J. O. THORNHILL.

COTTON CHOPPING MACHINE.

APPLICATION FILED MAY 2, 1917.

1,305,840.

Patented June 3, 1919.

2 SHEETS—SHEET 1.

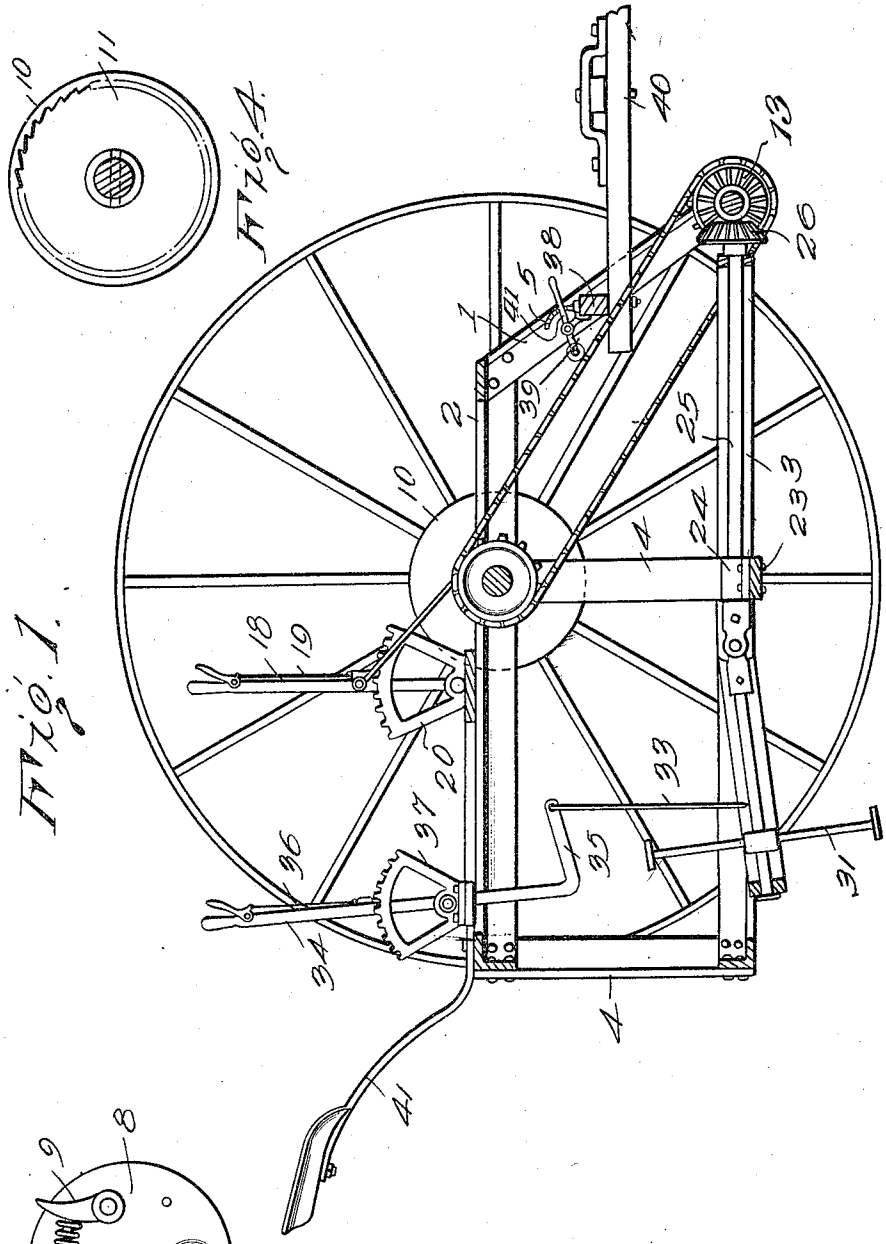



Fig. 4.

Fig. 1.




Fig. 3.

