June 20, 1944. E. W. ALLARDT 2,351,894

MECHANISM FOR COILING SHEET MATERIAL

Filed Feb. 14, 1941 4 Sheets-Sheet 1

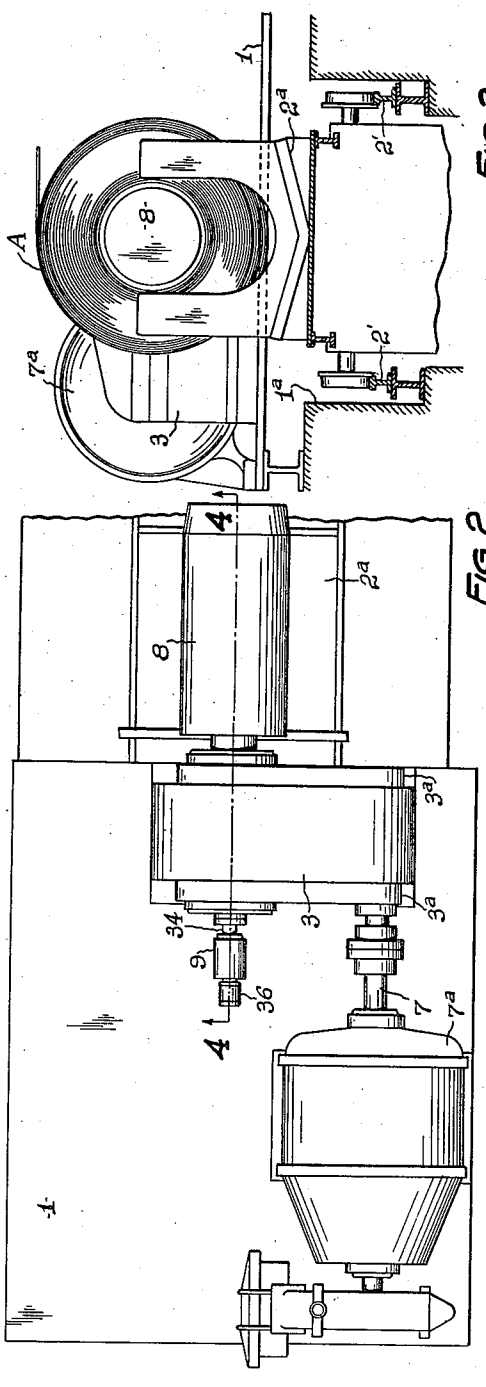


FIG. 3



FIG. 2

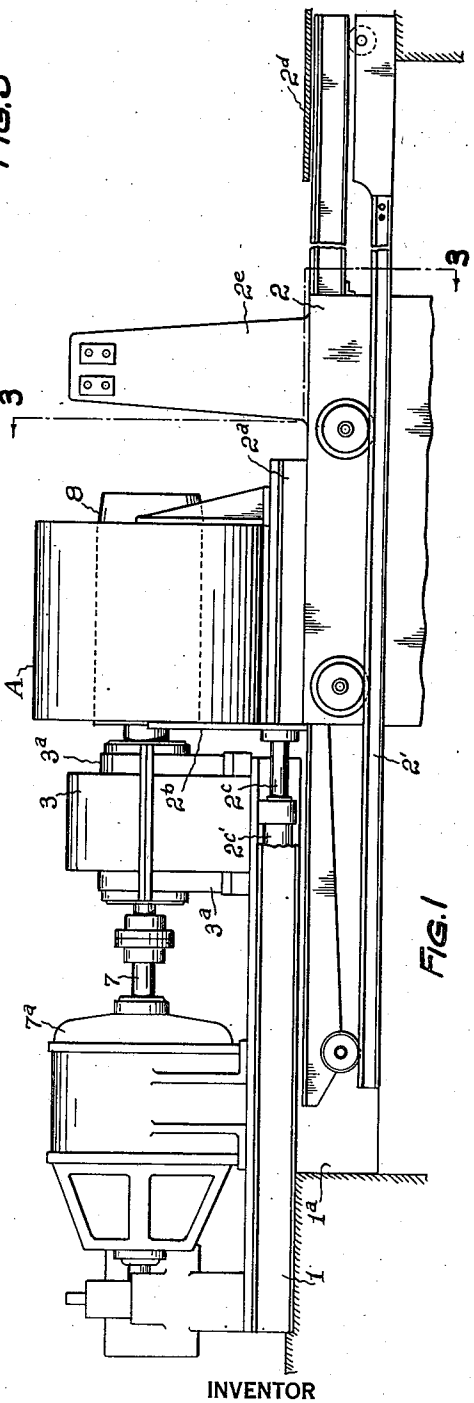


FIG. 1

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MECHANISM FOR COILING SHEET MATERIAL

