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CORN HARVESTER ROLL

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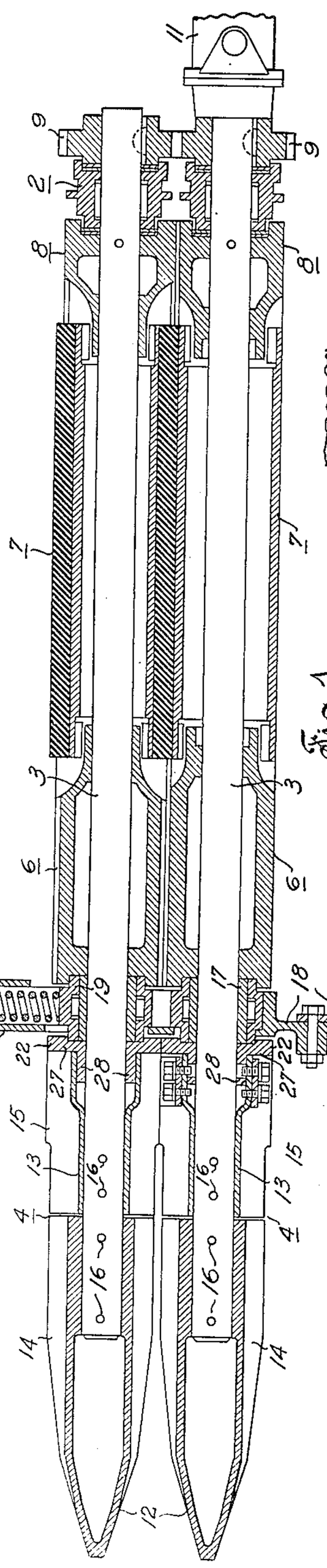

