No. 666,298. Patented Jan. 22, 1901.

J. A. WISHERD.

ENDLESS CUTTING APPARATUS.

(Application filed Mar. 23, 1900.)

(No Model.) 2 Sheets—Sheet 1.

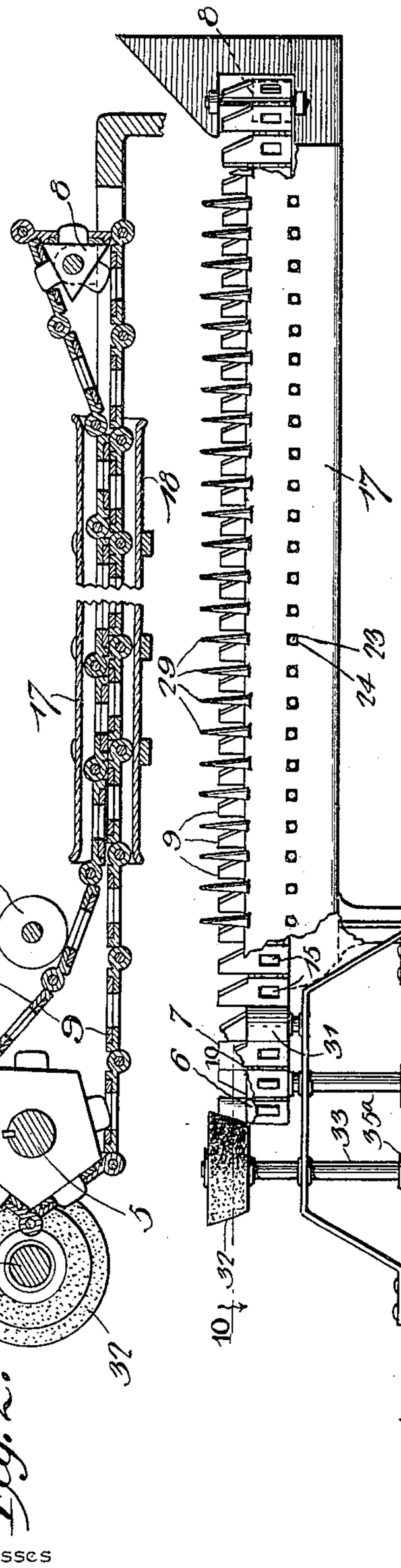

Fig. 1.

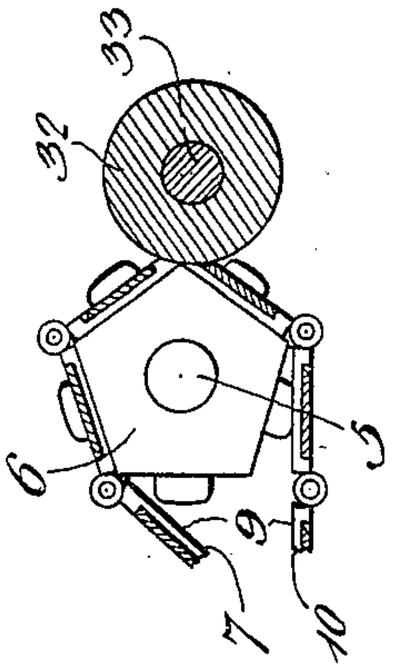

Fig. 10.

