

(No Model.)

2 Sheets—Sheet 1.

M. KANE.
GRAIN BINDER.

No. 536,991.

Patented Apr. 2, 1895.

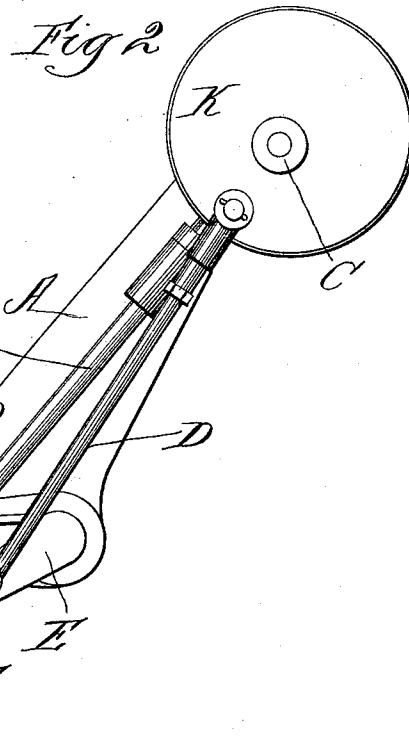
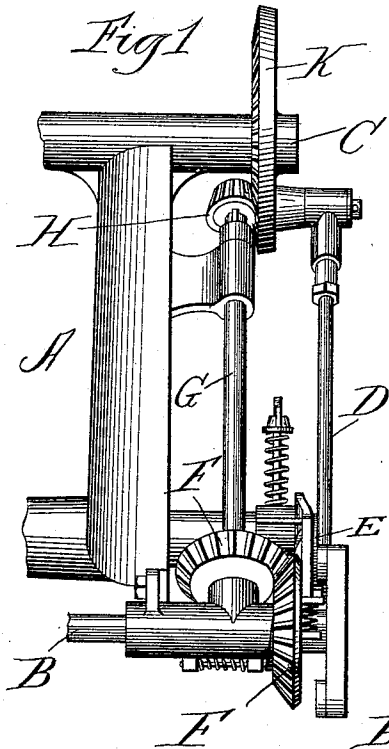


Fig 3

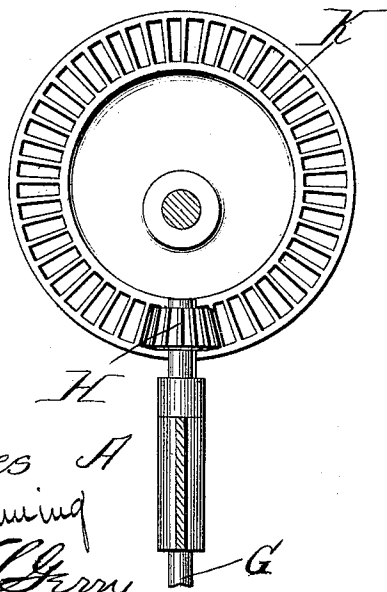
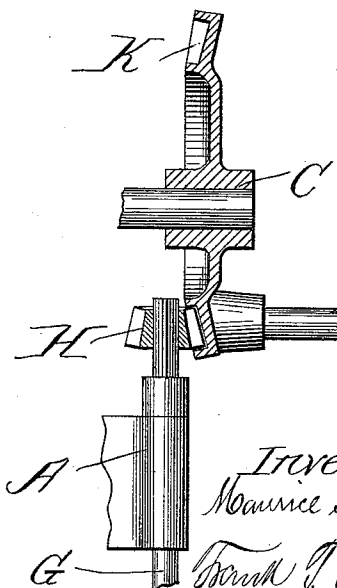


Fig. 4



Witnesses A
Wm. J. Fleming
James Perry

Inventor
Maurice Kane by
Frank T. Brown
Atty.