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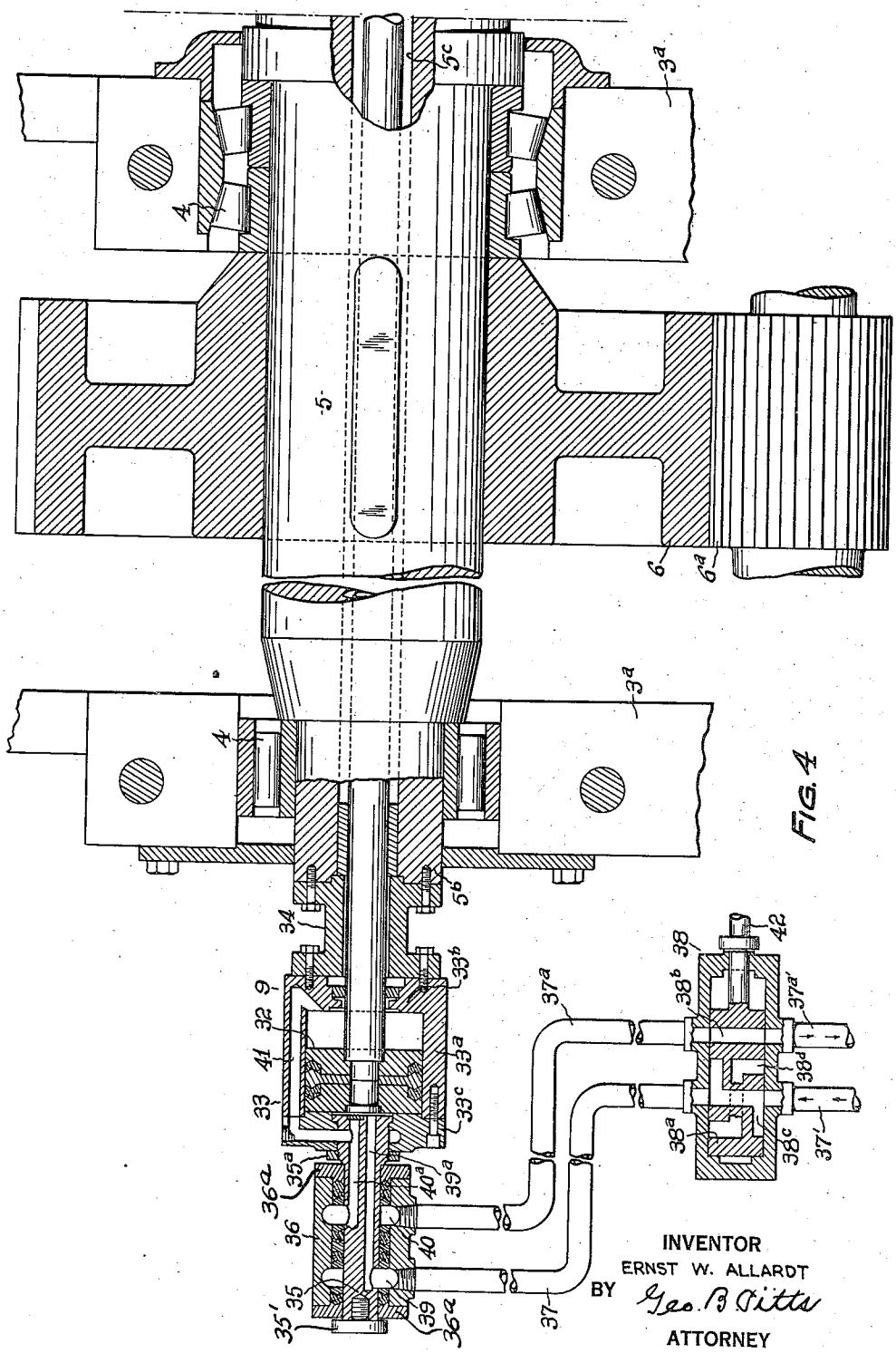



FIG. 4

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MECHANISM FOR COILING SHEET MATERIAL

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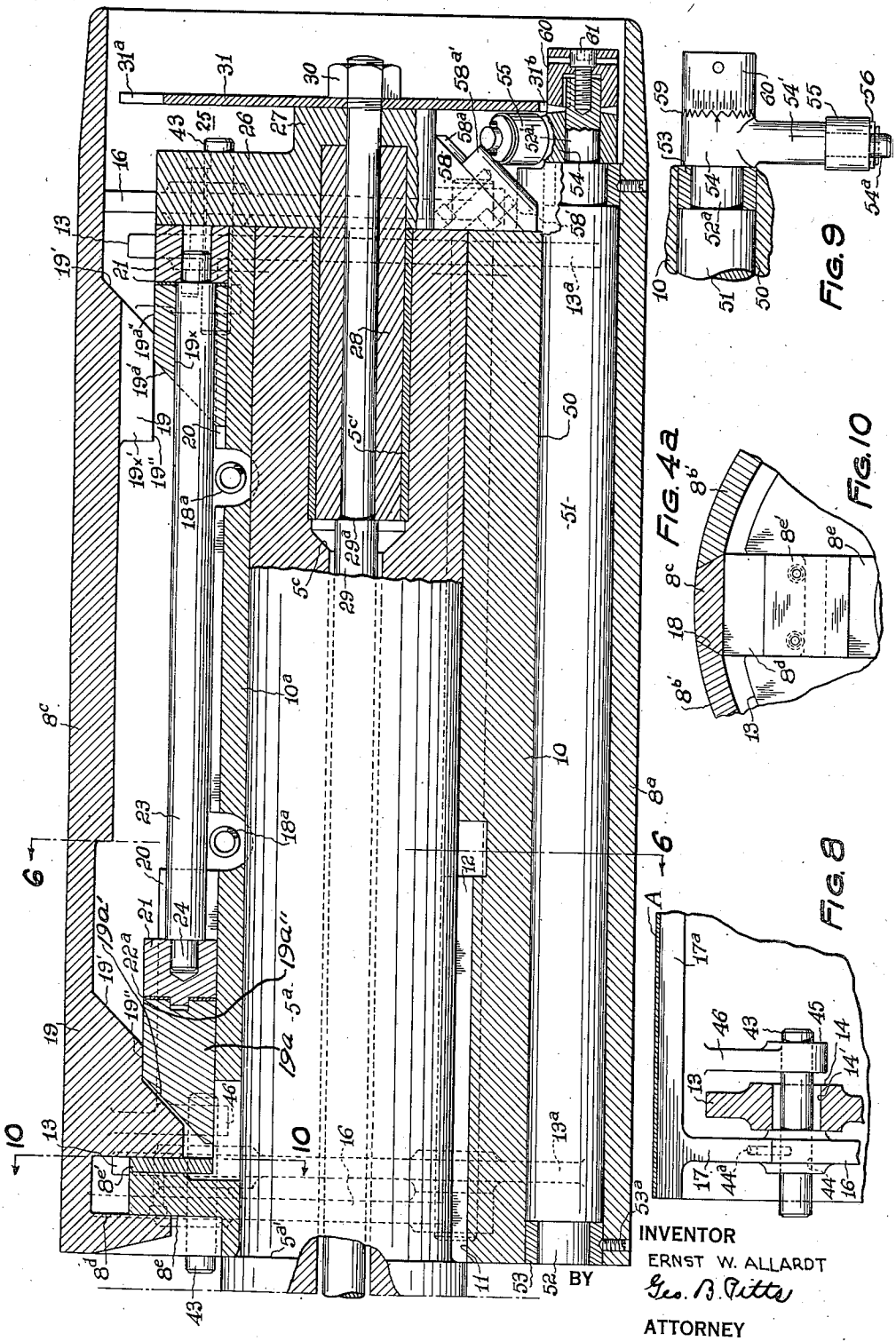


