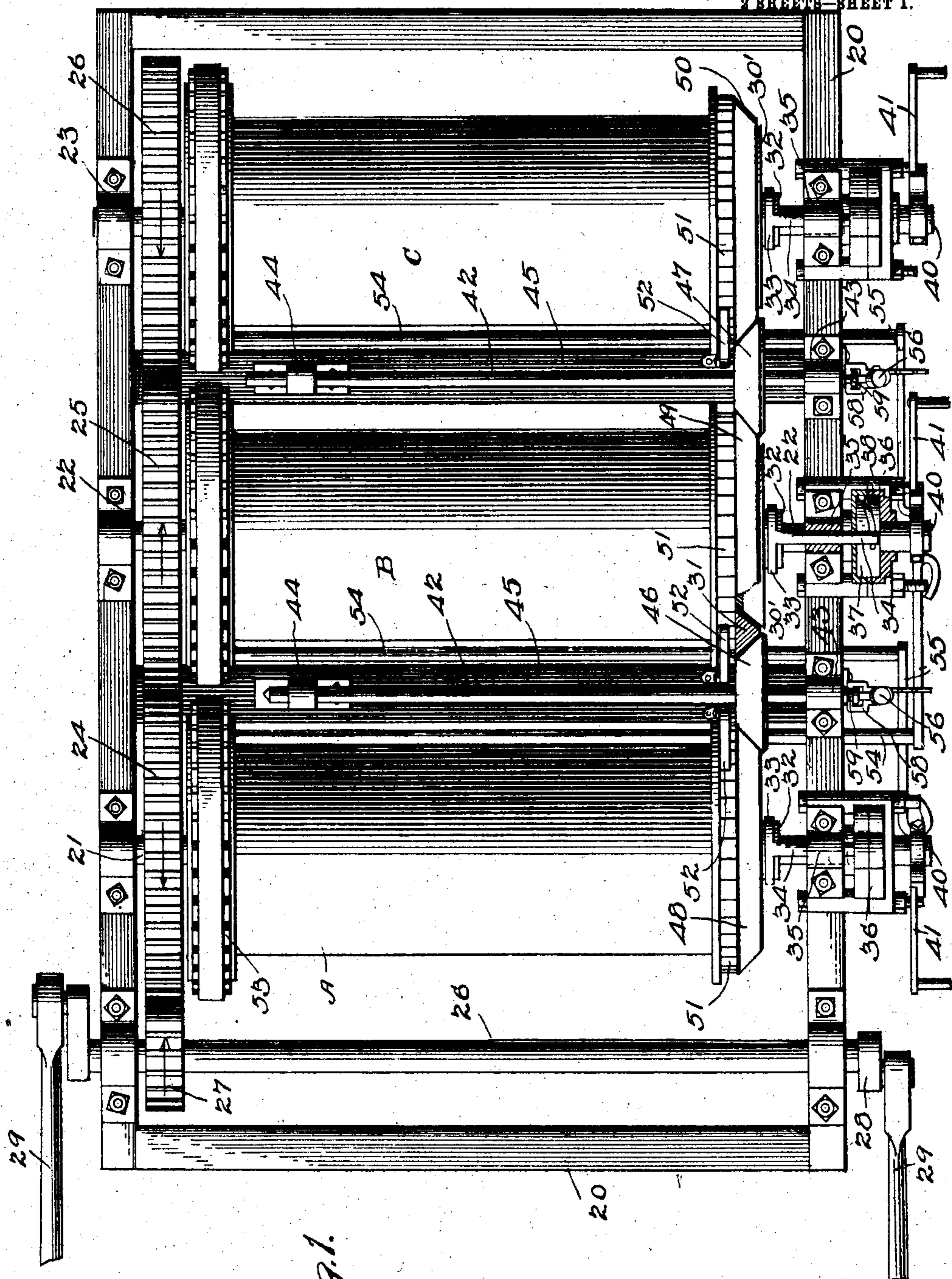


No. 834,881.

PATENTED NOV. 6, 1906.

J. D. AUSTIN.
HOISTING APPARATUS.
APPLICATION FILED DEC. 16, 1905.

2 SHEETS-SHEET 1.



WITNESSES:

E. J. Stewart
W. C. Shepard

Fig. 1.

John D. Austin, INVENTOR.