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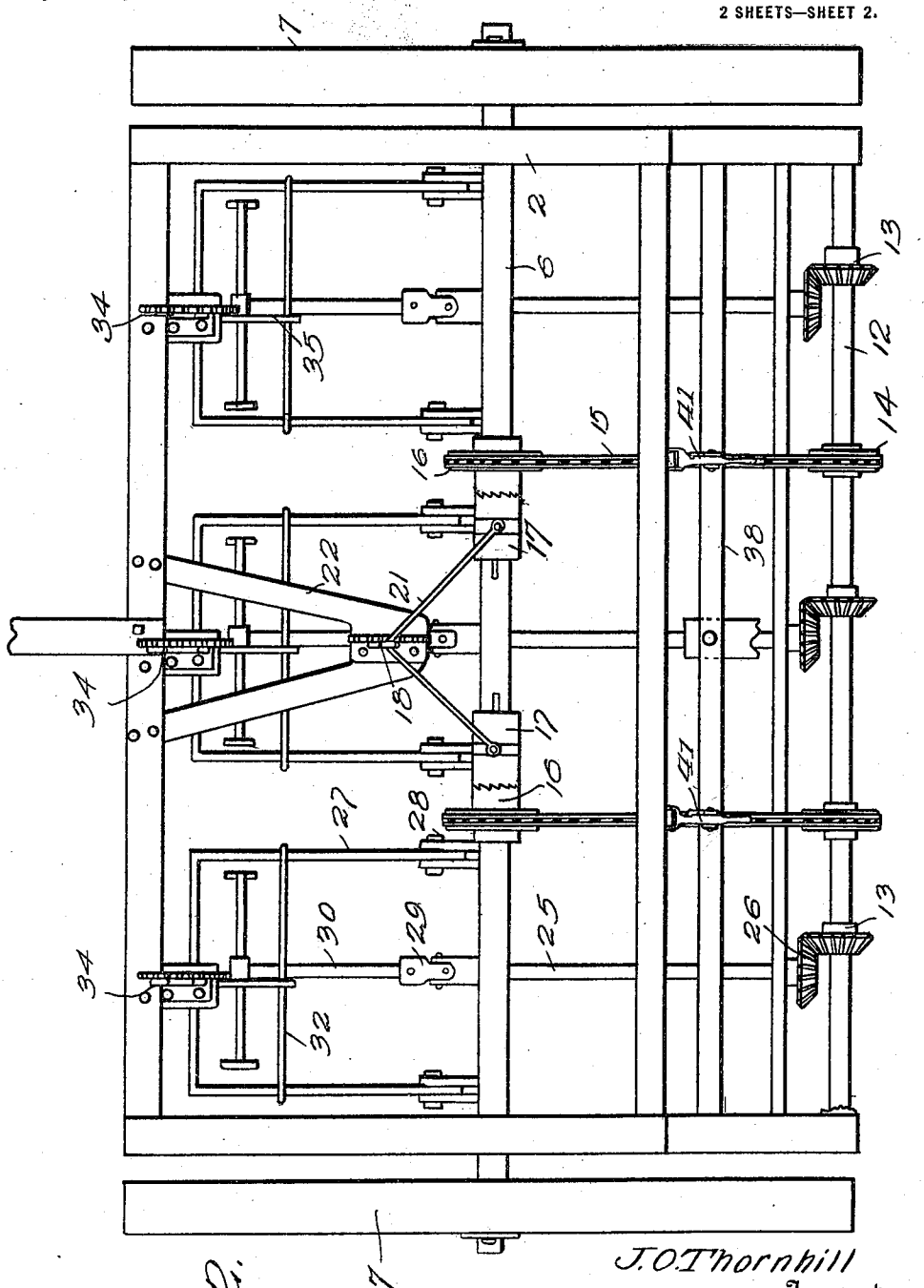



Fig. 2.

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# UNITED STATES PATENT OFFICE.

JAMES O. THORNHILL, OF JELLE, MINNESOTA.

## COTTON-CHOPPING MACHINE.

1,305,840. Specification of Letters Patent. Patented June 3, 1919.

Application filed May 2, 1917. Serial No. 165,877.

*To all whom it may concern:*

Be it known that I, JAMES O. THORNHILL, a citizen of the United States, and resident of Jelle, in the county of Beltrami and State of Minnesota, have invented certain new and useful Improvements in Cotton-Chopping Machines, of which the following is a specification.