Fig. 1

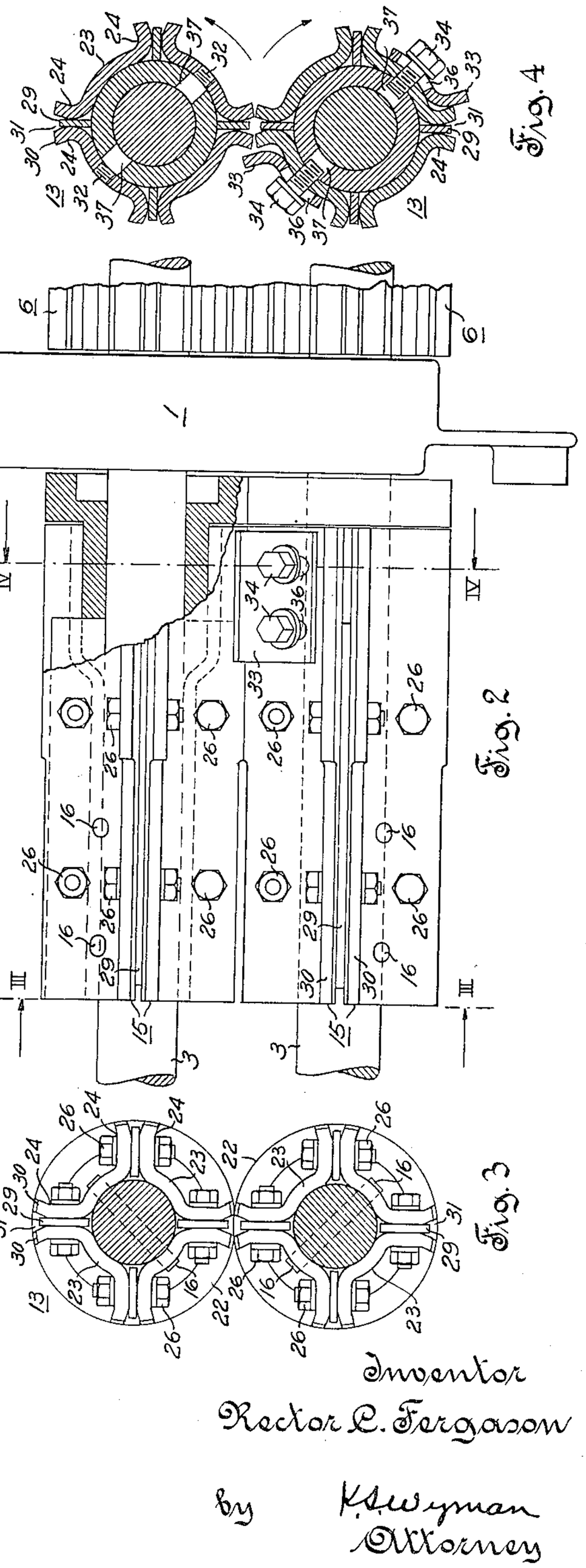

Fig. 2

Fig. 3

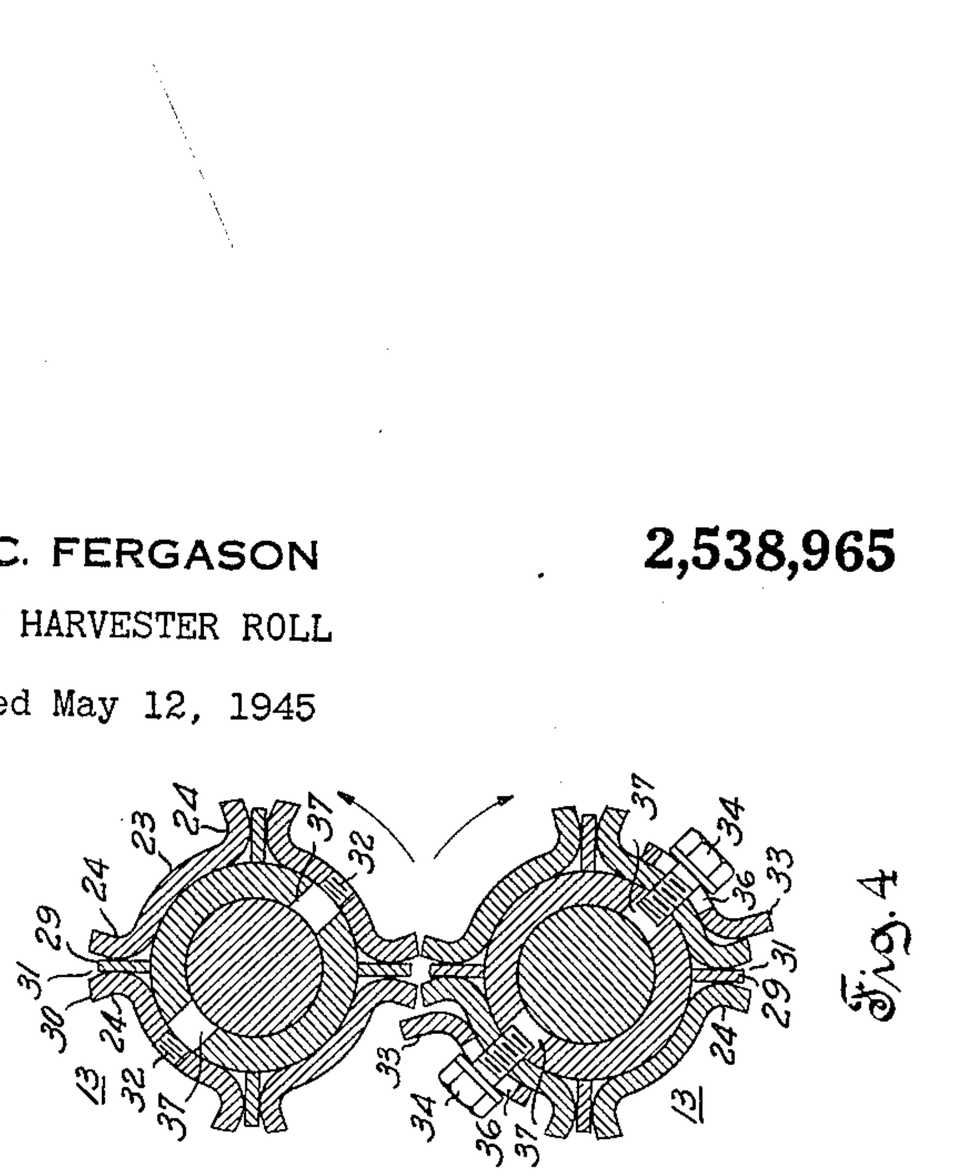

Fig. 4

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CORN HARVESTER ROLL

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22 Claims. (Cl. 130—5)

1

This invention relates generally to corn harvesters of the type including a pair of oppositely rotating rolls having coacting stalk-gripping portions or sections utilized in picking or removing the ears from the stalk passing therebetween and more particularly to the construction of such rolls.

