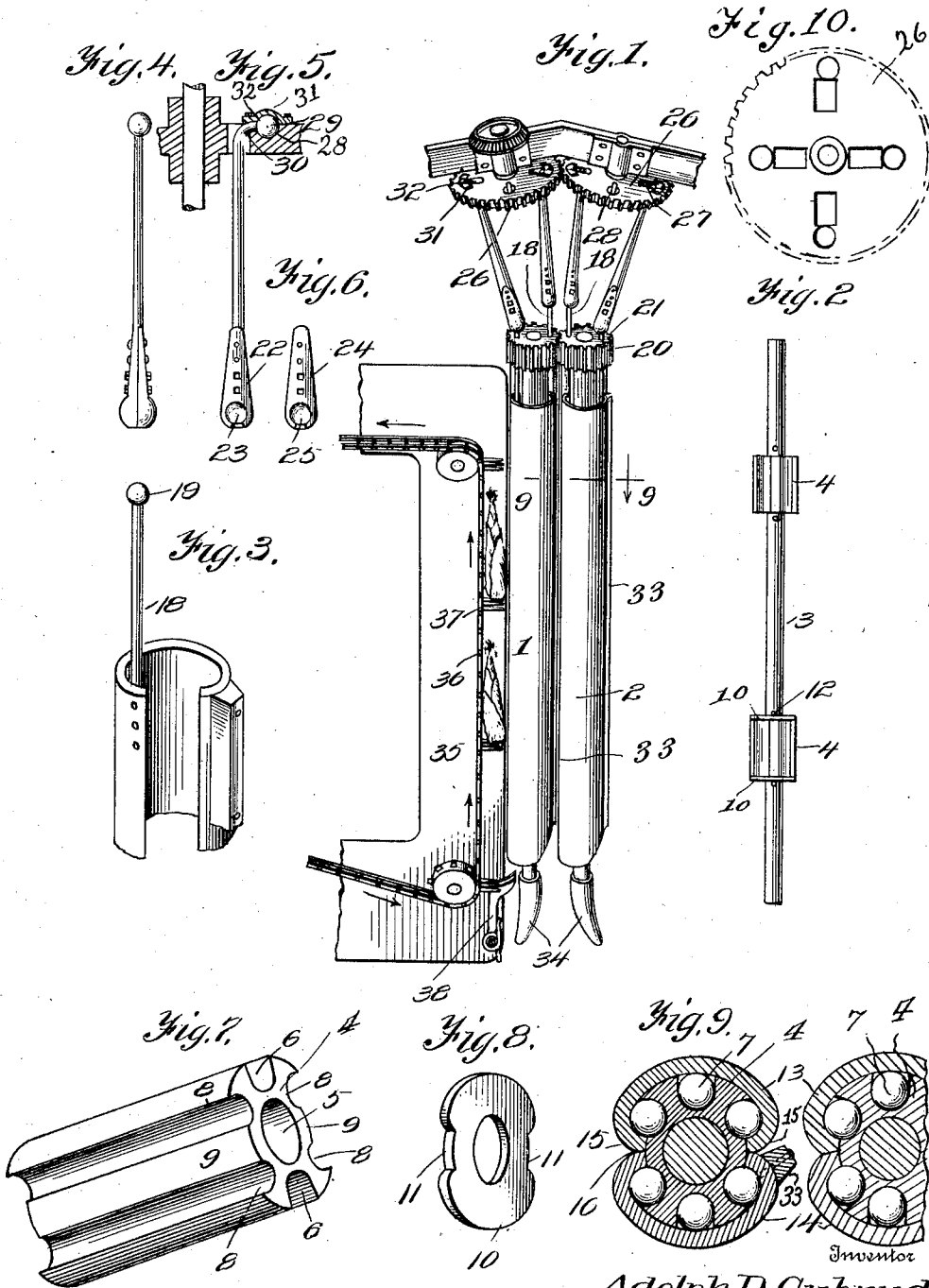


A. P. GUBRUD.
CORN HARVESTER.
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Patented Feb. 6, 1912.



Witnesses
H. L. Gibson.
K. Allen

Adolph P. Gubrud
By Victor J. Evans
Attorney

UNITED STATES PATENT OFFICE.

ADOLPH P. GUBRUD, OF HUDSON, SOUTH DAKOTA.

CORN-HARVESTER.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ADOLPH P. GUBRUD, a citizen of the United States, residing at Hudson, in the county of Lincoln and State of South Dakota, have invented new and useful Improvements in Corn-Harvesters, of which the following is a specification.

The invention relates to improvements in corn harvesting machines, being more particularly directed to snapping rolls therefor which are constructed to automatically and intermittently provide a space between them at the entrant ends for the admission of the corn stalks.

The main object of the present invention is the provision of snapping rolls, each made up of oppositely moving sections, the construction including simple means whereby the extent of movement of the sections may be adjusted at will.

Another object of the invention is the provision of a snapping bar designed to be attached to one section of each roll, whereby the snapping operation is more certainly and expeditiously performed.

