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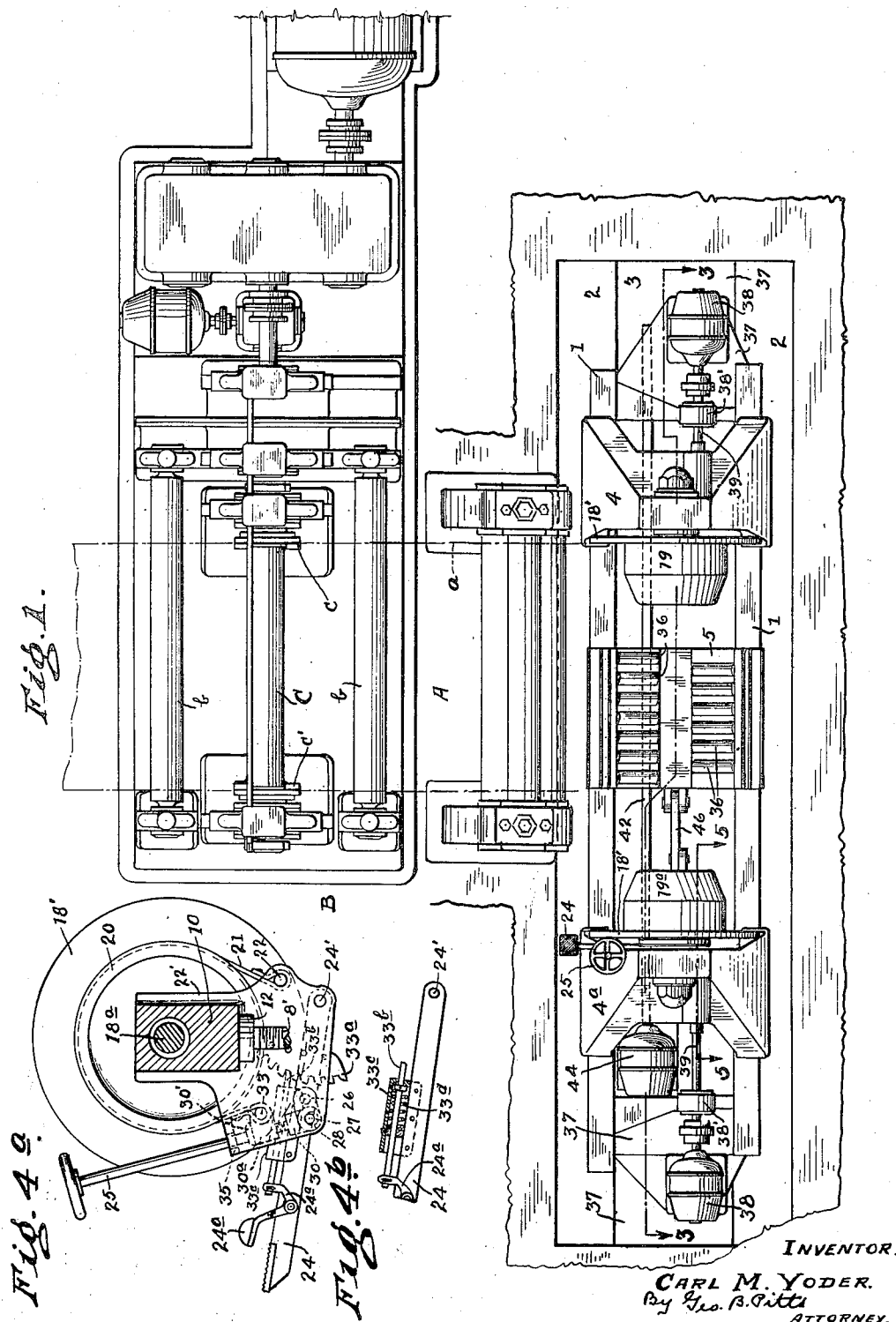
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**2,139,873**