In most practical constructions of this type, each roll includes hollow stalk-gripping, trash-removing, and ear-husking sections mounted in longitudinal alinement on an inner shaft member to which the sections are removably secured by means of tapered pins, cap screws or the like, and the stalk-gripping section (hereinafter called snapping roll) is usually externally fluted or ribbed and made in two parts comprising a forwardly tapering, pointed front part and a rear part disposed in end-abutting relation with respect to the front part with the flutes or ribs on the front part forming straight or spiraling continuations of equally spaced, longitudinally extending flutes or ribs on the rear part. Generally, a spiraling of the continuing flutes or ribs on the front part is for the purpose of effecting a feeding of the stalks toward the rear part. And the inner shaft members are usually supported in a manner permitting the snapping rolls to move apart as the standing stalks and other material pass rearwardly and downwardly between the rolls due to their relative rotation and to the travel of the harvester mounting same.

Consequently, the removal of the ears from the standing stalks passing between the snapping rolls is primarily effected by the coaction of the longitudinally extending ribs or flutes on the rear parts of such rolls, and more particularly by the longitudinally aligned leading edges of such ribs or flutes which are preferably hardened and sharpened in order to improve and prolong their stalk-gripping and/or ear-snapping effectiveness. In general, the stalk-gripping and ear-snapping effectiveness of the ribs decreases as their leading edges become dull, worn and/or damaged by the passage of stalks and foreign material therebetween, and sooner or later it becomes necessary or desirable to replace or recondition the rear parts of one or both of the snapping rolls in order to obtain satisfactory operation.

However, with the constructions heretofore

2

employed it has been necessary, in order to provide a harvester with a new or reconditioned snapping roll to remove and replace the entire roll, or to remove both the separable front and rear parts of the snapping roll and substitute a new or reconditioned rear part for the one removed, all of which involve considerable time and cost and are therefore objectionable. In fact, the time and cost of replacing or reconditioning the snapping roll constructions heretofore employed has frequently resulted in the machines being kept in operation for long periods with the rear parts of the snapping rolls in an extremely poor, ineffective condition.

It is therefore an object of this invention to provide an improved construction for corn harvester snapping rolls which will materially increase the effective useful life of such rolls.

Another object of this invention is to provide a corn harvester snapping roll with an improved external flute or rib construction affording a more positive stalk-gripping and/or ear-snapping action.

Another object of this invention is to provide an improved mounting and spacing construction for the ear snapping ends of corn harvester rolls.

Another object of this invention is to provide an improved construction for corn harvester snapping rolls which will permit the rolls to be readily installed, and when once installed, to be readily removed and replaced, in whole or in part, with a minimum of time, effort and skill.

Another object of this invention is to provide an improved snapping roll for corn harvesters in that the snapping roll includes a separable rear part composed of interchangeable elements united and mounted in a manner permitting such part or one or more of the elements thereof to be readily removed from the roll proper and replaced or interchanged with a minimum of time, effort and skill.

Another object of this invention is to provide an improved construction for corn harvester snapping rolls which permits utilizing thin-walled, tube-forming sections in connection with the formation of extremely effective and more durable stalk-gripping ribs or flutes.

Still another object of this invention is to provide an improved construction for corn harvester snapping rolls which permits the use of inter-

changeable thin-walled, roll-forming stampings or the like affording a material reduction in the weight and cost of the roll.

The construction, application and advantages of snapping roll sections embodying the invention will become readily apparent as the disclosure progresses and particularly points out additional features and advantages deemed of special importance. And accordingly the invention may be considered as consisting of the various details of construction, combinations of elements and arrangements of parts as is more fully set forth in the appended claims and in the detailed description, reference being had to the accompanying drawing, in which:

Fig. 1 is a longitudinal horizontal section through a pair of corn harvester rolls embodying the invention;

Fig. 2 is a plan view of the rear, ear-snapping part of the roll shown in Fig. 1 with the rolls turned 90° from the position shown in Fig. 1 and with parts broken away to better show the construction;

Fig. 3 is a section taken on line III—III of Fig. 2; and

Fig. 4 is a section taken on line IV—IV of Fig. 2.

