Sept. 15, 1936. F. WALDORF 2,054,347

METHOD AND MECHANISM FOR UNCOILING

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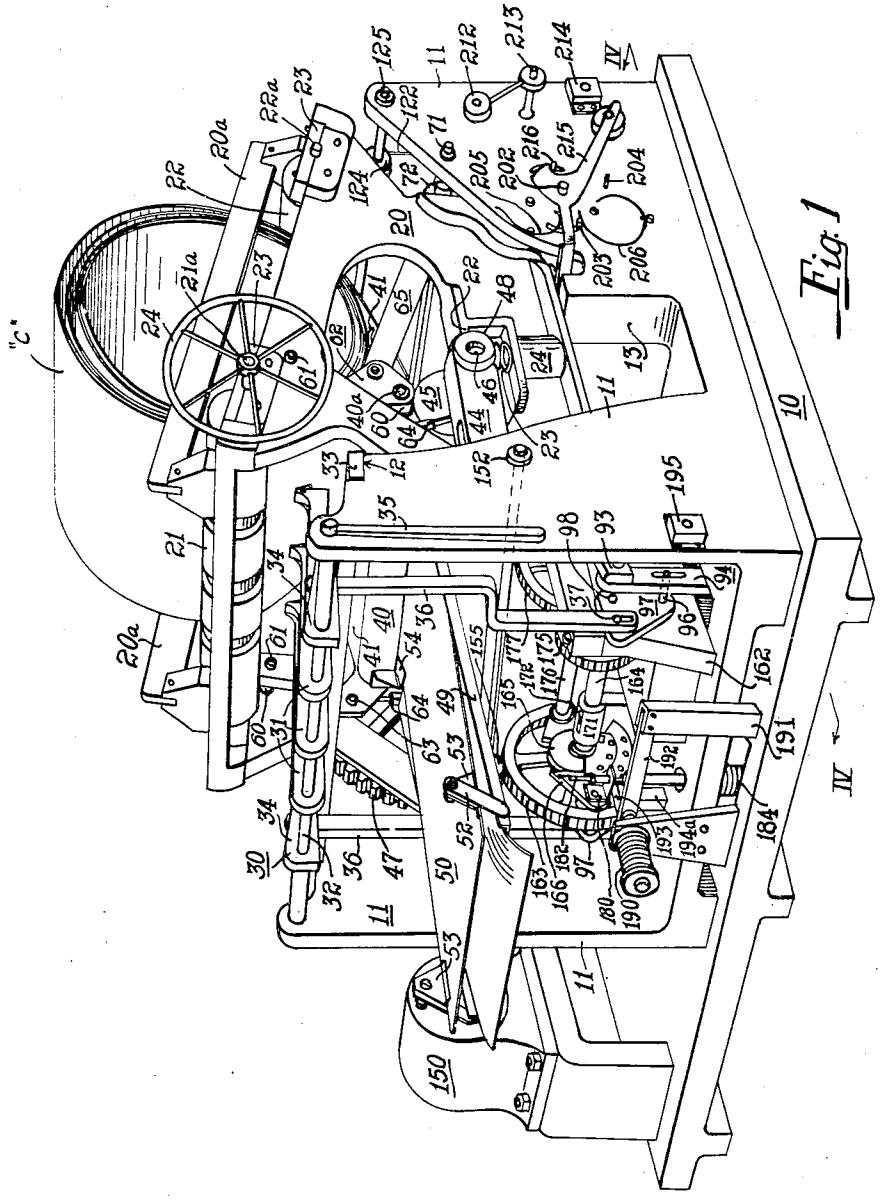


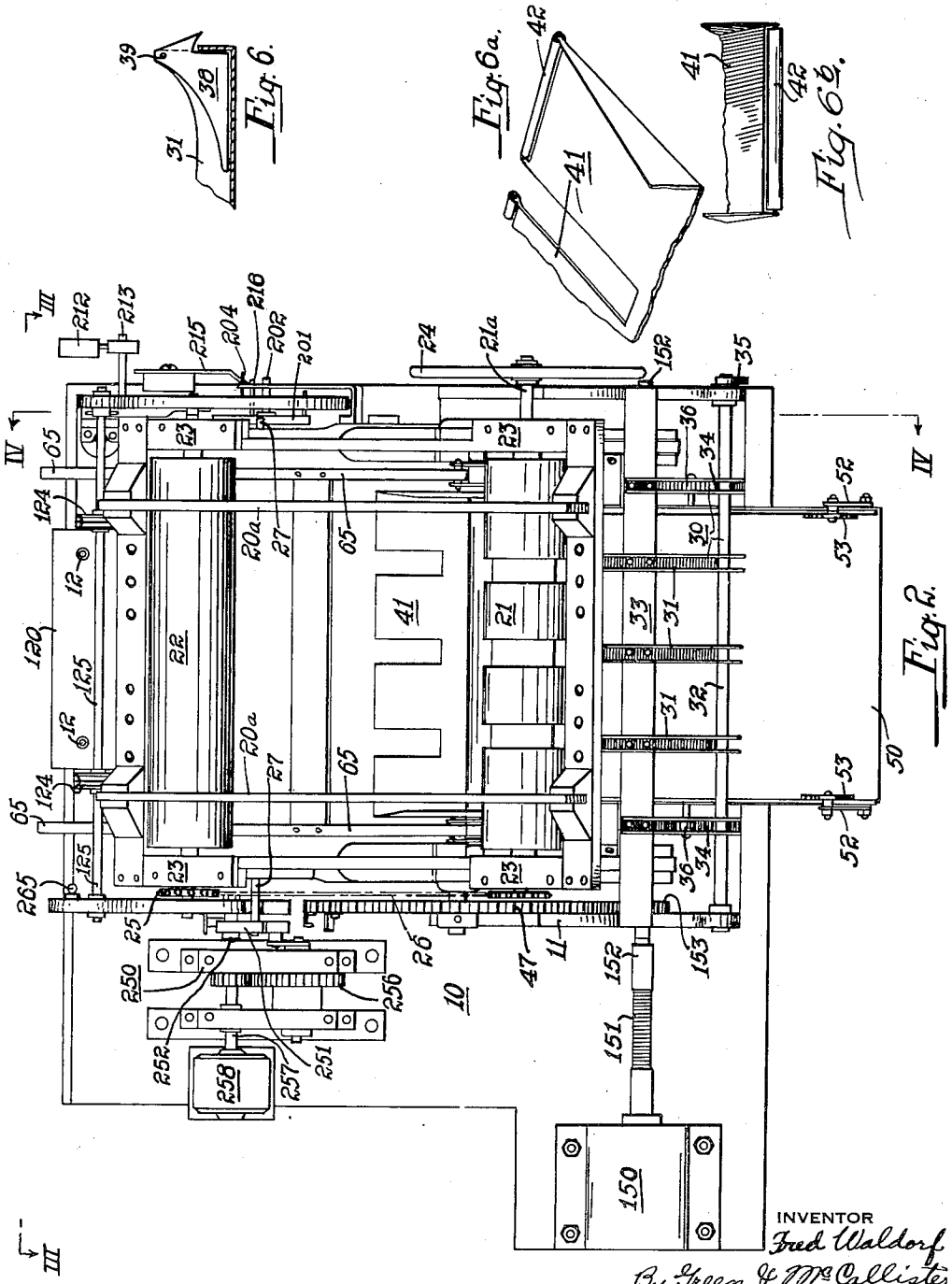
Fig. 1

INVENTOR
Fred Waldorf
By Green & McCallister
His Attorneys

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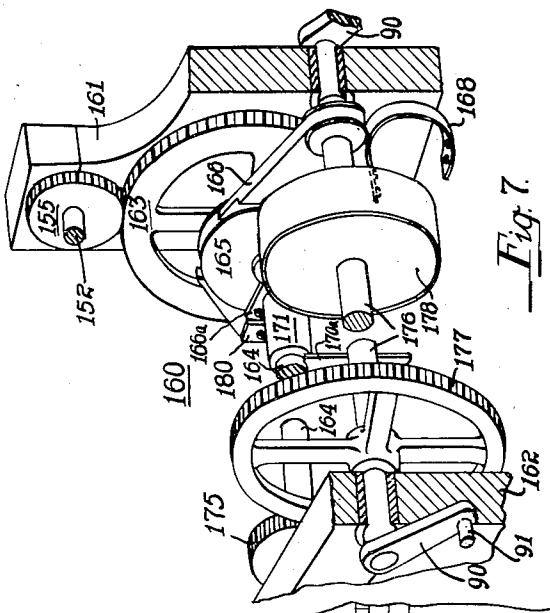


Fig. 7.

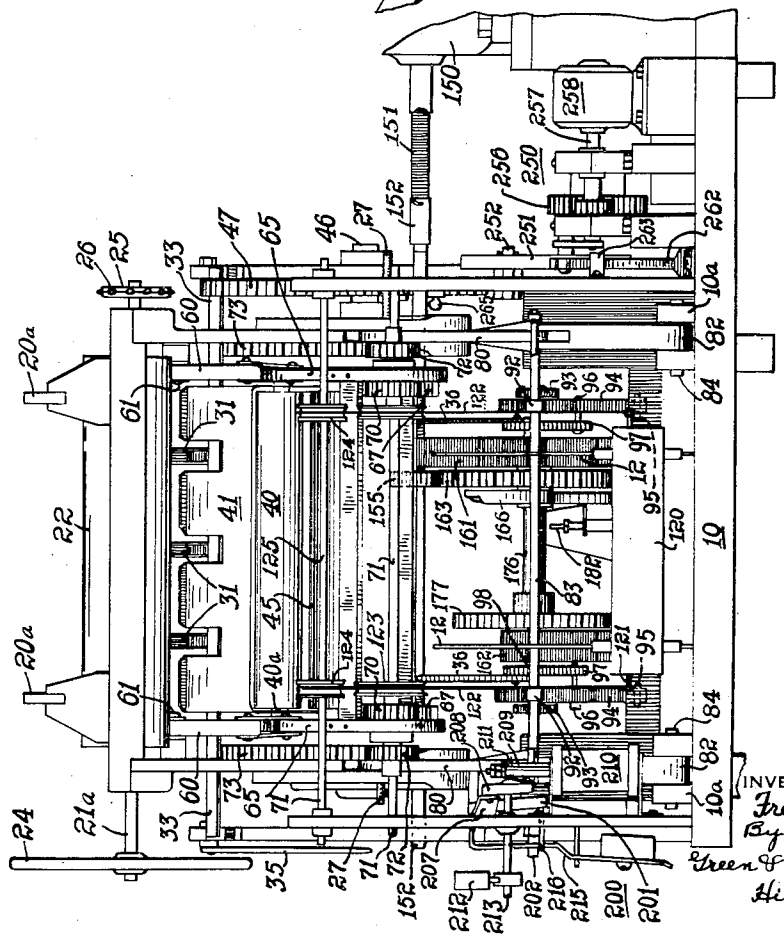


Fig. 3.