## COIL HANDLING MECHANISM

Filed Dec. 31, 1935

4 Sheets-Sheet 1



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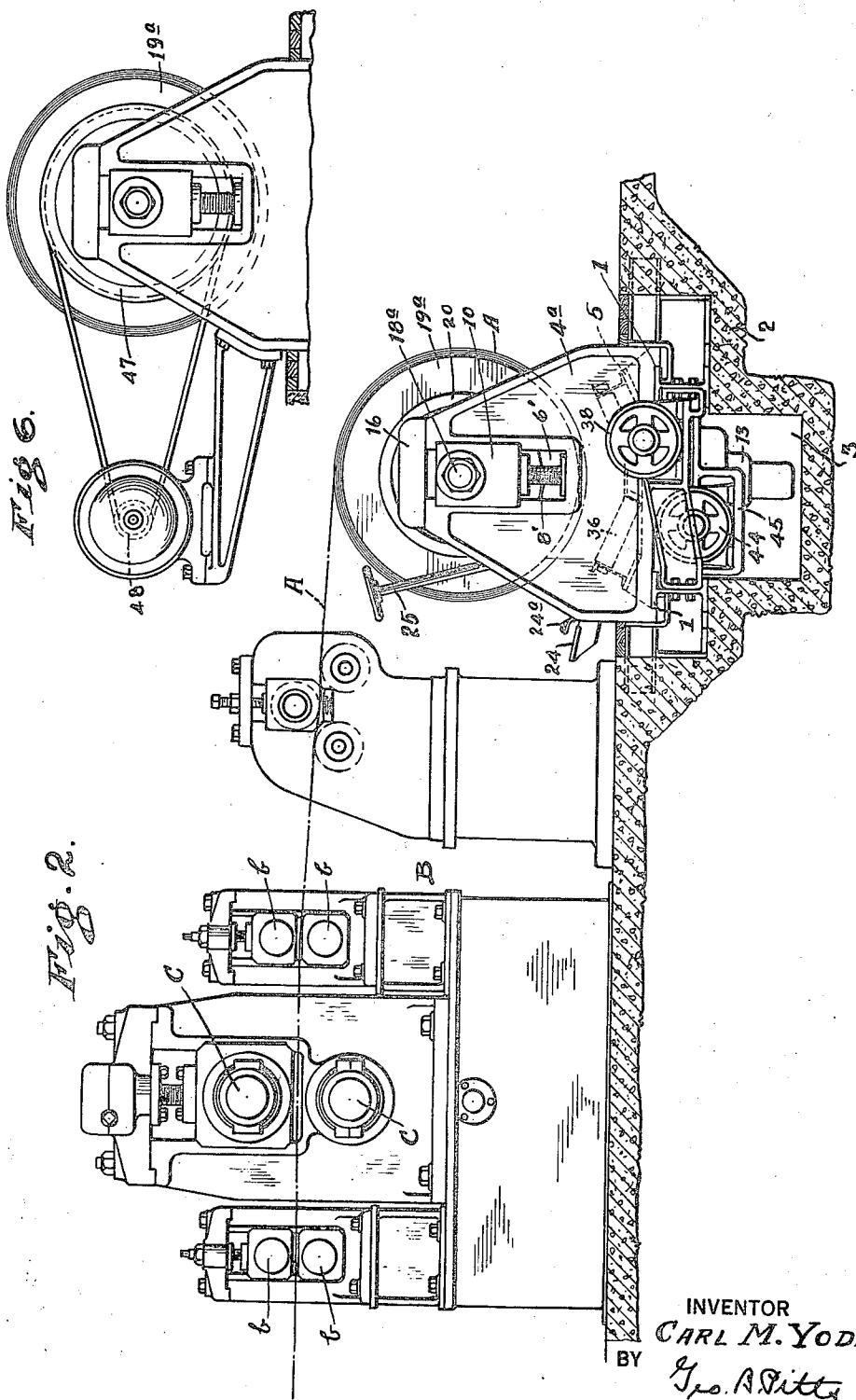
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Fig. 5.