Referring to Fig. 1 of the drawing, it is seen that the invention may be applied to a pair of corn harvester rolls supported in coacting side-by-side relation by longitudinally spaced front and rear pairs of bearing structures 1 and 2, respectively, and that each roll may include an inner shaft member 3 to which is removably secured a forward ear-snapping section 4, an intermediate trash-removing section 6, a rear husk-removing section 7, and a rear trash-removing part 8. The rear end portions of inner shaft members 3 are drivingly connected by meshed gears 9 and the end of one shaft member is provided with a suitable coupling 11 for connecting same with a power shaft or source (not shown). In this connection, a pair of rolls such as herein described is adapted to be utilized in a corn harvester of the type disclosed in U. S. patent, C. J. Scranton, 2,340,084, to which reference may be had for additional information as to the general arrangement and coaction of parts.

The ear-snapping sections 4 are externally fluted or ribbed and each section includes a forwardly tapering, pointed front or nose part 12 and a rear part 13 disposed in end-abutting relation with respect to the front part with the flutes or ribs 14 on the front part forming continuations of the equally spaced, longitudinally extending flutes or ribs 15 on the rear part. The front and rear parts may be secured to shaft members 3 in any suitable manner such as by means of one or more pins 16. The front pair of bearing structures 1 include a fixed bearing 17 supported by a bracket structure 18 and a movable bearing 19 supported by a bracket structure (not shown) and continuously urged toward fixed bearing 17 by means of an adjustable compression spring 21. The normal position of bearing 19 relative to bearing 17 and thereby the spacing of snapping sections 4 is determined by the engagement of annular ring parts 22 disposed between bearings 17, 19 and the opposed ends of rear parts 13 as is clearly shown in Fig. 1.

Referring also to Figs. 2–4, inclusive, it will be seen that each rear part 13 comprises interchangeable arcuate sections 23 having outwardly extending longitudinal edge flanges 24 detachably united in longitudinal rib-forming relation by

means of bolts 26, and a separable annular member 27 presenting the associated spacing ring part 22 (previously mentioned) and having a reduced end part 28 disposed within and clampingly engaged by the enlarged tube-forming rear end portions of sections 23. In this connection, the rib-forming pairs of flanges 24 are preferably disposed in spaced, gap-forming relation in order to improve their stalk-gripping effectiveness and this relation of the flanges is readily effected and maintained by an interposed spacing strip 29 of less width than the radial width of flanges 24. The stalk-gripping effectiveness of the longitudinal ribs may be further improved by bending or otherwise shaping the outer edge portions of the pairs of flanges forming same to provide longitudinal ribs each presenting a pair of nonparallel stalk-gripping surfaces 30 separated by a gap 31. In any event, it will be noted that the gap separating each pair of longitudinally extending outer stalk-gripping surfaces is of considerably less radial depth than the overall radial height of the rib presenting such surfaces and/or of less radial depth, where more than one rib is employed, than the depth of the space separating adjacent ribs.

As illustrated, each rear part 13 may be formed of four interchangeable arcuate sections 23, and a diametrically opposed pair of these sections is provided with alined holes for receiving pins 16 retaining same non-rotatably positioned on shaft member 3. In addition, the enlarged rear end portions of the same diametrically opposed pair of sections may be provided with a pair of internally threaded holes 32 (see Fig. 4) for the purpose of detachably securing ear-snapping clips 33 thereto by means of cap screws 34. The clips are provided with slotted openings 36 in order to permit adjustment of same relative to the leading edge of the leading stalk-gripping surface presented by the longitudinal rib. The reduced end portion 28 of annular member 27 is provided with enlarged holes 37 which are alined with the holes 32 in the ends of sections 23 and serve to receive the ends of cap screws 34. In this connection, only one roll is shown as provided with clips 33 and these clips should be positioned so that their radially projecting, stalk-shearing edges just clear the flute or rib on the opposing roll (see Fig. 4). Referring again to Figs. 1 and 2, it will also be noted that the rear end portions of ribs 15 are of increased radial width and present stalk-gripping surfaces substantially flush with the peripheral surface of spacing ring parts 22.