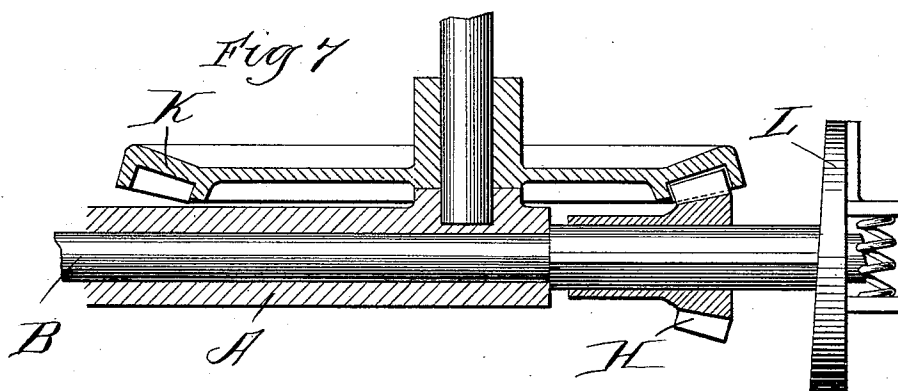
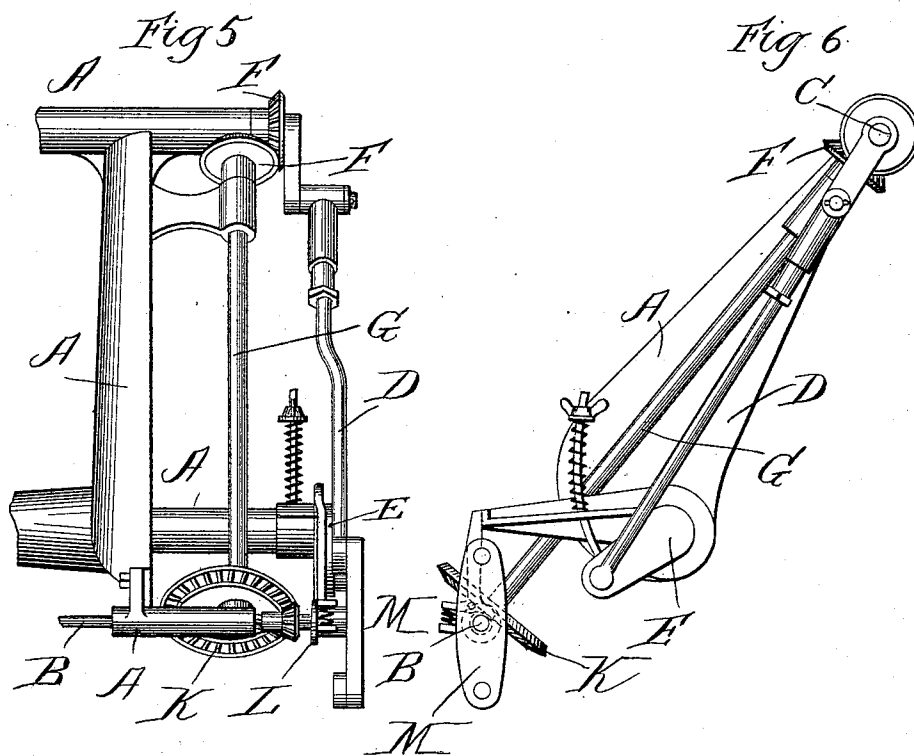
(No Model.)

2 Sheets—Sheet 2.

M. KANE.
GRAIN BINDER.

No. 536,991.

Patented Apr. 2, 1895.



Witnesses

Geo. H. Strong.

James Gerry

Inventor

Maurice Kénel

by Frank J. Brown ^{at} Atty

UNITED STATES PATENT OFFICE.

MAURICE KANE, OF CHICAGO, ILLINOIS.

GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 536,991, dated April 2, 1895.

Application filed December 19, 1893. Serial No. 494,061. (No model.)

To all whom it may concern:

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

This invention relates to improvements in grain binders and its object is to simplify and render more efficient the mechanism for communicating motion from the packer shaft to the knotter shaft and the needle shaft.

The invention will in some of its forms be shown in the accompanying drawings, described in the subjoined specification and more particularly pointed out in the claims.

Like letters refer to the same parts in the several figures of the drawings, in which—

Figure 1 is a side elevation of one form of the mechanism which I may employ. Fig. 2 is an end view of the same figure. Fig. 3 is a detail inside view of the bevel gears directly operating the knotter driving shaft. Fig. 4 is a vertical section of the mechanism shown in Fig. 3. Fig. 5 is a side elevation of a modified form of mechanism for the same purpose which I may employ. Fig. 6 is an end view of the same; and Fig. 7 is a vertical section of the lower pair of bevels and bearings therefor shown in Fig. 5.

