

No. 677,553.

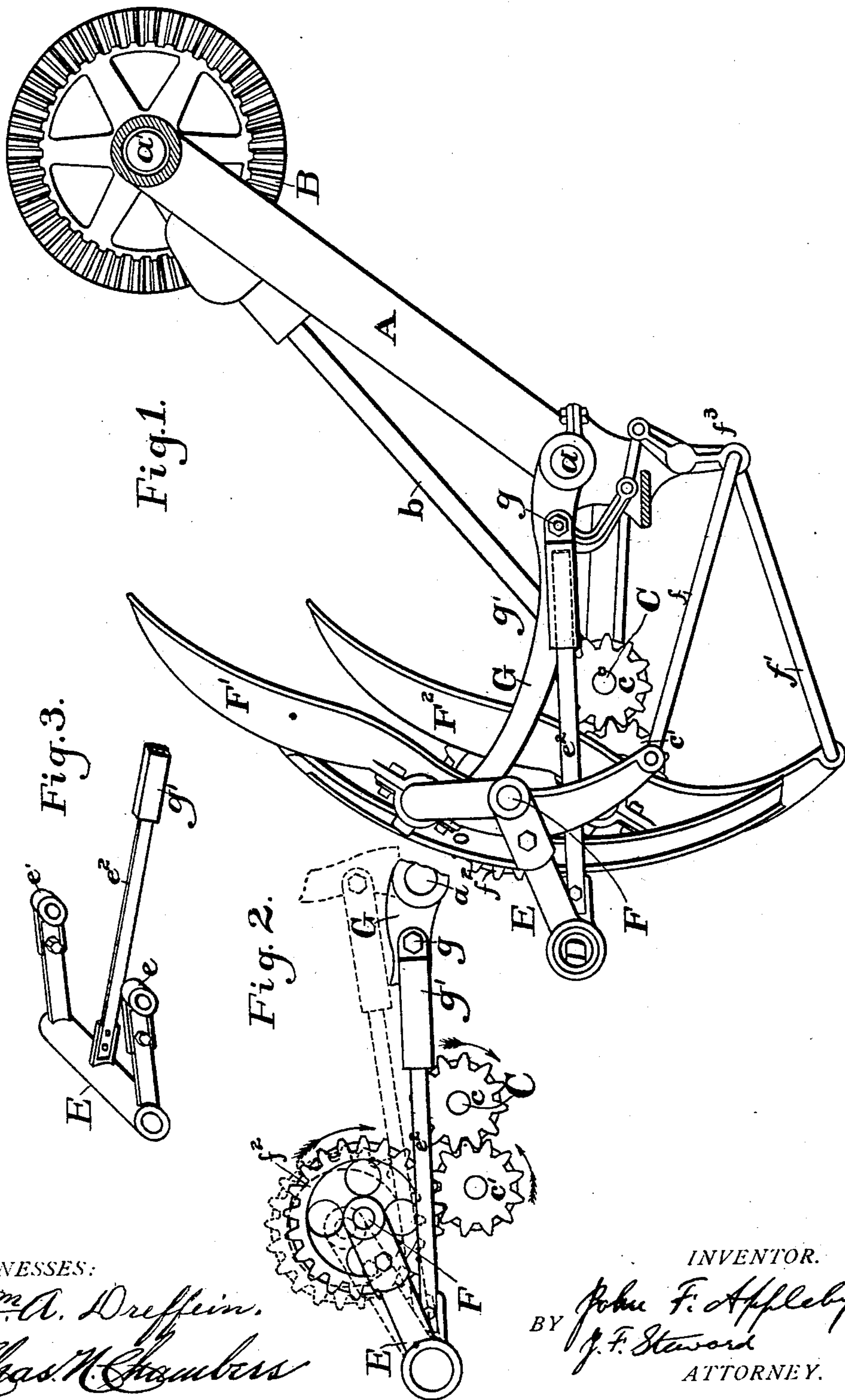
Patented July 2, 1901.