This invention relates to new and useful improvements in cotton choppers, and the primary object of the invention is to provide a device of this character that is provided with a plurality of rotatable choppers which are vertically adjustable with respect to the machine to vary the depth of the cut as desired.

Another object of the invention is to provide a machine of this character having a plurality of rotatable cutters with means for operating said cutters when the machine moves forwardly, and supplemental means for moving the cutters in and out of operative engagement with the operating mechanism carried thereby.

A still further object of the invention is to provide a device of this character, which is easily and simply constructed, inexpensive to manufacture, and one which will be very efficient in operation.

With these and numerous other objects in view my invention consists of the novel features of construction, combination and arrangement of parts which will be hereinreferred to and more particularly pointed out in the specification and claim.

In the accompanying drawings:

Figure 1 is a vertical longitudinal section through the machine;

Fig. 2 is a top plan view of the same;

Fig. 3 is a side elevation of one of the plates that are secured to the wheels of the machine, and

Fig. 4 is a side elevation of the band that is secured to the axle.

In describing my invention I shall refer to the drawings in which similar reference characters designate corresponding parts throughout the several views.

The main supporting frame of this machine is designated in its entirety by the numeral 1, and the same comprises a pair of horizontally disposed substantially rectangular upper and lower portions 2 and 3 respectively, the lower portion 3 extending forwardly beyond the front edge of the upper portion. These portions of the frame are connected by upright bars 4, disposed at the rear end, and intermediate the ends thereof, and forward connecting bars 5 being inclined, as clearly shown in Fig. 1 of the drawings. This frame is formed of any desired material, preferably metal strips, and the said strips are connected by riveting or the most applicable means for fastening.

Mounted transversely in the upper portion of the frame, is an axle 6 which has its opposite ends projecting therefrom and mounted thereon are supporting wheels 7 for the machine. Secured to the wheels 7, by the spokes thereof, and surrounding the axle are plates 8, which have spring-pressed pawls 9 thereon. Surrounding the pawls 9 is a band 10 secured to a plate 11 that is keyed to the axle 6, and the inner surface of the band 10 is formed from a plurality of ratchet teeth thereon, against which the pawls 9 are normally pressed. These parts are so arranged, that when the machine is moved forwardly, the axle 6 will be rotated, but rotation of the axle upon rearward movement of the machine will be prevented, owing to the fact that the pawls 9 will not engage the ratchet teeth, but will slide thereover.

Mounted in the forward portion of the lower frame 3, is a transversely extending rotatably mounted shaft 12, having a plurality of spaced beveled gears 13 mounted thereon. This shaft 12 is also provided with a pair of sprocket wheels 14 thereon, and the same are connected by chains 15 with sprocket wheels 16 mounted on the axle 6. The sprocket wheels 16 are loosely mounted on the axle, and the same are adapted to be connected therewith by clutch members 17 that are keyed to the same, but slide longitudinally thereof, to have their outer ends moved into engagement with the inner ends of said sprocket wheels. The movement of the clutch members 17 is controlled by an operating lever 18 carrying a locking pawl 19 adapted for engagement with a stationary segmental rack 20, and said lever is connected by links 21 with the two clutch members. This lever is mounted on a forwardly extending bracket 22 that has its opposite ends secured to the rear edge of the upper portion 2 of the frame 1.

The bottom portion 3 of the frame 1 is provided with a transversely extending strip 23, which has a plurality of bearing plates 24 thereon, and adapted to be mounted there-

through intermediate their ends, are a plurality of spaced jointed rotatable shafts 25, which extend longitudinally of the frame, and have their front ends extending through the said frame, and provided with beveled gears 26 adapted for engagement with the beveled gears 13 on the shaft 12. Pivotally connected with the strip 23 and extending rearwardly therefrom are a plurality of vertically swingable supplementary frames 27, that are substantially U-shaped, and have their opposite ends connected with said strip as shown at 28. The rear ends of the shaft 25 extend through the bearing plates 24, and they are connected by universal joints 29 past the strip 23, the rear swinging portion of said shafts being designated by the numeral 30, and having their rear ends rotatably mounted in the rear ends of said frames. A plurality of these swinging frames are provided, preferably three, as shown in the accompanying drawings, although any desired number may be employed. The universal connection 29 between the opposite ends of the shaft allow the same to swing when the vertically swingable frames are moved.

