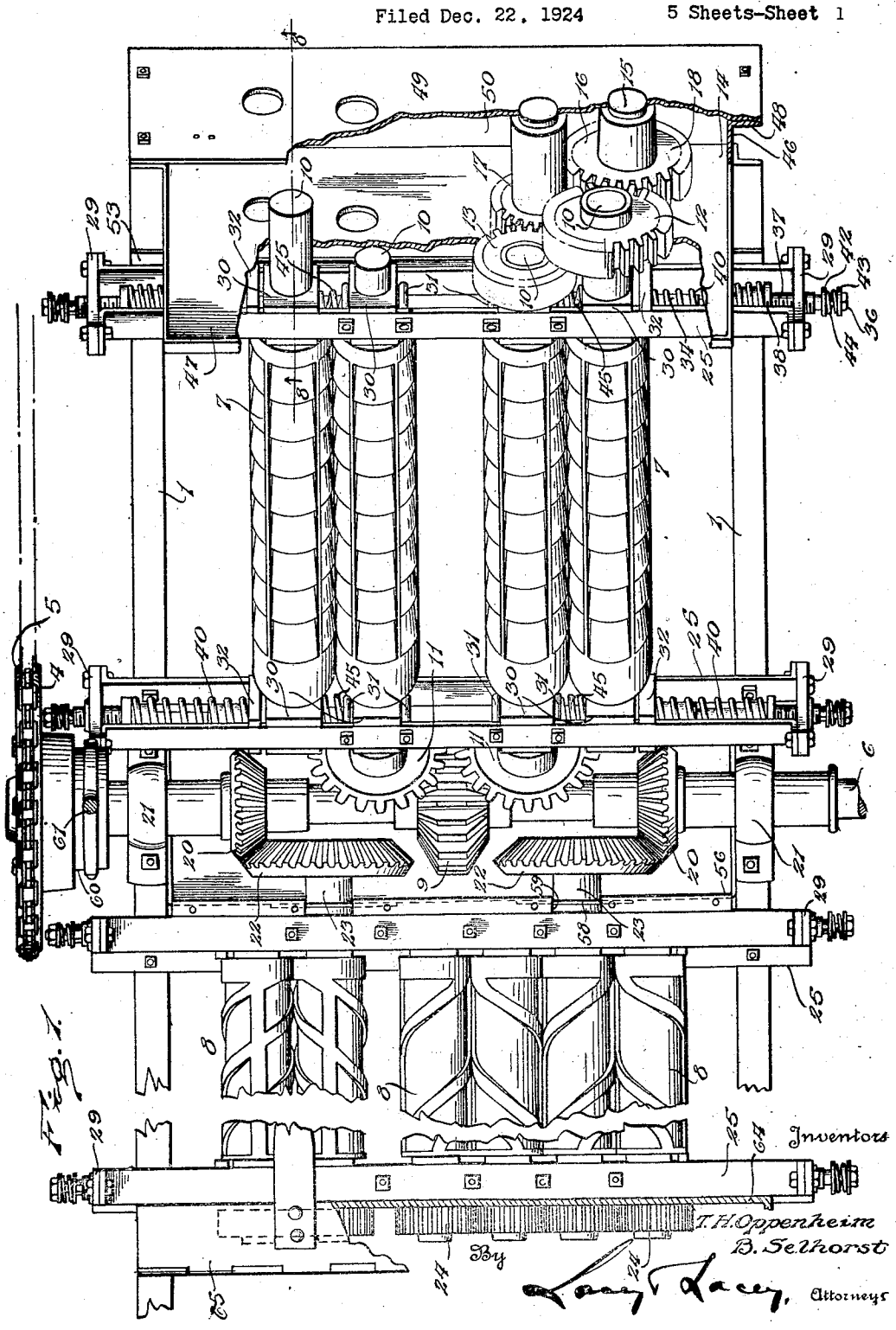
Oct. 20, 1925. 1,557,768

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MEANS FOR OPERATING THE ROLLS OF CORN HUSKING MACHINES

Filed Dec. 22, 1924 5 Sheets-Sheet 1