J. F. APPLEBY.  
AUTOMATIC GRAIN BINDER.

(Application filed Apr. 11, 1901.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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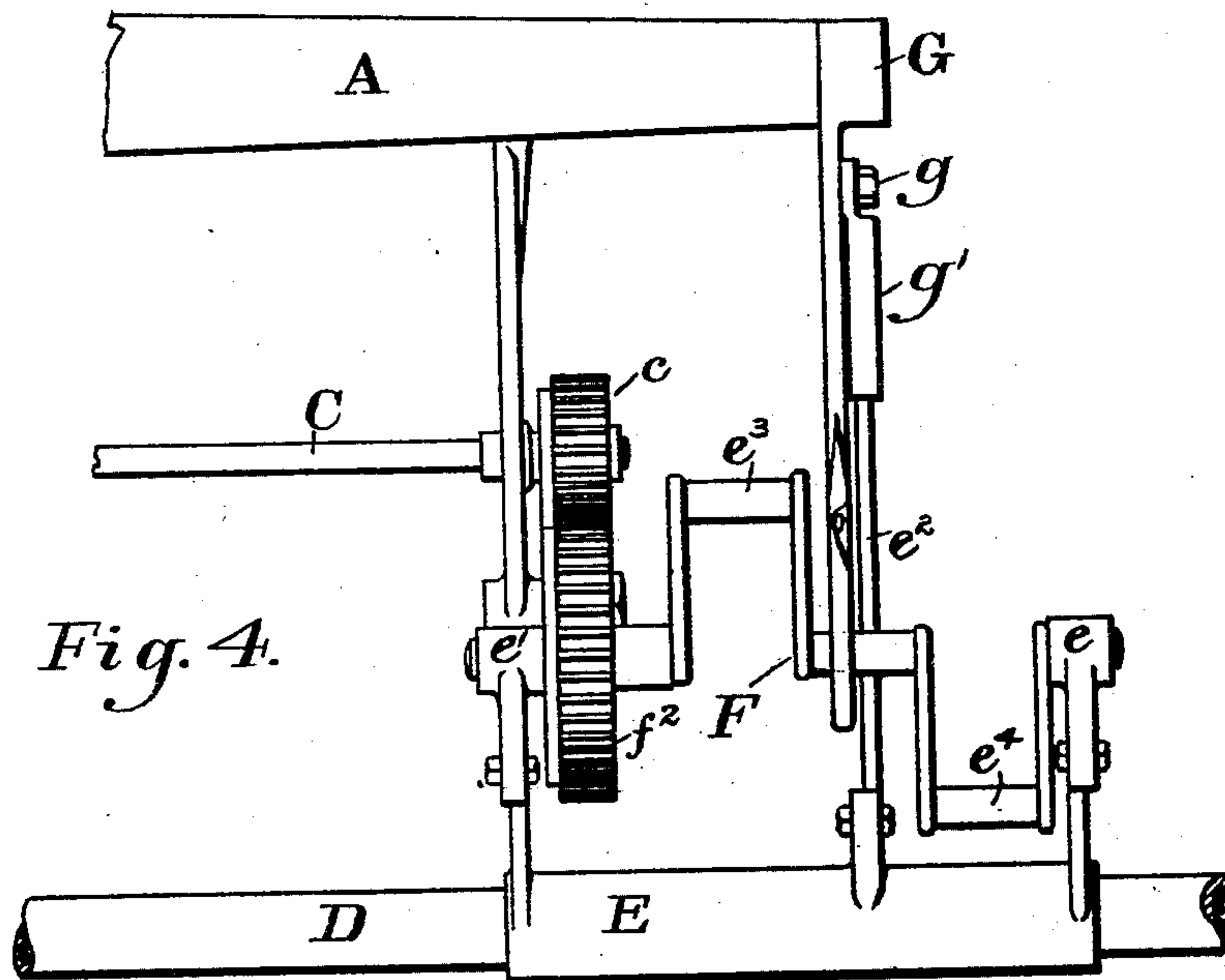
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# UNITED STATES PATENT OFFICE.

JOHN F. APPLEBY, OF CHICAGO, ILLINOIS.

## AUTOMATIC GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 677,553, dated July 2, 1901.

Application filed April 11, 1901. Serial No. 55,304. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN F. APPLEBY, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Grain-Binders, of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of so much of an automatic grain-binder as necessary to show my invention. Fig. 2 is a side elevation of those parts of an automatic grain-binder which I have introduced consisting of means for driving the packer-shaft intermittently. Fig. 3 is a perspective view of the parts provided for supporting the packer-shaft in such a manner that the shaft, and consequently the gear upon it, may be moved into and out of mesh with the constantly-rotating gear by which it is driven; and Fig. 4 is a plan view of the packer-shaft, its gear, and the rocking support E.

A is the main frame of an ordinary Appleby binder. Within its lower member is the needle-shaft  $a$ . In the upper member is the knot-driving shaft  $a'$ .

The knotter and bundle discharging devices are not shown, as they form no part of the present invention.

B is a gear upon the shaft  $a'$ , which is driven by a housed pinion on the shaft  $b$ . This shaft is intermittently rotated by the usual clutching devices upon the shaft C. The shaft C rotates constantly and the pinion  $c$  is keyed directly thereto.

