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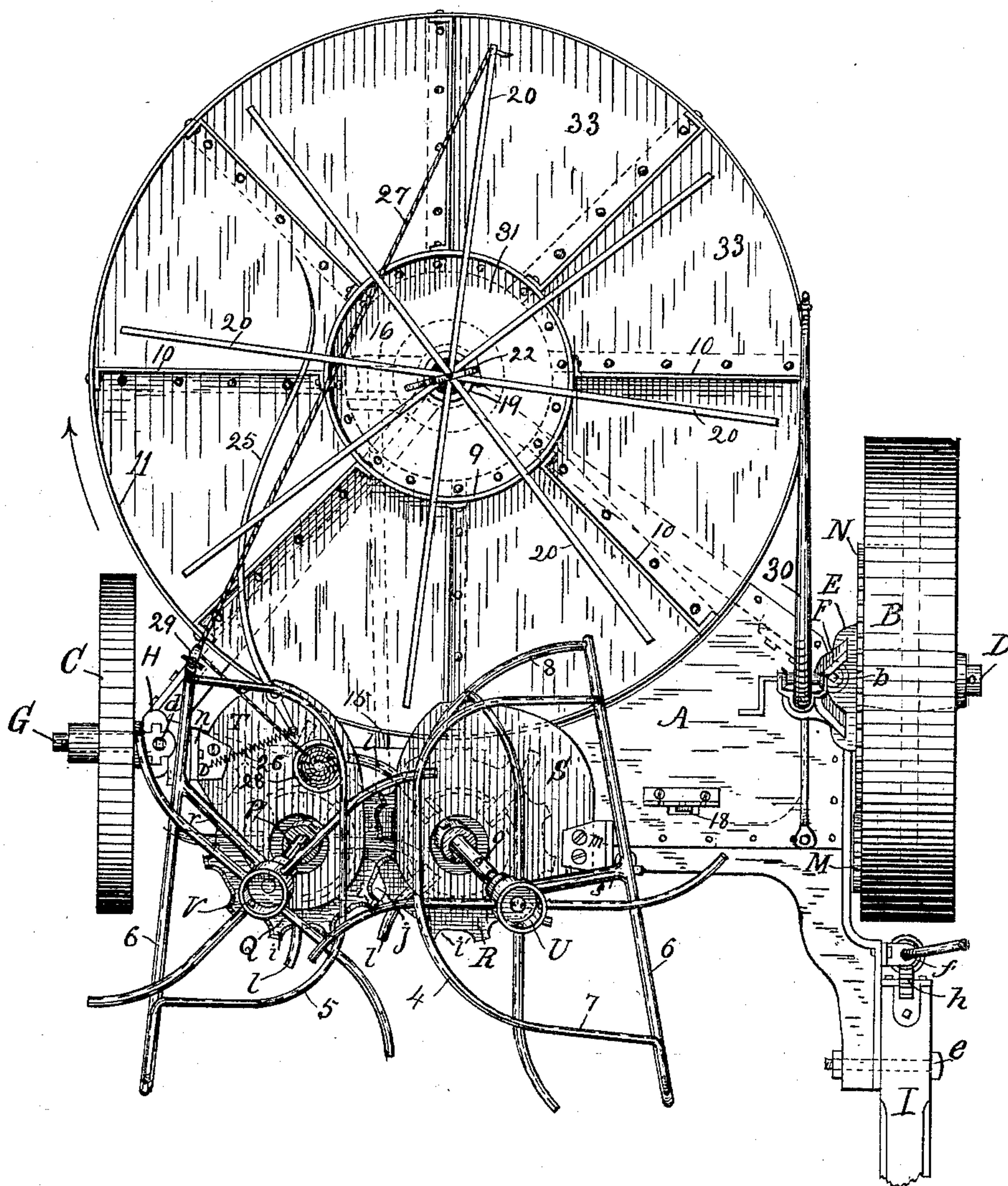
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A. N. HADLEY.
CORN HARVESTER.

No. 432,750.

Patented July 22, 1890.

Fig. 1.



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(No Model.)

