

No. 697,429.

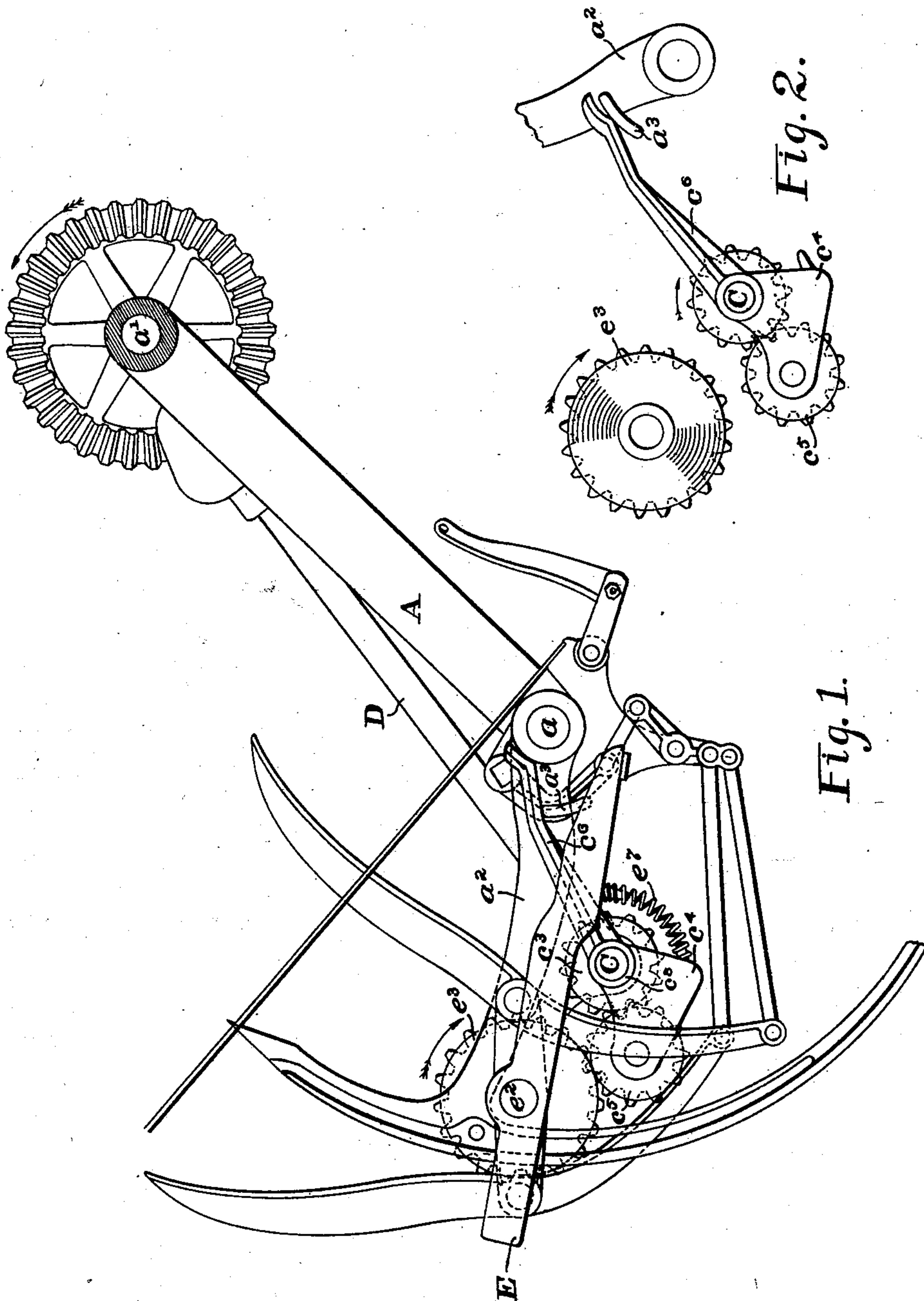
Patented Apr. 15, 1902.

J. F. APPLEBY.
AUTOMATIC GRAIN BINDER.

(Application filed Nov. 26, 1900.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:
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Chas. W. Chambers.