D is a part of the binder-frame, which for lightness is usually made of gas-pipe.

In Fig. 2 the arrangement of the gearing may be best understood. The gear  $c$  upon the shaft C is constantly rotated, as stated. Upon a suitable stud, supported upon the main frame, is the intermediate gear  $c'$ . Upon the gas-pipe D is a rocking support E, having arms supporting the bearings  $e$  and  $e'$ . The lever  $e^2$  is as one piece with the rocking support E, by means of which lever said rocking support is connected to the intermittently working parts of the binder. Upon the crank-wrists  $e^3$  and  $e^4$  of the packer-shaft F are the packers  $F'$  and  $F^2$ , connected at their

lower ends by the links  $f$  and  $f'$  to a fixed portion of the machine at  $f^3$ .

G is the needle. At a point eccentric to the axis of the needle is a pivot  $g$ . Upon this pivot is placed the socket  $g'$ , into which the lever  $e^2$  passes freely.

The object of my invention may be best understood by reference to Fig. 2, in which a constantly-driven gear  $c$  imparts rotation to the intermediate gear  $c'$  and the constantly-rotating intermediate gear  $c'$  to the intermittently-rotating packer-shaft gear  $f^2$ . When the parts are in the position shown, the packers are in operation; but when the binding mechanism is put in motion the movement of the needle causes the lever  $e^2$ , and consequently the arms  $e$  and  $e'$  of the rocking support E, to rise, and thereby lift the packer-shaft F and move its gear  $f^2$  out of mesh with the gear  $c'$ . Because of the fact that the pivot  $g$  moves some distance laterally as well as upward the arm  $e^2$  is, in fact, made extensible by the use of the socket  $g'$ .

In order that the depth of mesh of the gears, particularly the intermediate gear  $c'$  with the packer-shaft gear  $f^2$ , shall be definite, I shroud the teeth as far up as the pitch-circle. The result in the action of the gears is that the pitch-line shrouds roll together, thus forming an automatic stop. As here illustrated, the constantly-driven gear  $c$  moves in the direction indicated by the arrow. As it is necessary to move the packer-shaft in the same direction, the intermediate gear  $c'$  is used and the packer-shaft gear  $f^2$  permitted to intermittently mesh with it. In machines where the shaft  $c$  rotates in a reverse direction the intermediate gear  $c'$  may be dispensed with, the only change necessary being to move the position of the shaft C or enlarge the gears  $c$  and  $f^2$ .

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In an automatic grain-binder, the combination with a constantly-rotating driving-shaft and a binding mechanism actuated thereby, of an intermittently-rotating packer-shaft, a rocking support in which said packer-shaft is journaled, gears mounted upon said driving-shaft and packer-shaft, and means



actuated by said binding mechanism for rocking said support, thereby moving the packer-shaft gear into and out of mesh with the driving-shaft gear, or gear actuated thereby, substantially as described.

2. In an automatic grain-binder, the combination with a constantly-rotating driving-shaft and a binding mechanism actuated thereby, of an intermittently-rotating packer-shaft, a rocking support in which said packer-shaft is journaled, spur-gears mounted upon said driving-shaft and packer-shaft, an oscillating needle-shaft and a mechanism connecting said needle-shaft with said rocking support whereby the oscillation of the needle-shaft shall rock the support and thereby move the packer-shaft into and out of mesh with the driving-shaft gear or gear actuated thereby, substantially as described.

3. In an automatic grain-binder, the combination with a constantly-rotating driving-shaft, and a binding mechanism intermittently actuated thereby, of an intermittently-rotating packer-shaft, a rocking support in which said packer-shaft is journaled, spur-gears secured to the said driving-shaft and packer-shaft, an intermittently-vibrating needle, and a connection between said needle

and said rocking support whereby the vibration of the needle shall rock the support and thereby move the packer-shaft gear into and out of mesh with the driving-shaft gear or gear actuated thereby, substantially as described.

4. In an automatic grain-binder, the combination with a constantly-rotated driving-shaft, and a binding mechanism intermittently actuated thereby, of a constantly-rotated gear actuated by said driving-shaft, an intermittently-rotating packer-shaft, a rocking support in which said packer-shaft is journaled, a spur-gear secured to said packer-shaft, an intermittently-vibrating needle, and an extensible connection between said needle and said rocking support whereby the vibration of the needle shall rock the support and thereby move the packer-shaft gear into and out of mesh with said constantly-rotated gear, substantially as described.

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

JOHN F. APPLEBY.

Witnesses:

CHAS. N. CHAMBERS,  
CHARLES H. THOMPSON.