It should now be obvious that arcuate sections 23 are detachably united by bolts 26 and are detachably secured to shaft member 3 for rotation therewith by means of pins 16 and by the clamping action afforded by the bolts 26. In addition, it should also be obvious that the annular members 27 are secured to and rotate with arcuate sections 23 due to the clamping action of bolts 26 and to the projection of cap screws 34 into the holes 37, and that the cap screws 34 and clips 33 need not be removed in order to remove and replace one or more of the arcuate sections 23. If however, the clips 33 should become ineffective, they may be readily moved and replaced either separately or with the section mounting same, as desired. In this connection, all that has to be done in order to remove and interchange or replace one or more of such sections is to remove the bolts 26 securing same to the next adjacent sections, and if the section to be removed is additionally secured to shaft member 3 by means of pins 16, to also remove such pins whereupon the

section or sections can be readily removed from the roll in an obvious manner without disturbing any other parts of the assembly. The feature of interchangeability is important in that the effective life of the rear parts of a pair of coacting rolls can be greatly increased by an interchange of one or more of the sections forming same since the leading edges wear more rapidly than do the lagging edges and since such an interchange of sections in effect reverses the leading and lagging edges of the sections interchanged.

In addition to the feature of affording readily replaceable, interchangeable parts, the construction herein shown and described also affords an improved stalk-gripping rim presenting a pair of nonparallel stalk-gripping surfaces separated by a gap into which a portion of a stalk is pressed in passing between the pairs of opposed ribs presented by a pair of coacting rolls. Moreover, a stalk-gripping rib of this type presents in effect two leading stalk-gripping edges irrespective of whether the rib is formed by pairs of coacting flanges on separable sections as herein disclosed, or in any other manner. Furthermore, the sectional rear part construction herein disclosed permits the use of thin-walled, tube-forming sections thereby affording a relatively inexpensive, lightweight structure which can be readily made extremely durable and effective simply by suitably hardening the outer edge portions of the rib-forming flanges and grinding the stalk-gripping surfaces of same to provide sharp stalk-gripping edges.

Another feature considered of special importance is the provision of replaceable annular members 27 affording a hub-like support for rear parts 13 of the snapping sections and presenting plain exposed cylindrical surfaces having diameters at least equal to the maximum external diameter of rear parts 13 and to the maximum external diameter of the opposed relatively movable parts of bearings 17 and 19 (see Fig. 1). This feature is of particular advantage in that it permits the use of readily replaceable hardened members for determining the minimum spacing of the rolls and thereby avoids subjecting the opposed relatively movable parts of bearings 17 and 19 to frequent impact engagement normally resulting from a spreading of the rolls due to the passage of material therebetween and from the action of spring 21 tending to snap the rolls together when cleared of such material. In this connection the frequent impact engagement of opposed bearing parts inherently results in a rapid wearing of such parts which in turn necessitates frequently adjusting the spacing of the snapping sections by insertion of shims or the like between opposed bearing parts in order to obtain satisfactory operation and in order to prevent impact engagement of and damage to the stalk-gripping surfaces and/or edges of opposed flutes or ribs presented by rear parts 13.

Certain features of the invention are obviously applicable to all types of corn harvester snapping rolls irrespective of how the rolls or sections thereof are formed, and while all features of the invention have been disclosed in connection with snapping rolls having separable rear parts of sectional construction, it should be understood that it is not intended to limit the invention to the exact details of construction, combinations of elements and arrangements of parts as herein shown and described for purposes of illustration as various modifications within the scope of the appended claims may occur to persons skilled in the art.

It is claimed and desired to secure by Letters Patent:

1. In a corn harvester, a fabricated snapping roll comprising arcuate sections having outwardly extending longitudinal edge flanges, and means detachably uniting said sections in tube-forming relation with their edge flanges coacting to form a plurality of circumferentially spaced, longitudinally extending stalk-gripping ribs each including a pair of said flanges, said pairs of flanges having their outer edge portions spaced apart in outwardly diverging relation to present a pair of nonparallel stalk-gripping surfaces separated by a gap therebetween.

2. In a corn harvester, a fabricated snapping roll comprising arcuate sections having outwardly extending longitudinal edge flanges, and means detachably uniting said sections in tube-forming relation with their edge flanges coacting to form a plurality of circumferentially spaced, longitudinally extending stalk-gripping ribs each including a pair of said flanges, said pairs of flanges having their outer edge portions deformed in outwardly diverging relation to improve their stalk-gripping action.