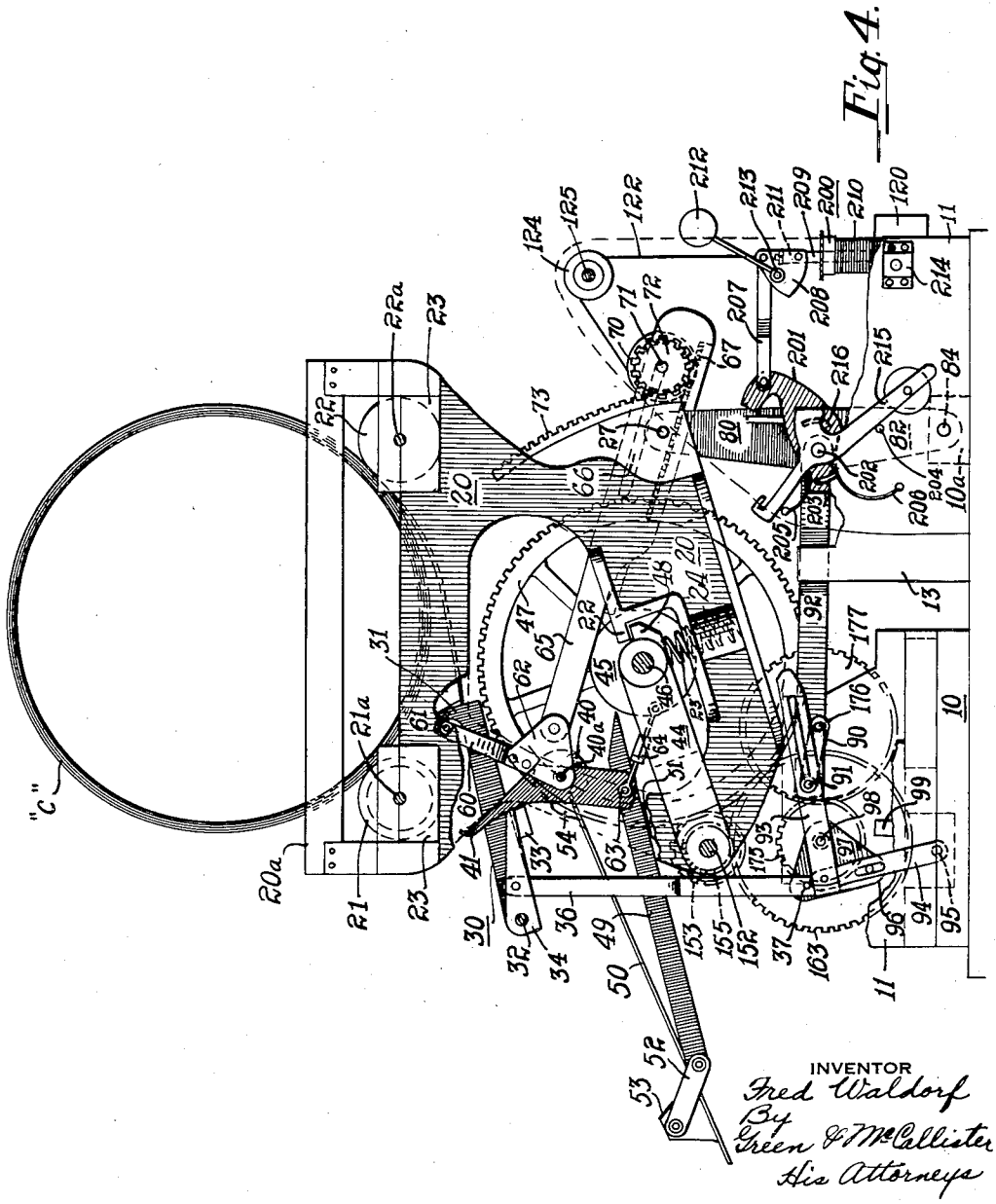
INVENTOR
Fred Waldorf
By
Green & McCallister
His Attorneys

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Fig. 4.



INVENTOR
Fred Waldorf
By
Green & McCallister
His Attorneys

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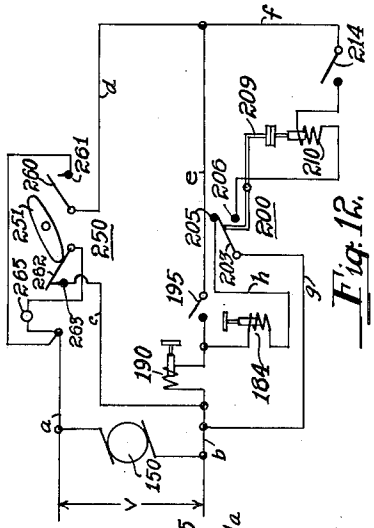


Fig. 12.

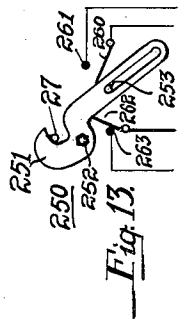


Fig. 13.

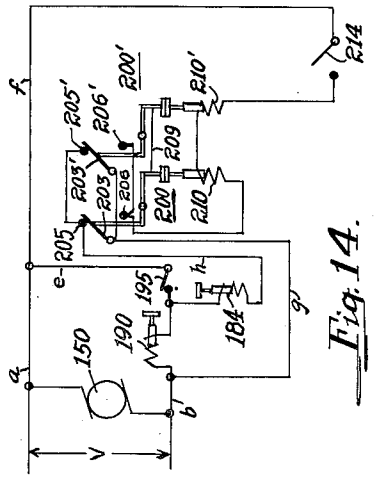


Fig. 14.

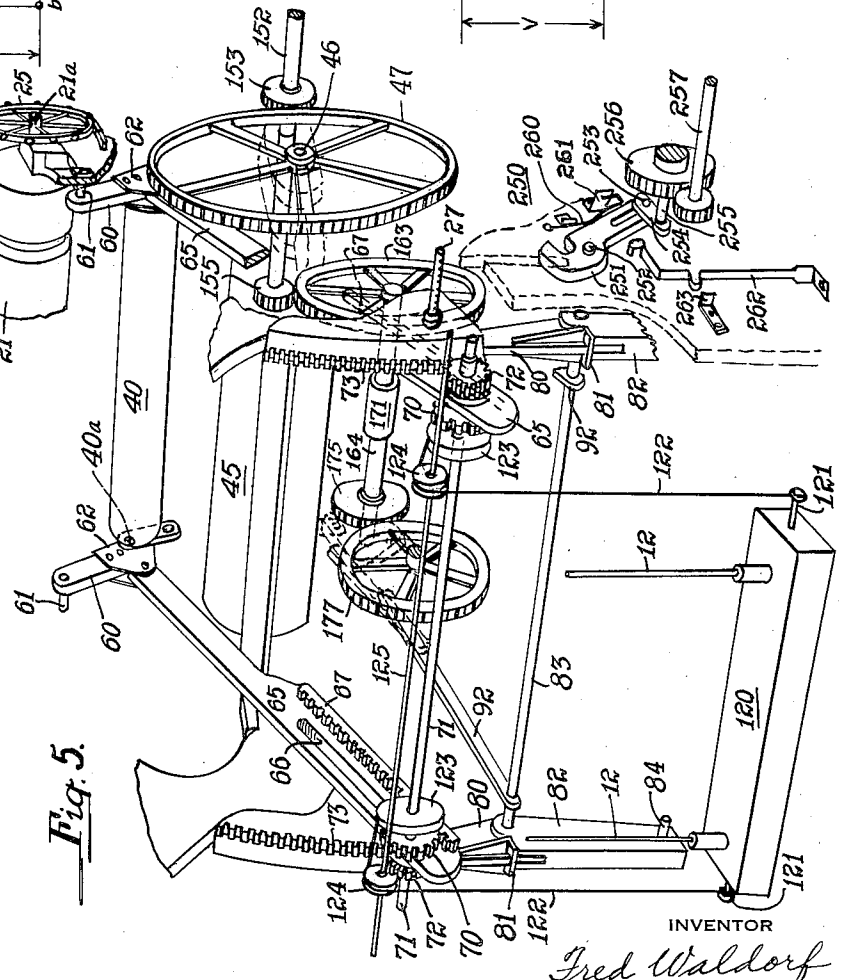


Fig. 5.

INVENTOR

Fred Waldorf

By Green & McCallister

His Attorneys

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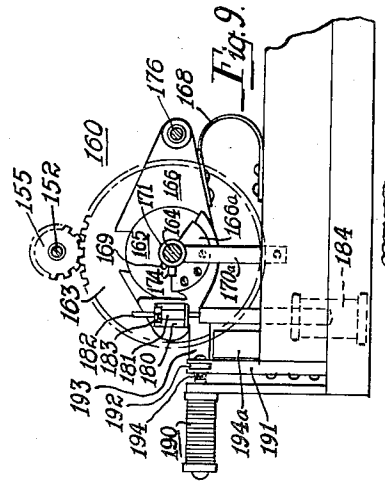


Fig. 9.

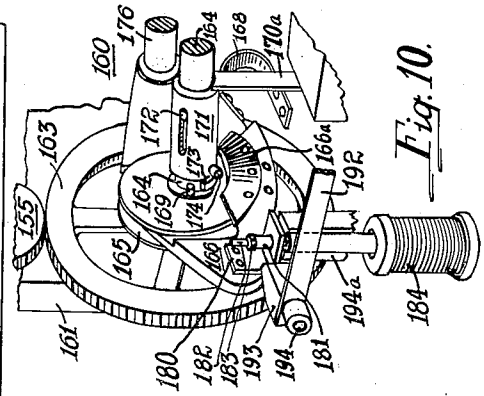


Fig. 10.

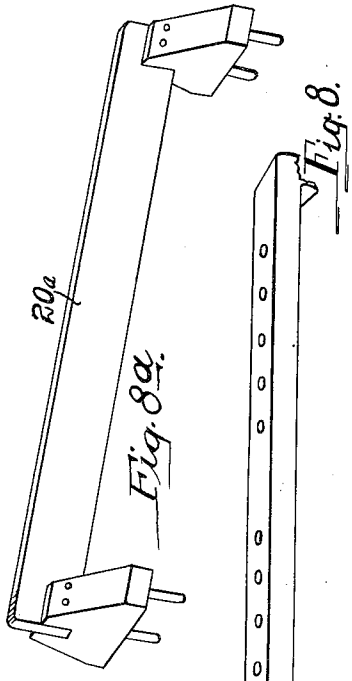


Fig. 8a.