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MEANS FOR OPERATING THE ROLLS OF CORN HUSKING MACHINES

Filed Dec. 22, 1924 5 Sheets-Sheet 2

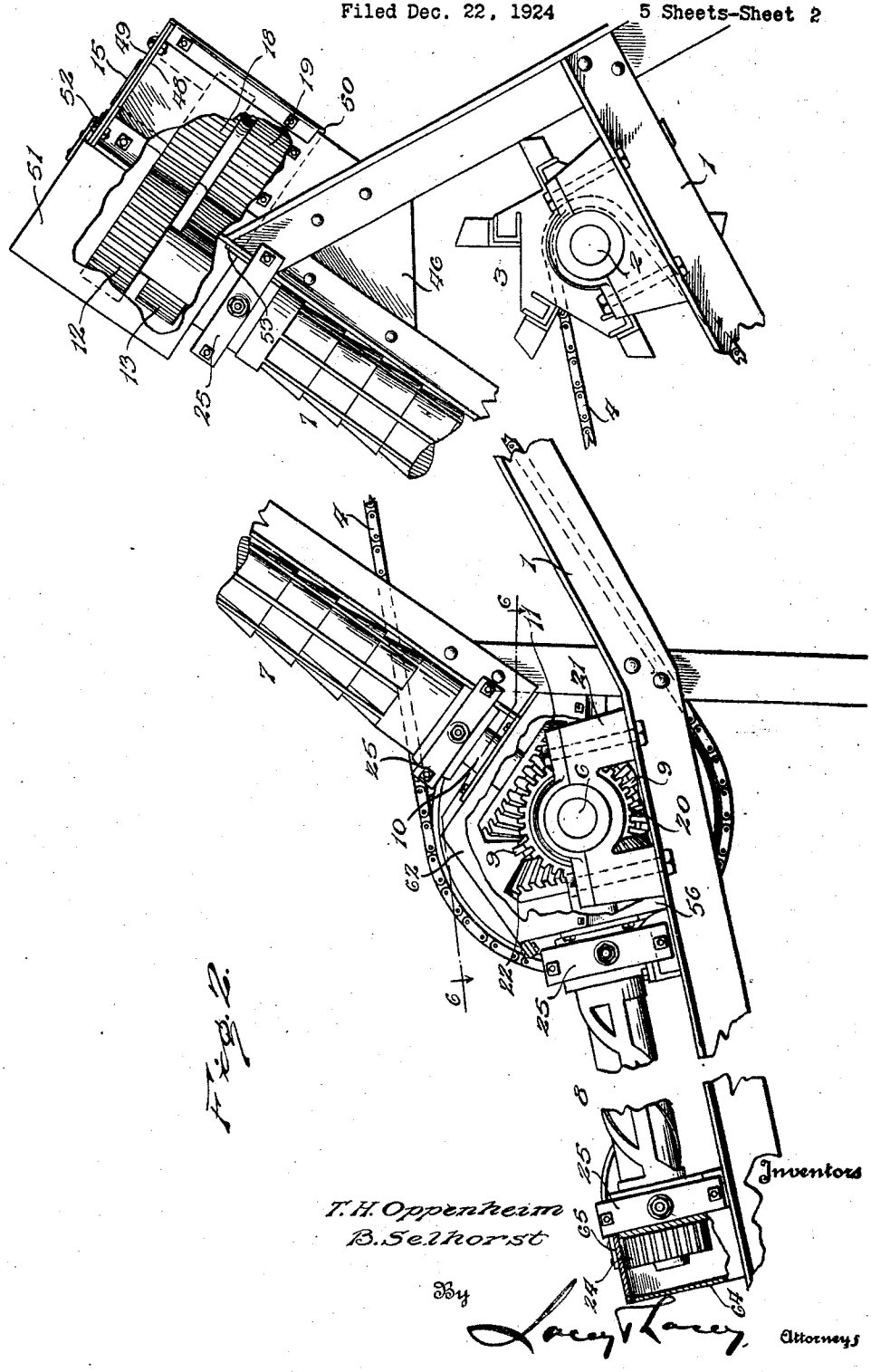


Fig. 2.

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Fig. 3.