FIG. 9



FIG. 10

FIG. 4a



FIG. 8

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MECHANISM FOR COILING SHEET MATERIAL

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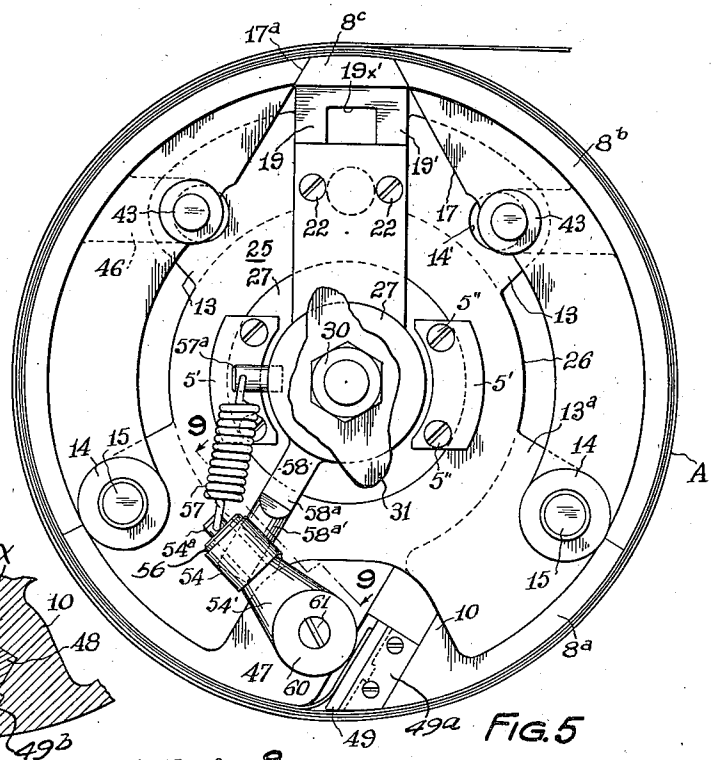