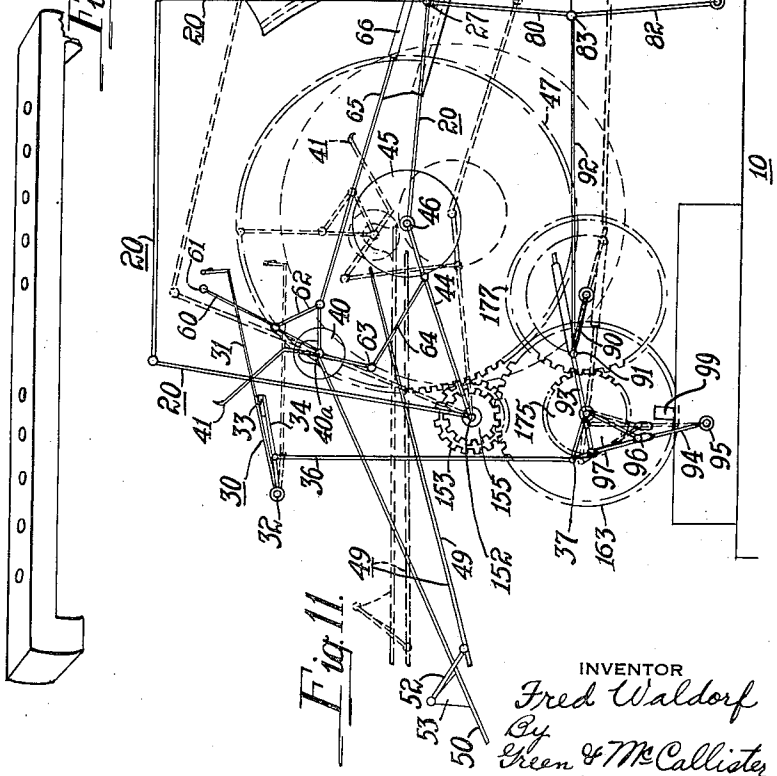


Fig. 8.

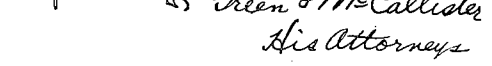


Fig. 11.

INVENTOR
Fred Waldorf
By
Green & McCallister
His Attorneys

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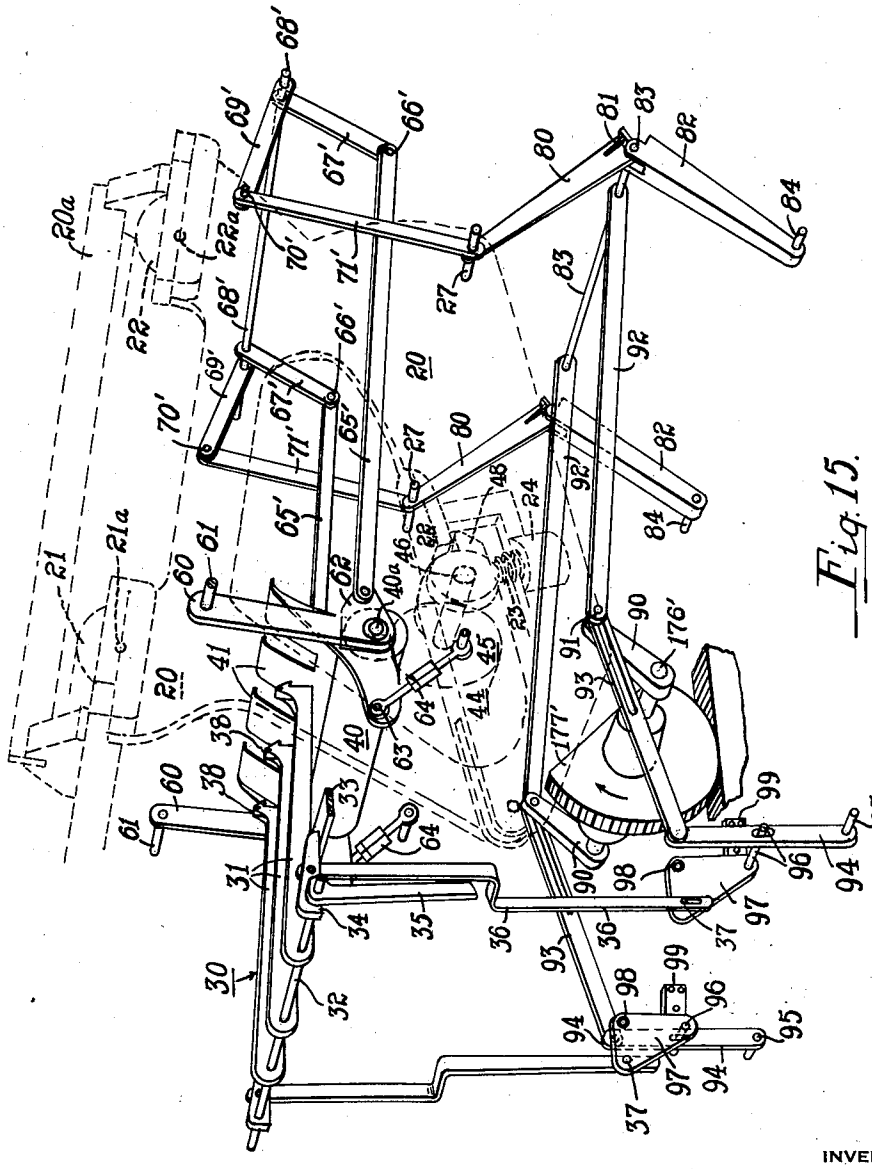


Fig. 15.

INVENTOR
Fred Waldorf
By Green & McCallister
His Attorneys

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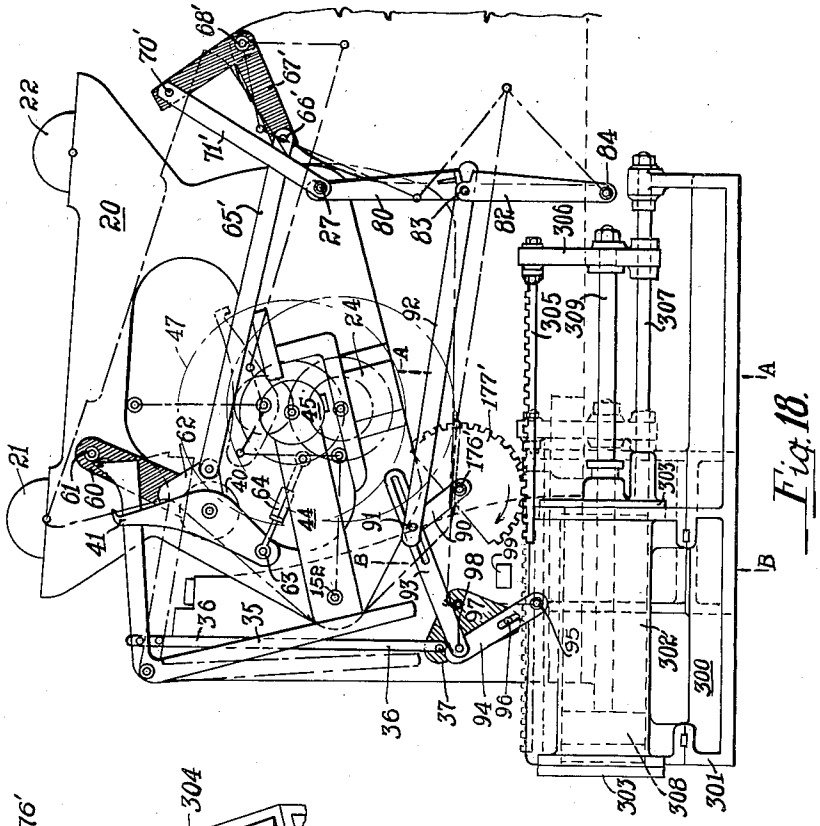


Fig. 18.

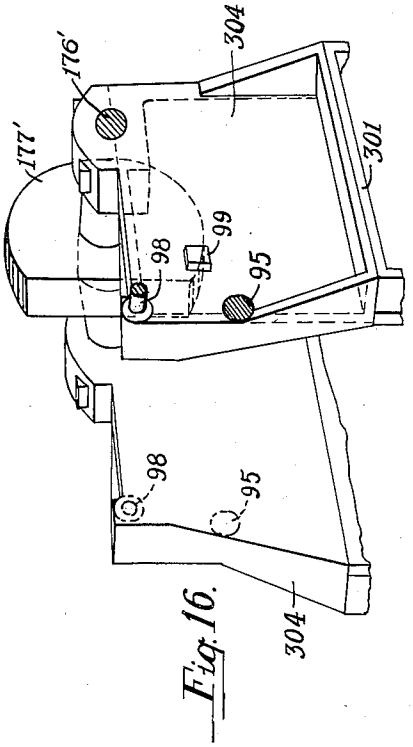


Fig. 16.

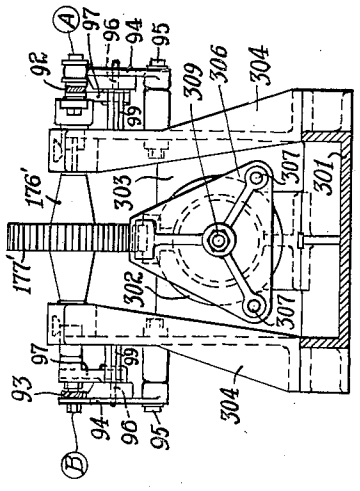


Fig. 17.

