cord or twine tending to reversely rotate pinion D, causing said roller to be carried home firmly against shoulder M, thereby insuring a locking of the pinion D against further reverse rotation.

In order to avoid the other objection above noted, I plane down the delay surface H, or, if desired, entirely do away with said surface throughout nearly the entire extent thereof, and I provide said rim or surface with an elevation or cam N, adjacent to the forward gear-teeth G upon said wheel. The object of this elevation or cam-surface is to engage the planed-off surface J upon the pinion when there is no twine in the knotter, and to position said pinion properly to engage at the exact point the gear-teeth G when the wheel A is rotated.

From the foregoing description it will be seen that the only function of cam-surface N is to properly position pinion D, to engage properly the gear-teeth G, when there is no twine in the knotter, and it is not the purpose to depend upon the engagement of surface J with said cam N to lock the pinion against rotation, and hence said surfaces J and N are entirely relieved of undue wear. The locking of pinion D against rotation is provided by the pull of the cord or twine and the engagement of roller L with shoulder M, and when in this position the teeth of pinion D are held in proper position to mesh with teeth on wheel A by the twine.

By the construction above described, danger of breakage of the parts is entirely avoided, whereas in case of injury in the prior construction an entirely new pinion or operating-wheel is required.

Having now described the object and nature of my invention and a form of apparatus embodying the same, and having explained the construction and mode of operation of such apparatus, I desire to be understood that I do not limit myself to the exact details of construction, size, proportions, or relative arrangement of parts shown; but

What I do claim as new and of my own invention, and desire to secure by Letters Patent of the United States, is—

1. In a knotter-operating mechanism, a knotter-pinion carrying the usual bill and tongue, and having equally-spaced gear-teeth thereon, and a knotter-operating wheel having the same number of gear-teeth thereon as on said pinion, and adapted when rotated one complete revolution to engage and rotate said pinion slightly more than one complete revolution, and means for locking said pinion against reverse rotation beyond a desired point; as and for the purpose set forth.

2. In a knotter-operating mechanism, a knotter-pinion, carrying the usual bill and tongue, a shoulder arranged to engage said tongue after a complete revolution thereof, to lock the same against reverse rotation, a knotter-operating wheel, provided with gear-teeth thereon, equal in number to the number of gear-teeth on said pinion, and adapted when rotated one revolution to engage and rotate said pinion slightly beyond a complete revolution; as and for the purpose set forth.

3. In a knotter-operating mechanism, a pinion carrying the usual knotter bill and tongue, means for locking said pinion against reverse rotation beyond a desired point, a knotter-operating wheel provided with gear-teeth, adapted when rotated one complete revolution to engage and rotate said pinion slightly more than one complete revolution, and an elevation or cam-surface formed on said wheel adjacent to the gear-teeth formed thereon, adapted to engage and properly position said pinion to be engaged at the desired point by said gear-teeth; as and for the purpose set forth.

4. In a knotter-operating mechanism, a pinion, carrying the usual knotter bill and tongue, a fixed shoulder, arranged to be engaged by said tongue to lock said pinion against reverse rotation, and an operating-wheel, provided with gear-teeth adapted to engage and actuate said pinion, and having a raised surface, formed thereon adjacent to said gear-teeth, said raised surface adapted to engage and properly position said pinion to be engaged by said gear-teeth; as and for the purpose set forth.

In witness whereof I have hereunto set my hand this 26th day of October, 1895.

MAURICE KANE.

Attest:
S. E. DARBY,
M. I. CAVANAGH.