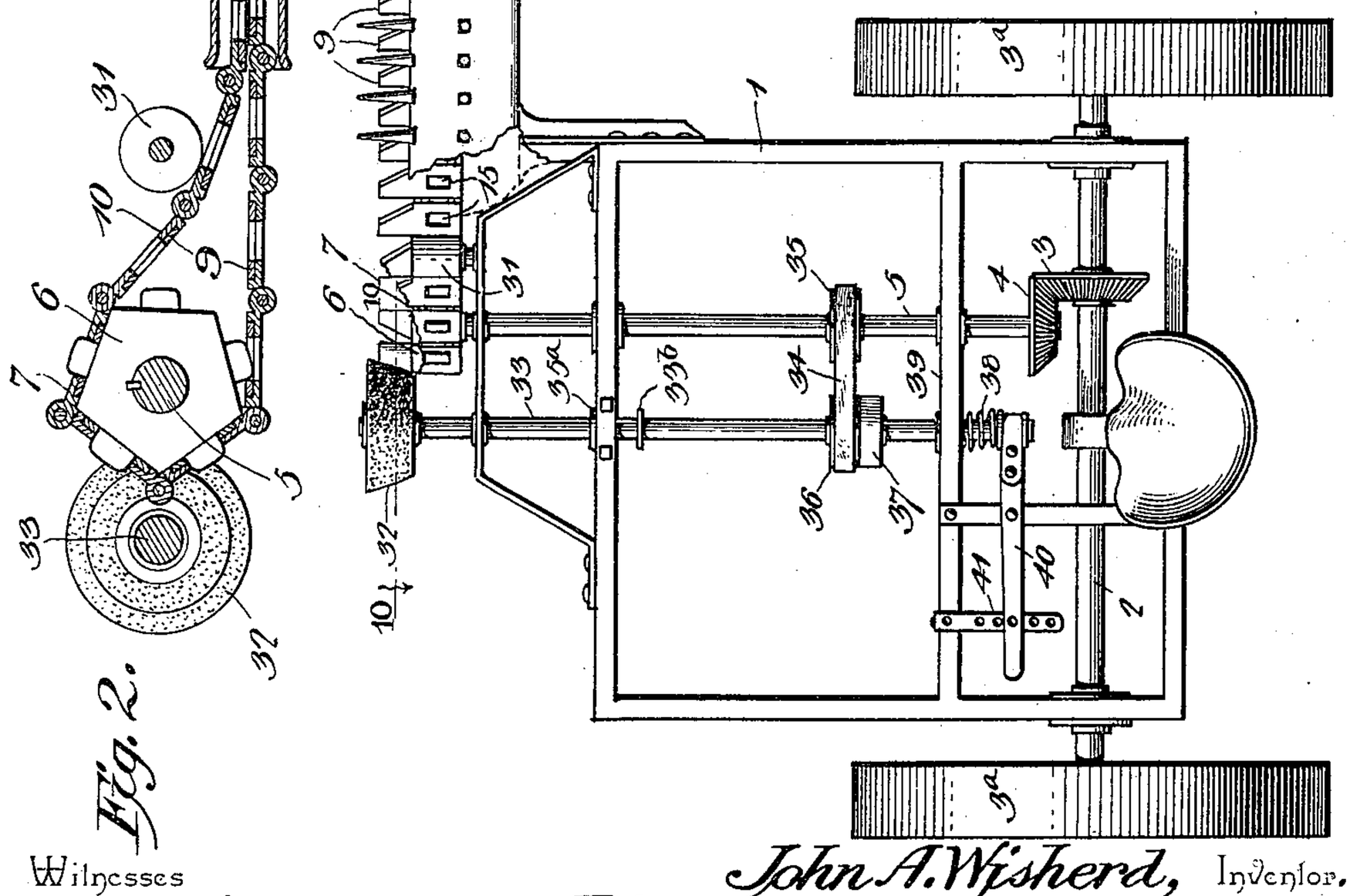

Fig. 2.

Witnesses
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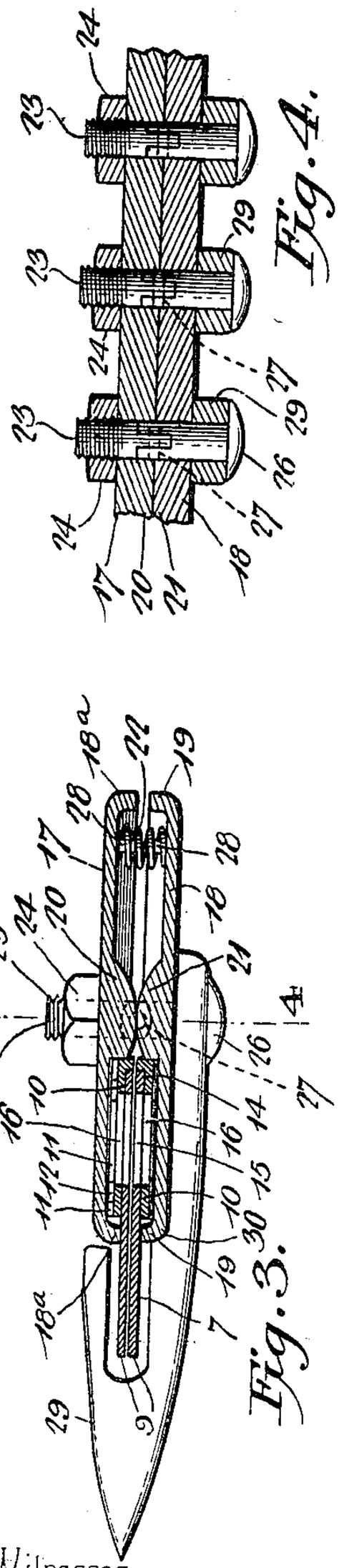