3. A corn harvester snapping roll comprising a separable rear part formed of interchangeable arcuate sections having outwardly extending longitudinal edge flanges detachably united and providing circumferentially spaced, longitudinally extending stalk-gripping ribs each including a pair of said flanges, said flanges having their longitudinal edge portions deformed in outwardly diverging relation to improve their stalk-gripping action.

4. A corn harvester roll structure comprising a pair of shaft members each mounting an ear snapping section including a tubular front part, a separate tubular rear part end-abutting said front part, and a separate annular member having a reduced portion providing a hub-like support for the rear end of said tubular rear part, a first pair of bearing structures rotatably supporting opposed rear end portions of said shafts remote from said ear snapping sections, and a second pair of bearing structures rotatably supporting opposed portions of said shafts adjacent said annular members, said second pair of bearing structures including opposed, relatively movable parts and a biasing means continuously acting to retain said parts in engaged, shaft spacing relation, and said annular member presenting an exposed plain cylindrical surface having a diameter at least equal to the maximum external diameter of said tubular rear part and to the maximum external diameter of said opposed, relatively movable bearing parts.

5. A corn harvester ear snapping and husking apparatus comprising a pair of rolls each including alined ear snapping and husking sections, a first pair of bearing structures rotatably supporting opposed rear end portions of said rolls, and a second pair of bearing structures rotatably supporting opposed portions of the rolls adjacent the rear ends of said ear snapping sections, said second pair of bearing structures including opposed, relatively movable parts and a biasing means continuously acting to retain said parts in engaged, shaft-spacing relation, and said ear snapping sections each including separable front and rear parts and a separate annular member providing a hub-like support for the rear end of said rear part and presenting an exposed plain

cylindrical external surface having a diameter at least equal to the maximum external diameter of said rear part of the ear snapping section and to the maximum external diameter of said opposed relatively movable bearing parts.

6. A corner harvester ear snapping and husking apparatus comprising a pair of rolls each including alined ear snapping and husking sections, a first pair of bearing structures rotatably supporting opposed rear end portions of said rolls, a second pair of bearing structures rotatably supporting opposed portions of the rolls remote from said rear end portions, said second pair of bearing structures including opposed, relatively movable parts and a biasing means continuously acting to retain said parts in engaged, shaft-spacing relation, and a pair of annular members replaceably, coaxially carried by said rolls in opposed relation adjacent said second pair of bearing structures, said pair of members presenting plain cylindrical external surfaces having a diameter sufficient to determine the minimum spacing of said rolls and to prevent the action of said biasing means from effecting an engagement of said opposed relatively movable bearing parts.

7. A corn harvester comprising a pair of rolls, a first pair of bearing structures rotatably supporting opposed rear end portions of said rolls, a second pair of bearing structures rotatably supporting opposed portions of the rolls remote from said rear end portions, said second pair of bearing structures including opposed, relatively movable parts and a biasing means continuously acting to retain said parts in engaged, shaft-spacing relation, and a pair of annular members replaceably, coaxially carried by said rolls in opposed relation adjacent said second pair of bearing structures, said pair of members presenting plain cylindrical external surfaces having a diameter sufficient to determine the minimum spacing of said rolls and to prevent the action of said biasing means from effecting an engagement of said opposed relatively movable bearing parts.

8. A corn harvester roll structure comprising a pair of shaft members each mounting an ear snapping section including a tubular front part, a separate tubular rear part end abutting said front part, and a separate annular member having a reduced portion providing a hub-like support for the rear end of said tubular rear part, means rotatably mounting said shafts including a pair of bearing structures rotatably supporting opposed portions of said shafts adjacent said annular members, said pair of bearing structures including opposed, relatively movable parts and a biasing means continuously acting to retain said parts in engaged, shaft spacing relation, and said annular member presenting an exposed plain cylindrical surface having a diameter at least equal to the maximum external diameter of said tubular rear part and to the maximum external diameter of said opposed, relatively movable bearing parts.

9. In a corn harvester, a pair of co-operative harvester rolls mounted for rotation in side opposed generally parallel relation, one of said rolls including a separable portion comprising complementary arcuate longitudinal sections having outwardly extending longitudinal edge flanges, and means detachably uniting said sections in coacting tube-forming relation with the edge flanges on adjacent sections disposed in contiguous abutting relation providing a plurality of longitudinally extending circumferentially

spaced ribs each presenting a pair of longitudinally extending outer edge surfaces separated by a slight gap therebetween as compared to the spacing between said ribs.