This invention is designed to accomplish a similar purpose to that effected by the construction covered by my Patent No. 499,838, granted June 20, 1893. In the said former patent a sprocket wheel was mounted eccentrically upon the knotter driving shaft, so as to give increased power to said shaft and the needleshaft driven thereby at a definite point in the rotation, and increased speed at another point in such rotation; and the present invention is intended to effect the same ends in a different way.

In the drawings, A designates the frame and various housings for the several shafts to be hereinafter more specifically referred to.

B designates the packer shaft which latter is connected to the knotter driving shaft C by intermediate gearing, and this in turn by means of the usual crank and pitman D communicates motion to the crank E which latter actuates the needle shaft.

In the form of mechanism shown in the first

sheet of the drawings a pair of miter wheels F communicate the motion of the packer shaft through a vertical shaft G to a bevel pinion H which latter meshes with what I term an eccentric bevel lantern wheel K, this latter being mounted eccentrically upon the knotter driving shaft and having its teeth bounded by flanges at each end as is plainly shown at Figs. 3 and 4, thus constituting it what might be termed a lantern wheel for want of a better name. Secured to the outside of this wheel is the usual crank pin attached to the pitman rod D which latter in turn is fastened to a crank E which crank is upon the needle shaft. The bevel pinion H in meshing with the teeth of the eccentric bevel lantern wheel is caused to slide or move vertically during each complete revolution for the reason that said lantern wheel being mounted eccentrically presents its teeth to the pinion at varying distances from its shaft. Provision is made for this movement by means of a spline or feather on the vertical shaft which rotates the pinion. It is obvious that instead of such arrangement many other forms might be devised having a similar capacity, all of which it would be impossible to set forth in the description or illustrate; the essential point being that there must be some play provided to compensate for this varying position of the teeth of the eccentric wheel.

The eccentric wheel need not necessarily be arranged upon the knotter driving shaft, but instead may be located in any convenient position between the packer shaft and said knotter driving shaft, and a modified form of thus arranging it is indicated in Sheet 2 of the drawings in which said eccentric wheel is placed at the lower end of the vertical shaft and is driven by a pinion upon the sleeve of the packer shaft said pinion being feathered to such sleeve so that it may have play back and forth. In this instance it is preferable to provide a separate disk L for the stops which the clutch M engages. It would be difficult to decide what details of arrangement would be preferable until after some years' experience in the manufacture and use of the different forms, but as at present advised, I prefer the construction illustrated on the first sheet of the drawings.

It is remarked that the form of clutch illus-

trated is not particularly described herein for it is the usual form, such as is set forth in my Patent No. 495,044, granted April 11, 1893.

5 The operation of the mechanism may be generally described as follows: The packer shaft is continually revolving and carries with it the clutch M which at suitable intervals engages with stops secured to the sleeve carrying one of the bevel pinion gears, which latter meshes with the bevel gear at the lower end of the vertical shaft, and thereby causes the bevel pinion at the upper end of such shaft to revolve and in turn revolving the eccentric lantern bevel wheel. This lantern bevel wheel being formed of teeth bound by concentric flanges confines the bevel pinion between such flanges and hence said pinion is moved back and forth on the shaft which supports it according as the portion of the eccentric teeth which engages such pinion varies in distance from the center of the shaft of the eccentric wheel. The parts are so arranged that just at the time when the needle is caused to complete its forward movement the longest side of the eccentric wheel is being engaged by the bevel pinion, which drives it, and therefore a greater leverage is at that time exerted and more power provided for operating the needle which is desirable because at that time the needle is most tightly compressing the bundle. Again the eccentric wheel must complete each revolution in the same time, and inasmuch as its movement is comparatively slow while its long side is being engaged by the pinion, this loss of time is compensated for by the comparatively rapid movement when the pinion is meshing with the short side of such eccentric wheel at which last mentioned time very little power is required for the bundle has been compressed to the limit desired.

Instead of constructing the device as shown herein, it is manifest that many modified forms might be employed which would come within the principle of my invention, and I do not therefore wish to be understood as limiting myself to the precise construction set forth herein.