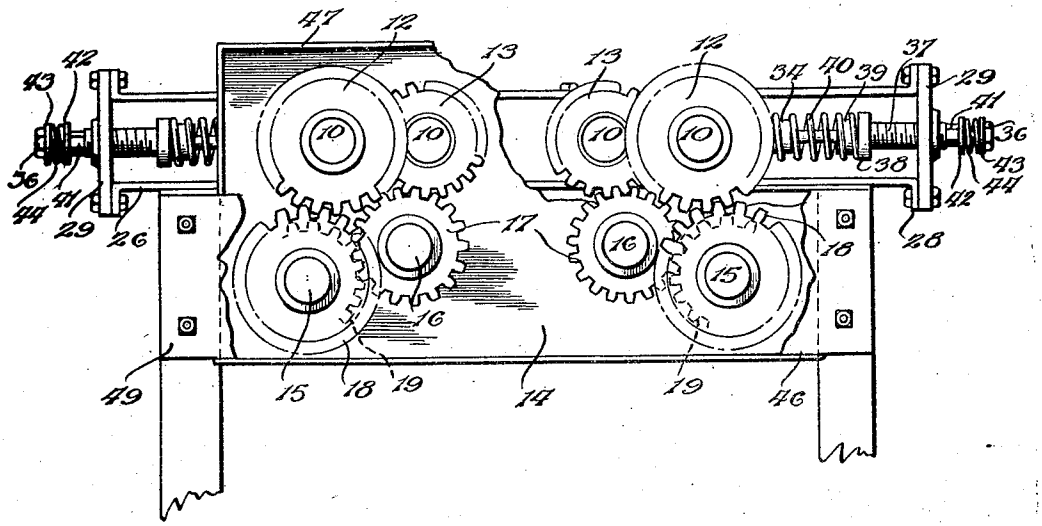
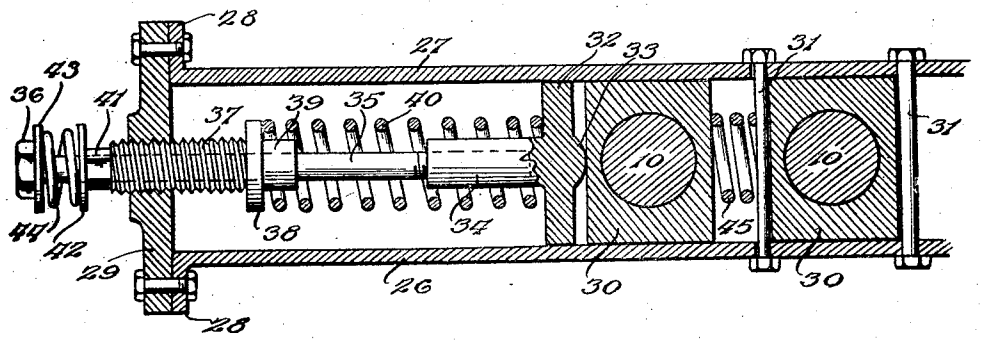


Fig. 4.



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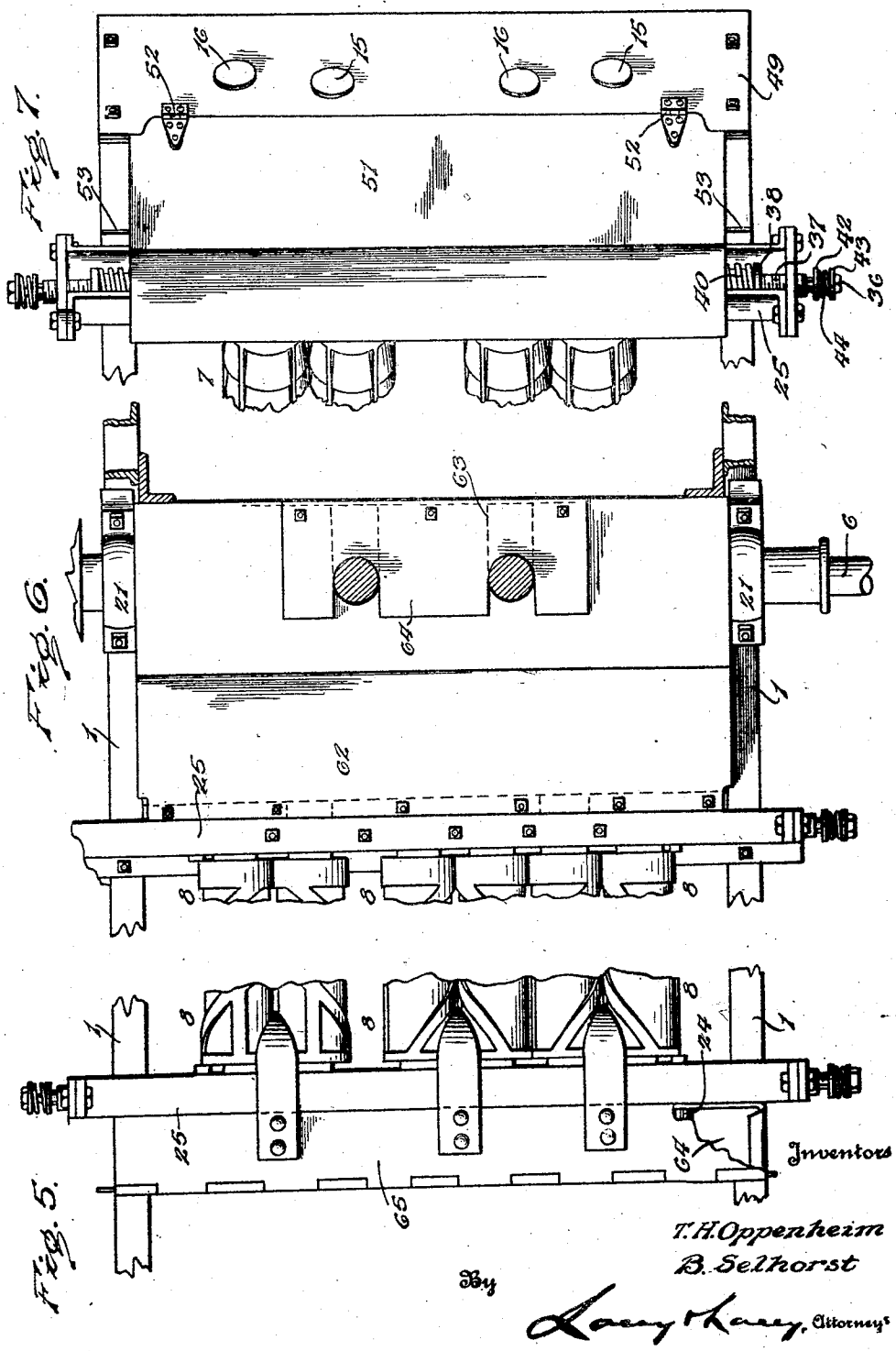
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MEANS FOR OPERATING THE ROLLS OF CORN HUSKING MACHINES