10. In a horn harvester, an ear picking structure comprising a pair of co-operative harvester rolls mounted for rotation in side opposed generally parallel relation, one of said rolls including a forwardly tapered externally fluted nose portion and a separable stalk-gripping rearward extension thereof having axially extending external ribs forming continuations of the flutes on said nose portion, said rearward extension comprising complementary arcuate tube-forming sections having outwardly extending longitudinal edge flanges, and means detachably uniting said sections in coacting tube-forming relation with the edge flanges on adjacent sections disposed in contiguous abutting relation providing a plurality of longitudinally extending circumferentially spaced ribs, said ribs each presenting a pair of longitudinally extending stalk-gripping outer edge surfaces separated by a slight gap therebetween as compared to the spacing between said pairs of ribs.

11. In a corn harvester, an ear picking structure comprising a pair of co-operative harvester rolls mounted for rotation in side opposed generally parallel relation, one of said rolls including a nose portion and a separately detachable stalk-gripping rearward extension thereof comprising complementary arcuate tube-forming sections having outwardly extending longitudinal edge flanges, and means detachably uniting said sections in coacting tube-forming relation with the edge flanges on adjacent sections disposed in contiguous abutting relation providing a plurality of longitudinally extending circumferentially spaced ribs, said ribs each presenting a pair of longitudinally extending outer edge surfaces separated by a slight gap therebetween to improve their stalk-gripping action.

12. In a corn harvester, an ear picking structure comprising a pair of co-operative harvester rolls mounted for rotation in side opposed generally parallel relation, one of said rolls including a nose portion and a separately detachable stalk-gripping rearward extension thereof comprising complementary arcuate longitudinal sections having outwardly extending longitudinal edge flanges, and means detachably uniting said sections in coacting tube-forming relation with the edge flanges on adjacent sections disposed in contiguous abutting relation providing a plurality of longitudinally extending circumferentially spaced ribs, said ribs each presenting a pair of longitudinally extending stalk-gripping outer edge surfaces separated by a slight gap therebetween as compared to the spacing between said pairs of ribs.

13. In a corn harvester, a harvester roll comprising a rotatably mounted core member, a tubular nose part enclosing the forward end of said core member and being secured thereto for rotation therewith, a tubular stalk-gripping part surrounding said core member in end opposed relation with respect to the rear end of said nose part, said stalk-gripping part comprising complementary arcuate longitudinal sections having outwardly extending longitudinal edge flanges, and means detachably uniting and mounting said sections in coacting tube-forming relation about said core member for removal therefrom independently of said nose part and for rotation therewith with the edge flanges on adjacent sec-

tions disposed in contiguous abutting relation providing a plurality of longitudinally extending circumferentially spaced ribs each presenting a pair of similarly extending stalk-gripping outer edge surfaces separated by a slight gap therebetween.

14. In a corn harvester, a harvester roll comprising a rotatably mounted core member, a tubular nose part enclosing the forward end of said core member and being secured thereto for rotation therewith, a tubular stalk-gripping part surrounding said core member in end opposed relation with respect to the rear end of said nose part, said stalk-gripping part comprising complementary arcuate longitudinal sections having outwardly extending longitudinal edge flanges, and means detachably uniting and mounting said sections in coacting tube-forming relation about said core member for removal therefrom independently of said nose part and for rotation therewith with the edge flanges on adjacent sections disposed in contiguous abutting relation providing a plurality of longitudinally extending circumferentially spaced ribs, said ribs each presenting a pair of similarly extending stalk-gripping outer edge surfaces separated by a slight gap therebetween as compared to the spacing between said ribs.

15. A corn harvester snapping roll comprising a core member, means rotatably mounting said core member, tubular roll parts surrounding and fixed to said core member for rotation therewith in spaced end opposed relation with respect to each other, a tubular intermediate part surrounding said core member in end opposed relation with respect to said roll parts, said intermediate part comprising complementary arcuate longitudinal sections having outwardly extending longitudinal edge flanges, and means detachably uniting and mounting said sections in coacting tube-forming relation about said core member for removal therefrom independently of said roll parts and for rotation therewith with the edge flanges on adjacent sections disposed in contiguous abutting relation providing longitudinally extending circumferentially spaced ribs each presenting a pair of similarly extending stalk-gripping outer edge surfaces separated by a slight gap therebetween.