INVENTOR
Fred Waldorf
By Green & McCallister
His Attorneys

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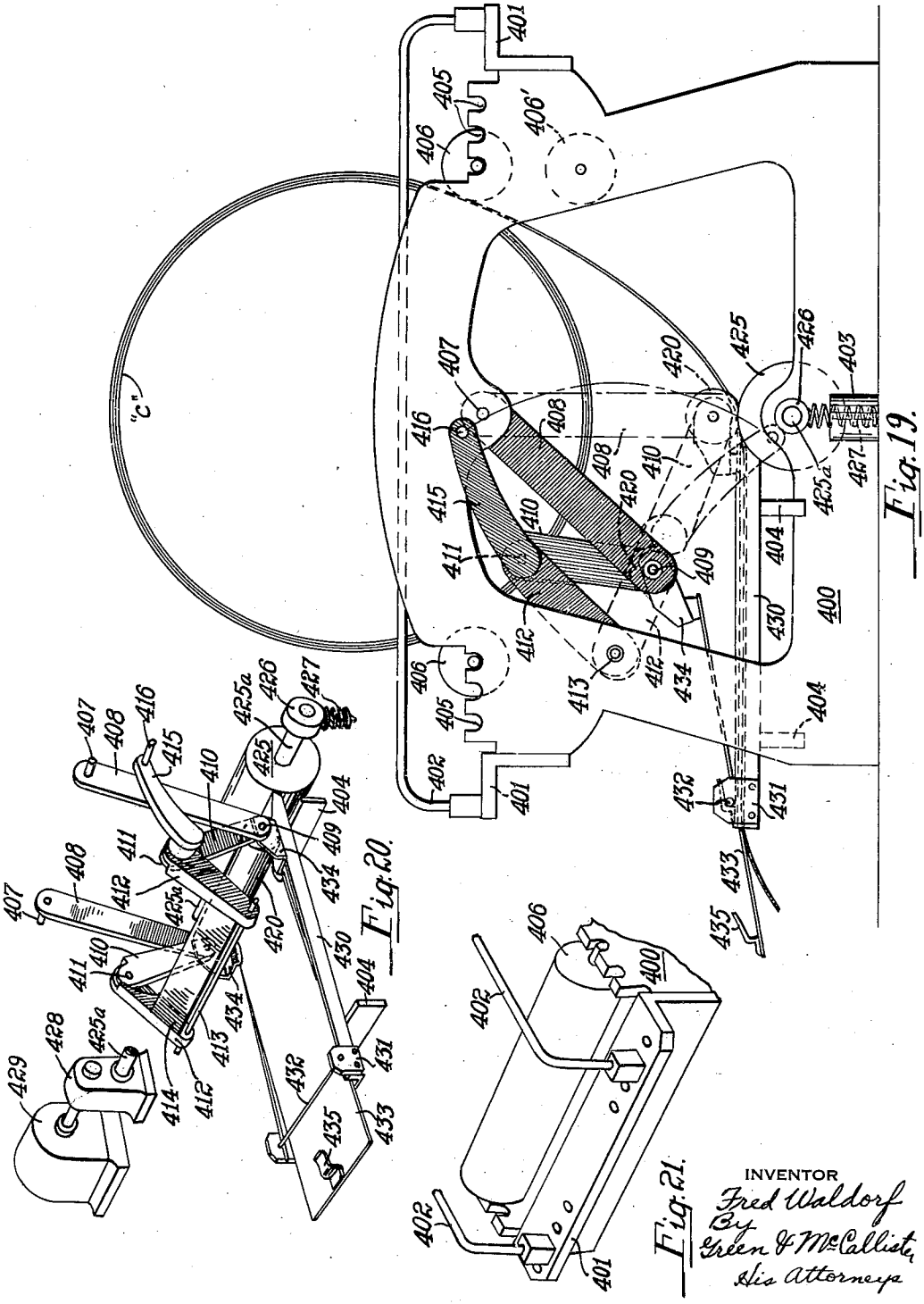


Fig. 19.

Fig. 20.

Fig. 21.

INVENTOR
Fred Waldorf
By
Green & McCallister
His Attorneys

Patented Sept. 15, 1936 2,054,347

UNITED STATES PATENT OFFICE

2,054,347

METHOD AND MECHANISM FOR UNCOILING

Fred Waldorf, Pittsburgh, Pa.

Application February 2, 1933, Serial No. 654,877

35 Claims. (Cl. 242—78)

This invention pertains to uncoiling procedure and to apparatus for uncoiling or unwinding such materials as hot and cold metal coils. In one phase, my invention pertains to mechanism for actuating the active part (or parts) of any apparatus wherein the active part is moved about a pivot point (or points).

Since metal manufacturers find it to be convenient and advantageous to wind or coil strip, sheet, and wire materials into more compact forms, such as reels, rolls, or convolutions, chiefly, in order to aid in storing, and to make further handling of the metal easier, it follows that some suitable form of apparatus must be employed for reversing the operation, or for uncoiling and/or straightening the metal when it is to be further treated, such as pickled or cold rolled, or when the ultimate form is to be noncircular.

And, it has been an object of my invention to produce an improved mechanism in which movement of active parts may be consecutively controlled.

Another object has been the production of a new procedure in connection with the positioning and/or control of an active part (or parts) of such machines as wire and sheet uncoilers and/or mills.

A further or more specific object has been to provide an improved metal uncoiler that eliminates objectionable features inherent in such apparatus as now in use and known to me.

In connection with an uncoiler, a feature of the invention is the provision of a timed operating mechanism whereby a systematic and positive operation is attained.

Another feature of the invention is the production of an uncoiler in which relative movement between the parts thereof is successively made available to strip an end of a coil, to incline the coil, and to feed the stripped end to and through a pinch roll pass.

In the compact embodied forms of my invention here illustrated, I bring out a simplified uncoiling procedure, by which I have been able to diminish the manual labor required, particularly, for the stripping operation, and to bring about a continuous operative procedure from the stripping to the pinching steps.

While I have illustrated my invention in connection with an uncoiler, it will be understood that the principle thereof may be embodied in any mechanism in which relative movement between two or more elements is employed, particularly, where space displacing parts are controlled in a timed relation.

Figure 1 is a front perspective view in elevation of an illustrated embodiment of my invention in a lowered position.

Fig. 2 is a top plan view of the embodiment and its position shown in Figure 1.

Fig. 3 is a rear view in elevation taken along line III—III of Fig. 2; it also shows the embodiment in a raised position.

Fig. 4 is a side elevational taken along line IV—IV of Figs. 1 and 2, but illustrates the embodiment in a raised position; in this view the wall of a housing frame or stand has been partially broken away to better show operating members.

Fig. 5 is a fragmental rear perspective of the embodiment of Fig. 1 in a raised position and shows certain details.

Fig. 6 is a detail of a stripper finger.

Figs. 6*a* and 6*b* are detail illustrations which show a modified form of apron finger.

Fig. 7 is a perspective rear elevation of an operating mechanism which embodies a slight modification of detail.

Figs. 8 and 8*a* are enlarged perspective views in elevation of parts of a guide rail assembly.

Fig. 9 is a side view and Fig. 10 is a perspective view of details of a clutch mechanism.

Fig. 11 is a schematic operating diagram of the embodiment of Fig. 1, wherein the full lines show a raised position, and the dotted lines show a lowered position of the apparatus; the connections represented by a single circle show movable pivot points, and those represented by a double circle show fulcrum or fixed pivot points.

Fig. 12 is a circuit diagram that may be employed for operating the embodiment of Fig. 1.

Fig. 13 is a somewhat diagrammatic detail.

Fig. 14 is a modified circuit diagram.

Fig. 15 is a front perspective view illustrating a modified lever system.

Fig. 16 is a fragmental front perspective in elevation of a modified form of a raising and lowering or motivating mechanism.

Fig. 17 is an end view in elevation, partially in section, and taken along lines A—A and B—B of Fig. 18.

Fig. 18 is a side view in elevation of an apparatus employing the lever system of Fig. 15, the frame and carriage of the embodiment of Fig. 1, and the motivating mechanism of Figs. 16 and 17; dot and dash lines are employed to show a lowered position of the apparatus; for better illustration of operating parts, the support or bear-

ing stand walls for a driving gear (see Figs. 16 and 17) have been omitted.

Fig. 19 is a side elevational view of another illustrated embodiment of my invention; the dot and dash lines show a lowered position, and the full lines show a raised position of the apparatus.

Fig. 20 is a front perspective showing certain details of the embodiment of Fig. 19; and

Fig. 21 is a perspective showing of further details.

Taken generally, the apparatus set forth in the illustrated embodiments of my invention includes a frame or housing, a carriage supported and carried in the frame, and rolls adapted to receive the end of a piece of coiled material.

In the embodiment of my invention shown in Fig. 1 and the related drawings, I have provided a housing frame **10**, a carriage **20** pivotally supported and received in the frame, means **30** for stripping an end of a coil of material, pinch roll means **40**, **45** for pushing out the material, apron means **41**, **49** for guiding the rolled material to and from the apparatus, and a motivating means **150**.

As seen from Fig. 1, the frame **10** is provided with oppositely positioned and spaced upwardly projecting walls **11** within which the carriage **20** is journaled by a transversely extending pivot shaft **152**.

In carrying out my invention, the coiled material "C" such as strip metal, is placed upon and between a pair of oppositely positioned carrying rollers **21** and **22** that are transversely journaled within suitable bearing boxes **23**. The boxes **23**, as seen, are mounted near the extreme ends of the upper portion of carriage **20**. If desirable for accommodating extremely different sizes of reels or coils, the rollers **21** and **22** may either be adjustably mounted in the boxes **23**, or the boxes may, themselves, be adjustably mounted on the carriage **20** (not shown).

As seen (see Figs. 1, 4, 8, and 8*a*), suitable adjustable side-rails **20***a* are removably mounted to extend transversely across and between rollers **21** and **22**, as well as across and between opposite top edges of the carriage **20**; these rails have a pair of plugs at each end thereof adapted to fit within a suitable pair of holes in the front and rear edges of the carriage that represent the width of a given coil "C".

An axle shaft **21***a* of the fore roller **21** at one end extends beyond a side of the carriage **20** and receives a handle wheel **24** thereon, in order that the roller, and thus, coil "C" may be turned and/or rotated about its support until the outside end of the material thereof is adjacent to the stripper means **30**. As shown, roller **21** is provided with a plurality of peripheral slots spaced along the length thereof, in order to permit sufficient clearance with the stripper means **30**.

Although a certain amount of squeeze between the coil positioning and supporting rollers **21** and **22** may be advantageous, yet, where lighter and more flexible coils are to be uncoiled, I prevent excessive squeeze by connecting or gearing one roller to the other for a substantially timed rotative movement. As seen from Figs. 2, 3, and 5, I may accomplish this purpose by a sprocket and chain arrangement **25**—**26**, that is mounted on extensions of the roller shafts **21***a* and **22***a*.

The stripper means **30** includes a plurality of longitudinally extending fingers **31** rigidly secured to and mounted at one end on a common operating shaft **32** that is turnably mounted or journaled within the opposite walls **11** of the housing frame. A transverse cross bar **33** extends from cut-out portions **12** in the opposite walls **11** of the frame **10** and abuts lower faces of the stripper fingers **31**, in order to limit their maximum lowered positioning. Support fingers **34** are secured between cross bar **33** and operating shaft **32** for holding the fingers in abutment with the bar.

The fingers **31** are raised and lowered by means of a vertical lifting frame **36**; the latter is at one end pivotally connected to the support fingers **34**, and at the other end, is slotted and pivotally connected at **37** to oppositely-spaced, triangular-shaped actuating cams **97** that are pivoted at fixed pivot points **98**. The control of the fingers **31** may be supplemented by a manual lever **35**, at one end secured to and downwardly depending from an extending end of operating shaft **32**; the longitudinal slot of the pivot connection **37** permits such to be accomplished.

As shown in the detail drawing of Fig. 6, the extending end of each stripper finger **31** is slotted or is open upwardly to receive a catch finger **38** that is mounted on a pivot **39** that extends between opposite sides of the stripper finger. And, after an end of the outer convolution of the coil "C" has been turned to a position adjacent the stripper means **30**, and, has been "backed off" slightly until this end is snapped into nebs of the catch fingers **38** (see Figs. 1 and 6), then, the stripper means **30** is actuated to strip or work this end downwardly loose from the coil, in order that it may be carried or fed to the pinch roll means **40**—**45**.