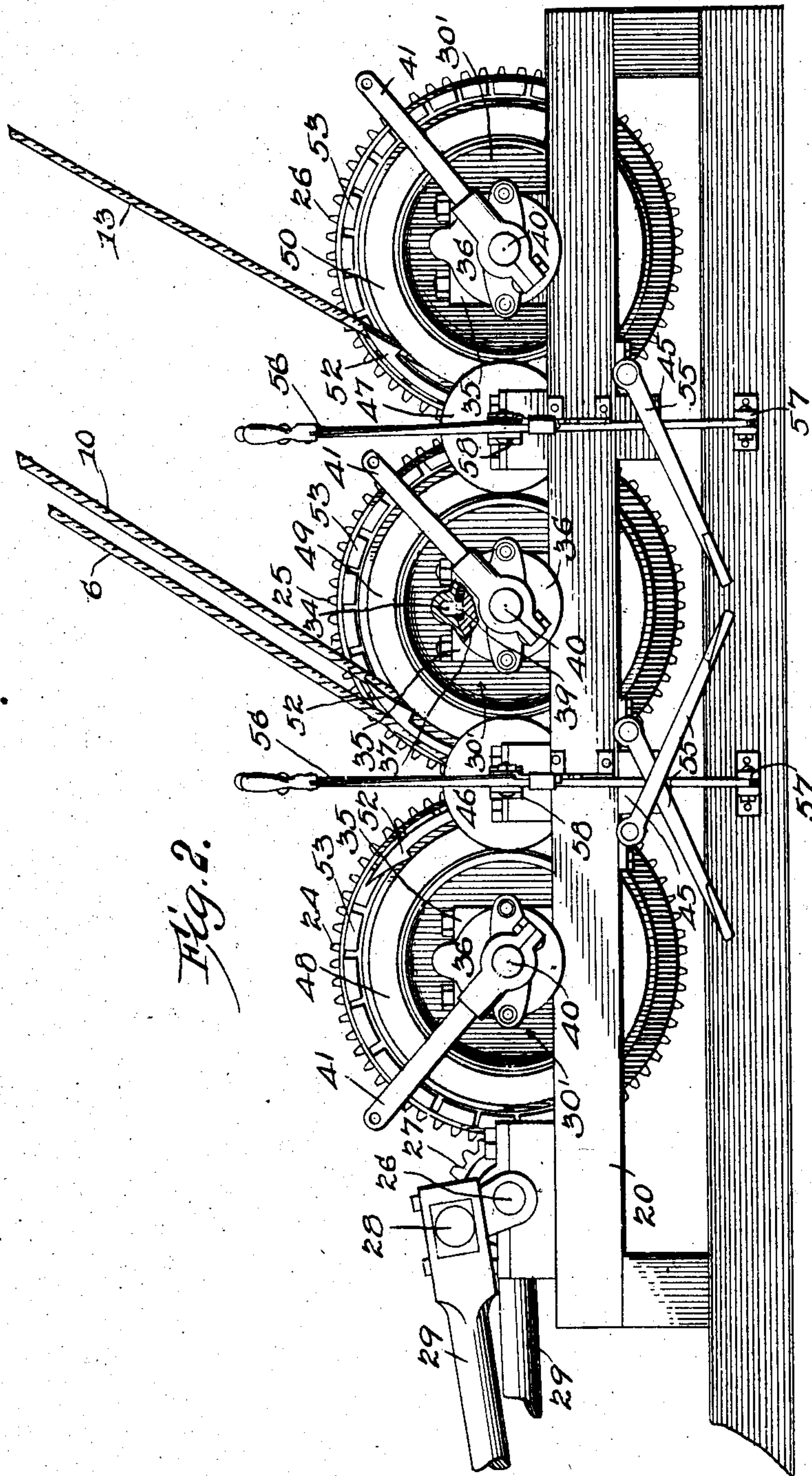
By *C. A. Snow & Co.*
ATTORNEYS

No. 834,881.

PATENTED NOV. 6, 1906.

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APPLICATION FILED DEC. 18, 1905.

2 SHEETS—SHEET 2.



WITNESSES:

WITNESSES:
C. F. Stewart
H. T. Shepard.

John D. Austin, INVENTOR

By

Cashmore
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UNITED STATES PATENT OFFICE.

JOHN DAVID AUSTIN, OF THONOTOSASSA, FLORIDA.

HOISTING APPARATUS.

No. 834,881.

Specification of Letters Patent.

Patented Nov. 6, 1906.

Application filed December 16, 1905. Serial No. 292,099.

To all whom it may concern:

Be it known that I, JOHN DAVID AUSTIN, a citizen of the United States, residing at Thonotosassa, in the county of Hillsboro and State of Florida, have invented a new and useful Hoisting Apparatus, of which the following is a specification.

This invention relates to hoisting mechanism for use in connection with conveyers of that class utilizing a plurality of cables adapted to be wound and unwound either separately or simultaneously.