FIG. 5

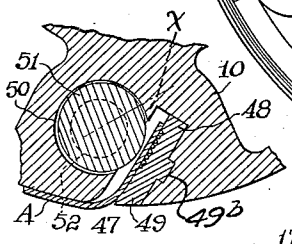



FIG. 6a

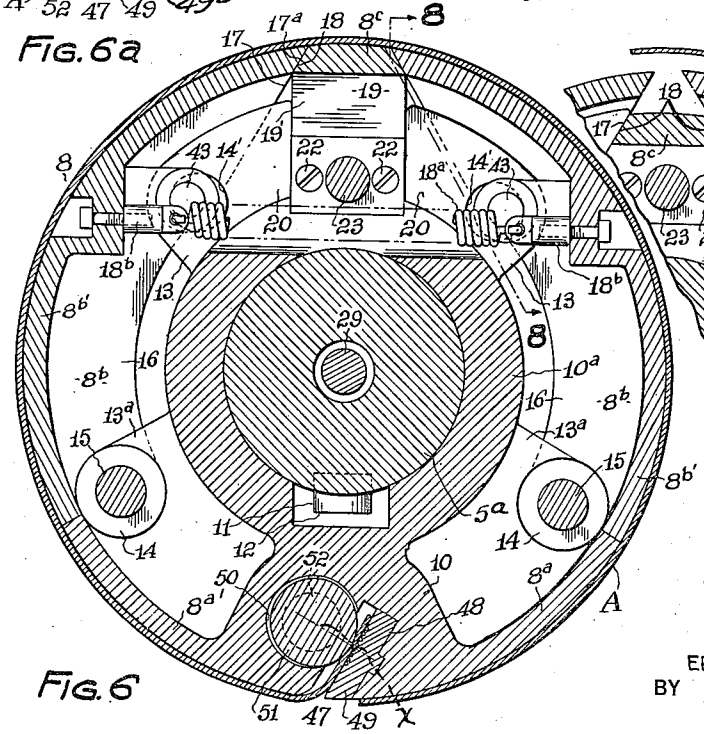



FIG. 6

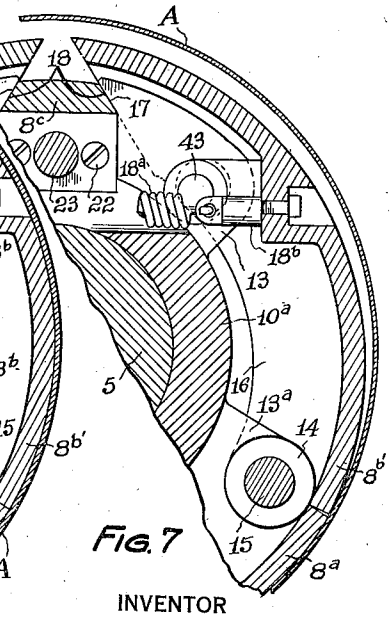



FIG. 7

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Patented June 20, 1944

2,351,894

# UNITED STATES PATENT OFFICE

2,351,894

## MECHANISM FOR COILING SHEET MATERIAL

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Application February 14, 1941, Serial No. 378,927

6 Claims. (Cl. 242—72)

This invention relates to mechanism for coiling sheet material, the embodiment herein disclosed being adapted to coil sheet material having a width substantially equal to the length of the coiling drum or less, or to simultaneous coil a plurality of sections of sheet material. The embodiment of the invention herein disclosed has been applied to the coiling of sheet metal.

One object of the invention is to provide an improved mechanism of this type having a drum provided with one or more contractible and expansible sections and fluid operated means for operating the section or sections in one direction, or releasing them for operation in the opposite direction, whereby the drum may be readily set for coiling and the coiled material readily released for removal from the drum.

Another object of the invention is to provide an improved mechanism of this type having a driven drum provided with one or more contractible and expansible sections and fluid operated means exterior of the drum for operating the section or sections in one direction and permitting operation thereof in the opposite direction.

Another object of the invention is to provide an improved mechanism of this type having a drum provided with a contractible and expansible section, means for operating said section to expand or contract it and a material gripping device controlled by said operating means.

Another object of the invention is to provide an improvd mechanism of this type having a coiling drum and means external to the drum for simultaneously securing the end of the material to the drum and expanding it ready for coiling

Another object of the invention is to provide in a drum for coiling sheet material, improved means for gripping the end of the material and readily adapting it to material of different thicknesses.

A further object of the invention is to provide an improved mechanism of this type comprising a contractible and expandible drum having therein simplified elements which co-act to expand or contract the drum and power means interiorly of the drum for controlling the movement of the operating elements.

Other objects of the invention will be apparent to those skilled in the art to which my invention relates from the following description taken in connection with the accompanying drawings, wherein

Fig. 1 is a side elevation of a mechanism embodying my invention, including apparatus for handling the coiled material.

Fig. 2 is a plan view of parts shown in Fig. 1.

Fig. 3 is a section on the line 3—3 of Fig. 1.

Figs. 4 and 4*a* together constitute a section on the line 4—4 of Fig. 2.

Fig. 5 is an end elevation of the drum looking towards the left of Fig. 4*a*, parts being broken away.

Fig. 6 is a section on the line 6—6 of Fig. 4*a*.

Fig. 6*a* is a fragmentary section showing certain parts illustrated in Fig. 6 but in a different position.

Fig. 7 is a fragmentary sectional view of parts shown in Fig. 6, but showing the collapsible sections of the drum in contracted position.

Fig. 8 is a fragmentary section on the line 8—8 of Fig. 6.

Fig. 9 is a fragmentary section on the line 9—9 of Fig. 5.

Fig. 10 is a fragmentary section on the line 10—10 of Fig. 4*a*.

In the drawings, 1 indicates a support or bed plate having a portion extending over a pit 1*a* to accommodate a truck 2 to which reference will later be made. 3 indicates as an entirety a housing mounted on the support 1 and having spaced members 3*a*, 3*a*. The members 3*a* form seats for bearing boxes having anti-friction bearings 4 for a shaft, indicated as an entirety at 5, one of the bearings consisting of sets of tapered rollers arranged to take end thrusts on the shaft 5. Between the supporting members 3*a*, the shaft is provided with a gear 6 in mesh with and driven by a pinion 6*a*, which, through a suitable gear reduction mounted in the housing 3, is driven by the shaft 7 of a suitable motor 7*a*, the latter being mounted on the support 1. The shaft 5 extends through the housing 3, its outer end 5*a* carrying a drum indicated as an entirety at 8. The drum 8 comprises a plurality of sections related to provide a cylindrical wall on which the material A is coiled, certain of said sections being movable inwardly to a collapsed position to release the coiled material, whereby it may be readily removed from the drum. 9 indicates as an entirety a fluid operated mechanism for controlling the movable sections of the drum, as later set forth, parts thereof being disposed exteriorly of the drum. In the preferred form of construction, I provide a main section 8*a* to which the shaft 5 is connected to effect rotation of the drum, movable sections 8*b* disposed at opposite sides of the section 8*a* and preferably pivotally mounted on the latter and a movable section 8*c* disposed diametrically of the main section 8*a* between the sections 8*b* and arranged to

co-act with the adjacent ends of the sections 8b to control their movement inwardly and outwardly.