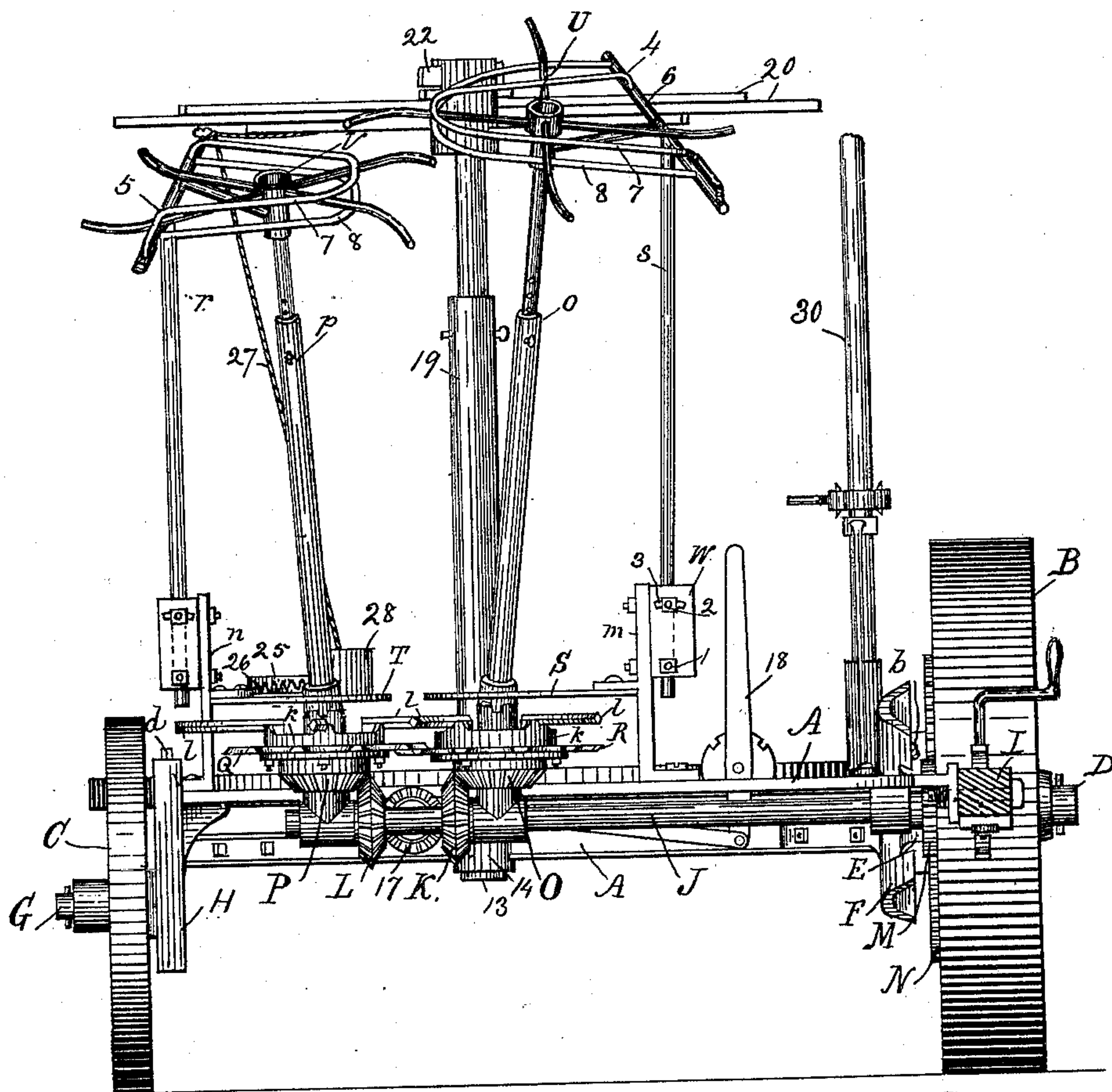
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Fig. 3.