Fig. 4.

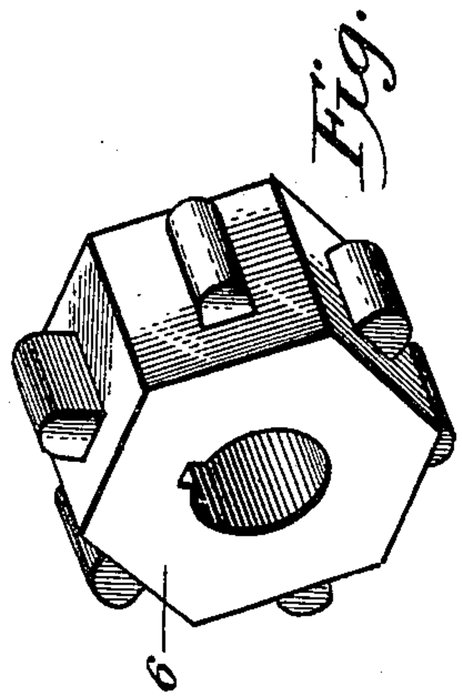

Fig. 8.

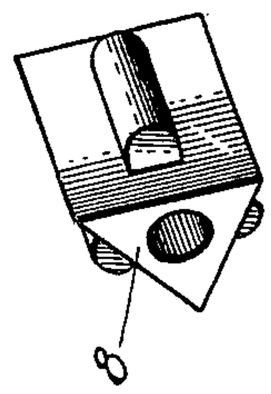

Fig. 9.

Fig. 3.

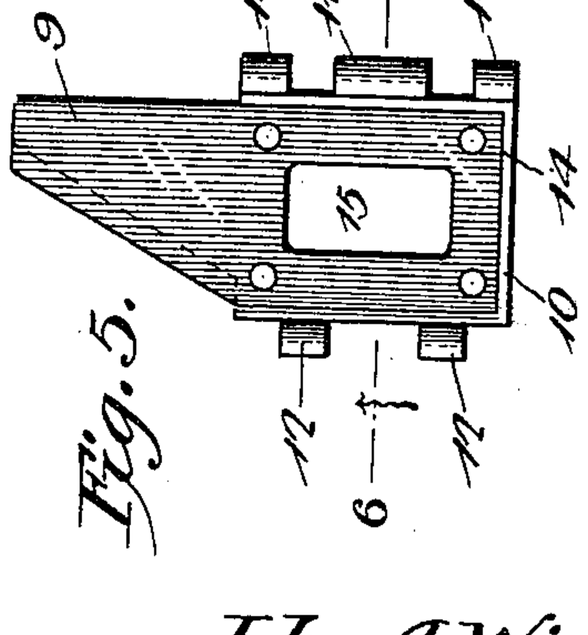

Fig. 5.

Fig. 6.

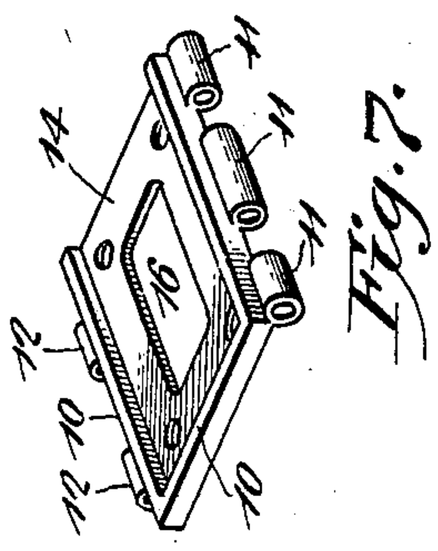

Fig. 7.