The main section 8a consists of a curvilinear wall 8a' having on its inner side an integral, longitudinally extending rim 10 to which is integrally connected a sleeve 10a. The sleeve 10a surrounds the outer end 5a of the shaft 5 and seats at its inner end against an annular shoulder 5a' (see Fig. 4a) provided on the shaft outward of the adjacent housing supporting member 3a. The sleeve 10a preferably extends from the shoulder 5a' to the outer end of the shaft, its outer end being utilized as a stop to limit in one direction the movement of the devices (later referred to) for operating the movable drum section 8c radially outwardly. The sleeve 10a is preferably held on the shaft 5 with its inner end in engagement with the shoulder 5a' by a pair of plates 5' each of which is secured to the outer end of the shaft 5 by screws 5'' and extending laterally into overlapping relation to the outer end of the sleeve (see Fig. 5). 11 indicates a groove formed in the inner wall of the sleeve 10a and extending from its inner end inwardly longitudinally of the sleeve to receive a longitudinally extending key 12 provided on the shaft 5, whereby the latter is connected to the sleeve 10a to effect rotation of the drum by the shaft. The sleeve 10a is provided on each side adjacent its opposite ends with upper and lower pairs of outwardly extending walls 13, 13a, each terminating in a hollow boss 14 alined with the adjacent boss at the opposite end of the sleeve. The bosses 14 on the walls 13a at each side of the sleeve 10a support a rod or shaft 15 on which the adjacent movable section 8b swings from the position shown in Fig. 6 to the position shown in Fig. 7 and in the opposite direction to the Fig. 6 position. Each movable section 8b consists of a curvilinear wall 8b' provided adjacent its opposite ends with inwardly extending ribs 16, which at their inner ends are formed with alined openings to receive the rod 15 (see dotted lines in Fig. 4a). The ribs 16 at their opposite ends and the outer longitudinal side edge of the adjacent wall 8b' (from end to end thereof) terminate in inclined walls 17, 17a (disposed in the same plane), which and the corresponding walls on the other drum section 8b are arranged to slidably engage correspondingly inclined walls 18 provided on the opposite sides of and extending from end to end of the movable section 8c, whereby the outward radial movement of the section 8c serves to expand or swing the sections 8b outwardly (see Fig. 6) and the inward radial movement thereof permits the sections 8b to contract or move inwardly (see Fig. 7), under the influence of spaced springs 18a. Each of the springs 18a is connected at its opposite ends to studs 18b suitably secured to the section 8b and normally tends to swing the latter inwardly. The tension of the springs 18a also operates through the drum sections 8b due to the engagement of their walls 17, 17a, with the inclined walls 18 on the drum section 8c to move the latter inwardly upon release thereof by its operating devices hereinafter referred to.

Means are provided, as later set forth, for limiting the inward swinging movement of the sections 8b to relieve pressure on the devices, which operate the section 8c, when these devices are moved to their inoperative position, so that any pressure on the sections 8b due to the tension of the coiled material will not be transmitted to the section 8c and devices for operating it.

The drum section 8c is moved outwardly radially by spaced pairs of relatively movable co-acting devices 19, 19a, one device 19 of each pair of devices being mounted on the inner side of the section 8c and the respective co-acting devices 19a being connected to and operated by the fluid operated mechanism 9. The devices 19 consist of inwardly extending integral portions on the section 8c, each portion having on its outer end an inclined face 19', and on its lower side a horizontal face 19'', whereas each device 19a consists of a block slidably mounted on the sleeve 10a between guides 20 and having on its inner end an inclined face 19a' arranged to engage the face 19' of the adjacent device 19 and on its upper side a horizontal face 19a'' arranged to engage the face 19'' of the adjacent device 19. Accordingly, movement of the blocks 19a toward the left, as viewed in Fig. 4a, will operate the drum section 8c outwardly, as shown in Fig. 6, and movement of the blocks toward the right will permit the drum section to move inwardly under the influence of the springs 18a. Each device 19a is provided with a pusher 21, which is secured to the device by screws 22. The pushers are connected together by a rod 23 having reduced ends which fit into openings formed in the pushers and secured thereto by pins 24. Between each block 19a and the adjacent pusher 21 I provide shims 22a one or more of which may be utilized to adjustably space the blocks 19a relatively to each other to insure their simultaneous engagement with the devices 19. As shown in Fig. 4a, the outer block 19a is formed with a through opening 19x to permit the rod 23 to extend through it and the adjacent depending portion on the section 8c is formed with a longitudinally extending recess 19x' to accommodate the rod 23 when the section 8c moves inwardly.

To present endwise movement of the movable drum section 8c during its operation inwardly and outwardly, its inner end is provided with a vertical recess 8d the front and rear sides of which engage a guide member 8e preferably formed integrally with and extending upwardly from the adjacent end of the sleeve 10a. The inner side of the guide member 8e is preferably provided with a wear plate 8e'.