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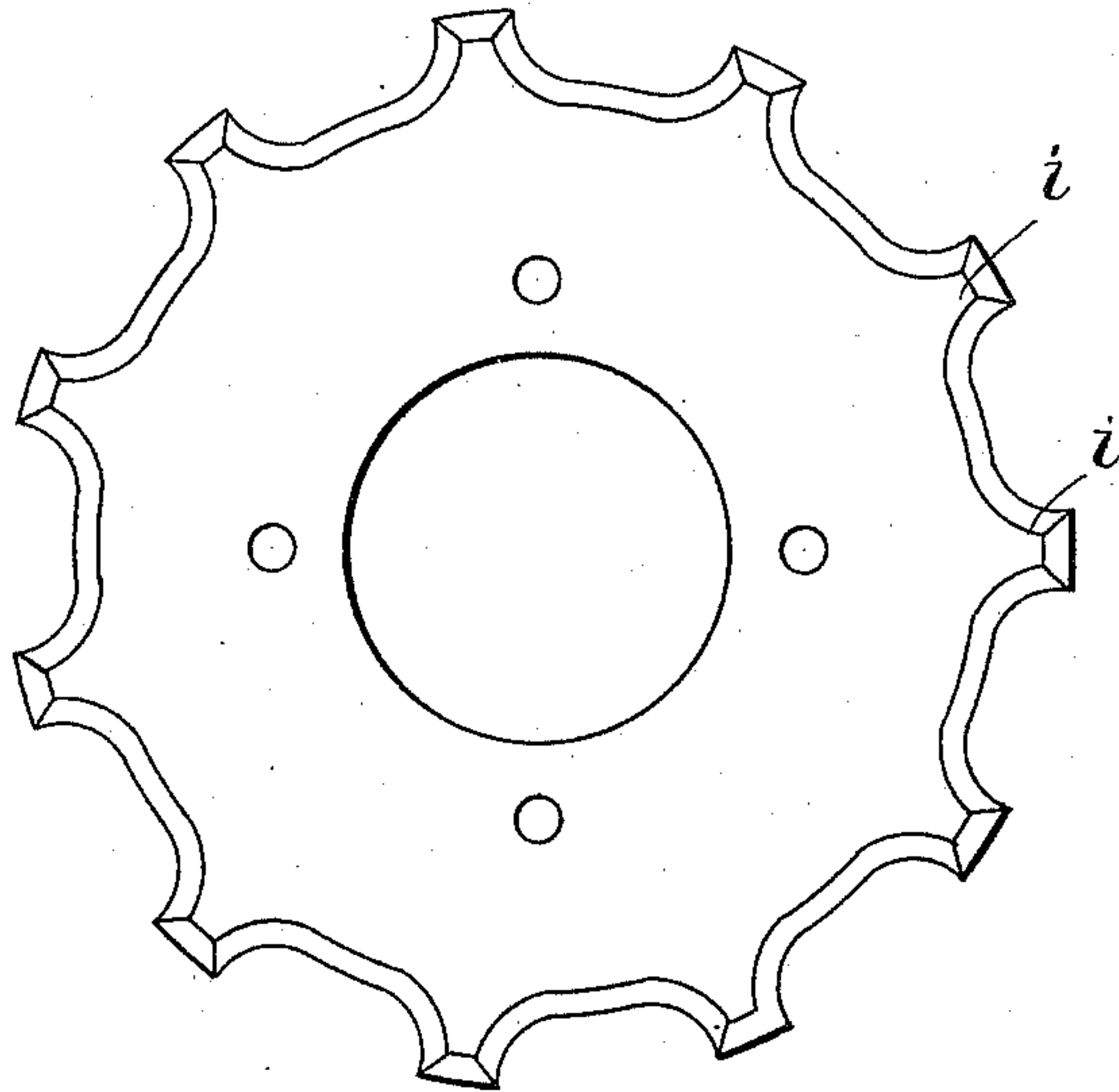


Fig. 6.