Mounted on the portions 30 of the shafts 25, within the frames 27 are cutters 31, which will be rotated when the shafts are rotated, for the purpose of which is obvious. The frames 27 are provided with transversely extending rods 32 and connected therewith by means of links 33 is a lever, or a plurality of levers, one lever being provided for each frame 34, which are provided with forwardly bent lower ends 35. These levers are pivotally mounted on the upper portion 2 of the frame 1, and each lever is provided with a locking pawl 36 adapted for engagement with a stationary segmental rack 37, to hold the same in various adjusted positions. It is obvious that upon the operation of these levers, the frames 27 may be swung vertically to raise or lower the same, and consequently raise or lower the rotatable cutters that are mounted therein.

Extending transversely across the front of the frame 1, and connected with the inclined connected portions 5 thereof is a bar 38 which has a centrally disposed pin 39 intermediate the ends thereof, adapted to receive the inner end of a draft bar 40. This draft connection is of the conventional type whereby the animals are connected with the machine to pull the same. Secured to the rear edge of the upper portion 2 of the frame 1 is a conventional type of spring seat 41, which is ordinarily employed on devices of this character.

In operation, when the machine is moved forward, it is obvious that the axle 6 will be rotated, and when the clutch members 17 are moved into operative engagement with the sprocket wheels 16, these wheels will consequently be likewise rotated and motion will be transmitted through the chains 15 to the sprocket wheels 14, that are fixed to the shaft 12, hence rotating the same. This rotation of the shaft 12 will be transmitted through the medium of the beveled intermeshing gears 13 and 26 to the longitudinally extending jointed shafts 25, to rotate the same, and hence rotate the cutters 31 secured on the rear portions of said shafts. The operation of the clutch members is controlled by the lever 18, whereby the device may be operated, or disconnected as desired.

Each of the supplemental frames 27 in which are mounted the rear ends or portions 30 of the shafts 25 is connected to an operating lever 34, which is adjustable, to raise or lower said supplementary frames, and consequently raise or lower the rotatable cutters. This movement of the rear portions of the shafts 25 is permitted owing to the fact that the said portions of the shafts are connected by means of the universal joints 29. The different levers that control the movement of the supplementary frames are provided with locking means so that they may be held at various adjusted positions according to the cut desired of the rotatable cutters 31. The lever 18 is also provided with locking means to hold the clutch members either in or out of engagement with the sprocket wheels 16. As has been hereinbefore stated the machine is provided with means that only allow the axle 6 to be rotated when the same moves forwardly, and to hold the same stationary, or prevent its rotation when the wheels are moved rearwardly by rearward movement of said machine.

As has been hereinbefore stated any number of supplementary adjustable frames may be employed, according to the number of cutters desired. The mechanism employed in this machine affords a simple and efficient means for vertically adjusting the rotary or rotatable cutters without the operator leaving the machine to adjust the same. The depth of the cut may be easily adjusted while the machine is in operation, a great advantage in devices of this character.

The chains between the sprocket wheels of the driving mechanism may be provided with tightening devices 41 that are secured to the horizontally extending bar 38. Also various sizes of sprocket wheels may be provided so as to vary the speed of the cutters as desired.

From the foregoing description, taken in connection with the accompanying drawing, the advantages of the construction and the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the device which I

now consider to be the best embodiment thereof, I desire to have it understood that the device shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claim appended hereto.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is:

In a cotton chopping machine, a wheel mounted frame structure, a plurality of substantially U-shaped frames having forwardly directed terminals pivoted to said frame structure, a power transmitting shaft supported by the frame structure having connection with the wheels thereof, universally jointed shafts connected to the power transmitting shaft and supported on the frame structure, the rear and relatively movable shafts being journaled in the web portions of the U-shaped members, brace rods connecting the parallel portions of the U-shaped members, hand levers pivotally supported upon the frame structure, means connecting the hand levers with the brace rods to effect manual adjustment of the U-shaped frames, and cotton chopping means secured on portions of said universally jointed shafts intermediate the joint and the web portion of the U-shaped frame.

In testimony whereof, I affix my signature hereto.

JAMES O. THORNHILL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."