25 indicates the operating connections between the fluid operated means 9 and the outer pusher 21, arranged to move the devices 19a inwardly and outwardly longitudinally of the drum. The connections 25 comprise the following: 26 indicates an arm secured at its outer end to the outer pusher 21 by the adjacent screws 22. The inner end of the arm 26 is enlarged to form a cap 27 which receives the outer end of a sleeve 28, the latter preferably having a pressed-in fit with the inner side walls of the cap 27. The sleeve 28 extends into an opening 5c formed in and extending through the shaft and surrounds the reduced portion on the outer end portion of a pitman or rod 29, which forms a part of the hydraulic means 9, the inner end of the sleeve being seated against the shoulder 29a formed by the reduced portion of the rod. The outer end portion of the opening 5c is enlarged to accommodate the sleeve 28 and a sleeve bushing 5c' which permits the sleeve to reciprocate in the opening 5c. The rod 29 extends outwardly through the cap 27, a nut 30 threaded on its outer end serving to secure the cap and sleeve together and the sleeve 28 seated against the shoulder 29a, so that these parts will move as a unit when the rod 29 is moved endwise, as

later set forth. Between the nut 30 and outer face of the cap 27 I provide a plate 31 which serves as a guard and closure for the outer end of the drum 8. The plate at its upper side is formed with a recess 31a to accommodate the drum section 8c when the latter is moved inwardly and at its lower side the plate is formed with a recess 31b to accommodate other parts hereinafter referred to.

The rod 29 extends in the opposite direction through the opening 5c beyond the inner end 5b of the shaft 5 and is provided at its free end with a piston 32, which is reciprocatable within a cylinder 33, the piston and cylinder forming parts of the fluid operated means 9. The cylinder 33 consists of a side wall 33a and inner and outer heads 33b, 33c, the inner head 33b being rigidly connected by a collar 34 (through which the rod 29 extends) to the inner end of the shaft 5, whereby the latter rotates the cylinder. The outer cylinder head 33c is suitably bolted to the outer end of the cylinder 33 and formed with an opening, which is axially related to the shaft 5 and forms the seat for the inner flanged end of a conduit member 35. The member 35 extends outwardly from the head 33c, a ring nut 35a threaded thereon and tightened against the head 33c serving to secure the member 35 thereto for rotation with the cylinder 33. The conduit member 35 extends into and through a casing 36 for rotation therein to provide for the supply of the fluid, such as oil or air under pressure, to the cylinder 33 and its discharge therefrom through stationary pipes 37, 37a, dependent upon the position of the valve element of a valve indicated as an entirety at 38. The pipe 37 is connected to an opening leading through the side wall of the casing 36 into an annular recess 39 formed in its inner wall and connected to one end of a conduit 39a formed in the conduit member 35, the opposite end of the conduit 39a leading into the outer end of the cylinder 33, so that when the fluid is supplied from the pipe 37 to the conduit 39a it will move the piston 32 inwardly (to the right as viewed in Fig. 4) and through the rod 29, arm 26 and pushers 21, move the blocks 19a toward the right (as viewed in Fig. 4a) to release the drum section 8c and permit it and the sections 8b to move inwardly under the influence of the springs 18a. The pipe 37a is connected to an opening leading through the side wall of the casing 36 into an annular recess 40 formed in its inner wall and connected to one end of a conduit 40a formed in the conduit member 35, the opposite end of the conduit 40a being connected to one end of a duct 41 formed in the cylinder head 33c and side wall 33a of the cylinder 33. As shown in Fig. 4, the opposite end of the duct 41 leads through the cylinder head 33b, so that when the fluid is supplied from the pipe 37a to the conduit 40a and duct 41, it will move the piston 32 outwardly (to the left as viewed in Fig. 4) and through the rod 29, arm 26 and pushers 21, move the blocks 19a toward the left (as viewed in Fig. 4a) to operate the drum section 8c radially outwardly and through the section 8c to swing the sections 8b outwardly into coiling position as shown in Figs. 5 and 6.

The valve 38 serves simultaneously to connect either pipe 37, 37a, with a fluid supply pipe 37' and the other pipe with a discharge pipe 37a', dependent upon the position of the valve element 38a of the valve 38. As shown in Fig. 4, the valve element 38a is provided with passages 38b, 38c and 38d. In the position shown, the passage 38c connects the supply pipe 37' to the pipe 37 and the passage 38b connects the pipe 37a to the discharge pipe 37a'. Upon movement of the valve element 38a by a rod 42 to the right (as viewed in Fig. 4), the passage 38c will connect the supply pipe 37' to the pipe 37a and passages 38d, 38a, will connect the pipe 37 to the discharge pipe 37a'. The end walls of the valve casing are preferably utilized to limit the movement of the valve element in either direction with the passages therein in registry with the pipes in either operated position. Accordingly, in either position of the valve element 38a, the fluid will be supplied through one pipe to one side of the piston 32 and the fluid on the other side thereof will be discharged from the cylinder through the other pipe.

The casing 36 is mounted on the conduit member 35 between a shoulder thereon and the head of a screw 35' threaded into the outer end of the conduit member. The casing 36 consists of a substantially annular side wall and inner and outer end walls 36a, the side wall being lined with packing material in which the conduit member 35 rotates.