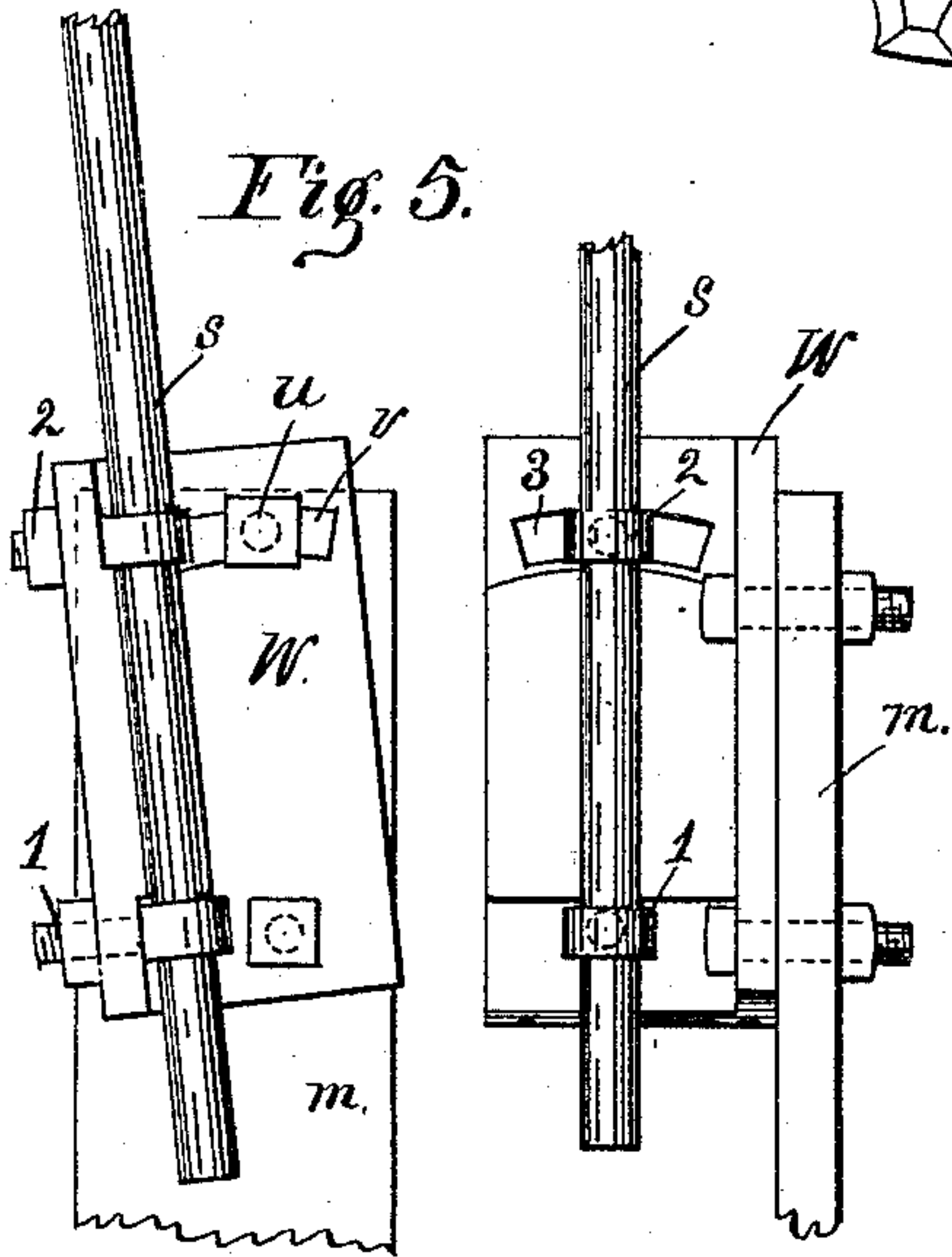


Fig. 5.

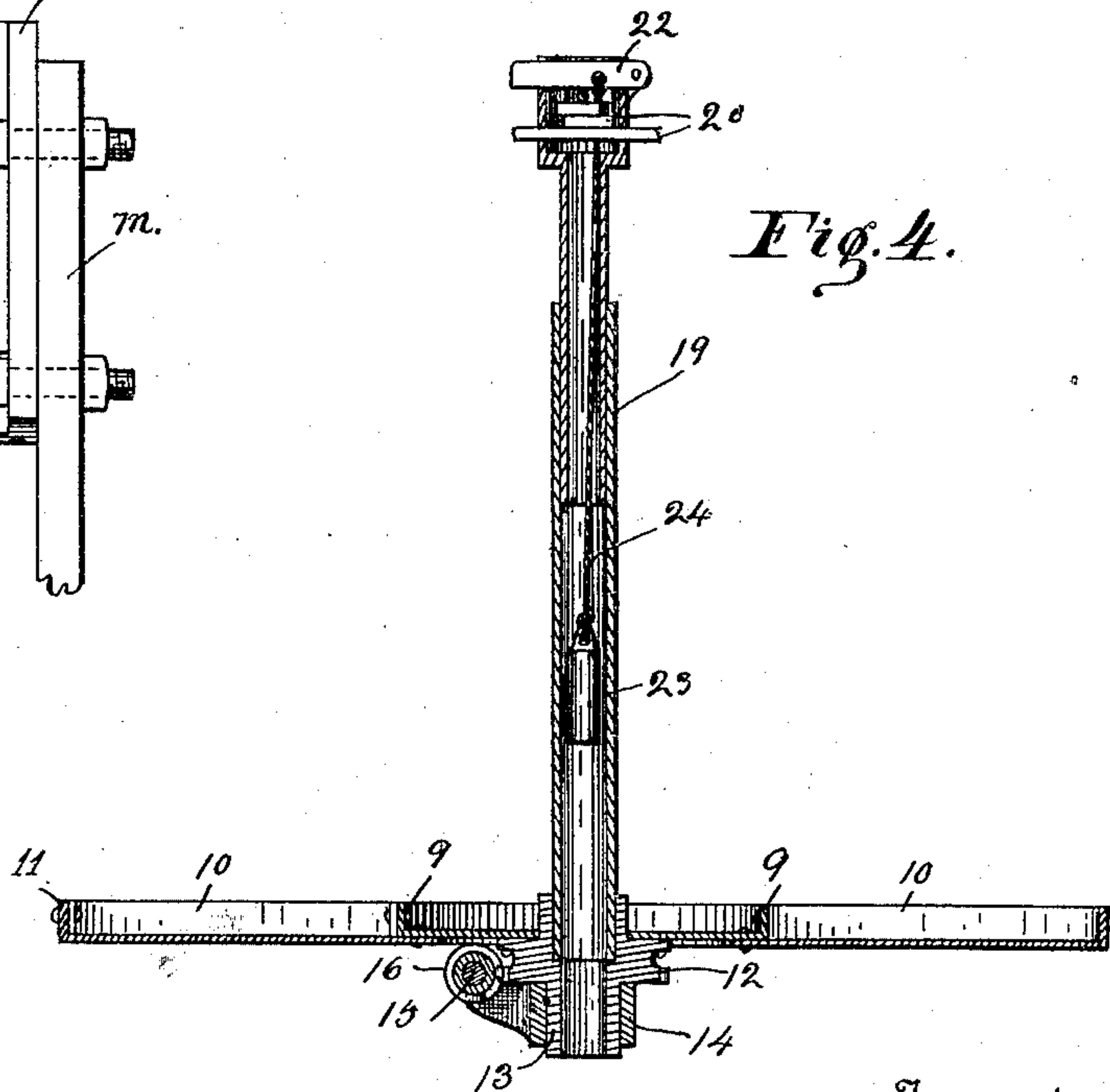


Fig. 4.