The object of the invention is to provide mechanism of this character which is at all times under the absolute control of the operator and which is provided with means whereby any one or more cables connected thereto can be wound or unwound, said mechanism being adapted to be actuated by a single engine. It is proposed to arrange for having the engine run continuously while the apparatus is in operation and to enable a convenient adjustment of the apparatus to control the direction of rotation of the drums without interfering with the operation of the engine, thereby obtaining quick and positive response of the cables connected to the drums.

With the above and other objects in view the invention consists of certain novel features of construction and combinations of parts, which will be hereinafter more fully described, and pointed out in the claims.

In the accompanying drawings is shown the preferred form of the invention.

In said drawings, Figure 1 is a plan view of the mechanism, and Fig. 2 is a side elevation thereof.

Referring to the figures by characters of reference, 20 is a suitable frame for the support of the winding-drums and other elements. A series of three parallel horizontal shafts 21, 22, and 23 is journaled transversely across the frame, the left-hand ends of the shafts being connected by means of a series of gears 24, 25, and 26, fixed to the respective shafts and always in mesh with one another. These gears are of the same diameter, and therefore the three shafts rotate continuously at the same rate of speed and in the directions indicated by the arrows in Fig. 3 of the drawings. Across what will be called the "rear" end of the frame there is a drive-shaft 26, provided with a pinion 27 in mesh with the adjacent gear 24 and driven in the direction of the arrow applied thereto. Each

end of the shaft is projected beyond the frame and provided with a terminal crank 28, to which is connected a pitman or connecting rod 29 of an engine.

Upon the successive shafts are drums A, B, and C, each of which is loose upon its shaft and capable of being interlocked therewith by some approved form of clutch—such, for instance, as shown by the broken portion of one terminal of the drum B. This clutch includes a beveled friction-disk 30, fixed to the shaft and working within the adjacent end of the drum in coöperative relation with a beveled external friction head or face 31 upon the drum. This friction-disk is keyed to slide longitudinally upon the shaft and is provided upon its outer side with an annularly-channeled hub 32, the channeled portion of the hub being engaged by a fork 33, having a shank 34 working endwise through a guide-opening in the adjacent bearing for the drum-shaft 21, 22, or 23.

Any approved controlling means may be employed for working the fork 33 back and forth to move the friction-clutch 33 into and out of engagement with the drum. For instance, a cylindrical case 36 is supported upon the outer side of the frame and contains a rotatable cylinder 37, having a spiral channel or groove 38 in its top peripheral portion. The outer end portion of the shank 34 pierces the case across the top thereof and has a depending projection 39 fitting in the cam-groove 38, whereby upon rotation of the member 37 in opposite directions the shank 34 will be forced in and out and the friction-disk 30 thereby moved into and out of engagement with the adjacent drum. The cam member 37 is provided with a hub 40, which rotatably pierces the outer end of the case, and a lever or crank-handle 41 is connected to the hub, whereby the member 37 may be rotated to control the clutch.

It will be here explained that the lever 41 is always at one or the other of its limits, its play being limited by reason of the end walls of the cam-groove 38 engaging the pin or projection 39 upon the shaft 34 of the fork.

It will of course be understood that each drum is equipped with a friction-clutch and controlling means, as just described, wherefore the drums may be individually locked with their shafts for rotation therewith and also freed therefrom to run loosely thereon.

Between each pair of adjacent drums there

is an idle shaft 42, having its outer end mounted in a bearing 43 upon the frame and its inner end mounted in a bearing 44, supported upon a cross-bar 45 of the frame, said shaft also capable of being slid endwise through its bearings. Upon the shafts 42 are the respective friction-gears 46 and 47, which are designed to successively connect the drums A B and B C, said drums being provided with friction-gears 48, 49, and 50 for contact with the gears 46 and 47. Each of the drums is furthermore provided with ratchet-teeth 51 for engagement by a dog or pawl 52, suitably journaled upon the frame so as to hold the drum against rotation when loose upon its shaft and not coupled to one of the other drums.

It will here be noted that the shaft-gearing 24, 25, and 26 is at one side of the winding apparatus, while the drum-gearing is at the other side thereof, the shaft-gearing always being in mesh, so as to rotate the shaft continuously, while the drum-gearing is engaged only according to the work to be performed by the drums.

Each of the drums is provided with any conventional or approved form of brake 53 at the shaft-gearing end of the drum, said brake being controlled by a rock-bar 54, extending across the bottom portion of the frame, with its inner end in operative relation with the brake, the outer end of the rock-bar being projected beyond the frame and provided with a crank-arm or lever 55, working in a direction front and rear of the frame, whereby the rotation of the drum may be stopped after it has been released from the shaft or from the adjacent drum.