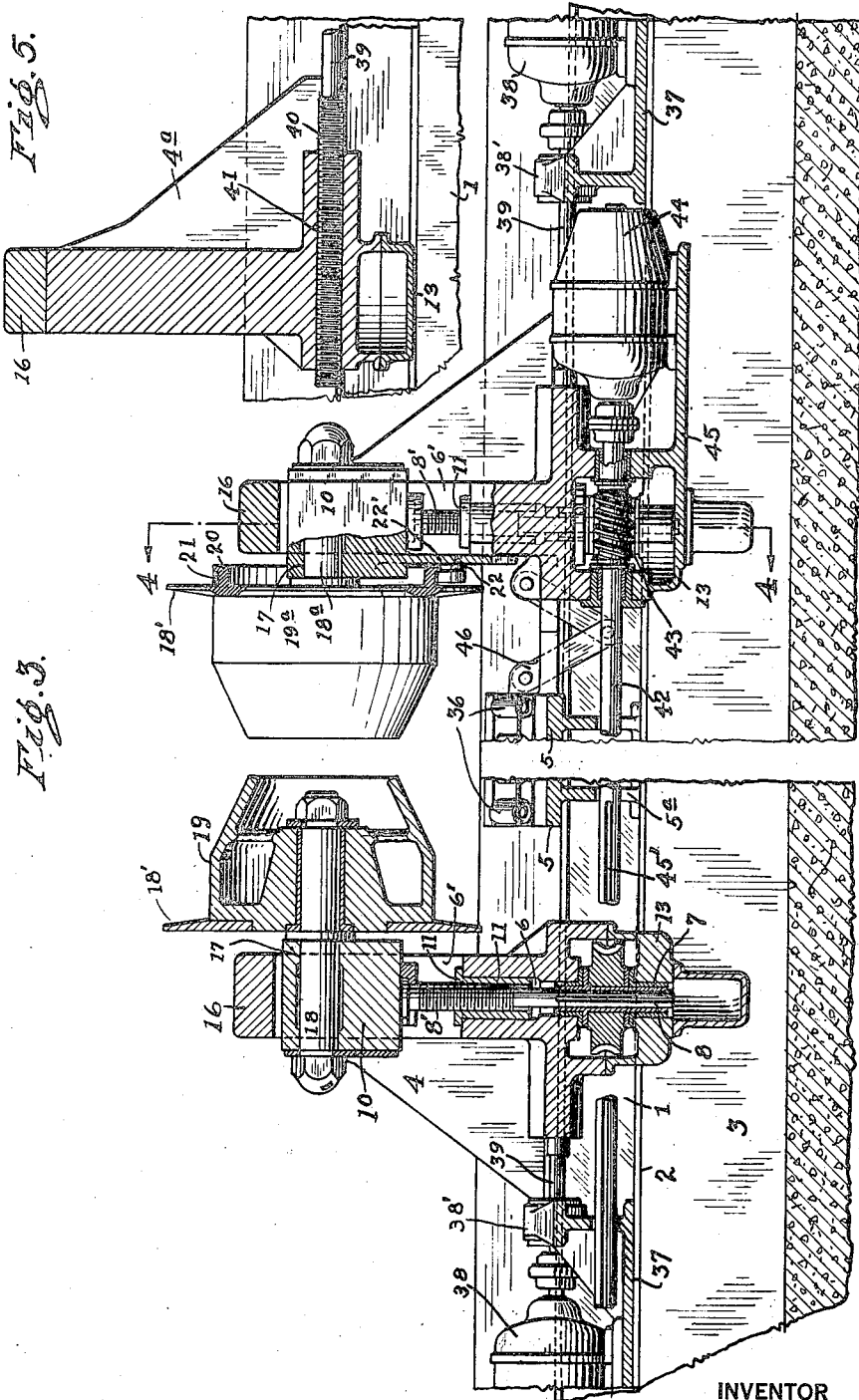
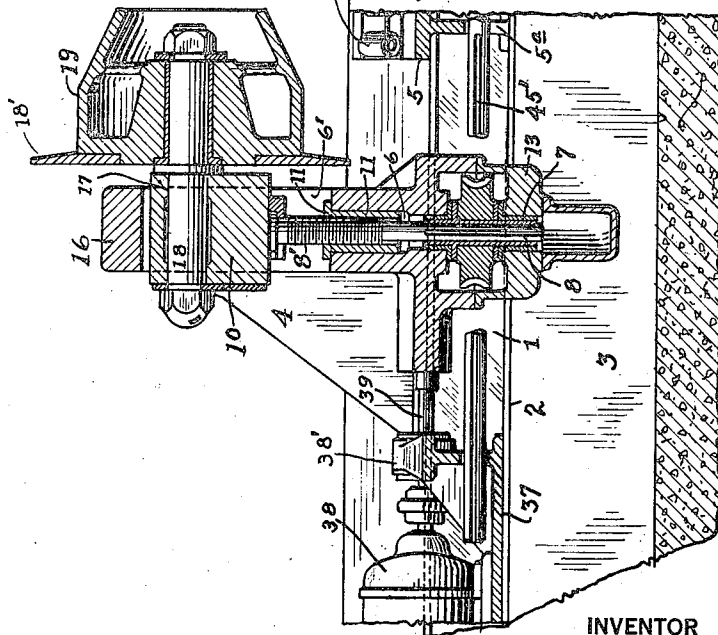