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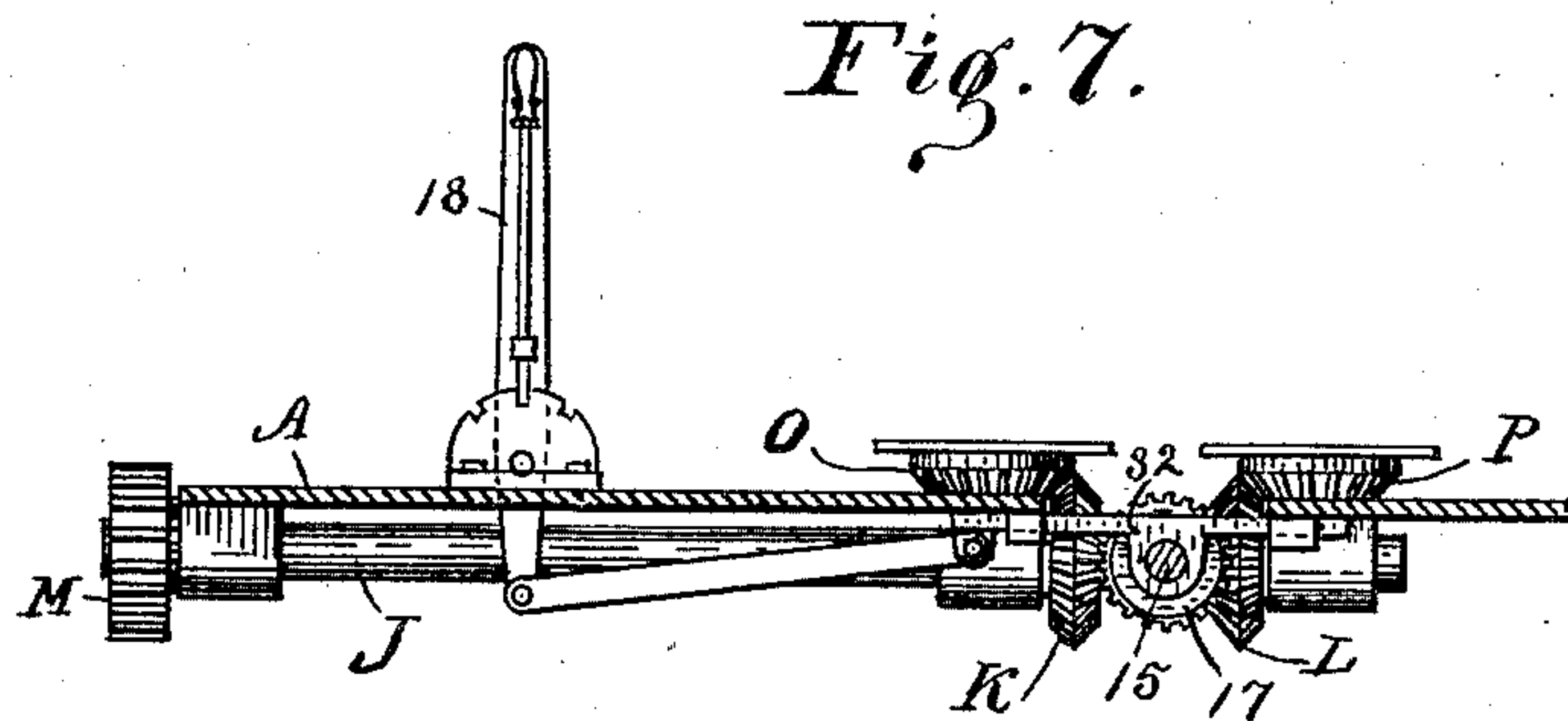
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UNITED STATES PATENT OFFICE.

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CORN-HARVESTER.

SPECIFICATION forming part of Letters Patent No. 432,750, dated July 22, 1890.

Application filed July 17, 1889. Serial No. 317,779. (No model.)

To all whom it may concern:

Be it known that I, ARTEMUS N. HADLEY, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Improvement in Corn-Harvesters, of which the following is a specification.

My invention relates to an improvement in that class of corn-harvesters in which the stalks are deposited, after being cut, in an upright position on a horizontal turn-table similar to that shown in Letters Patent No. 399,988, granted to me March 19, 1889.