After the means **30** has stripped an adjacent end of the coil "C" by lowering the fingers **31** hooked upon this end, an apron means **41** pushes and guides the now loosened or stripped end of coil "C" downwardly and enters it between the pinch roll means **40**—**45**; the apron means may be termed a feed apron having fingers (see Figs. 1, 2, 3, and 4) whose spacing corresponds to the width of each stripper finger **31**. It should be noted that both the stripper means **30** and the apron means **41** move in a substantially arcuate path. And, since as seen from the drawings, both **30** and **41** are adapted to move on the forward slope of an arc, the holding pressure exerted by the fingers of means **30** will increase and depth of hold of the fingers of means **41** will increase, as the end of coil C is being fed to the pinch rolls. Thus, after the end of the coil has been stripped, the apron fingers **41** move from a position between the stripper fingers **31** (see Fig. 4) to contact and receive the stripped end of coil "C", to lower it upon the pinch roll **45**; and, leg **65** lowers pinch roll **40** upon this end to a cooperative and pass-forming relationship with respect to the roll **45** (see Figs. 1 and 2). In employing the term "pushing" I have particular reference to the apron means **41** which presses against what may be termed the inner side of the end of the coil C and moves it in a direction corresponding to the direction of the pressure force exerted by such means.

In the modification of Figs. 6*a* and 6*b* the ends of each finger of the feed apron **41** are provided with rolls **42** rotatably mounted thereon.

Depending upon where the apparatus is stopped after the carriage **20** has been raised, the stripper fingers may rise slightly before they begin to lower; this action may be advantageous where the nebs of catch fingers **38** have difficulty in catching the end of the coil, e. g., when the

coil "C" is very stiff; this action will be apparent from a study of the lever system which will hereafter be further studied.

As seen, apron finger member 41 is pivotally mounted at 40a within an operating and support-framework or lever system; since the portions of this framework on opposite sides of the housing 10 are bi-laterally symmetrical, I will only describe one side in detail. The framework operating system includes an upper leg member 60, at one end 61 pivotally mounted or fulcrumed on the wall of carriage 20, extending downwardly therefrom, and being rigidly secured between and re-enforced at its lower end by a set of oppositely positioned clamp plates 62. This clamp assembly 62 forms in the nature of a knee, in that at one corner it rotatably receives or journals shaft 40a which supports the upper pinch roll 40 and near its ends pivotally supports the apron fingers 41 (see Fig. 4); and, in that, at another corner it pivotally supports the upper end of a downwardly inclining lower leg member 65. This lower leg 65 (see Fig. 5) is raised and lowered along a longitudinal slot 66 therein, and along longitudinally extending rack teeth 67 that are spaced from the slot 66 and mounted on an inner side of the leg 65. These teeth 67 are adapted to mesh with and to be driven by a pinion 70 keyed or feathered to shaft 71 that is journaled between opposite walls of housing frame 10.

Since the side positioning portions of the apron finger member 41 are pivotally tied near their lower ends 63 by an adjustable tie rod 64 to a cradle 44, it therefore follows that this member 41 has two pivot points, a main fixed one 40a, and a secondary, movable one 63.

In order to raise and lower carriage 20 and to operate the framework mechanism above described, as before mentioned, I have mounted the carriage near a front lower end thereof on a pivot shaft 152 that is pivotally mounted or journaled within the opposite walls 11 of the housing frame 10. Cradle members 44 at one end journal axle shaft 46 of the lower pinch roll 45, and are bifurcated at the other end to straddle the walls of carriage 20 and also pivot on shaft 152.

As shown, the extending end of each cradle member 44 is provided with a bayonet flange or seat 48 adapted to abut against an extending bayonet flange 22 of the carriage and to limit the maximum upward travel of the main pinch roll 45.

In order to permit the pinch rolls 40 and 45 to automatically adjust themselves for wear, for irregularities in the material, and for various thicknesses thereof, the lower roll 45 is resiliently or yieldably pressed upwardly by suitable spiral springs 23 that are disposed to rest within casings 24 in the carriage 20 and to abut or seat upon the journalling portions of cradle members 44. It should be noted when the main or lower roll 45 is pressed downwardly against the resilience of springs 23 that the tie rod 64 will be pulled downwardly, thereby slightly raising apron member 41 about its fixed pivot point 40a.

Carriage 20 is raised and lowered about its pivot point 152 by means of a toggle lever system pivotally secured to opposite walls thereof near their lower rear ends by a transverse shaft 27. Each toggle includes an upper leg portion 80 connected by a toggle knee 81 to a lower leg portion 82 that is in turn pivotally connected at 84 to a pivot block 10a on the bedplate of the housing frame 10. The toggle knees 81 may include a common pivot shaft 83 (see Fig. 5) that has bi-laterally similar operating lever systems pivotally connected thereto adjacent the toggles.

When the carriage 20 is actuated by toggles 80—82, it pivots about point 152, moves through an arc at its rear end, and drives pinion shaft 71. As seen, in order to accomplish this result, the pinion shaft 71 has a pinion 72 splined or keyed thereon near each end thereof (adjacent to the sides of the lower leg members 65); pinions 72 are driven by arcuate-shaped racks 73 mounted to extend from the rear portion of each wall of the carriage 20. Thus, a raising and lowering of the carriage will move racks 73 over pinions 72, rotate shaft 71 and pinions 70, and cause racks 67 to slide lower leg member 65 up and down, and in turn, actuate the stripper and apron fingers and raise and lower the upper roll 40.

Each bi-laterally similar lever operating system includes a crank 90 (see Figs. 4 and 7) at one end secured to a clutch driven shaft 176 and at the other end having a crank pin 91 that pivotally connects driven lever 92 to the shaft 83 of the knee 81 of the toggle.

The operation of the toggle is timed with the operation of the stripper fingers 31 through a suitable lever system. This latter system includes a drive lever 93, at one end making a slide or slotted pivot connection with pin 91, and at the other end being pivoted to an upper end of a swing lever 94. The lower end of swing lever 94 is pivoted about point 95 within the floor or bedplate of housing frame 10. As seen, the swing lever has a centrally located slot for receiving a pivot pin 96 that is mounted in a lower corner of the stripper-finger-lift cam 97.

As seen in Fig. 5, a raising of the rear end of carriage 20 may be materially aided, and, a lowering of the carriage may be limited or better controlled, by utilizing a counterbalancing mechanism. This mechanism includes a weight 120 whose value will depend upon the average weight of the carriage and of the coils or reels to be placed thereon. The weight is slidably mounted for vertical movement on guide rails 12 that extend upwardly from the bedplate of the housing frame 10, and at either end, is supported on outwardly projecting end balances 121 by suitable cables or chains 122. Each cable is secured at its other end to a spindle wheel 123 having a peripheral guide groove and being keyed to pinion shaft 71 for rotation therewith. Each cable slides over a suitable suspension pulley 124 that is mounted for rotation on a horizontally and transversely extending support shaft 125, that is in turn, mounted between opposite walls 11 of the frame housing 10. The counterweight 120 thus serves to balance the carriage 20 at positions within the frame 10, and to prevent motor jerk by counteracting a tendency of the weight of the carriage to lag when it is being raised and to lead when it is being lowered.

As shown in Figs. 1, 2, and 4, the end and progressively adjacent portions of coil C, after being pinched between rolls 40 and 45, are fed outwardly between an apron tray 49 and a cover plate 50. The tray has been mounted adjacent to pinch rolls on a transverse support beam or member 51 (see Fig. 4) extending from and between the opposite cradle members 44, in order that the inner end of the tray will move simultaneously with the lower pinch roll 45 when the latter yields with a given thickness of strip passed thereover. The cover plate 50 of the

apron is pivotally levered at its outer or extending end by a lever arm 52; as seen, the cover has a pair of upwardly projecting pivot lugs 53 for receiving one end of the arm, and, the side walls of the tray pivotally receive the other end of the arm. In addition, the cover plate 50 is provided at its other or inner end with a pair of upwardly and inwardly projecting, offset, or substantially Z-shaped lugs 54 that are pivotally mounted on opposite ends of the axle shaft 40a of upper pinch roll 40. This pivot mounting between cover plate 50 and tray 49 permits the discharge apron to raise and lower with the carriage 20 and to move in timed relation to the other pivotally mounted mechanisms and members of the apparatus.

Suitable stops 99 are provided for positively limiting maximum travel of the finger-lift-cams 97 (see Figs. 15 and 18).

A common motivating mechanism has been provided for the illustrated embodiment of my invention shown in Fig. 1 and the related figures. This mechanism includes a driving motor 150 (see Fig. 2), a flexible coupling 151, and a drive shaft 152. In order to continuously rotate the lower, main, or driven pinch roll 45, its axle shaft 46 at one end extends beyond an adjacent wall of the frame of carriage 20 and has a large gear wheel 47 (see Fig. 5) keyed or splined thereto for meshing with a pinion 153 that is splined on the drive shaft 152.

As seen, drive shaft 152 is journaled or rotatably mounted within opposite walls of the frame housing and serves as the pivot support for carriage 20, and has been journaled near the motor side of the housing frame in a stand 161 mounted on the bedplate of the latter. A pinion 155 has been keyed or splined to shaft 152 adjacent the journal stand 161 for meshing with and driving a gear wheel 163 of the primary portion of a clutch mechanism 160 (see Figs. 1, 4, 7, 9, and 10).

The clutch mechanism 160 has been provided for controlling, and/or regulating the operation of crank arms 90. As seen, in Figures 1, 7, 9, and 10, the mechanism includes a primary or driving shaft 164, and a secondary, crank-driving shaft 176; the primary shaft 164 is journaled within the lower portion of stand 161 (see Figs. 1, 3, and 10), is driven by and rotatably receives the idle gear wheel 163 that carries a peripherally grooved wheel 165; the wheel 165 is adapted to receive the slotted-out portion of a clutch control cam 166 which is levered or pivoted at one end on the secondary shaft 176. As shown in Figures 7, 9, and 10, the lever cam 166 is resiliently held upwardly against the lower periphery of grooved wheel 165 by means of a leaf-like positioning spring 168 that is securely mounted between the bedplate of frame 10 and a bottom edge of the cam.

The engaging mechanism of the clutch 160 includes a sleeve member 171 slidably mounted on the central portion of primary shaft 164 by a lug and slot means 172, and has a projecting end tooth member 173 (see Figs. 9 and 10) adapted to cooperate with and engage a tooth member 169 that projects longitudinally from the grooved cam-receiving wheel 165, and, to thus, drive the primary shaft 164 through lug means 172.