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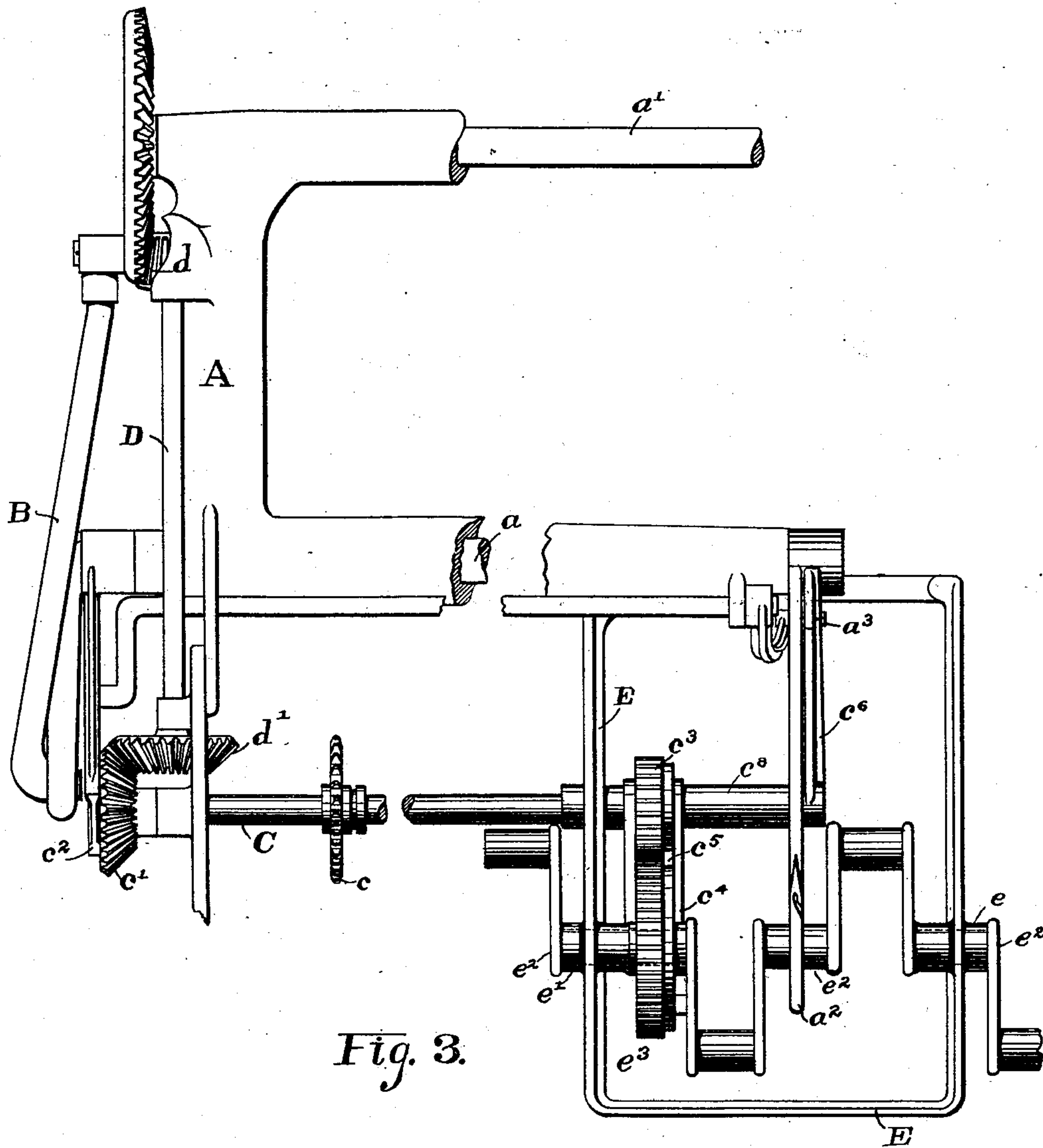


Fig. 3.

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UNITED STATES PATENT OFFICE.

JOHN F. APPLEBY, OF CHICAGO, ILLINOIS, ASSIGNOR TO DEERING
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AUTOMATIC GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 697,429, dated April 15, 1902.

Application filed November 26, 1900. Serial No. 37,796. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. APPLEBY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Grain-Binders; and I 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, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to certain improvements in the gearing for driving the packer-shaft of self-binding harvesters.

The object of my invention is to provide means by which the packers may be allowed to come to rest while the bundle is being bound.

This invention may be considered an improvement on the machine shown in Patent No. 552,503, granted to me January 7, 1896. In the said patent the driving-shaft is so mounted that it is capable of being moved bodily to carry the spur-gear mounted thereon out of mesh with the spur-gear on the packer-shaft, and the needle is made to effect this movement of one end of the packer-shaft by engaging a pivoted arm in which the bearing for said end of the driving-shaft is carried. This necessitates revolving the driving-shaft in a direction opposite to that of the packer-shaft. In my present invention I provide means for disengaging an intermediate pinion which meshes with a driving-pinion secured to the driving-shaft from the spur-gear secured to the packer-shaft. By this means I am able to revolve the driving-shaft in the same direction as the packer-shaft, as required by the majority of harvesters. This disengagement is effected by means of a cam located on the needle, which comes in contact with an operating-arm, which is secured to a vibrating arm pivoted on the driving-shaft carrying the intermediate pinion.