The objects of my improvement are to provide in a corn-harvesting machine of the class mentioned cutters of improved form, improved means for directing the stalks to the cutters and removing them therefrom, and improved means for supporting the cut stalks in place on the turn-table and for forming them into a shock, all as hereinafter fully described.

The accompanying drawings illustrate my invention.

Figure 1 is a plan. Fig. 2 is a side elevation. Fig. 3 is a front elevation. Fig. 4 is a vertical section through the center of the turn-table and stalk-support. Fig. 5 shows a front and side elevation, on a larger scale, of the means for adjusting the guard-supports. Fig. 6 is a plan of one of the cutters on a larger scale. Fig. 7 is a partial transverse section at the rear of the main shaft, showing the means for reversing the driving mechanism of the turn-table.

The main frame A, which is constructed, preferably, of iron, is mounted on a pair of carrying-wheels B and C in such a manner as to be vertically adjustable thereon, wheel B being mounted on a short axle D, having on its inner end a casting E, which embraces and slides upon a curved way F, forming a part of the main frame, and wheel C being mounted on a short axle G, whose inner end slides in a vertical way H, which also forms a part of the main frame. The main frame is adjusted vertically in relation to wheels B and C by means of a screw b, which is mounted in the casting E and engages a rack c, Fig. 2, formed in the way F, and a screw d, passing through the inner end of

axle G and resting on the lower part of the way H. The draft-pole I is pivoted to the main frame at e, and is adjusted vertically at any desired angle with the main frame by means of a screw f, mounted on the frame and engaging a segment-rack h, secured to the rear end of the pole.

J is a shaft mounted in suitable bearings on the under side of the main frame at the front end and carrying two double-faced bevel gear-wheels K and L and a pinion M. Shaft J is rotated during the forward movement of the machine by means of a gear-wheel N, which is secured to the carrying-wheel B and intermeshes with pinion M.

Mounted upon two short vertical studs projecting from the upper side of the main frame are two bevel gear-wheels O and P, which intermesh with the outer faces of the double-faced gear-wheels K and L. Secured to the upper surfaces of the bevel-wheels O and P are the cutters Q and R. The cutters consist of two like circular disks, each having a series of radial teeth *i i*, whose sides are curved so as to fit, approximately, the circumferential surface of an ordinary corn-stalk, and whose ends are concentric with the periphery of the body of the disk. The whole circumference of each disk, including all of the edges of the radial teeth, is beveled to a sharp edge, and the arrangement is such that the disks overlap and the edges of their respective teeth form, as they approach each other during the simultaneous rotation of the disks, an inclosed space *j*, Fig. 1, in which the stalk is inclosed before the cutting commences.

For the purpose of having in reserve new cutting-edges for the teeth, so as to avoid the delay of grinding the cutters during an ordinary harvesting season, the forward and rear flanks of the cutting-teeth are made of the same shape, and are both sharpened, so that when the forward edges become dulled it is only necessary to cause the cutters Q and R to exchange places on their respective shafts, and what were before the rear flanks or cutting-edges of the teeth then become the forward or working edges. A circular vertical flange *k* rests on the upper surface of each cutting-disk, so as to rotate therewith, and

from the upper edge of said flange a series of arms *l l* projects by and above the periphery of the disk. Immediately above the arms *l* horizontal guard-plates *S* and *T* are fixed, being rigidly secured to standards *m* and *n*, which rest on the main frame. Plates *S* and *T* protect the cutters from becoming clogged with débris falling from the stalks, and their inner edges form a passage along which the butts of the cut stalks pass to the turn-table, and they are extended rearwardly beyond the path of the arms *l*, for the purpose of clearing the stalks from the arms. Above the guard-plates I mount a pair of gathering-reels *U* and *V*, whose arms engage and gather toward the cutters the upper ends of the stalks. Reels *U* and *V* are mounted on vertical extension-shafts *o* and *p*, which are connected, respectively, by a universal clutch with the bevel gear-wheels on which the cutting-disks are mounted. The upper ends of said shafts are mounted, respectively, in bearings formed on vertical standards *r* and *s*, which are connected with the main frame in such a manner as to be adjustable backward and forward laterally and vertically, the purpose being to incline the reels at such an angle and adjust them at such a height as will best engage the top of standing stalks. This result may be accomplished by several forms of universal joints. That form which I have shown is illustrated in detail in Fig. 5, in which *m* is a standard, which projects upward from the main frame, and having its face parallel with the line of movement of the machine. *W* is a right-angled bracket having one face pivoted at one end to the standard *m*, and adjustably secured at the other end by a bolt *u*, passing through a slot *v* in the bracket, and the other face provided with eyebolts 1 and 2, one of which forms a pivot and the other is adjustable along a slot 3. The standard *s*, on the upper end of which the bearing for the reel is formed, slides vertically through the eyebolts when their nuts are loosened, and is clamped in position by the tightening of the nuts.