Fig. 3.



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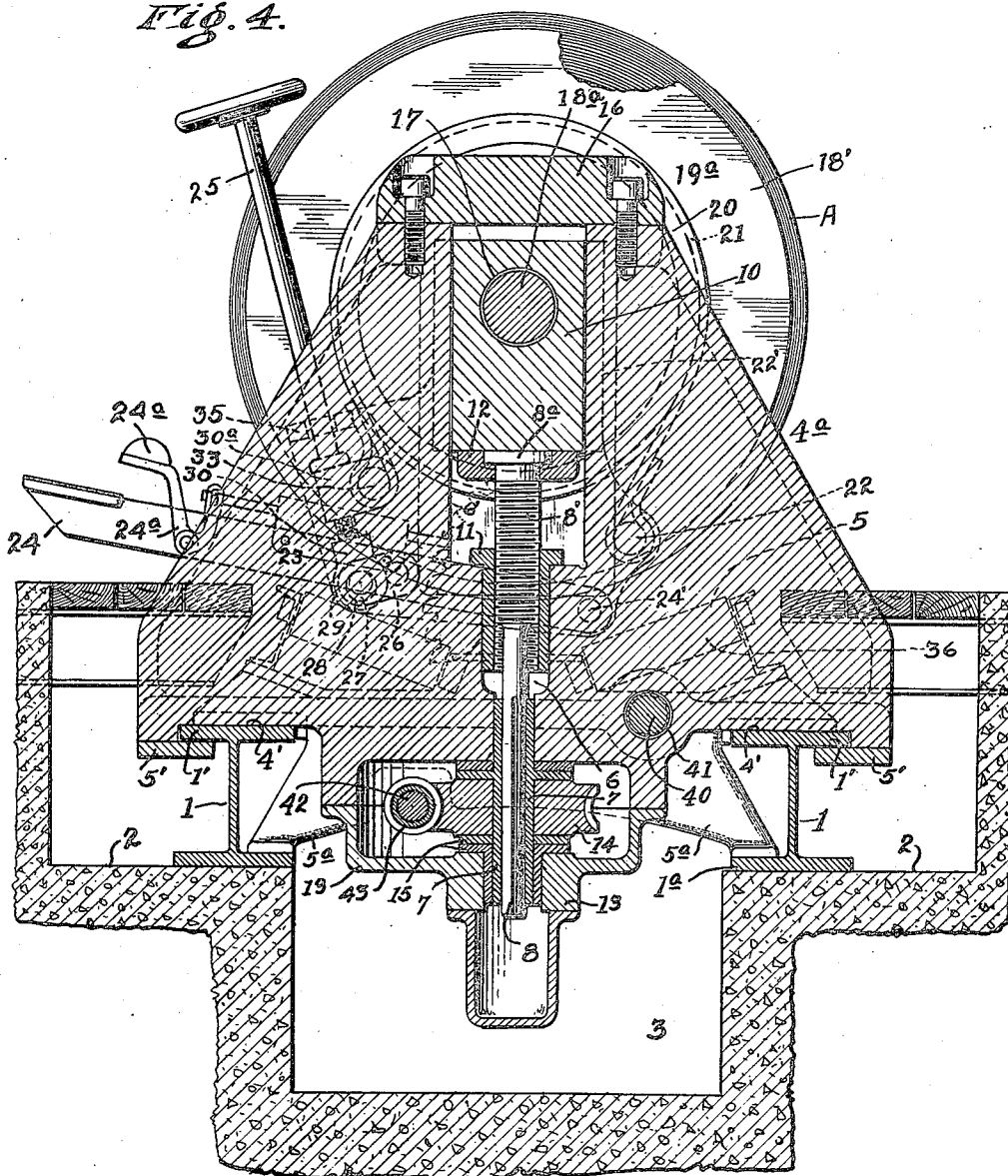
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Fig. 4.