For disconnecting the teeth of the clutch 160, the illustrated embodiment shows an auxiliary, somewhat arcuately-shaped cam segment 166a secured to the lower lateral face of lever cam 166 and extending upwardly therefrom to project over the lower lateral surface of cam-receiving wheel 165. The ends of the segment cam 166a slope or incline laterally from their ends and terminate in a central, transverse shoulder portion, in order that when the cam is raised to contact with sleeve 171, a roller uncoupling lug 174 (see Fig. 10) extending radially from the sleeve, will rotatably move upon the face of the cam during a rotation of the primary shaft 164, and will compress leaf spring 170a that resiliently and normally holds sleeve 171 in a coupled position. The compression of spring 170a and the resultant slide of the sleeve 171, will, of course, break the couple or connection between the clutch teeth and will allow the idle gear 163 and its wheel 165 to rotate without driving the primary shaft 164.

For raising lever cam 166 and its associated arcuate cam 166a, a right angle bracket 180 has been rigidly secured by one face to the extending end of the lever cam 166; its down face is provided with a positioning collar 181, adapted to slidably receive the extending end of an operating rod 182 of a magnetic clutch control 184, and to position the rod by abutting a set nut 183 threaded on the end thereof.

A magnetic safety 190 has been provided for holding lever cam 166 in an "up" position under certain conditions which will be hereinafter more fully explained. As seen from Figs. 1, 9, and 10, a mount post 191 extends upwardly from the base plate of frame 10, and, at its upper end is slotted to receive and secure an end of a resilient or spring-like safety arm 192. The other end of the safety arm, on one (inner) face, is provided with a projecting lock foot 193 which is adapted to slide beneath the lower face of right angle bracket 180 when it is in a raised position, in order to hold it in such a position even when the magnetic clutch control 184 is energized and subjects the operating rod 182 to a downward pull. In order to re-enforce the foot 193 against a downward pull, a slide support block 194a is mounted on a secondary or upper bedplate of the housing frame 10 and extends upwardly in such a manner that its upper face abuts the lower face of lock foot 193.

The other (outside) face of this end of the safety arm 192 is provided with a magnetically attracted lug 194, adapted to be pulled outwardly when the magnetic safety 190 is energized, and to thus, move the lock foot 193 out from beneath the bracket 180, and, to permit a downward pull of the operating rod 182 of the magnetic clutch release coil 184. A single pole, single throw switch or push button 195 has been provided for operating the coils 184 and 190 in a manner that will be hereafter more fully described.

As seen from Figs. 1 and 7, the primary or driven shaft 164 is journaled at one end in a journal stand 162 (spaced from the opposite stand 161), and, has a pinion 175 meshing and driving a gear wheel 177 that is splined or keyed on the tertiary or the crank shaft 176. Crank shaft 176 is spaced from the primary shaft 164, and is also journaled within the same oppositely-positioned stands 161 and 162 as this latter shaft. If desired, an ordinary form of braking means having a suitable drum 178 may be mounted on the crank shaft 176 for spragging movement of the carriage; it may be controlled in the usual manner by a solenoid operated brake shoe (not shown).

Although in the embodiment of Figs. 1, 3, 4, and

5, I have shown a magnetic lock 200 on one side and a power lock 250 on the other side of the carriage 20, yet it will appear that only one lock may be employed, that a manual lock may be employed, and that a set of opposite-magnetic, or a set of opposite-manual, or a set of opposite-power locks may be employed. In a lowered position, the under edges of the opposite walls of the carriage 20 rest upon suitable positioning posts 13 (see Fig. 1) that extend upwardly or vertically from the bedplate of the housing 10.

The magnetic lock 200 is provided with a latch lever 201 (see Figs. 1, 2, 3, and 4) that is pivotally mounted or fulcrumed on a side wall of the housing frame 10 by a fulcrum shaft 202, and has a switch finger 203 at one end adapted to extend through a slot in the wall and contact with an upper resilient switch point 205 when the carriage 20 is unlocked, and to contact with a lower resilient switch point 206 when the carriage is locked. To lock the carriage, an upper end of the latch lever 201 hooks over a latch lug (that is shown as an extension of an adjacent upper toggle-support pivot 27) which projects outwardly from the side of the carriage 20.

As seen in Figure 4, the upper or hook end of latch lever 201 is pivotally connected by an offset lever arm 207 to a corner of a somewhat triangular-shaped operating and control cam 208. The cam 208 is connected at an opposite end to the plunger arm 209 of a magnetic release coil 210 by a short pivot link 211 (see Figs. 3 and 4); this cam is manually controlled by a counterweighted reset or latch set and throw lever 212 which is feathered or keyed to a common pivot or support shaft 213 that extends through and from both sides of a housing wall and is turnable therein. The magnetic coil 210 is actuated by a single pole, single throw switch or push button 214 in order to attract plunger 209, to throw lever 201, and to release carriage 20.

An off-balanced carriage-follow trigger 215 has been turnably or pivotally mounted on the fulcrum shaft 202 and is provided with a hooked shoulder portion somewhat centrally thereof on a weighted or off-balancing side of the fulcrum. A finger 216 extends outwardly from a lower corner of the latch lever 201 through a slot in the adjacent side wall of the housing frame 10, and cooperates with and is received by the hooked shoulder of trigger 215. Since the hooked side of the trigger 215 is provided with a greater weight than the other or carriage-follow side, if the carriage 20 is raised, the finger 216 will be pressed downwardly within its slot, and the latch lever 201 will be moved backwardly about its pivot 202; thus, the latch portion 27 of the carriage 20 will always clear the lever 201 when the carriage is being raised and will remain out of the way until the carriage is moved to a completely lowered position. At the lowered position, the carriage holds the follow-side of the trigger 215 downwardly, moves the weighted side or end upwardly, releases the finger 216, and permits the magnetic latch 200 to be locked by a throw of the reset lever 212 to the left (see the set position of Fig. 1 and the released position of Fig. 4).

As shown in Figs. 2, 3, 5, and 13, the power lock 250 is mounted on the opposite side of the housing frame 10 from the magnetic lock 200, and cooperates with an outward extension of an adjacent toggle-support pivot 27 for holding the carriage in a down or pinch-roll-operative position. The power lock includes a lock-lever 251, at one end having a hook-shape to engage and disengage carriage extension 27, and is pivoted at a fulcrum or support point 252; this lever is operated by a suitable motor 258 through a drive shaft 257, a speed reduction gearing 256, a stud shaft 255, and a crank lever 254 whose extending pivot 253 operates within a lower slotted extension of the lock-lever 251. When the lock is in an unlatched position (see Fig. 5), its front edge presses a spring-like switch lever 260 into contact with a switch point 261; and, when the lock is in a latched position (see Figs. 3 and 13), its rear edge presses a spring-like switch lever 262 into contact with the switch point 263. This lock may be manually operated by substituting a hand crank for the motor 258.

The light means 265 (see Figs. 3 and 12) shown mounted on the rear end of the wall of the housing frame 10 adjacent the power lock is employed as a warning signal and is lighted when the power lock is in a latching position; it warns the operator to not to attempt to raise the carriage 20 until the lock 250 has been unlatched.

Fig. 12 shows a circuit diagram suitable for the magnetic and power locks, as well as for the clutch mechanism of the illustrative embodiment of my invention shown in Figure 1 and the related drawings. In Fig. 14 I have shown a circuit diagram suitable for use with a set of magnetic locks; this diagram is similar to the diagram of Fig. 12, except the power lock 250 is omitted, and a magnetic lock 200′ is employed instead of the latter; this lock 200′ is connected in parallel with the magnetic lock 200.

When the switch levers 262, 260, and 203 are in the positions of Fig. 12, the power lock 250 is latched, the light 265 is burning, the magnetic lock 200 is released, and the carriage 20 is down and is not free to be raised or lowered. Thus, the light 265 gives the operator warning not to close the carriage raising and lowering switch 195; but, if it is closed no damage will be done in that no current can flow through line *"a–d–e"* to energize the safety release coil 190 and the clutch control coil 184.

When lever 251 is turned to the right in the diagram of Fig. 12, the carriage power lock 250 is released, switch 260 contacts with its point 261, causing a current flow from *"a"* to *"d"*, and from *"d"* to *"e"*; and, switch 262 is opened and the flow to lamp 265 from *"a"* to *"c"* to *"b"* is cut off. As a result, if switch 195 is closed, current flows from *"a"* to *"d"* to *"e"* to *"b"* and from *"e"* to *"h"* to *"g"* to *"b"*, energizing the parallel coils 190 and 184; this causes the safety coil 190 to pull the lock foot 193 out from beneath the lower face of the angle bracket 180 of the clutch mechanism 160, and to allow the magnetic coil 184 to pull the clutch operating rod 182 downward, carrying with it bracket 180, and thus, the end of the lever cam 166. As a result, the tooth 174 is released from abutment with the shoulder of the segment cam face 166*a*, permitting leaf spring 170*a* to slide clutch sleeve 171 endwise against the face of cam wheel 165; thus, the tooth 169 and the lug 173 mesh to couple idle gear 163 to primary shaft 164. Now, the carriage crank driving shaft 176 will be rotated by shaft 164 to raise the carriage 20; the shaft 176 of course causes the carriage to lower if it is in a raised position at the time of actuation. Switch button 195 need only be pressed momentarily until lug 169 and tooth 173 take hold, since a complete revolution of primary shaft 164 is sufficient to raise or lower the carriage from one position to the other, and since the throw or uncoupling tooth 174 is adapted to operate only

on the high central shoulder of the segment cam 166a.

Next, suppose the power lock 250 is in the unlatched position above and that the carriage 20 is down, and, is locked by throwing reset lever 212 of the latch 201 to the left. Then, switch 260 contacts point 261 and switch 203 contacts its lower point 206. As a result, current flows from line "a" to line "d" to the branch lines "e" and "f". If the magnetic-throw, latch-release switch button 214 is momentarily pressed, the coil 210 is energized by current from line "f" to "g" to "b", and the plunger 209 is pulled downwardly, throwing reset lever 212 to the right and unlocking the carriage; switch 203 then contacts point 205. It will appear that the safety coil 190 as well as the clutch coil 184 may then be energized if switch 195 is closed, for current flows from line "a" to "d" to "e" to "b" through the parallel circuits "e–b" and "e–h–g–b".

Suppose the operator wishes to raise the carriage 20, but, forgets to close switch 214 and to unlock the carriage first; there will be no jamming of the mechanism if switch 195 is now closed since only the safety coil 190 will be energized; clutch coil 184 cannot be energized since the switch 214 and the line "h–g" are open, and the switch points 203 and 206 are contacting. From a study of the circuit, such holds true regardless of whether or not the power latch 250 is unlocked; it also appears that the magnetic lock throw switch 214 cannot be energized through lines "d–f–b" until the power lock 250 is released.