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John A. Wisherd, Inventor.
By his Attorneys,
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UNITED STATES PATENT OFFICE.

JOHN A. WISHERD, OF CLARKSON, NEBRASKA.

ENDLESS CUTTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 666,298, dated January 22, 1901.

Application filed March 23, 1900. Serial No. 9,960. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. WISHERD, a citizen of the United States, residing at Clarkson, in the county of Colfax and State of Nebraska, have invented a new and useful Endless Cutting Apparatus, of which the following is a specification.

The invention relates to improvements in endless cutting apparatus.

The objects of the present invention are to improve the construction of endless cutting apparatus for harvesters, mowers, and the like and to increase the effectiveness of the same and enable the blades to be readily sharpened without removing them from the machine.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is a plan view of a machine provided with an endless cutting apparatus constructed in accordance with this invention. Fig. 2 is an enlarged sectional view taken longitudinally of the cutting apparatus. Fig. 3 is a sectional view taken transversely of the cutting apparatus. Fig. 4 is a detail sectional view on line 4 4 of Fig. 3. Fig. 5 is a detail view of one of the blades and necks. Fig. 6 is a detail sectional view on line 6 6 of Fig. 5. Fig. 7 is a detail perspective view of one of the links. Figs. 8 and 9 are detail views of the chain or sprocket wheels upon which the endless sickle is mounted. Fig. 10 is a detail sectional view on line 10 10 of Fig. 1.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates the frame of the machine, which frame may be of any desired construction and which is provided with suitable bearings for an axle 2, having carrying-wheels 3^a fixed to it; but clutch mechanism may be employed for throwing the machine into and out of operation, as will be readily apparent. The axle is connected by bevel gear-wheels 3 and 4 with a longitudinal shaft 5, extending forward to the front of the machine and carrying a driving sprocket-wheel 6, upon which an endless sickle 7 is arranged, the endless sickle being supported at the other end of the cutting apparatus by a substantially triangular sprocket-wheel or idler 8, as clearly illustrated in Fig. 2 of the accompanying drawings. By this construction and arrangement it will be clear that as the machine moves forward the gearing which connects the cutting apparatus with the carrying-wheels will set the former in motion.

The endless sickle is composed of a series of blades 9 and a series of links 10, hinged together at opposite sides and forming a sprocket-chain. The links are provided at opposite sides with eyes 11 and 12 and are connected by pintles 13, passing through the eyes and having their ends countersunk in the end eyes, so that the said ends will be flush with the adjacent edges of the links. Each link is provided at its sides and inner ends with marginal flanges to provide a recess 14 for the reception of the inner portions of the blades 9, which are secured to the links by means of countersunk rivets, having their ends or heads flush with the upper and lower faces of the blades and links. The blades and links are provided with registering openings 15 and 16 to receive the teeth of the sprocket or chain wheels; but instead of mounting the blades on the links in the manner shown any other desired construction may be employed and the blades and links may be formed integral with each other.

The upper and lower flights of the endless sickle are yieldingly held together by means of upper and lower bars 17 and 18, adapted to maintain the projecting or cutting portions of the blades in proper relation with one another to insure a proper cutting action of the apparatus. The upper and lower bars are provided at their front and rear edges with longitudinal flanges 18^a and 19, forming recesses and providing a longitudinal way for the links of the endless sickle, and the said upper and lower bars 17 and 18 are provided with central longitudinal ribs or enlargements 20 and 21, which space the front and rear flanges 18^a and 19 from each other and which provide a space by this means at the front of the bars for the passage of the blades. The blades 9 project through the space or opening of the front of the upper and lower bars and extend in advance of the same, as clearly shown in Fig. 3, and they are yieldingly held