Another object of the invention is the provision of bearings for the moving sections in order to reduce the friction of such parts and the power necessary to operate them to a minimum.

The invention, in its preferred details of construction, will be described in the following specification, reference being had particularly to the accompanying drawings, in which,

Figure 1 is a plan of the improved snapping rolls, a portion of the conveyer being shown. Fig. 2 is a plan of one of the roller shafts. Fig. 3 is a broken perspective of one end of one of the roll sections. Fig. 4 is a plan of one of the connecting rods complete. Fig. 5 is a side elevation of said rod, with the removable socket plate disconnected. Fig. 6 is a side elevation of the removable socket plate. Fig. 7 is a perspective view of the ball carrier. Fig. 8 is a perspective view of the cap ring for said carrier. Fig. 9 is an enlarged transverse section on the line 9-9 of Fig. 1. Fig. 10 is a detail view in elevation showing one of the gears.

Referring particularly to the accompanying drawings, the present invention is directed to snapping rolls 1 and 2 between

which the stalks of corn are successively passed and in the rotation of which rolls the ears are snapped from the stalks. The rolls are identical in construction, and therefore a detailed statement of one will suffice for both.

Each roll comprises a main or central shaft 3 of rod-like form supported at opposite ends in any way appropriate to structures of this type on which, near each end, there is secured a ball-carrier 4. The ball-carrier comprises a solid body formed with a central longitudinal opening 5 snugly fitting the shaft 3. At diametrically opposite points, the ball-carrier is formed with longitudinally extending ball channels 6 having a depth slightly less than the diameter of the balls 7 fitted therein. On each side of the main ball channels 6, the carrier is formed with side channels 8, corresponding in size to the main channels 6, except that the proximate walls of the side channels, and the intervening section of the carrier, are cut away to provide rounded side surfaces 9, all as clearly shown in Fig. 7. As thus constructed, the carrier, in end elevation, is materially reduced on its horizontal diameter. Cap rings 10 are designed to bear against the respective ends of the carrier, comprising disk-like sections having central openings to fit the shaft 3. The diameter of the disk corresponds to the maximum diameter of the carrier, the periphery of the disk being cut out at diametrically opposed points, as at 11, so that when the disk is in place, the cut out portions 11 accurately register and aline with the surfaces 9 of the carrier. The cap rings are designed to close the open end of the ball channels and prevent the escape of the balls, and are secured in place by pins 12 passing through the shaft 3 beyond the rings, as clearly shown in Fig. 2.

Each roll comprises sections 13 and 14 of duplicate construction, each forming one half of the roll. The sections are metallic strips conforming, in sectional outline, to the outline of approximately one half of the carrier, the edges of each section being inturned at 15 to bear upon the surfaces 9 of the carrier. Each section is thus approximately semi-cylindrical in shape with its edges inturned. The sections are supported solely by the balls in the carrier, thus reduc-

ing the friction of their end-wise movement to a minimum, it being noted that the intumed side edges of the sections serve to hold the balls in the side channels 8. Furthermore, the intumed edges of the sections form in effect a V-shaped recess 16 at the meeting edges of the section, for a purpose which will presently appear.

Each section is provided with an operating rod 18 secured at its inner end to the section and formed at its outer end with a ball terminal 19. A gear pinion 20, is secured upon the end of each shaft 3, the pinions of both shafts intermeshing in operation. The operating rods 18 of the sections of each roll pass through diametrically opposed openings 21 in the pinion of its shaft, and are each beyond the pinion connected to a connecting rod. This rod is formed, at one end, with a socket plate 22 having a semi-spherical depression 23 to receive the ball end 19 of the operating rod, a socket plate 24 formed with a semi-spherical depression 25 being secured to the plate 22 to removably join the operating and connecting rods.

Supported in a suitable part of the harvester frame, adjacent and in line with the pinions 20, are double gears 26, one for each roll. The gears 26 are arranged at an angle to each other having their meshing or relatively inner edges spaced the greatest distance from the proximate ends of the rolls. At diametrically opposite points, each gear 26 is formed with radially extending slots 27, said slots being preferably in two pairs—one pair extending from a point immediately adjacent the central opening of the gear, while the other pair extends from a point immediately adjacent the periphery of the gear. Outwardly beyond each slot the body of the gear is formed with a semi-spherical depression 28 to receive the ball end 29 upon the free or outer end of the connecting rod, said rod adjacent said ball end being laterally projected as at 30 to offset the ball from the main plane of the rod. A cap plate 31 is designed to be secured to the gear overlying the depression 28, said cap being formed with a corresponding depression 32 to overlie the ball 29 and thereby fix the latter to the gear.

The respective slots receive the offset portion 30 of the connecting rods, and as said slots are arranged in a plurality of pairs which are respectively, at different distances from the center of the gear, it is obvious that the rods may be connected to the gear at different distances from its center. This permits the adjustment of the movement of the sections, as will later appear.