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## UNITED STATES PATENT OFFICE

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## COIL HANDLING MECHANISM

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6 Claims. (Cl. 242—58)

This invention relates to mechanism for handling a coil of sheet material and positioning and supporting the coil, whereby the material may be uncoiled and fed to a machine for punching, cutting, trimming, treatment of or fabricating the material. The mechanism herein illustrated is adapted to engage, position and support a coil of metallic sheet material as it comes from the mill or after it has been subjected to any special treatment; but the mechanism is equally adapted to engage, position and support coils of other sheet materials.

One object of the invention is to construct an improved mechanism of this character capable of readily engaging the coil, raising it to the desired position and providing for its uncoiling for any desired purpose.

Another object of the invention is to provide a machine of this character that is relatively simple and readily operated and controlled.

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 plan view of a mechanism embodying my invention, shown associated with a trimming machine.

Fig. 2 is a side elevation of the parts shown in Fig. 1.

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

Fig. 4 is a section on the line 4—4 of Fig. 3.

Figure 4a is a vertical section on the line 4a—4a of Fig. 3.

Figure 4b is a fragmental side elevation of the brake latch partly in section.

Fig. 5 is a fragmentary section on the line 5—5 of Fig. 1.

Fig. 6 is a side elevation of a mechanism similar to Fig. 1, but slightly modified.

In the drawings, 1 indicates suitable tracks, such as I-beams, preferably mounted on spaced ledges 2 of a pit 3. The tracks 1 serve to slidably support a pair of members 4, 4a and a support or cradle 5, each of which has guide portions 4', engaging the flanges 1' of the tracks; but separate tracks may be provided for the support 5. The members 4, 4a, are held in engagement with the tracks 1 by strips 5' bolted to the members and extending below the flanges 1'. The members 4, 4a, and parts carried or associated therewith are preferably of similar construction so that the description of one, for example, the member 4a, will suffice; the same ref-