together in proper position for making an effective cut by means of coiled springs 22, interposed between the rear portions of the bars. The central longitudinal ribs or enlargements 20 and 21 are rounded and operate as rockers to form a bearing or pivotal connection, and the said bars are connected by means of a central longitudinal series of bolts 23, having their heads at the lower face of the lower bar and provided at their upper ends with nuts 24. The bolts are composed of upper and lower sections 25 and 26, connected together at their adjacent ends by a transverse pivot 27, which permits the relative movement of the upper and lower bars 17 and 18, which form the frame of the cutting apparatus. The upper and lower sections of the bolts are preferably connected as illustrated in Fig. 4 of the drawings, one of the sections being bifurcated and the other section being reduced to fit in the bifurcation; but any other form of joint may be employed. The spiral springs are retained in position by means of lugs or projections 28, extending from the inner faces of the upper and lower bars, as clearly shown in Fig. 3.

The bolts for connecting the upper and lower bars of the frame of the cutting apparatus also pass through the inner portions of guard-fingers 29, arranged on the lower face of the lower bar and extending in advance of the same, as clearly illustrated in Fig. 3 of the accompanying drawings. The inner portions of the guard-fingers are interposed between the lower bar and the heads of the bolts and are provided between their ends with shoulders 30, which abut against the lower bar at the front edge thereof, whereby they are held against lateral movement. The guard-fingers are provided with openings to receive the blades, and they extend inward over the same to a point adjacent to the front of the upper bar, and their lower faces are inclined to enable them to readily pass over obstructions which do not extend above their points. These guard-fingers effectually prevent the blades from coming in contact with stones and the like. The blades are provided with diagonal cutting edges, and as the upper and lower flights of the endless sickle move in opposite directions and are yieldingly held in proper position for cutting it will be clear that an effective cutting apparatus is provided. The blades of the lower flight of the endless sickle are arranged in the same horizontal plane, as clearly shown in Fig. 2, and in order to tighten and guide the upper flight an upper idler 31 is employed, and this idler is located adjacent to the driving sprocket-wheel 6 and may be adjusted by any suitable means.

The blades of the endless sickle are sharpened automatically, without removing them from the machine, by a grinding device 32, preferably in the form of a conical wheel mounted on the front end of a longitudinal shaft 33, journaled in suitable bearings of the frame of the machine and arranged parallel with the shaft 5. The shafts 5 and 33 may be connected by a belt 34 or other suitable means, and when the belt 34 is employed it is arranged on pulleys 35 and 36, fixed to the shafts 5 and 33, as clearly illustrated in Fig. 1 of the accompanying drawings. A loose pulley 37 is preferably arranged adjacent to the fixed pulley 36 of the shaft 33 to receive the belt when it is desired to stop the shaft 33. Any suitable belt-shifter may be employed for this purpose. The shaft 33 is capable of longitudinal movement to carry the grinding device into and out of position for engaging the blades of the endless sickle, and when it is moved outward the loose pulley will be brought opposite the fast pulley 35 of the shaft 5, so that the belt will not be twisted when arranged on either of the pulleys 36 and 37. The longitudinal movement of the shaft 33 is limited by flanges 33^a and 33^b, located adjacent to the front of the frame, the front flange 33^a being adapted to prevent the grinding-wheel from being drawn backward too far against the blades of the endless sickle.

The shaft 33 is yieldingly held in position for engaging the blades of the endless sickle by means of a coiled spring 38, interposed between a transverse bar or beam 39 of the frame of the machine and a suitable stop of the rear end of the shaft, which is connected with a shifting lever 40, fulcrumed on the frame of the machine at a point between its ends and having its outer end adjustably secured to a ratchet 41. The inner end of the lever 40 may be forked to engage an annular groove of the shaft or any other suitable connection may be employed, and the ratchet 41, which may be of any desired construction, is shown provided with a series of perforations adapted to receive a pin or other suitable fastening device which passes through a perforation of the outer portion of the lever 40, whereby the grinding device is locked out of engagement with the blades of the cutting apparatus. The grinding device may be rotated, or a stationary grinder may be employed and may be provided by simply disconnecting the shafts 5 and 33. Also the form of the grinding device may be changed, especially when it is not designed to be rotated. The operation of the cutting apparatus carries the beveled or cutting edges of the blades into contact with and across the contiguous surface of the grinding device, whereby the blades may be maintained continually sharp and may be easily sharpened without removing them from the endless sickle.