16. A corn harvester snapping roll comprising a core member, means rotatably mounting said core member including a bearing structure supporting a forward end portion thereof, a tubular nose part enclosing the front end of said core member and being fixed thereto for rotation therewith in spaced relation with respect to said bearing structure, a tubular rear part surrounding the portion of said core member between said nose part and bearing structure in end opposed relation thereto, said rear part comprising complementary arcuate longitudinal sections having outwardly extending longitudinal edge flanges, and means detachably uniting and mounting said sections in coacting tube-forming relation about said core member for removal therefrom independently of said nose part and for rotation therewith with the edge flanges on adjacent sections disposed in contiguous abutting relation providing longitudinally extending circumferentially spaced ribs each presenting a pair of similarly extending stalk-gripping outer edge surfaces separated by a gap therebetween.

17. A corn harvester snapping roll comprising a rotatably mounted core member, a front part secured to said core member for rotation therewith and for removal therefrom by movement

of said front part forwardly longitudinally of said member, an annular member mounted on said core member in spaced relation with respect to the rear end of said front part and presenting a forwardly extending reduced end portion, a tubular stalk-gripping part surrounding said core member in end opposed relation with respect to said front part with its rear end surrounding and supported by the reduced end portion of said annular member, said stalk-gripping part comprising arcuate longitudinal sections having outwardly extending longitudinal edge flanges, and means detachably uniting and mounting said sections in coacting tube-forming relation about said core member for removal therefrom independently of said front part and annular member and for rotation with said core member with the edge flanges on adjacent sections disposed in contiguous abutting relation providing a plurality of longitudinally extending circumferentially spaced ribs each presenting a pair of similarly extending stalk-gripping outer edge surfaces.

18. A corn harvester roll comprising a stalk gripping section provided with at least one axially extending radial rib having a circumferential thickness considerably less than its radial height and presenting a pair of circumferentially longitudinally extending outer surfaces separated by a substantial gap therebetween of considerably less radial depth than the overall radial height of said rib, said outer surfaces each presenting at least two longitudinally extending circumferentially spaced stalk gripping edges.

19. A corn harvester roll comprising a stalk gripping section provided with at least one axially extending radial rib having a circumferential thickness considerably less than its radial height and presenting a pair of circumferentially spaced longitudinally extending outer radial portions having outwardly diverging opposed walls forming the sides of a separating gap of considerably less radial depth than the overall radial height of said rib, said radial portions each presenting at least two longitudinally extending circumferentially spaced outer stalk gripping edges.

20. A corn harvester roll comprising a forwardly tapered externally fluted nose portion and a stalk gripping rearward extension thereof provided with at least one axially extending radial rib forming a continuation of a flute on said nose portion, said rib having a circumferential thickness considerably less than its radial height and presenting a pair of circumferentially longitudinally extending outer surfaces separated by a substantial gap therebetween of considerably less radial depth than the overall radial height of said rib, and said outer surfaces each presenting at least two longitudinally extending circumferentially spaced stalk gripping edges.

21. In a corn harvester, an ear picking structure comprising a pair of cooperative harvester rolls mounted for rotation in side opposed generally parallel relation, said rolls each including a stalk gripping section having at least one axially extending radial rib with the rib on one roll opposing that one the other roll, said ribs each having a circumferential thickness considerably less than its radial height and each presenting a pair of circumferentially longitudinally extending outer surfaces separated by a substantial gap therebetween of considerably less radial depth than the overall radial height of said rib, said outer surfaces each presenting at least two longitudinally extending circumferentially spaced stalk gripping edges.

22. A corn harvester snapping roll comprising a separable rear part formed of interchangeable arcuate sections having outwardly extending longitudinal edge flanges detachably united and providing circumferentially spaced, longitudinally extending stalk gripping ribs each presenting a pair of circumferentially spaced longitudinally extending outer surfaces separated by a substantial gap therebetween of considerably less radial depth than the overall radial height of said rib, said outer surfaces each presenting at least two longitudinally extending circumferentially spaced stalk gripping edges.

RECTOR C. FERGASON.

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