erence characters being applied to corresponding parts and associated parts of the member 4. The member 4a is formed with a vertical opening 6, in the lower portion of which is mounted the upper portion of a sleeve shaft 7 serving to slidably support the shank 8 of an adjusting screw 8'. The upper portion of the opening 6 is enlarged, as shown at 6', to form a guide way for a vertically adjustable bearing block 10, to which reference will later be made. The intermediate portion of the opening 6 is shaped to receive a sleeve nut 11, which is fixedly mounted in the opening and preferably provided at its upper end with a flange adapted to seat on the bottom wall of the way 6'. The screw 8' is threaded through the nut 11 and engages at its upper end with the block 10 to support it in any adjusted position and when rotated, the screw 8', by reason of its threaded engagement with the nut 11, serves to move the block 10 upwardly or downwardly as later set forth. The upper end of the screw 8' is preferably provided with a circular bead 8a which rotates in a recess formed in a plate 12 suitably fixed to the lower end of the block 10, whereby the screw 8' is connected thereto. The lower end of the sleeve shaft 7 is mounted in suitable bearings provided in a cap member 13, which cooperates with the lower end of the member 4a to form a housing for a worm gear 14 disposed between suitable bearing disks 15. The gear 14 is fixed to the sleeve shaft 7 and the latter is splined to the screw shank 8 to rotate the latter, but permit endwise movement of the shank in the sleeve shaft 7, whereby through the co-action of the nut 11, the screw 8' may be effective to raise or lower the adjacent block 10. The driving means for the gear 14 will be later referred to. The upward movement of the block 10 is limited by a cross bar 16, bridging the upper end of the way 6'. The block 10 is formed with an opening 17 in which is mounted the outer end of a spindle 18, the inner end of which projects from the block 10 toward and in axial alignment with the correspondingly mounted spindle 18a on the block 10 carried by the slidable member 4.

The inner ends of the spindles 18, 18a, carry coil engaging and supporting devices 19, 19a, respectively, arranged to engage the central portions of a coil of material A at its opposite ends or the core on which it may be wound. Each of the engaging devices 19, 19a, may consist of a conical free end portion and a concentric inner portion extending parallel to the axis of the adjacent spindle 18, 18a, and surrounded by a

flange 18' at its outer end. The outer end plate of either or both engaging devices 19, 19a, may be provided with a brake or retarding means to prevent free rotation of the coil while the material is being delivered or uncoiled or to stop or release the coil at any desired time. These means are shown for illustrative purposes associated with one device (device 19) only and as consisting of a drum 20 mounted on the outer face of the end plate for the device 19 and a suitable brake band 21 engaging the drum, one end of the band being fixed to a pin 22 projecting from a plate 22' preferably formed integral with the adjacent block 10 for movement or adjustment therewith. The other end of the band 21 is connected to suitable operating means indicated as an entirety at 23, also mounted on the plate 22'. The operating means 23 is constructed so as to permit of (a) quick application of the brake by the operation of a foot pedal 24 pivoted at 24' on the plate 22', (b) its quick release by the operation of a lever 24a pivoted on the pedal, or (c) a predetermined setting by the operation of a device, such as a shaft 25. Of the operating means 23, 26 indicates a link pivoted to the lever 24 and to a connecting element 29 at its outer end. The outer end of the link is provided with an eccentric 27, which rotates in an opening 28 formed in the wall of the connecting element 29. The element 29 is formed with a boss 30 having an opening in which is threaded the lower end of the shaft 25. 30' indicates a collar fixed to the shaft 25 by a set screw (not shown) and engaging a sleeve 30a which is slidable on the shaft. The sleeve 30a is provided with a lateral boss carrying a pin 33 to which the other end of the band 21 is connected. The shaft 25 extends through and loosely fits an opening formed in a bracket 35 carried by the plate 22'. Accordingly, when the pedal 24 is operated downwardly, the eccentric is rotated and operates through the element 29, shaft 25 and sleeve 30a to tighten the band 21. 33a indicates a ratchet fixed to the plate 22' and arranged to be engaged by a thrust rod 33b. The rod 33b is slidably mounted in a housing 33c and pivotally connected at its outer end to the lever 24a, by which it is operated outwardly to release the rod 33b from the ratchet 33a. The rod 33b is normally operated inwardly into engagement with the ratchet 33a by a spring 33d arranged between a stationary abutment 34 fixed to the housing 33c and a collar 34' fixed to the rod 33b. In operation, the pedal 24 is moved downwardly to an intermediate position and locked by the engagement of the rod 33b with the ratchet 33a; then by adjustment of the shaft 25, the brake band may be set to permit of a predetermined slippage between it and the drum 20. By operating the pedal 24 downwardly beyond its intermediate position, the band may be applied quickly to the drum and effect its stoppage, or by operation of the lever 24a, which disengages the rod 33b from the ratchet 33a, the brake band is released to permit free rotation of the engaging device 19. If desired, a spring may be employed to normally act on the pedal to move it upwardly.