Filed Dec. 22, 1924 5 Sheets-Sheet 4



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Fig. 8.

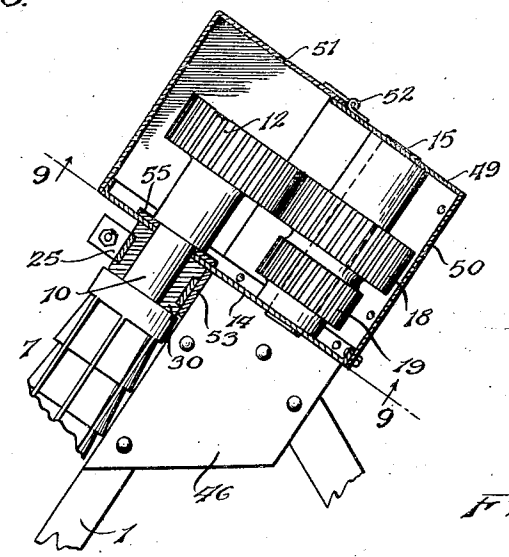


Fig. 9.

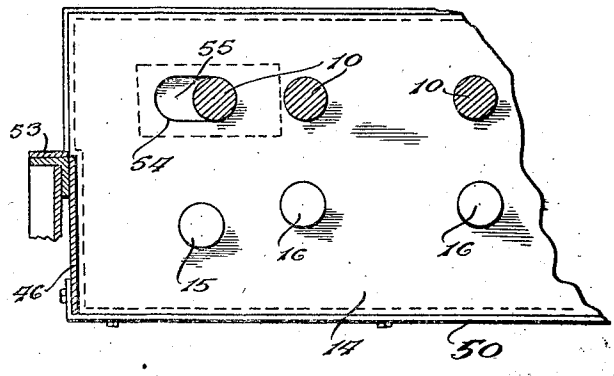
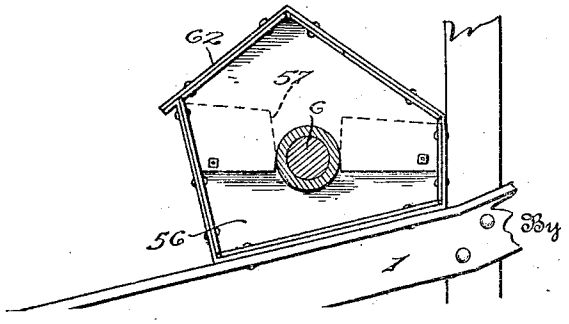


Fig. 10.



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UNITED STATES PATENT OFFICE.

THEODORE H. OPPENHEIM AND BERNARD SELHORST, OF COLDWATER, OHIO, ASSIGNORS TO NEW IDEA SPREADER CO., OF COLDWATER, OHIO, A CORPORATION OF OHIO.

MEANS FOR OPERATING THE ROLLS OF CORN-HUSKING MACHINES.

Application filed December 22, 1924. Serial No. 757,533.

To all whom it may concern:

Be it known that we, THEODORE H. OPPENHEIM and BERNARD SELHORST, citizens of the United States, residing at Coldwater, in the county of Mercer and State of Ohio, have invented certain new and useful Improvements in Means for Operating the Rolls of Corn-Husking Machines, of which the following is a specification.

Our present invention has for one object the provision of means whereby all the rolls of a corn-husking machine may be driven from a single shaft, and another object of the invention is to provide improved means for yieldably holding the rolls in engagement with the stalks or other bodies passing between them while keeping the rolls in gear. The invention also has for an object the provision of means whereby wear upon the gears will be minimized.

Other objects will appear incidentally in the course of the following description and the invention resides in certain novel features which will be particularly pointed out in the appended claims.