I have shown in the accompanying drawings the ordinary binding mechanisms and the general type of gearing illustrated in the above-mentioned patent and have applied my improvement thereto, showing only such parts

of a binding attachment as necessary to illustrate the general features of my invention.

Figure 1 is an elevation. Fig. 2 is a detail view of the means I provide for causing the packers to intermit in their action, and Fig. 3 is a plan view.

Referring to the drawings, A is the main binder-frame, of the usual form of construction; a , the needle-shaft; a' , the knötter-driving shaft, and a^2 the needle. These two shafts are connected by the usual crank-wrist formed upon them and the pitman B.

C is the driving-shaft, mounted in suitable bearing, c the driving-sprocket, and c' a bevel pinion secured to said driving-shaft.

D is a shaft having bearings in the main frame of the binder and parts attached thereto, provided with a bevel-pinion d at its upper end and bevel-gear d' at its lower end. By means of the bevel-pinion and the bevel-gear last named the rotation of the driving-shaft is imparted to the knötter-driving shaft.

Upon the driving-shaft at c^2 are the usual clutching devices. To the inner end of the binder-frame is secured the yoke E, carrying the bearings e and e' . In these bearings is mounted the packer-shaft e^2 with its cranks. To said packer-shaft is secured the spur-gear e^3 . Near the inner end of the driving-shaft is secured a spur-pinion c^3 . Concentric with the driving-shaft is pivoted the vibrating arm c^4 , carrying an intermediate pinion c^5 , which meshes with the driving-pinion c^3 and is adapted to mesh intermittently with the spur-gear e^3 , secured to the packer-shaft. Said vibrating arm c^4 is secured to a sleeve c^8 , the other end of which is provided with an operating-arm c^6 , which is adapted to engage a cam a^3 , located upon the needle.

When sufficient grain has been received into the binding mechanism to form a bundle and the mechanism been set in motion through the agency of the ordinary tripping devices, the needle a^2 rises and moves forward. The cam a^3 , located thereon, engages the operating-arm c^6 and raises it thereby, rocking the vibrating arm c^4 , carrying the intermediate pinion c^5 upon its pivot, thus disengaging the said intermediate pinion from the spur-gear on the packer-shaft. By this disengagement the packers are allowed to remain at

rest while the bundle is being bound and to be free in their movement as determined by the grain delivered upon the deck back of the needle. When now the bundle has been bound and discharged and the needle a^2 returns to its position of rest, the cam a^3 allows the operating-arm c^6 of the vibrating arm c^4 to drop down as the needle recedes to or near the hub of the needle, thereby rocking the vibrating arm carrying the intermediate pinion c^5 and engaging said intermediate pinion again with the spur-gear e^3 , secured to the packer-shaft, thus imparting the motion of the driving-shaft to the packer-shaft, setting the packers again in operation. To make positive the rocking of the vibrating arm c^4 upon its pivot, a spring e^7 is provided to react between said vibrating arm and the yoke E. Due to the relation of the driving-shaft and the packer-shaft to the axis of the intermediate pinion when the intermediate pinion begins to engage with the spur-gear the force imparted by the driving - pinion operating against the resistance of the packers tends to make it engage more vigorously with the spur-gear, thus holding it firmly in mesh. To prevent the said gears from meshing too closely together, they are provided with pitch-line shrouds, the peripheries of which roll together, forming an automatic stop. By forming a stop in this manner any variation in manufacture will not prevent the gears meshing together perfectly.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a grain-binder, the combination with the packer-shaft, of a drive-shaft mounted in fixed relation to and rotating in the same direction as the packer-shaft, gears on said shafts, a swinging arm pivoted coaxially with the drive-shaft and carrying an intermediate gear normally meshing with both gears, a connection between the arm and a movable part of the binder to swing the arm so as to disconnect the intermediate gear from the packer-shaft gear when the needle rises, and means for swinging the arm so as to cause the intermediate gear to roll around the drive-shaft gear into mesh with the gear on the packer-shaft when the needle falls, said packer-shaft gear and intermediate gear being provided with pitch-line shrouds to form stops to prevent them from being thrown too closely into mesh.

2. In a grain-binder, the combination with the packer-shaft, of a drive-shaft mounted in fixed relation to and rotating in the same direction as the packer-shaft, gears on said shafts, a rocking sleeve on the end of the drive-shaft that projects beyond the gears, an arm on one end of the sleeve carrying an intermediate gear meshing with the drive-shaft gear, a cam on the needle, and an arm projecting from the other end of the sleeve in the plane of movement of the cam.

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

JOHN F. APPLEBY.

Witnesses:

CHAS. H. CHAMBERS,
MARVIN CRAMER.