For the purpose of guiding the upper ends of the stalks and preventing them from becoming entangled in the reels a pair of guards 4 and 5 are mounted, respectively, on the upper ends of the standards *s* and *r*. Said guards each consist of a horizontal bar 6, which is secured to the standard, and two bars, as 7 and 8, secured to the bar 6 at their ends and extending toward the meeting line of the cutters in planes parallel with the arms of the reel, but arranged one above and one below, so that the arms revolve in the narrow space between the bars, the arrangement of the rear ends of the guard-bars being such that they extend beyond the path of the ends of the reel-arms. By this construction the stalks when engaged by the reel-arms cannot become wound into the reel, but are propelled along the opposed edges of the two guards until they pass out of the path of the reel-

arms and are forced backward onto the turn-table.

The turn-table consists of a flat disk of sheet metal having on its upper face a circular central vertical flange 9, a series of radial vertical flanges 10, and a peripheral flange 11. The purpose of flange 9 is to keep the butts of the cut stalks away from the center of the table, so that the tops may lean inward against the central support hereinafter described. The purpose of the radial flanges 10 is to prevent the stalks from slipping about on the turn-table and to insure their revolution with it in an orderly manner. The purpose of the flange 11 is to prevent the stalks from being thrown off of the edge of the table.

Secured to the under side of the turn-table is a screw gear-wheel 12, Fig. 2, having a hollow hub 13, which fits into a boss 14 on the main frame and forms an axis for the turn-table.

Heretofore in corn-harvesters of this class the turn-table has been placed some distance in the rear, beyond the path of rotation of the reel-arms, and dependence has been placed upon the momentum imparted to the stalks by the cutters and the reels to carry the stalks onto the turn-table. It has been found in practice, however, that in such a construction many of the stalks fail to reach the turn-table, thus choking the passage-way from the cutters to the turn-table. For the purpose of remedying this difficulty I arrange the turn-table in such relation to the cutters that it is overlapped by the paths of rotation of the arms *l* and the reels *U* and *V*, and also by their respective guards, so that the stalks do not leave the arms and reels until after they have reached the turn-table. By this arrangement the stalks are positively controlled until they reach the turn-table, and I regard it as important to the successful operation of this class of harvesters.

The turn-table is rotated by the driving-shaft *J* at the will of the operator by means of a shaft 15, mounted in suitable bearings on the main frame, and carrying at one end a screw 16, which intermeshes with the gear-wheel 12 on the turn-table, and carrying at the other end a bevel gear-wheel 17, which may be caused to intermesh with the inner face of either of the double-faced bevel gear-wheels *K* and *L*, or disengaged from both by means of the lever 18, which is connected with a sliding bearing 32, in which this end of shaft 15 is mounted.

The mechanism for rotating the turn-table is fully described and forms the subject-matter of one of the claims in my patent, No. 399,988, above mentioned, and therefore need not be more fully described here.

The central support for the tops of the stalks consists of an extensible vertical shaft 19, which is secured to the center of the turn-table, so as to revolve therewith, and is provided at the top of its upper section with a series of radial arms 20, which are detach-

ably secured to the shaft in the following manner: The shaft is formed, preferably, of tubing, and is provided at the top with an enlarged portion or head having a series of vertical open slots 21. The arms 20 consist of straight rods which extend diametrically across the head, so as to project equally on each side. They are laid in the respective slots one above the other, and are clamped in place by a latch-bar 22, which is pivoted at one end to the head of the shaft and passes diametrically across it above the uppermost arm, the latch-bar being held down with a yielding pressure by a weight 23, suspended from the latch-bar within the shaft by a cord 24.

For the purpose of packing the stalks closely against the central flange and the central support, I pivot to some fixed portion of the machine, preferably the guard-plate T, a curved horizontal arm 25, which is arranged at one side of the center and extends backward over the turn-table a short distance above its flanges. The free end of said arm is forced by the spring 26 with a yielding pressure toward the center of the turn-table, so that as the table turns in the direction indicated by the arrow the butts of the stalks are forced toward the central circular flange.

For the purpose of binding the shock a cord 27 passes from the twine-box 28 to a tension-clamp 29, and from thence across and above the turn-table, and is secured to the outer end of one of the radial arms of the central support.

For the purpose of raising the shock off the turn-table a crane 30 is mounted on the main frame.

In constructing the turn-table it may be built up and the flanges secured thereto in any suitable manner; but for the purpose of lightness and strength I prefer to construct it as follows: The center is formed of a single circular plate 31 of sheet-iron having its edges turned up to form the flange 9. A series of segments 33, sufficient in number to surround plate 31, are now formed, one edge of each being turned up to form a radial flange 10 and the outer edge turned up to form a portion of the peripheral flange 11. The meeting edges of the segments 33 are arranged to overlap and are riveted together, as shown, and the ends of the flanges 10 are turned inward and secured, respectively, to the central flange 9 and the peripheral flange 11.