In the accompanying drawings:

Figure 1 is a plan view, partly broken away and with some parts removed, of the rolls of a corn-husking machine illustrating our present invention;

Fig. 2 is a side elevation of the same;

Fig. 3 is an end elevation, partly broken away, of the upper ends of the snapping rolls;

Fig. 4 is an enlarged longitudinal section of the mounting for the rolls which is shown in Fig. 3;

Fig. 5 is an enlarged plan view, partly broken away, of the mounting for the lower ends of the husking rolls;

Fig. 6 is a plan view of the housing for the central driving gearing, with parts in section on the line 6—6 of Fig. 2;

Fig. 7 is a plan view of the housing for the upper ends of the snapping rolls;

Fig. 8 is a section on the line 8—8 of Fig. 1;

Fig. 9 is a section on the line 9—9 of Fig. 8, and

Fig. 10 is an end elevation of the housing for the central driving gearing.

In the drawings, the reference numeral 1 indicates the side bars of a supporting frame or bed for the rolls and 2 designates the shaft carrying the cutter head 3, by the operation of which the stalks or other bodies passing between the snapping rolls are cut into short lengths suitable for fodder. The cutter head may be of any approved construction and is driven from a motor which is connected by a suitable driving belt with a driving pulley upon the cutter head shaft. Upon one end of the shaft 2 is secured a sprocket about which is trained a chain 4 which is also trained about a large sprocket 5 upon one end of a shaft 6 which is disposed transversely of the frame and passes between the lower ends of the snapping rolls and the upper ends of the husking rolls to constitute the main driving element for all the rolls. Referring more particularly to Fig. 1, it will be noted that we have illustrated two sets of snapping rolls 7 and three sets of husking rolls 8. The particular number of snapping rolls and husking rolls is, of course, immaterial and the particular configuration of the rolls is of no moment for the purposes of our present invention. The rolls are disposed in pairs and in the operation of the machine the stalks are fed to and pass between the members of a pair of snapping rolls, the ears of corn being snapped therefrom. The ears of corn pass by gravity to and beyond the lower ends of the snapping rolls and are directed onto the husking rolls which grip the husks and feed the same between the rolls, the cleaned ears of corn passing longitudinally over the rolls and being delivered at the rear end of the machine. The sprocket 5 is locked to the shaft 6 at will by a clutch which is indicated at 60 and controlled by a rod 61 having a handle located within convenient reach of the operator at the end of the machine. If an operator or other person approaches too close to the rolls, a jerk of the handle will throw out the clutch and the rolls will immediately stop as there is no momentum in the roll-driving gearing.

In the present embodiment of our invention, we have shown a double bevel gear 9 secured upon the shaft 6 at about the center of the same and midway between the inner snapping rolls. The snapping rolls are secured upon or formed with shafts or trunnions, indicated at 10, and upon the lower trunnions we secure bevel gears 11 which

mesh with the opposite sides of the double driving gear 9, as clearly shown in Fig. 1. Upon the trunnions 10, at the upper ends of the snapping rolls, we secure spur gears 12 and 13, respectively, the gear 12 upon the outer snapping roll being disposed longitudinally beyond the gear 13 upon the inner snapping roll. A bracket or plate 14 is secured to the frame immediately adjacent and below the upper trunnions of the snapping rolls and in this plate or bracket are secured stub shafts 15 and 16, a gear 17 mounted upon the stub shaft 16, meshing with the gear 13 and a gear 18 mounted upon the stub shaft 15, meshing with the gear 12. The gear 18 is located outwardly beyond the gear 17, as will be readily understood upon reference to Fig. 1, but the gear 17 meshes with a gear 19 which is mounted upon the shaft 15 and is fixed to or formed integral with the gear 18, as shown in Fig. 2. It will thus be seen that the inner snapping roll is positively driven through the gears 9 and 11 and the outer snapping roll is in turn driven through the train of gearing at the upper ends of the rolls and comprising the gears 13, 17, 19, 18 and 12. This train of gearing is very efficient inasmuch as the outer snapping roll is mounted for sliding movement relative to the inner snapping roll, as will be presently set forth, and the sliding of the outer roll will not destroy the intermeshing engagement of the gears, the gear 12 rolling upon the gear 18 as the snapping roll moves inwardly or outwardly, and consequently the rotation of the rolls will be uninterrupted.