The means for limiting the inward movement of the drum sections 8b consist of the following: 43 indicates a rod supported by each rib 16 of each drum section 8b. As shown in Fig. 8, the rib 16 is formed with an opening 44 in alinement with the boss 14 provided on the adjacent wall 13 and the adjacent rod 43 is mounted at one end in the opening 44 and secured against movement by a pin 44a. The rod 44 extends inwardly from the wall 16 through the adjacent boss 14, its opposite end fitting into a boss 45 provided on the outer end of a lug 46 formed integrally with and extending inwardly from the adjacent drum section 8b. As shown in Figs. 5, 6, 7 and 8, the openings 14' in the bosses 14 on the walls 13 are enlarged or slightly elongated to permit movement of the pins 43 with the adjacent drum section but disposed so that the pins will engage their inner sides to limit the inward movement of the drum section.

47 indicates as an entirety the means for detachably gripping the free end of the material A to secure it to the drum and arranged to be controlled by the operating connections which operate the blocks 19a, whereby the material is automatically secured to the drum when the sections 8b, 8c, are moved outwardly and automatically released from the drum when these sections are contracted. Of these gripping means, 48 indicates a slot formed in the wall 8a' and rib 10 and extending from end to end of the drum, the slot preferably being inclined to a radius of the drum (see Figs. 5 and 6). One side of the slot is provided with a wall 49, which is held in the slot against endwise movement by plates 49a (one only being shown) secured by screws to the end walls of the rib 10. The inner face of the wall 49 is provided with a longitudinally extending key 49b which fits into a complementary recess formed in the rib 10 to lock the wall in the slot 48. Opposite the wall 49, the rib 10 is formed with a through recess 50 merging on its inner side with the slot 48. The recess 50 accommodates a rotatable member 51 which co-acts with the wall 49 to grip or release the free end portion of the material A, as shown in Figs. 5 and 6. The member 51 is reduced at its opposite ends to provide trunnions 52, 52a, which are rotatably mounted in bearings 53, 53, the latter being secured in the recess 50 by set screws 53a. The

outer wall of the member 51 from end to end is disposed eccentrically to the axis of the trunnions 52, 52a, so that in one angular position the "throw" of the eccentric is spaced from the wall 49 to permit the insertion of the free end of the material and when the member is rotated to another angular position the "throw" of the eccentric moves toward the wall 49 and accordingly co-acts with the latter to grip the material as indicated by the line x (see Fig. 6). When the member 51 is in its non-gripping position the throw of the eccentric is preferably arranged adjacent the inner end of the slot 48 (as indicated by the line x as shown in Fig. 6a), so that when the member 51 is operated to grip the material it is rotated clockwise, as viewed in Figs. 5 and 6. Accordingly, pull on the material A tends to bind it between the member 51 and wall 49. The trunnion 52a extends beyond its bearing 53 through the collar 54 on the inner end of an arm 54', as shown at 52a' (see Fig. 4a). The arm 54' is reduced at its outer end to form a shaft 54a for a roller 55. The roller 55 is held on the shaft 54a by a washer 56 engaging its outer end. The washer 56 may be held in position on the shaft 54a by a cotter pin, but by preference I employ one end of a spring 57, which is connected at its opposite end to a pin 57a extending outwardly from the cap 27 and normally tends to swing the arm 54' in the direction to rotate the gripping member 51 clockwise, as viewed in Figs. 5 and 6, to engage and grip the material A. 58 indicates a wall preferably formed integrally with and depending from the cap 27, its forward end being inclined and positioned to engage and ride the roller 55 as the cap 27 is moved outwardly by the rod 29, such engagement operating through the arm 54' to rotate the member 51 counterclockwise, as viewed in Figs. 5 and 6, so that (a) when the rod 29, cap 27 and arm 26 are moved outwardly to permit the drum section 8c to move inwardly, the gripping member 51 is disengaged from the material and (b) when these parts are moved inwardly to expand the drum section 8c, the wall 58 moves away from the roller 55 and permits the spring 57 to swing the arm 54' and through it rotate the member 51 clockwise, whereby the material A is gripped. The plate 58 preferably consists of an inner section 58a and an outer section 58a', the latter being formed of hardened metal to reduce the wear thereon incident to its engagement with the roller 55. In the arrangement shown and described, a spring is relied upon to operate the member 51 into gripping engagement with the material and dispose its eccentric portion in relation to the wall 49 so that any pull on the material will bind it between these parts, whereas the hydraulic means, operating through the rod 29, cap 27 and plate 58 are relied upon to release the member 51 from the material.

While the member 51 may operate to grip and release sheet materials having slight differences in thickness, I prefer to provide adjustable connections between the collar 54 and member 51 to dispose the "throw" of the latter in any predetermined non-gripping position, dependent upon the thickness of the material to be coiled, so that when the member 51 is rotated by the spring 57 (upon movement of the wall 58 inwardly, the "throw" of the member 51 will engage the material and grip it as already set forth. These connections preferably comprise clutch elements 59 between the outer face of the collar 54 and the inner face of a removable cap 60, which is keyed to the outer end portion of the trunnion 52a', the cap 60 being removably secured to the trunnion by a cap screw 61. Accordingly, upon removal of the cap 60, the arm 54' may be rotated on the trunnion 52a' to the desired position and then locked thereto in its adjusted position by the cap 60 upon replacement of the latter.