50 What I claim as new, and desire to secure by Letters Patent, is—

1. In a grain binder the combination of the needle shaft and mechanism for operating the same including an eccentrically mounted gear and a movable concentric gear meshing therewith and imparting motion thereto; substantially as and for the purpose set forth.

2. In a grain binder the combination of a needle shaft and mechanism for operating the same including an eccentrically mounted bevel wheel and another bevel wheel meshing therewith and imparting motion thereto; said bevel wheel mounted concentric with and adapted to move longitudinally upon its supporting shaft substantially as and for the purpose set forth.

3. In a grain binder the combination of a

needle shaft and mechanism for operating the same including an eccentrically mounted wheel, another wheel mounted concentrically upon its supporting shaft and meshing with the eccentric wheel and adapted to slide upon its shaft so as to compensate for the variable distance from the center of the teeth upon the eccentric wheel; substantially as and for the purpose set forth.

4. In a grain binder, the combination with a packer shaft, and a needle shaft, of a system of gears for communicating motion between such shafts, one of which gears is eccentrically mounted, and another meshing therewith is concentrically mounted and adapted to move longitudinally upon its supporting shaft, and means for keeping said gears in mesh with each other, notwithstanding the variable motion of the eccentric gear; substantially as and for the purpose set forth.

5. In a grain binder, the combination with a packer shaft, a knoter driving shaft and a needle shaft, of a system of bevel gears for communicating motion between the packer shaft and the knoter driving shaft, one of which is eccentrically mounted, and constitutes one of a pair, the other member of which is concentrically mounted upon its shaft and adapted to be moved thereon, and means for automatically effecting such movement, without disengaging the gears; substantially as and for the purpose set forth.

6. In a grain binder the combination with a packer shaft, a knoter driving shaft, and a needle shaft, of a system of bevel gears communicating motion between such packer shaft and knoter driving shaft, one of said gears mounted eccentrically and another meshing therewith mounted concentrically, and adapted to be slid along its shaft to adjust its position to the portion of the eccentric gear presented to it, and means upon the eccentric gear for effecting the sliding adjustment of the other gear; substantially as and for the purpose set forth.

7. In a grain binder the combination of a packer shaft, a knoter driving shaft and a needle shaft with a system of bevel gears for communicating motion from the packer shaft to the knoter driving shaft, one of which is mounted eccentrically, and the other concentrically with respect to its supporting shaft, meshing with the eccentric gear and secured to its shaft by a spline or feather whereby it can move longitudinally therewith, so as to continually remain in mesh with the eccentric gear notwithstanding its eccentricity; substantially as and for the purpose set forth.

8. In a grain binder the combination of a packer shaft, a knoter driving shaft and a needle shaft with a system of bevel gears for communicating motions between the packer shaft and the knoter driving shaft, one of which is eccentrically mounted with the outer and inner ends of its teeth bounded by concentric flanges, and another bevel gear meshing therewith is splined to its shaft and

thereby adapted to a back and forth movement corresponding to the variable motion of the said eccentric gear; substantially as and for the purpose set forth.

- 5 9. In a grain binder the combination of a packer shaft a knotter driving shaft and a needle shaft, of a system of bevel gears for communicating motion from the packer shaft to the knotter driving shaft, one of which is ec-
10 centrically mounted and has its teeth bounded at opposite ends by flanges concentric with each other and another of which meshes with such eccentric gear and is splined to a shaft which at its opposite end carries one of a pair
15 of miter gears, the other of the pair carried upon the sleeve and operated intermittently by a constantly revolving clutch upon the packer shaft; substantially as and for the purpose set forth.

10. In a grain binder the combination of a 20 packer shaft a knotter driving shaft and a needle shaft and a system of gearing for communicating motion between the packer shaft and the knotter driving shaft comprising a gear wheel having its teeth eccentric with re- 25 spect to its supporting shaft, a gear wheel meshing therewith concentric with and adapted to slide upon its supporting shaft and means for keeping said wheels in mesh notwithstanding the variations due to the eccentricity of 30 one of said wheels, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in the presence of two witnesses.

MAURICE KANE.

In presence of—

FRANK T. BROWN,
JAMES L. GERRY.