Outwardly beyond the gears 11, bevel gears 20 are secured upon the shaft 6 and have their hubs suitably journaled in bearings 21 secured upon the side bars of the frame. These gears 20 mesh with bevel gears 22 secured upon trunnions 23 at the upper ends of some of the husking rolls 8 and the lower ends of the husking rolls are operatively connected through spur gears 24, shown in Figs. 1 and 2. It will be noted that the gears 20 are reversed with respect to each other so that the husking rolls are rotated in the proper direction, the rotation of the positively driven husking roll being imparted to the mating husking roll through the gears at the lower ends of the rolls in substantially the same manner as the motion is imparted to the snapping rolls through the upper ends of the latter. It will be seen at once that we have provided a compact train of gearing whereby all the rolls are driven from a single shaft and this gearing is disposed between the opposed ends of the rolls so that it occupies but very little space in the corn-husking machine and may be supported by the frame of the machine at such point that breaking of the gears through chance blows of extraneous objects will be minimized. It will also be noted that we drive our husking rolls from the cutter head shaft so that the number of moving parts is less than in other machines for the same purpose now known to us.

Secured upon and extending across the husking machine frame are yokes 25 which carry the bearings for the several rolls, the yokes being provided at both the upper and lower ends of the snapping rolls as well as the husking rolls. These yokes are substantial duplicates in construction and the description of one will suffice for all. Each yoke consists of a lower bar 26 which is secured rigidly to the frame of the corn-husking machine, and an upper bar 27 which is of the same form and dimensions as the lower bar and is arranged parallel therewith. The outer ends of the bars 26 and 27 are turned downwardly and upwardly, respectively, as shown at 28, and a cap plate 29 is secured to these turned or bent ends of the bars. The trunnions or shafts of the rolls are journaled in bearing blocks or boxes 30 which fit closely between the yoke members 26 and 27 and that block or box which receives the trunnion or journal of the outer roll has its upper and lower sides grooved whereby it may slidably engage the yoke bars 26 and 27, as will be readily understood by reference to Fig. 1. The block or box receiving the trunnion or shaft of the inner roll is, however, held against lateral movement by the stay bolts 31 inserted through the said bars adjacent the sides of the box, as shown most clearly in Fig. 4. It will be readily understood that by this arrangement the outer roll may yield to the thickness of a stalk or other article passing between the rolls so that the proper operation of the parts will be effected. While it is highly desirable that the outer roll may yield to the stalk or other member passing between the rolls, it is also necessary to maintain the rolls in such relation that the stalk will be properly engaged and fed through by them. To maintain this operative relation of the rolls, tension springs are now generally employed, but they are not entirely satisfactory, for the reason that they are constantly under tension and when the movable roll is relieved of the pressure of a stalk or a husk passing between the rolls, it is returned to its position close to the relatively stationary roll with such force that the rolls are subjected to violent contact and are frequently damaged. In our present invention, we provide a pressure head 32 which is slidable within the yoke 25 at the outer side of the journal box 30 which receives the trunnion of the outer roll. This pressure head is formed with a small convex teat 33 upon its inner face which bears against the journal box 30, as shown in Fig. 4, so that while the desired pressure is exerted upon the box the area of

contact is minimized and wear upon the parts is, therefore, obviated. A thimble or tubular projection or socket 34 is formed upon the outer face of the head 32 at the center thereof and a stem 35 is threaded into the said socket, as shown clearly in Fig. 4. The stem extends outwardly through the cap plate 29 and is equipped at its outer extremity with a nut 36, as shown. Threaded through the cap plate 29 and surrounding the stem 35 is a sleeve nut 37 having an annular shoulder 38 near its inner end, the end of the nut inwardly beyond said shoulder being smooth, as shown at 39. A coiled spring 40 is disposed around the stem 35 between the shoulder 38 and the outer face of the head 32 and its ends fit around the socket 34 and the smooth extremity 39 of the sleeve nut whereby it will be properly centered. The outer extremity of the sleeve nut 37 is formed with flat faces 41 to be engaged by a wrench or other turning tool in order that the proper tension may be placed upon the spring 40, and at the outer end of the flat-faced portion 41 is an abutment plate 42, a similar abutment plate 43 being provided at the base of the nut 36 and a coiled spring 44 being provided around the outer end of the stem 35 between the said abutment plates 42 and 43, as shown in Fig. 4. When the outer roll moves outwardly under the pressure exerted thereon by a stalk or husk passing between the pair of rolls, the spring 40 will be compressed against the shoulder 38 of the sleeve nut 37. When the pressure of the stalk is removed, the spring 40, of course, expands and returns the roll to its innermost position. The outward movement of the roll and the resulting outward movement of the stem 35 will, of course, relieve the pressure upon the spring 44 which will expand, but when the return movement is imparted to the roll by the expansion of the spring 40, the spring 44 will be compressed and will, therefore, serve to check or cushion the return movement and overcome the tendency of the roll to contact forcibly with the relatively stationary roll. We thus avoid slamming, friction and breakage of the rolls, while at the same time permitting the needed relative movement of them and maintaining the proper engagement of the rolls with the stalks or other parts which are to pass between them. If so desired, a cushion spring 45 may be arranged between the box 30 carrying the outer roll and the adjacent bolt 31 which restrains the inner roll from sliding movement. Ordinarily, however, the spring 44 will accomplish the result unaided, but it will be understood that either the spring 44 or the spring 45 may be employed without involving any departure from our invention or any change in the operation of the mechanism.