The cradle or support 5 may be of any desired construction, but preferably consists of a casting provided with pairs of longitudinal supports, each pair having sets of bearings for a series of rolls 36 extending transversely to the tracks 1 and arranged to support each series of rolls in an inclined position so as to form a seat for a coil when rolled thereon, or positioned thereon, for

example, by an overhead crane or a truck. The cradle casting preferably slides on the tracks 1, as already set forth, and may be provided with depending legs 5a which may slide on the flanges 1a of the I-beams. The cradle supports the coil and moves on the tracks 1 as later set forth. The cradle 5 is connected to the member 4a by a flexible connection, preferably pivotally connected links, so that when the member 4a is moved on the tracks 1 away from the member 4 preparatory to the supply of a new coil of material, it draws with it, after a limited movement, the cradle 5 to position the latter opposite the coil delivery station, as shown in Fig. 1. As the cradle is disposed in the path of movement of the member 4a movement of the latter toward the member 4 may be utilized to move the cradle toward the member 4 to adjust the cradle in any desired coil receiving position.

Each of the members 4, 4a, is moved along the tracks by the following means: 37 indicates a base mounted on the ledges 2 and supporting a motor 38. The shaft of the motor 38 is connected to the shank 39 of a screw 40, which has threaded engagement with the threads provided in an opening 41 extending through the walls of the member 4a. (See Fig. 5.) The thrust of the screw is taken by suitable thrust bearings provided in a box 38' mounted on the base 37. The motors 38 are preferably mounted on the same side of the members 4, 4a, and as each is operatively connected to one of the members 4, 4a, the latter may be simultaneously moved on the tracks in either or opposite directions or independently one relative to the other.

Provision is made for raising or lowering the blocks 10 relative to the support 5, so as to raise the coil of material A bodily without tilting it. For this purpose I provide a shaft 42 having worms 43 driven thereby and meshing with the worm gears 14 to rotate the latter simultaneously. Each worm 43 is mounted on the shaft 42 between the side walls of the chamber for the adjacent worm gear 14 (see Fig. 3). The shaft 42 is driven by a motor 44. The motor 44 is mounted on a base 45 preferably formed integral with the casing fitting 13 which is connected to the walls of the slidable member 4a; accordingly the motor 44, shaft 42 and the adjacent worm 43 move with the member 4a when it is adjusted along the tracks 1 by the adjacent motor 38. To permit of the adjustment or movement of one member 4 or 4a relative to the other member on the tracks 1, while maintaining a driving connection between the shaft 42 and the other worm 43, the latter is splined to the shaft—see spline 45' shown in Fig. 3.

The machine B may be of any desired construction, that shown for operating on the material A being constructed to trim the opposite side edges of the material and consists of pairs of rolls b, b, and an intermediate pair of driven rolls C carrying sets of trimming devices c, c', which are adjusted to effect trimming of the material A to the desired width.