The operation of my machine is as follows: As the machine is drawn forward along a row of standing stalks, the cutters Q and R are rotated in unison in opposite directions by the rotation of the carrying-wheel B and shaft J. The extension-shafts o and p having been with the standards r and s adjusted so as to bring the reels U and V with their respective guards 4 and 5 below the tops of the stalks, the reels are rotated by their connections with the gear-wheels C and P, and the stalks are swept toward the cutters by the

arms l and the reels U and V. It will be observed that the bearing for the reel-shaft and the reel-guard being both mounted on the standard r or s, the reel and its guard are adjusted simultaneously, and always bear the same relation to each other. The stalks are successively inclosed between the opposed curved edges of the meeting teeth i i of the two cutting-disks, and then are cut by the shearing action of one over the other, it being impossible for the stalk to escape from the teeth after being once engaged until it is severed. The cut stalks, resting upright upon the cutting-disks, and being supported and pushed backward by the arms l and the arms of the reels along the passage formed between the guard-plates S and T, are discharged upon the turn-table between two of the flanges 10 and against the flange 9, the table for the moment remaining stationary and the tops of the stalks being supported by the shaft 19 and arms 20. One section of the turn-table having been about half-filled, bevel gear-wheel 17 is thrown into engagement with gear-wheel L, and the turn-table is rotated until another section is brought opposite the cutters. This operation is continued until the turn-table has made two revolutions. During the first revolution the sections are about half-filled, and as the stalks at each revolution come in contact with the arm 25 they are pushed together compactly against the flange 9, and are at the same time embraced near the top in the bight of the binding-cord 27 and drawn closely together at the top toward the shaft 19 and intersecting parts of arms 20. The binding-cord is passed by the rotation of the turn-table once around the deposited stalks at each revolution of the table, thus first entwining the center or core of the shock deposited at the first revolution, and again passing around the outer stalks deposited at the second revolution. When the table has been filled, cord 27 is cut at the tension-clamp and the ends are drawn closely and tied. The shock is then lifted off the turn-table by means of the crane 30 and deposited on the ground, the latch-bar 22 yielding upward and allowing the arms 20 to lift off with the shock. When the shock has been set down, arms 20 are drawn endwise out of the shock and are replaced on shaft 19.

I claim as my invention—

1. In a corn-harvester, the combination of a main frame mounted on carrying-wheels, a pair of cutting-disks, constructed as shown and described, each having a series of radial teeth having their outer edges concentric with the periphery of the disk and their flanks oppositely curved, and all the edges of the teeth and the periphery of the disk between the teeth being cutting-edges, as shown and described, whereby the disks are adapted to be reversed and to embrace a stalk with either flank, and intermediate connecting mechanism connecting said disks and one of the carrying-wheels, whereby the disks are caused

to rotate in unison and a stalk is first surrounded by cutting-edges and then cut, substantially as set forth.

2. In a corn-harvester, the combination of
5 a main frame, a cutting-disk arranged to rotate in a substantially-horizontal plane thereon, a series of radial arms secured to the upper surface of the disk and arranged to project above and beyond its periphery, a reel
10 arranged above said disk and connected thereto, so as to rotate in unison therewith, and a bearing for said reel, said bearing being adjustable backward and forward, laterally and vertically, substantially as and for the purpose
15 specified.

3. The combination, with the main frame and the cutters of a corn-harvester, of a circular revoluble table mounted on the main frame at the rear of the cutters and having
20 a series of radial flanges projecting from its upper surface, substantially as and for the purpose specified.

4. In a corn-harvester, the combination, with the turn-table arranged to receive the
25 cut stalks, of the support for the upper ends of the stalks mounted centrally on said table and consisting of an extension-shaft and a series of radial arms detachably secured to the upper end of the shaft.

30 5. The combination, with the main frame and the cutters of a corn-harvester, of a revo-

luble table mounted on the frame at the rear of the cutters, so as to receive the cut stalks therefrom, a central support for the cut stalks erected on said table, and an arm mounted on
35 the main frame projecting rearwardly over said table and arranged to force the cut stalks with a yielding pressure toward said central support, substantially as and for the purpose specified.

6. In a corn-harvester, the combination, with the main frame, the revoluble table mounted thereon and arranged to receive the cut stalks, and the central support having
40 radial arms, of the binding-cord having one end supported on the main frame and the other end attached to one of the radial arms, whereby the cord is automatically wound about the stalks by the rotation of the table,
45 substantially as set forth.

7. In a corn-harvester, that method of forming and binding a shock of cut stalks which consists in automatically depositing the cut stalks in successive layers around a central
50 vertical support and winding a cord continuously around the successive layers, for the purpose of binding the shock, substantially as set forth.

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