Upon reference to Fig. 1, it will be noted that a considerable space appears between the two pair of snapping rolls. In actual practice, this space is covered by a deflecting or dividing bar whereby the bundles of corn are guided to the snapping rolls, but such dividing bar forms no part of our present invention and has been omitted for the sake of clearness. The arrangement devised by us for driving the snapping rolls simplifies the construction, minimizes the working parts and permits the bevel gears to be arranged in opposed relation so that the torsional strain thereon is neutralized, the gearing working easily and being constantly balanced. We also accommodate a very considerable shifting of the slidable roll without causing the gears to get out of mesh and are enabled to place the snapping rolls in a nearly vertical position without imposing any excessive strain upon any of the gears or upon the rolls. As has been stated, the main roll driving shaft is itself driven from the cutter head. In actual practice, we provide sprockets upon the said roll driving shaft at the end thereof remote from the sprocket 5 so that the motion of the shaft will be transmitted to the ear conveyer and to the shaking screen which are mounted in the lower portion of the corn-husking machine, so that we have a unitary drive for all the operating parts.

The sleeve nut 37 is adjustable through the cap plate 29 to impart the proper working tension to the spring 40. After the proper tension has been put upon the spring 40, the nut 36 is rotated so that it pulls the stem 35 outwardly until the bearing for the outer roll is free and no pressure is on the rolls. Then when a stalk or a husk passes between the rolls the movable roll bearing will move outwardly and push the stem 35 in the same direction, the nut 36, of course, moving outwardly therewith. When the stalk has passed through the machine, return movement of the bearing will be checked by the compression of the spring 40, as above described. It will be seen that, while our device applies the desired pressure when anything is passing between the rolls, the tension is taken off the rolls after the object has passed and the life of the bearings prolonged.

The plate 14 forms the bottom of a gear casing, the end walls of which are provided by the extended portions of gusset plates 46 which are secured to the upper corners of the main frame. The bottom plate is provided with a flange 47 along its edges whereby it may be easily bolted to the gusset plates, and the gusset plates are provided at their upper ends with flanges 48 to facilitate placing and securing the top plate 49, the top plate having openings therein to receive and support the ends of the stub

shafts 15 and 16. The bottom of the gear casing is provided by a plate 50 which is bolted or riveted to the flanges of the plate 14 and the gusset plates, while a cover 51 is provided for the front of the gear case. The cover is hinged, as at 52, to the top plate 49 and is in the form of an open box adapted to fit over and enclose the gearing and rest at its free edge upon the flange of the bottom plate 14. A plate 53 is secured upon and extends across the main frame below the yoke 25 and abutting the bottom plate 14 to reinforce the latter.

The gear case constitutes a grease pan to contain lubricant which is preferably a heavy oil and the level of which normally extends from the upper or front edge of the bottom plate to the lower or rear edge of the top plate, the greater portion of the train of gearing being thereby submerged and the unsubmerged portion receiving sufficient lubricant from the submerged part. To accommodate the trunnion of the movable roll, the plate 14 is slotted, as at 54, and a slide 55 is fitted about the trunnion to move therewith and cover the slot at all times to prevent leakage. When cleaning of the pan is necessary, the top plate is removed thereby giving access to the gears which may be easily withdrawn, whereupon the grease may be scraped from the pan. When the gears and top plate have been restored, it is a very simple matter to pour grease into the pan.

Between the side bars of the main frame, we provide a pan or trough 56 below the main shaft 6, the ends of this pan being secured to the frame side bars in any preferred manner and being provided in their upper edges with notches 57 to fit closely about the shaft. A sealing plate 58 is secured upon the front wall of the pan to cover the slots 59 provided for the trunnions of the husking rolls and prevent leakage of the lubricant placed in the pan. A box-like cover 62 is secured upon the pan with its end walls overlapping the end walls of the pan about the shaft 6, as shown in Fig. 10, and in the top of the cover are slots 63 to accommodate the trunnions of the driving snapping rolls. These slots are normally covered by a plate 64 which is removable to permit the lubricant to be replenished through the slots.

Secured to the machine frame so as to enclose the gears 24 is a box 64 which has a bottom, front, back, and end walls, and is located directly beneath the shield 65 by which the ears of corn are directed from the husking rolls onto the ear conveyer, said shield serving as a cover for the box.