In operation, the free end of the material A is inserted in the slot 48 and then fluid is admitted to the inner side of the piston 32, the movement of which toward the left as viewed in Fig. 4 serves to simultaneously effect a gripping of the material and expansion of the drum walls 8b, 8b, 8c. The motor 7a is then operated to coil the material on the drum 8. To remove the coil, the piston 32 is operated in the opposite direction to simultaneously retract the drum sections 8b, 8b, 8c and disengage the member 51 from the material. The truck 2 is then moved on the rails 2' to position its platform 2a below the coiled material. The platform 2a is then raised into engagement with the coil following which an upwardly extending arm 2b on the outer end of an endwise movable rod 2c and arranged to engage the truck and coil, moves the coil beyond the drum 8 for transfer to a platform 2d. The rod 2c is connected to a piston within a cylinder 2c' adapted to be operated by fluid pressure. The truck 2 is provided with a column 2e which supports suitable control devices for operating the platform 2a and controlling the fluid supply to the cylinder 2c'. The construction of the truck and the means for operating its platform and moving the truck form no part of the present invention, for which reason these parts are not fully illustrated.

To those skilled in the art to which my invention relates, many changes in construction and widely differing embodiments and applications of the invention will suggest themselves without departing from the spirit and scope of the invention. My disclosures and the description herein are purely illustrative and are not intended to be in any sense limiting.

What I claim is:

1. In apparatus of the class described, the combination with a support, of a shaft rotatably mounted thereon, means for rotating said shaft, a drum fixed to said shaft, on which sheet material is adapted to be coiled, and provided with a collapsible section, mechanism within the drum for operating said collapsible section relative to the remaining portion of the drum, gripping devices for removably securing the free end of the material to said drum, one of said devices being rotatably mounted in the drum and having an eccentric portion intermediate its ends for engagement with and disengagement from the material, and connections between said mechanism and said rotatable gripping device for rotating it in one direction, said connections including an arm adjustably connected to said rotatable gripping device, whereby the angular position of the "throw" of the eccentric portion thereof relative to said arm may be changed.

2. In apparatus of the class described, the combination with a support, of a drum on which sheet material is adapted to be coiled, rotatably mounted on said support, said drum having a section movable inwardly to release the coil of material, a device movably mounted on said drum arranged to detachably secure one end of the material to the drum, a spring for operating said device into engagement with the material, and mechanism, arranged when moved in one direction to operate said movable drum section outwardly and when

moved in the opposite direction to operate said device out of engagement with the material in opposition to the tension of said spring, said device consisting of a rotatable member provided intermediate its ends with an eccentric portion, the "throw" of the eccentric portion being arranged to engage and disengage the material, and the connection between said rotatable member and said spring and said mechanism, being adjustable to change the position of the eccentric portion angularly of the axis of said member relative to said connection.

3. In apparatus of the class described, the combination with a support, of a shaft mounted thereon, means for driving said shaft, a drum on which material is adapted to be coiled and comprising a main section drivingly connected to said shaft, side sections pivotally connected to the opposite sides of said main section and an intermediate section movable radially of said shaft and arranged to engage the outer ends of said side sections to swing them outwardly, said main section being formed with an inwardly extending opening substantially co-extensive therewith, adapted to receive the free end of the material, clamping elements carried by said main section operable to clamp the material thereto when inserted in said opening, means operable in one direction to move said intermediate section outwardly, and a spring connected at its opposite ends to the outer portions of said side sections and normally tending to swing said sections inwardly and operable therethrough, upon operation of said moving means in the opposite direction, to simultaneously move said intermediate section inwardly.

4. An apparatus as claimed in claim 3 wherein means are provided between said main drum section and said side drum sections for limiting the inward movement of the latter to relieve pressure on the moving means for said intermediate section.

5. In apparatus of the class described, the combination with a support, of a shaft mounted thereon, a drum on which material is adapted to be coiled and comprising a main section drivingly connected to said shaft and a plurality of separate sections movable outwardly and inwardly, mechanism including elements within the drum for moving said separate sections outwardly and inwardly, said main drum section being formed with a slot adapted to receive the free end of the material, one side wall of the slot forming an abutment, a device movably mounted in said slot in opposed relation to said abutment for movement relative thereto and normally disposed in the path of movement of the material when the free end thereof is inserted in said slot, but arranged to move away from said abutment to permit insertion of the material in said slot, a spring operatively connected with said device and arranged to be put under tension when said device is moved away from said abutment, whereby said device grips the material when the free end thereof is inserted in said slot, and a device connected to one of the elements of said mechanism and arranged to move said first mentioned device away from said abutment upon operation of said mechanism to move said separate sections inwardly.

6. In apparatus of the class described, the combination with a support, of a shaft rotatably mounted thereon, means for rotating said shaft, a drum on which sheet material is adapted to be coiled, comprising a main section provided with a hub surrounding and fixed to said shaft and a plurality of interengaging collapsible sections, gripping devices for removably securing the free end of the material to said main drum section, one of said devices being rotatably mounted in said main drum section and having an eccentric portion intermediate its ends for engagement with and disengagement from the material, a pair of operating devices, one of which is fixed to one of said collapsible drum sections and the other operating device being slidably mounted on said hub, said operating devices having co-acting cam surfaces and co-acting dwell surfaces, mechanism for moving the operating device mounted on said hub relative to the operating device fixed to one of the collapsible sections, and connections between said mechanism and said rotatable gripping device for rotating it in one direction during the co-action of said dwell surfaces on said operating devices.

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