**Operation.**—To position a coil of material A for uncoiling and feeding to the machine B, the members 4, 4a, are first moved to their outermost positions. The coil is then positioned on the cradle 5 by rolling it thereon or by means of an overhead crane or other handling mechanism. The member 4 is then adjusted to align the flange 18' on the adjacent engaging device 19 with the set of trimming devices c (see line a in Fig. 1). Next, the member 4a is moved toward the mem-

ber 4, the effect of which is to move its engaging device 19a into engagement with one end of the coil and through such engagement move the cradle and coil toward the member 4 until the opposite end of the coil engages the engaging device 19, such movement being continued until the coil ends are engaged between the flanges 18'. Next, the motor 40 is started and through the shaft 42 and gearing 43, 14, shafts 7, and screws 8', the blocks 10 are raised to the desired elevation, whereupon the end of the material may be positioned in the machine B and the latter started, the uncoiling being controlled by the braking means 23. When a coil of material is used up, the members 4, 4a, are returned to their outermost positions, this movement of the member 4a serving to re-set the cradle 5 in its receiving position, as shown in Fig. 1, by means of a connection, such as pivotally connected links 46, between them.

When found desirable, either or both coil engaging devices 19, 19a, may be driven to facilitate the feed of the material to the machine B. In this arrangement, one example of which is shown in Fig. 6, the engaging device 19a may be provided with a pulley 47, belted to a pulley 48 on the shaft of a motor 49', which is suitably supported on a bracket 50, carried by the adjacent slidable member 4a so as to move therewith and permitting the blocks 10 to be raised or lowered as already described.

Where the cradle or support 5 is stationarily mounted on the I-beams or other supporting means, the movement of the member 4a to effect the engagement of the coil between the engaging devices 19, 19a, will slide the coil on the rolls 36 which freely rotate to prevent marking or scratching of the material A.

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 a machine of the class described, the combination of tracks, a pair of members movable on said tracks, a support slidably mounted on said tracks between said members and arranged to receive a coil of material, aligned coil engaging devices mounted on said movable members to move upwardly and downwardly relative to said support, means for moving said devices, and means connected with one of said members for moving said support in one direction.

2. In a machine of the class described, the combination of tracks, a pair of members movable on said tracks, a support slidably mounted on said tracks between said members and arranged to receive a coil of material, aligned coil engaging devices mounted on said movable members to move upwardly and downwardly relative

to said support, means for moving said devices, and means for moving said support in one direction, said support moving means comprising an articulated connection between it and one of said members.

3. In a machine of the class described, the combination of supporting means, tracks thereon, a pair of members movable on said tracks, a support arranged to receive a coil of material, aligned coil engaging devices mounted on said movable members to move upwardly and downwardly relative to said support, separate power means on said supporting means for moving each of said members along said tracks, and means for simultaneously moving said devices upwardly or downwardly irrespective of the position of said members.

4. In a machine of the class described, the combination of supporting means, tracks thereon, a pair of members movable on said tracks, a support arranged to receive a coil of material, aligned coil engaging devices mounted on said movable members to move upwardly and downwardly relative to said support, separate power means on said supporting means for moving each of said members along said tracks, independent power means carried by one of said members, and operating connections between said independent power means and said devices for simultaneously moving them upwardly or downwardly irrespective of the position of said members.

5. In a machine of the class described, the combination of parallel tracks, a pair of members movable upon said tracks, independent power means for actuating said members, a coil-receiving support slidable on said tracks between said members in the path of movement thereof and arranged to be moved thereby in one direction on said tracks, a linked connection between one of said members and said support, whereby the latter is moved by said member in one direction, aligned coil engaging devices mounted on said movable members to move vertically relative to said support, and means for simultaneously moving said devices upwardly or downwardly.

6. In a machine of the class described, the combination of supporting means, a pair of tracks thereon, supporting members independently movable on said tracks and each having an upright formed with a vertical guide-way, a block movable in each guide-way, a shaft rotatably mounted in each block against endwise movement and provided on its inner end with a coil supporting device aligned with the device on the other block, power means on one of said supporting members, means mounted in each of said uprights below the block therein and arranged to raise or lower the latter, operating connections between said power means and said raising and lowering means for simultaneously operating the latter to raise or lower both of said blocks, and separate means on said support operatively connected with said supporting members, respectively, for moving them on said tracks.

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