For convenience in shifting each shaft 42 to throw its friction-gear into and out of contact with the adjacent gears there is a lever 56, fulcrumed at its lower end, as at 57, upon the frame and having a fork 58 engaging an annular groove or channel 59 in the adjacent end of the shaft 42. The lever 56 is of course a ratchet-lever, so as to hold the adjacent shaft 42 at its opposite limits, and thereby positively hold the adjacent friction-gear in and out of contact with the drum-gears.

In practice, it being desired to run the drum B, the friction-clutch for drum B is thrown into engagement therewith, whereby the drum B rotates in the direction of the arrow applied to the shaft-gear on Fig. 3, so as to pay out the cable 10 thereon. The friction-gears 46 and 47 are thrown into contact with the adjacent drum-gears, whereby all of the drums are connected, the drums A and C being loose upon their shafts. When thus connected, the drum C rotates in the same direction as the drum B, and the cable 13 is thereby paid out, while the drum 8 is likewise rotated in the same direction as the other drums, and the cable 6 is thus wound upon the drum A.

It will here be noted that the cables 10 and 13 are wound in the same directions upon their drums, while the cable 6 is wound in a reverse direction, whereby when the drums are successively connected by the drum-gearing and the intermediate drum B is fixed upon its shaft all of the drums will rotate in the same direction from left to right, which draws in upon the cable 6 and pays out upon the cables 10 and 13.

After the cable 6 has been wound sufficiently the drum B may be released from its shaft and the friction-gears 46 and 47 thrown out of gear, whereupon the hoisting-drum C is loose upon its shaft, and its cable 13 can be readily unwound from the drum C. During this operation the drums A and B are locked against rotation by their dogs 52, so as to hold the carriage 4 stationary.

To wind the cable 13, the drums A and B remain locked and the drum C is clutched to its shaft by manipulation of the adjacent lever 41, whereby the cable 13 will be wound upon the drum 6.

Various other operations may be performed by properly manipulating the apparatus, and these operations are so obvious that it is not deemed necessary to go into a detailed description of them.

Having thus described the invention, what is claimed is—

1. In an apparatus of the character described the combination with a drive-shaft, of a series of counter-shafts successively geared to one another and to the drive-shaft, drums loose upon the respective counter-shafts, a clutch upon each shaft for securing the drum thereto, rotatable means for actuating each clutch, gears upon the drums, and a gear interposed between and shiftable into engagement with each pair of gears upon the drums.

2. In apparatus of the class described, the combination of a drive-shaft, a series of counter-shafts successively geared to one another and to the drive-shaft, drums loose upon the respective shafts, clutches to interlock the respective drums with their shafts, gears upon the drums, a gear interposed between and shiftable into engagement with each pairs of gears upon the drums, and brakes for the respective drums.

3. In apparatus of the class described, the combination of a drive-shaft, a series of counter-shafts successively geared to one another and to the drive-shaft, drums loose upon the respective shafts, brakes for the respective drums at corresponding ends thereof, gears carried by the other ends of the drums, clutches to interlock the respective drums with their shafts, and a gear interposed between and shiftable into engagement with each pair of gears upon the drums.

4. In apparatus of the class described, the

combination with a frame, of a drive-shaft thereon, a series of counter-shafts successively geared to one another and to the drive-shaft, drums loose upon the respective shafts, 5 clutches to interlock the respective drums with their shafts, gears upon the drums, end-wise-shiftable pinion-shafts mounted between adjacent drums, pinions upon the pinion-shafts and shiftable therewith into and out 15 of engagement with the drum-gears, levers fulcrumed upon the frame, and links connected to the levers and having swiveled connections with the pinion-shafts.

5. In apparatus of the class described, the 15 combination of a drive-shaft, a series of substantially parallel counter-shafts successively geared to one another and to the drive-shaft, drums loose upon the respective shafts, clutches to interlock the respective 20 drums with their shafts and including crank-operated controlling means, gears upon the drums, a pinion interposed between and shiftable into engagement with each pair of gears upon the drums, levers connected to

the respective pinions for shifting the same, 25 brakes for the respective drums, rock-bars for actuating the brakes, and crank-handles carried by the rock-bars.

6. In apparatus of the class described, the combination with a frame of a drive-shaft, 30 a series of substantially parallel counter-shafts mounted upon the frame in parallelism with the drive-shaft and geared to one another and to the drive-shaft at one side of the frame, drums loose upon the respective 35 shafts, clutches to interlock the respective drums with their shafts, gears upon the drums at the opposite side of the frame from the shaft-gears, and a gear interposed between and shiftable into engagement with 40 each pair of gears upon the drums.

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

JOHN DAVID AUSTIN.

Witnesses:

M. M. THOMPSON,
D. J. WADSWORTH.