Thus, the system is fool-proof from any standpoint and there is little or no danger of jams; but, as a further safeguard, as explained before, the driving motor 150 is coupled to the drive shaft 152 of the apparatus through a flexible coupling 151 that will take care of any misalignment of the mechanism.

In the layout of Fig. 14, employing another magnetically controlled lock 200' instead of the power lock 250, I show substantially the same circuit diagram as would be employed in Fig. 12 if power lock 250 were omitted. Since I connect the lock release coils 210 and 210' in series and their respective carriage switches 200 and 200' in parallel, it follows that closing release switch 214 will energize both coils and will simultaneously release both locks, and even if one is already released, the other will be released. The same features of safety explained in Fig. 12 as applicable to the coil 200, apply to both the coils 200 and 200' of Fig. 14.

In Fig. 15, I have shown a modified illustrative embodiment of my invention; one side of the carriage 20 has been shown in dotted lines to bring out the points of connection to the lever system. Since many of the parts of this embodiment have the same function, form, and mounting as in the embodiment of Fig. 1, I will designate similar parts of the present embodiment by their former numerals, and will employ numerals with prime suffixes for designating parts or construction details differing from the previously explained embodiment.

Both of the illustrative embodiments of Figs. 1 and 15 accomplish a raising of the carriage when the crank arms 90 move through 180° from one horizontal to an opposite horizontal position and accomplish a lowering of the carriage when the crank arms move through 180° more, to complete 360° of movement, and thus, to return to the original horizontal position.

While in the embodiment of Fig. 1 and related figures, the motor 150 is employed to continuously drive the pinch roll 45 and to raise and lower the carriage 20 by operating a lever system through the clutch mechanism 160, in the embodiment of Figs. 15 to 18, I employ the motor 150 to drive pinch roll 45 and I employ a pneumatic means to raise and lower the carriage and to operate the stripper and feed mechanisms.

It will be apparent, although I have shown a modified type of lever system in connection with the "pneumatic-raise" means, that the lever system of the "motor raise" means may be employed in place of the lever system shown in connection with the "pneumatic-raise" means, and vice versa, and that the present connection of showings is for the purpose of simplification of illustration. As seen, the lever system of Fig. 15 may be adapted to the drive and control mechanism of Fig. 1 by merely substituting shaft 176 and its gear 177 for the shaft 176' and its segment gear 177'; the same applies in the reverse manner for the adaptation of the lever system of Fig. 1 to the "pneumatic system" of Figs. 16 to 18.

Since, as explained before, the lever system of Fig. 15 is in many respects similar to that of Fig. 1 and the related figures, and the carriage, the stripper and apron are the same, I will endeavor to simplify the description as much as possible.

As seen in Fig. 15, points 95 and 84 are fixed pivots or fulcrum points in or on the housing frame 10, points 27 and 61 are fulcrums on the carriage 20, and 68' is a fulcrum shaft extending through the rear portion of opposite side walls of the housing frame 10; points 66', 83, and 70' are moving pivots or joints. In Fig. 18 the full lines represent the carriage and its lever and driven systems in an almost completely raised position, and, dot-dash lines represent them in a lowered position. In Fig. 18, I have broken away the mounting standard of gear 177', and have moved the pneumatic means slightly inward, in order to more clearly distinguish the levers adjacent such gear; of course, in the embodiment shown, the crank 90 turns through substantially 180° from one horizontal position to another when the carriage is moved from a raised to a lowered position, and vice versa.

The pneumatic means 300 includes a base plate 301 adapted to be mounted within the bedplate of the housing frame and to extend longitudinally therealong. A pressure cylinder housing 302 is mounted and keyed upon the baseplate 301, is substantially centered transversely thereof to extend longitudinally therealong, and is held in position between suitable end plates 303 and between side plates or standards 304.

As seen, the segment gear 177' is journalled within the standards 304, and cooperates and meshes with a driving rack member 305 that extends longitudinally and is mounted at one end to slide within a slotted top of the cylinder housing 302, and at the other end, to be secured within and be moved by a drive plate 306. The drive plate is, in turn, slidably positioned on a pair of spaced and longitudinally extending guide rods 307 that are mounted on upward projections of the baseplate 301. A piston 308 is provided with a rod 309 which is rigidly secured to the drive plate 306 substantially centrally thereof.

It will thus appear when the piston 308 is alternatively subjected to pressures entering at opposite ends of the cylinder housing 302 that the rack 305 will be reciprocated backward and forward and will, in turn, reciprocate segment

177' and raise and lower the carriage and its associated mechanism through the agency of the lever system.

In another illustrated embodiment of my invention (see Figs. 19 to 21), I have shown an uncoiler apparatus of simple form and operation that is particularly adapted for employment in connection with smaller size reels or coils; it and its procedure, like the previously expounded illustrative embodiments, are in no sense limited in application to materials of metallic form, but have utility as applied to many other materials, e. g., paper.

The coil of material "C" to be unrolled is placed between the opposite side walls of a housing stand 400 upon transversely mounted rollers 406. As seen, each roller is adjustably mounted within a series of slots in the upper edges of the housing walls, in order to take care of coils of various diameters; each slot may be somewhat hooked or inclined away from the coil "C" (not shown) to prevent any possibility of the axle shafts raising out during the uncoiling procedure, but ordinarily, the weight of the coil is sufficient. If the coil is very light and flexible and has a diameter that further weakens it, an additional roller 406' may be of advantage; if needed, one or more rollers may be so mounted in the carriage 20 of the previously illustrated embodiments.

Guide rails 402 are adjustably positioned on right-angle lips 401 that extend from each end of the housing 400, in order to limit excessive side movement of the leaves of coil "C" when such is undesirable; a plug and hole mounting is employed.

In Fig. 19 a hand or manually controlled and operated lever system has been shown in full line outline in its raised position and in dot and dash outline in its lowered position. This system is provided to feed an end of the coil "C" to a position between pinch rolls 420 and 425, ready for discharge; it includes a swing arm 408, fulcrumed at its upper end 407 to a bridge portion of the housing frame 400, and, at its lower end 409, it rotatably supports or journals an upper pinch roll 420 and pivotally supports an end of a lower toggle leg 410. A toggle arm 412 is pivotally connected by a knee 411 to the leg 410; a manual control lever system 415—416 is secured at one end to a knee portion of the toggle arm 412 for moving the knee 411 about a common fulcrum shaft 413 that is pivotally mounted between opposite sides of the housing frame. As seen, a re-enforcing transverse piece 414 may be secured between the opposite side walls of toggle arms 412.

As will be noted, the coil "C" is positioned above the lower pinch roll 425 in such a manner that if the coil is flexible or loose enough, its end will fall downwardly upon the face of the lower pinch roll 425. Thus, roll 425 has a positioning beneath the coil such that it is substantially in the normal path of the weight or gravity fall of a loose end of the coil. If the coil end is not, itself, flexible enough to permit fall upon the pinch roll 425, apparatus is employed which has been designed for aiding the movement of the coil end and which takes advantage of the gravity forces involved.

In the embodiments of my invention which employ a movable cradle or carriage, if the weight of the free end of the coil is not sufficient to cause it to fall upon the lower pinch roll, but the end is loose enough that a stripping operation is not required, the apron means will operate to push it the required additional distance to a position upon the lower roll. The operator can, at the proper time, rotate the support rollers 21 to back the coil "C" and further aid the pass-feeding operations previously enumerated. In the embodiment of my invention showing a fixed carriage the rolls 406 or the coil, itself, may be turned backwardly to aid in feeding the coil end to the roll pass.

When the knee 411 is moved from the bent position of the full line outline of Fig. 19 to the straight-line position of the dot and dash outline of the same figure, then the swing lever 408 moves to a vertical position, and the end of the coil "C" is clamped between the upper pinch roll 420 and the lower or driven pin roll 425. As seen, lower roll 425 is journaled within opposite housing walls, and its journal 426 is adapted to receive one end of a spiral spring 427 that is mounted to extend upwardly from its housing 403, in order to resiliently hold the roll in a pinching position.

At one end, roll 425 may be driven by a suitable motor 429 through a suitable gear reduction unit 428 and shaft 425a (see Fig. 20).

When the end of coil "C" is fed from pinch rolls 420, 425, it passes between an apron tray 430 and an apron cover 433. As seen, the apron tray 430 is securely mounted on the housing frame 400 by suitable cross beams 404. In order that the apron cover 433 will raise to permit the end of coil "C" to be more readily received, it has been pivotally mounted at one end by substantially Z-shaped lugs 434 that are disposed to extend from the axle shaft 409 of the upper pinch roll 420; at its other end, the apron cover is held in a slidable position with respect to tray 430 by means of ears 431 extending upwardly from the tray and receiving a transverse limit rod 432 therein.

When the apparatus is discharging material, the lever system is locked in position by the toggles 412, 410 and the swing lever 408, and, cannot be unlocked by pressure between pinch rolls, but must be manually unlocked by "breaking" or moving the knee 411 of the toggle. In this position, the other end of the apron cover 433 is held down by a clamp lug 435 as it abuts the limit rod 432. Of course, arm 415 may be mechanically or pneumatically controlled if desired.

Since my disclosure has many aspects, I hereby reserve to myself, and, do hereby express my purpose to neither abandon nor forfeit, any right to prosecute claims in this or in divisional applications that may be drawn to matter disclosed but not claimed.

While I have illustrated a few embodiments of my invention it will be apparent that various changes, additions, and omissions and combinations thereof may be made in the apparatus illustrated and that the procedure for accomplishing the uncoiling may be varied without departing from the spirit and scope of my invention as defined by the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. The method of uncoiling a coil which includes turning the coil about its center until its end is nearly in position, slightly backing off the coil until the end is in position, and then, stripping said end at the last position.

2. The method of uncoiling a coil which includes turning the coil until an end is in a strip-

ping position, stripping said end, and simultaneously moving said end downwardly away from the coil, and moving the coil a lesser distance downwardly with respect to said end, and thence, pinching and feeding outwardly said end and progressive portions of the coil.

3. The method of uncoiling a coil which includes turning the coil in one direction about its center until its outer end is nearly in position, then, slightly backing off the coil until said end is in position, stripping said end at the last position, moving said end downwardly away from the coil to a feed position, and progressively feeding portions beginning with said end away from the coil when said end reaches said feed position.

4. In combination, means for supporting a coil, means for turning the coil on said supporting means, means for engaging an end of the coil while being turned by said last-mentioned means, said engaging means being mounted to push said end away from the coil for stripping said end, means for receiving said end from said engaging means, a roll pass, and means actuating said receiving means and moving it through an arcuate path for moving said end of the coil into said roll pass.

5. In an uncoiler for a coil, the combination of means for supporting the coil, pinch rolls, means for receiving an end of the coil, means for tilting the coil, means operating in a timed relationship with said tilting means for moving said receiving means towards said rolls, so that said end will be fed to said rolls.