Any means may be employed for connecting the frame of the cutting apparatus with the frame of the machine and for hinging the cutting apparatus, so that it may be swung upward and otherwise operated similar to an ordinary hinged cutting apparatus; but as these features do not form any part of the present invention description and illustration thereof are deemed unnecessary.

It will be seen that the cutting apparatus is simple and comparatively inexpensive in construction, that it is positive and reliable in operation, and that the upper and lower flights of an endless sickle are yieldingly held together, so that the reversely-moving blades will always lie in proper position for making an effective cut. Furthermore, it will be clear that the blades are adapted to be readily sharpened without removing them from the cutting apparatus and by simply shifting a grinding device into and out of operative position. Also it will be apparent that the grinding device may be removably mounted on the shaft, so that it may be taken off after use, and with this construction shifting mechanism need not be employed.

Changes in the form, proportion, size, and the minor details of construction within the scope of the appended claims may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

What is claimed is—

1. In a machine of the class described, the combination with an endless sickle, of means for holding the flights of the sickle yieldingly in engagement with each other, whereby the blades of the sickle will lie in position for making an effective cut, substantially as described.

2. In a machine of the class described, the combination with an endless sickle, of a pair of bars located at the outer faces of the flights of the endless sickle, and means for holding the bars yieldingly in engagement with the flights of the endless sickle, substantially as and for the purpose described.

3. In a machine of the class described, the combination with an endless sickle, of upper and lower bars receiving the upper and lower flights of the sickle between them, said bars being pivotally connected, and a spring for holding the bars yieldingly in engagement with the flights of the sickle, substantially as described.

4. In a machine of the class described, the combination with an endless sickle, of upper and lower bars forming ways for the flights of the sickle and engaging the latter, said bars being provided with longitudinal ribs or enlargements rounded to form rockers, and means for holding the bars in engagement with the flights of the endless sickle, substantially as described.

5. In a machine of the class described, the combination with an endless sickle, of upper and lower bars receiving the sickle between them, bolts connecting the bars and composed of jointed sections, and means for holding the bars in engagement with the sickle, substantially as described.

6. In a machine of the class described, the combination with an endless sickle, of upper and lower bars receiving the sickle between them and provided with rounded ribs or enlargements, bolts connecting the upper and lower bars at the ribs or enlargements and composed of jointed sections, and means for holding the bars in engagement with the sickle, substantially as described.

7. In a machine of the class described, the combination of upper and lower bars provided with longitudinal ribs or enlargements rounded to form rockers and located between the front and rear edges of the bars, an endless sickle arranged between the front portions of the bars, and a spring interposed between the rear portions of the bars, substantially as described.

8. In a machine of the class described, the combination of upper and lower bars provided with ribs or enlargements arranged between their front and rear edges, an endless sickle located between the front portions of the bars, bolts connecting the bars at the ribs or enlargements, guard-fingers secured to the lower bar, and means for holding the bars in engagement with the sickle, substantially as described.

9. In a machine of the class described, the combination of a frame, the shaft 5 journaled on the frame and designed to be geared with the axle and carrying a sprocket-wheel, an endless sickle arranged on the sprocket-wheel, the shaft 33 located adjacent to the endless sickle, a grinding device mounted on the shaft in position to be engaged by the blades of the sickle, connections between the shafts, and means for reciprocating the shaft 33, substantially as described.

10. In a machine of the class described, the combination of an endless sickle, a shaft capable of longitudinal movement, a grinding device mounted on the shaft and arranged to be engaged by the blades of the endless sickle, a spring for actuating the shaft to hold the grinding device normally in position for operation, means for rotating the shaft, and operating mechanism for moving the shaft against the action of the spring, substantially as described.

11. In a machine of the class described, the combination of a frame, an endless sickle, a shaft journaled on the frame, a grinding device carried by the shaft and located adjacent to the blades of the sickle, a lever connected with and adapted to reciprocate the shaft, means for locking the lever in its adjustment, and a spring for actuating the shaft, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN A. WISHERD.

Witnesses:

JESSE MERRITT,

JOHN MERRITT.