It will be noted that the gearing for the rolls is all enclosed so that they are protected from damage due to objects falling upon any of the parts, will be kept from dirt falling from above as well as dust rising from below, and will run in lubricant so that they will operate easily and with minimum wear.

Having thus described the invention, what is claimed as new is:

1. In a corn-husking machine, the combination of snapping rolls, husking rolls, a driving shaft disposed transversely of the machine between the opposed ends of the husking rolls and the snapping rolls, opposed gears carried by said driving shaft, and gears carried by some of the husking rolls and some of the snapping rolls meshing with the opposed gears whereby all the rolls will be driven.

2. In a corn-husking machine, the combination of snapping rolls, husking rolls arranged below and spaced longitudinally from the snapping rolls, a cutter disposed below the snapping rolls, a roll-driving shaft arranged transversely of the machine between the lower ends of the snapping rolls and the upper ends of the husking rolls, gearing whereby said shaft will be driven from the cutter, opposed gears connecting the shaft with the snapping rolls, and other opposed gears connecting the shaft with the husking rolls.

3. In a corn-husking machine, the combination of snapping rolls, husking rolls arranged in spaced relation to the snapping rolls longitudinally of the machine, a roll driving shaft disposed transversely of the machine and between the lower ends of the snapping rolls and the upper ends of the husking rolls, a double bevel gear secured on said shaft at the center thereof, bevel gears arranged at opposite sides of said double bevel gear and meshing therewith and operatively connected to some of the snapping rolls, opposed bevel gears secured upon the shaft outwardly beyond and at opposite sides of the double bevel gear, bevel gears meshing with said opposed bevel gears and operatively connected with some of the husking rolls, gearing at the upper ends of the snapping rolls operatively connecting the said rolls in pairs, and gearing at the lower ends of the husking rolls operatively connecting said rolls in pairs, one member of each pair of rolls being movable toward and from the mating roll.

4. In a corn-husking machine, the combination of a supporting frame, yokes secured upon and extending across said frame, journal boxes secured in said yokes, rolls journaled in said boxes, means for rotating said rolls, other journal boxes slidably mounted in the yokes, rolls journaled in and carried by the slidably mounted journal boxes to cooperate with the first mentioned rolls, means carried by the yokes for yieldably holding the last mentioned rolls in operative relation to the first mentioned rolls, and

trains of gearing operatively connecting the said rolls and arranged to accommodate the relative sliding movement of one of the rolls.

5. In a corn-husking machine, the combination of a pair of rolls, one of said rolls being mounted in fixed bearings and the other roll being mounted in slidable bearings, means for positively rotating the roll mounted in fixed bearings, yieldable means for holding the sliding roll in operative relation to the mating roll, stub shafts disposed below the ends of the rolls, intermeshing gears on said stub shafts, a gear on the end of one roll meshing with one of said intermeshing gears, a second gear mounted on one of the stub shafts and fixed to the adjacent gear of the intermeshing gears, and a gear on the upper end of the other roll meshing with the said second gear.

6. In a corn-husking machine, the combination of yokes secured upon and extending across the frame of the husking machine, journal boxes secured in said yokes, rolls carried by said journal boxes, means for rotating said rolls, journal boxes slidably mounted in the yokes, rolls carried by the slidably mounted journal boxes, gearing connecting the two rolls, pressure heads mounted in the yokes at the outer sides of the slidable journal boxes and bearing against the same, stems extending from the said heads, sleeve nuts mounted in the outer ends of the yokes and encircling the stems, and a tension spring disposed about the stem between the said sleeve nut and the pressure head.

7. In a corn-husking machine, the combination of yokes secured upon the frame of the machine, journal boxes secured in said yokes, a roll carried by said journal boxes, means for rotating said roll, other journal boxes slidably mounted in the yokes, a roll carried by said slidably mounted journal boxes, gearing connecting the rolls, pressure heads mounted in the yokes in the outer sides of the slidable journal boxes and bearing against the same, tension springs bearing against said heads, means for adjusting the tension springs, and cushion springs acting in opposition to the tension springs.

8. In a corn-husking machine, the combination of yokes secured upon and extending across the machine, journal boxes secured in the yokes, a roll carried by said journal boxes, means for rotating said roll, other journal boxes slidably mounted in the yokes, a roll carried by said slidably mounted journal boxes, gearing connecting the rolls, pressure heads mounted in the yokes and bearing against the outer sides of the slidable journal boxes, sleeve nuts mounted in the outer ends of the yokes, stems extending from the pressure heads through the sleeve nuts, tension springs disposed around the stems between the sleeve nuts and the pressure heads, nuts on the outer ends of the stems, and cushion springs disposed between said nuts and the sleeve nuts.

In testimony whereof we affix our signatures.

THEODORE H. OPPENHEIM. [L. S.]
BERNARD SELHORST. [L. S.]