6. In an uncoiler for a coil, the combination of means for supporting the coil, pinch rolls, means for stripping an end of the coil, means for receiving the stripped end of the coil, and means for simultaneously tilting the coil and for moving said receiving means towards said rolls, so that said end will be fed to said rolls.

7. An uncoiling apparatus having a suitable housing, the combination of a carriage pivotally mounted within said housing, said carriage being adapted to receive a coil, a pair of pinch rolls mounted on said carriage, at least one of said rolls being movable into and out of a pass-forming relationship with respect to the other, and means for raising and lowering said carriage and for moving said movable roll with respect to the other.

8. In an uncoiling apparatus having a suitable housing, the combination of a carriage pivotally mounted within said housing, said carriage being adapted to receive a coil in the top portion thereof, a pair of pinch rolls mounted in said carriage, at least one of said rolls being movably mounted with respect to the other, and means for raising and lowering said carriage and for simultaneously raising and lowering said movable pinch roll.

9. In an uncoiling apparatus having a suitable frame, the combination of a pinch roll journaled within said frame, another pinch roll pivotally fulcrumed to said frame, means for moving said last-mentioned roll into and out of a cooperative relationship with respect to said first-mentioned roll, and means associated with said pinch rolls for pushing an end of a coil therebetween.

10. In an uncoiling apparatus having a suitable housing, the combination of a carriage pivotally mounted within said housing, said carriage being adapted to receive a coil therein, rack and gear means for raising and lowering said carriage, and means for driving said rack and gear means.

11. In an uncoiling apparatus having a suitable housing and a carriage movably mounted therein, means for raising and lowering said carriage within the housing, means for driving said raising and lowering means, said raising and lowering means including a rack and gear mechanism, said driving means including a pneumatic mechanism.

12. In an uncoiling apparatus having a suitable housing, the combination of a carriage pivotally mounted within said housing, said carriage being adapted to receive a coil therein, means for raising and lowering said carriage and thus the coil received therein, means for locking said carriage when in a lowered position, and means for preventing an actuation of said raising and lowering means until said lock has been released.

13. In an uncoiling apparatus having a suitable housing and a carriage movably mounted therein, said carriage being adapted to support a coil, of means for raising and lowering said carriage within the housing, means for driving said raising and lowering means, a magnetic lock means for holding the carriage in a lowered position, said magnetic lock means and said raising and lowering means having a timed relationship with respect to each other.

14. In an uncoiling apparatus having a suitable housing and a carriage movably mounted therein, said carriage being adapted to support a coil, of means for raising and lowering said carriage within the housing, means for driving said raising and lowering means, a magnetic lock means for holding the carriage in a lowered position, said magnetic lock means and said raising and lowering means having a timed relationship with respect to each other, said lock means having means for disconnecting said driving means from said raising and lowering means when the carriage is locked in a lowered position.

15. In an uncoiler for a coil, the combination of a carriage for supporting the coil, and a pinch roll mounted in said carriage and being positioned substantially in the path of a normal gravity fall of an end of the coil supported in said carriage.

16. In an uncoiler for a coil, the combination of a carriage for supporting the coil, a pinch roll mounted in said carriage and being positioned substantially in the path of the normal gravity fall of an end of the coil supported in said carriage, a movable pinch roll for aiding a fall of the coil end and for forming a pass with said first-mentioned roll, so that the coil end may be positively entered between the pass.

17. In an uncoiling apparatus having a suitable frame, the combination of a pinch roll journaled within said frame, another pinch roll pivotally fulcrumed to said frame, and lever means for moving said last-mentioned roll into and out of a cooperative relationship with respect to said first-mentioned roll, and means associated with said last-mentioned roll for pushing an end of a coil between said rolls.

18. In an uncoiler for a coil, the combination of means for supporting the coil, a pair of pinch rolls, a toggle joint means for raising and lowering an upper pinch roll, said toggle joint means having means for pushing an end downwardly away from the coil and for entering said end between said pinch rolls.

19. In an uncoiler for a coil, the combination of a pivotally mounted stripper finger means for stripping an end of the coil and moving it away from the coil, a straightening means, a pivotally mounted apron finger means for receiving said end of the coil from said stripper means and for moving said end of the coil into position with respect to said straightening means.

20. In an uncoiler for a coil, the combination of means for supporting the coil, a pair of pinch rolls, means for pushing an end of the coil away from it to a position between said pair of pinch rolls, and means for simultaneously moving the coil to a position in substantial alignment with said pair of pinch rolls.

21. In an uncoiler apparatus for a coil, the combination of straightening rolls, stripper means for moving an end of the coil away from the coil, a pivotally mounted means for receiving said end of the coil from said stripper means, one of said rolls being operatively mounted with respect to said pivotally mounted means and movable therewith through an arcuate path for pushing the stripped end of said coil away from the coil and between a pass formed by said rolls.

22. In an uncoiling apparatus having a suitable housing, the combination of a carriage pivotally mounted within said housing, said carriage being adapted to receive a coil, a pair of pinch rolls mounted in said carriage, at least one of said rolls being movably mounted with respect to the other, a pivotally mounted means for moving an end of the coil between a pass formed by said pinch rolls, said movably mounted roll being operatively associated with said means, and means for raising and lowering said carriage and raising and lowering said movable pinch roll.

23. In combination, means for supporting a coil, a pair of rolls, means including one of said rolls for engaging an end of the coil, and means for moving said engaging means away from the coil to a position adjacent the other roll of said pair and between a pass formed by said pair of rolls.

24. In combination, means for holding a coil, a pinch roll rotatably mounted upon said holding means, means for engaging an end of the coil, a second pinch roll rotatably mounted upon said means, and means for moving said rolls into an engaging and pass-forming relationship with respect to each other, and for simultaneously moving said engaging means and the end of the coil carried thereby downwardly between the thus-formed roll pass.

25. In an uncoiler for a coil, the combination of means for holding the coil, a plurality of stripper fingers for stripping an end of the coil, apron means for taking a stripped end of the coil from said stripper fingers, said apron means being pivotally mounted for movement between and away from said stripper fingers to grasp said end of the coil and to move it away from the coil to a feed position.

26. In an uncoiler for a coil, the combination of means for holding the coil, a pair of pinch rolls, means which includes a plurality of fingers for stripping an end from the coil, a plurality of fingers movable through said stripper means for receiving the stripped end of the coil therefrom and for moving it between said pinch rolls.

27. In an uncoiling apparatus having a suitable housing, the combination of a carriage frame pivotally mounted at one end thereof upon said housing, means mounted upon said carriage frame for rotatably supporting a coil, a lower pinch roll pivotally and resiliently mounted within said carriage frame, finger means pivotally mounted with respect to said carriage frame, an upper pinch roll mounted upon said finger means, means for moving said finger means and said associated upper roll to a cooperating relationship with respect to said lower pinch roll and for simultaneously moving an end of the coil between said pinch rolls.

28. In an uncoiling apparatus having a suitable housing, the combination of a carriage fulcrumed at one end within the housing, a toggle fulcrumed between another end of said carriage and said housing, means mounted in said carriage for receiving a coil, additional means mounted in the carriage for straightening the coil, and still additional means mounted in the carriage for feeding an end of the coil to said straightening means, said toggle having a knee, and means for moving the knee of said toggle, and thus, for raising and lowering the carriage, and a lever system connected between said carriage and said feeding means for actuating said feeding means when said carriage is raised and lowered.

29. In an uncoiling apparatus having a suitable housing, the combination of a carriage pivotally mounted in said housing, a plurality of rollers mounted in the top of said carriage for supporting a coil, a plurality of stripper fingers pivotally mounted in said housing and extending inwardly therefrom, and a lever system for raising and lowering said stripper fingers, so that an end may be moved outwardly from the coil, and a plurality of apron fingers pivotally mounted in said carriage and adapted to receive the stripped end of the coil, and means for moving said apron fingers downwardly for feeding the stripped end of the coil.

30. In an uncoiling apparatus having a suitable housing and a carriage movably mounted in said housing, of means for raising and lowering the carriage within the housing, means for driving said raising and lowering means, means for locking the carriage in a lowered position within the housing, said locking means including means for automatically disconnecting said raising and lowering means from said driving means, and means for preventing a connection of said raising and lowering means to said driving means while the carriage is in a locked position.

31. In an uncoiling apparatus having a suitable housing and a carriage pivotally mounted in said housing, the combination of means for raising and lowering the carriage within the housing about the pivot, a pair of pinch rolls mounted within the carriage, a common driving means for continuously rotating at least one of said pinch rolls and for actuating said raising and lowering means, a clutch mechanism for connecting and disconnecting said raising and lowering means from said driving means, means for locking the carriage in a lowered position and for automatically operating said clutch means to release said raising and lowering means from said driving means.

32. In an uncoiling apparatus having a suitable housing, the combination of a carriage mounted in said housing, a plurality of rollers mounted in the upper portion of said carriage for receiving a coil, guide rails for limiting side movement of the coil on said rollers, a handwheel for turning said rollers, and thus, turning the coil, a plurality of stripper fingers pivotally mounted in said carriage, each stripper finger having a catch finger pivotally mounted in an extending end thereof for snubbing an outer end of the coil, a pinch roll resiliently mounted in said carriage, an apron tray mounted on said carriage and extending from a pass level of said roll outwardly from said carriage, a lever system, another pinch roll mounted in said lever system, a cover apron mounted on the shaft of said last-mentioned roll,

means for raising and lowering said carriage and simultaneously actuating said lever system for moving said last-mentioned roll to and from a cooperative relationship with respect to said first-mentioned roll, and means timed to said last-mentioned actuating means for initially operating said stripper fingers before said carriage is lowered, and counterweight means at one end secured to said carriage for balancing said carriage at positions within the housing.

33. The combination with a support for a coiled strip, of a stationary feed roller, a movable feed roller, means for engaging the outer free end of the coil, and mechanism for actuating the said means and movable feed roller to bring the outer end of the coil into proximity to the stationary feed roller and to cause the same to be gripped between the stationary and movable feed rollers.

34. The combination with a coil support, of a carrying member or head movable in a fixed path relative to the support, means carried by the head for engaging and deflecting the free outer end of a coil mounted on said support, and second means carried by said member for engaging the coil end after it has been deflected to a predetermined extent.

35. In an uncoiling machine, in combination, a coil support, a feed roller positioned adjacent the support, a second feed roller parallel to the first roller, said rollers being relatively bodily movable into or out of position to frictionally grip between them a metallic strip, means for moving said rollers toward each other and into strip gripping position and for separating the rollers to facilitate insertion of the end of a strip between them, and means for engaging the outer free end of a coil mounted upon said support, and deflecting the same into position between said rollers while the rollers are separated, said last mentioned means disengaging the strip after the rollers have been moved into strip gripping position.

FRED WALDORF.