Secured to one section of each roll, is a longitudinally arranged snapping bar 33, designed to more effectively snap the ears from the stalks. These bars are arranged for alternate operation, respecting the

snapping plane of the rolls, that is, one bar will be in snapping position, while the remaining bar is remote from such position. The snapping bar of one roll will, in operation, fit into the V-shaped recess 16 of the opposing bar, thus imparting a bending action to the interposed stalk which will snap the ear therefrom with absolute certainty and precision.

In operation, owing to the angular arrangement of the gears 26, it will be understood that the connecting rods of each section, and thereby the sections of each roll, will be oppositely reciprocated. By this means, there is provided, at the entrance end of the sections, a space in which the stalks are freely guided, this space being incident to the rearward movement of corresponding sections of one roll and the forward movement of the corresponding section of the rolls, when the line of juncture of the respective sections of both rolls are approximately at right angles to each other.

It will be obvious that the extent of reciprocal movement of the respective sections of either roll may be increased or decreased by arranging the connecting rods in the outermost or innermost slots of the gears 26, and thereby the extent of entrance opening between the sections correspondingly adjusted.

If desired the forward ends of the shafts 3 may be provided with guide-fingers 34 which may be held against rotation by any suitable means (not shown) to guide the stalks to the rolls. After snapping action is had, the ears are delivered to a conveyor or guide trough 35 on which travels a conveying chain 36 having fingers 37 to force the ears lengthwise across. A protector 38 is mounted on the trough adjacent the ends of the rolls, said protector being spring pressed in one direction and having a series of terminal fingers curving away from the rolls and between which the fingers 37 may pass in the travel of the chain. The protector prevents the ears from traveling in the wrong direction, and by means of its spring connection, will yield to prevent choking under unusual conditions.

In the preferred form, illustrated and described, the snapping rolls are capable of adjustment in the movement of their sections, and said sections are mounted on ball bearings to reduce to a minimum the power necessary to operate them.

I claim:—

1. A corn harvester, including a coöperating pair of snapping rolls, each roll comprising opposite longitudinally movable sections and an antifriction bearing supporting the sections, and means for moving the sections relatively to each other.

2. A corn harvester including a coöperating pair of snapping rolls, each roll com-

prising opposite longitudinally movable sections, means for moving the sections of each roll relative to each other, and means for adjusting said relative movement of the sections.

3. A corn harvester, including a cooperating pair of snapping rolls, each roll comprising opposite longitudinally movable sections and an antifriction bearing supporting the sections, means for moving the sections relatively to each other, and a snapping bar carried by each roll.

4. Snapping rolls for corn harvesters, connected for simultaneous rotation, each of said rolls comprising oppositely longitudinally movable sections, the meeting lines of the sections of each roll forming V-shaped depressions, and a snapping bar carried by each roll to cooperate with the depression of the opposing roll.

5. Snapping rolls for corn harvesters, connected for simultaneous rotation, each of said rolls comprising oppositely longitudinally movable sections, the meeting lines of the sections of each roll forming depressions, and a snapping bar carried by each roll to cooperate with the depression of the opposing roll.

6. A corn harvester, including a cooperating pair of snapping rolls, each roll comprising opposite longitudinally movable sections and an antifriction bearing supporting the sections, means for moving the sections relatively to each other, and a snapping bar carried by one section of each roll.

7. A snapping roll for corn harvesters including a shaft, a ball carrier secured thereon and formed with a ball channel, balls in said channel, and roll sections oppositely longitudinally movable on the balls.

8. A snapping roll for corn harvesters, including a shaft, spaced ball carriers mounted thereon, sections encircling the carriers and longitudinally movable thereon, and in-

turned at their meeting edges to form depressions, and a bar carried by one section.

9. A snapping roll for corn harvesters, including a shaft, spaced ball carriers mounted thereon, and sections encircling the carriers and longitudinally movable thereon, said sections being inturned at their meeting edges to form depressions, and a snapping bar secured to one section.

10. A snapping roll for corn harvesters, including a shaft, spaced ball carriers mounted thereon, and sections encircling the carriers and longitudinally movable thereon, said sections being inturned at their meeting edges to form depressions, and a snapping bar secured to one section adjacent the depression.

11. Snapping rolls for corn harvesters, each including opposite longitudinally movable sections, means for causing simultaneous rotation of the rolls, said means including intermeshing bevel gears formed with diametrically opposed pairs of slots, and connections between the sections of one roll and a pair of slots, said bevel gears being arranged at an angle to each other.

12. Snapping rolls for corn harvesters, each including opposite longitudinally movable sections, means for causing simultaneous rotation of the rolls, said means including intermeshing bevel gears formed with diametrically opposed pairs of slots, and connections between the sections of one roll and a pair of slots, said bevel gears being arranged at an angle to each other, the different pairs of slots of the bevel gears being respectively at different distances from the centers of said gears.

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

ADOLPH P. GUBRUD.

Witnesses:

K. E. JACOBSON,

J. B. BRADLEY.