

April 29, 1947.

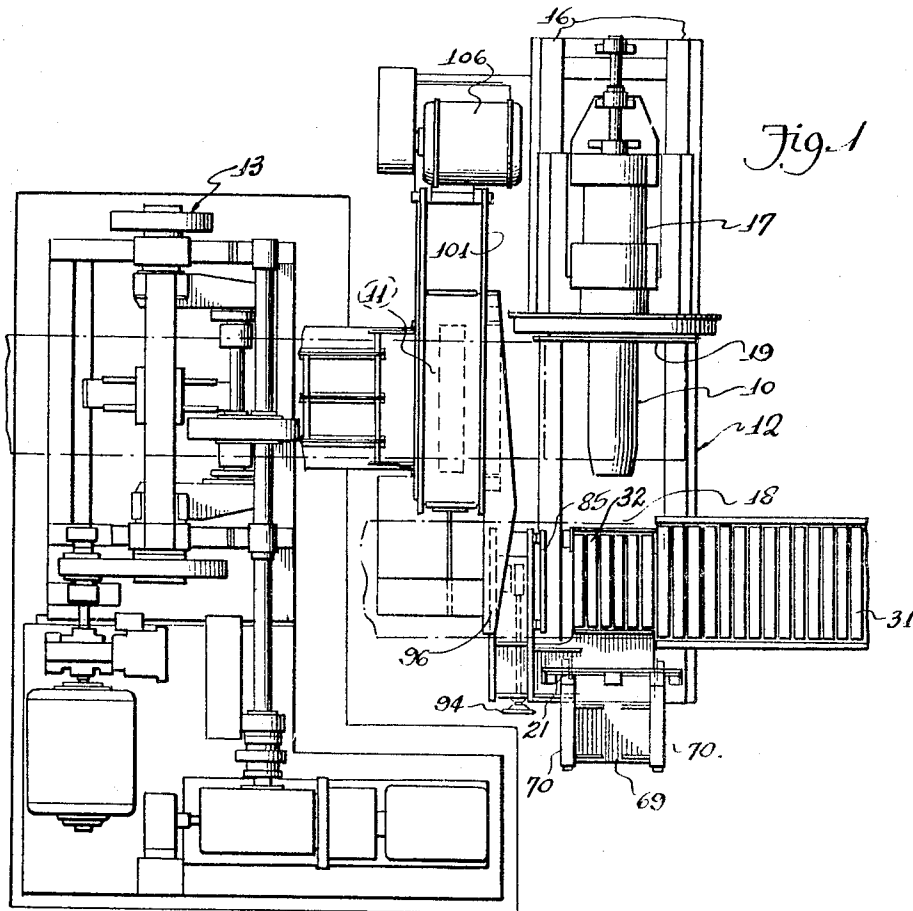
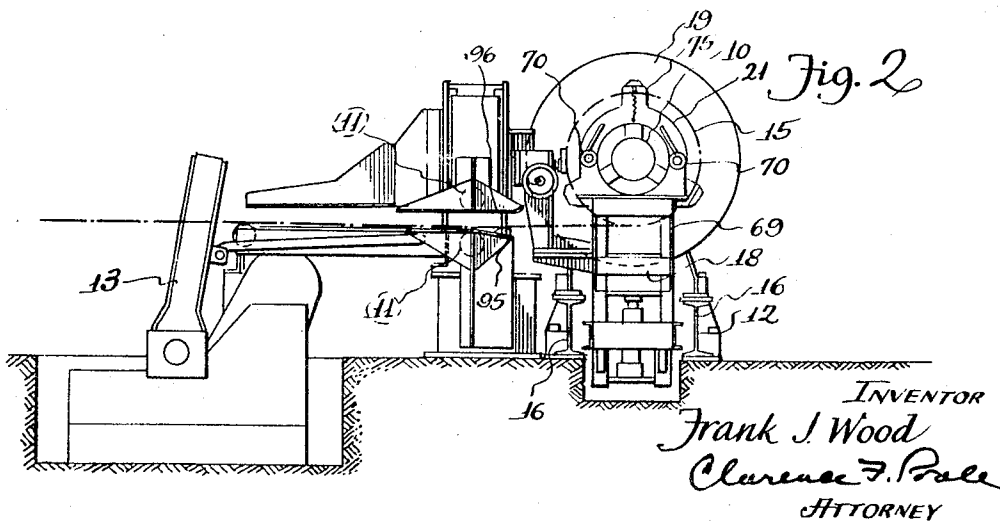
F. J. WOOD

2,419,699

LOADING AND FEEDING APPARATUS FOR COILS OF STRIP METAL

Filed June 8, 1944

5 Sheets-Sheet 1



INVENTOR
Frank J. Wood
Clarence F. Pale
ATTORNEY

April 29, 1947.

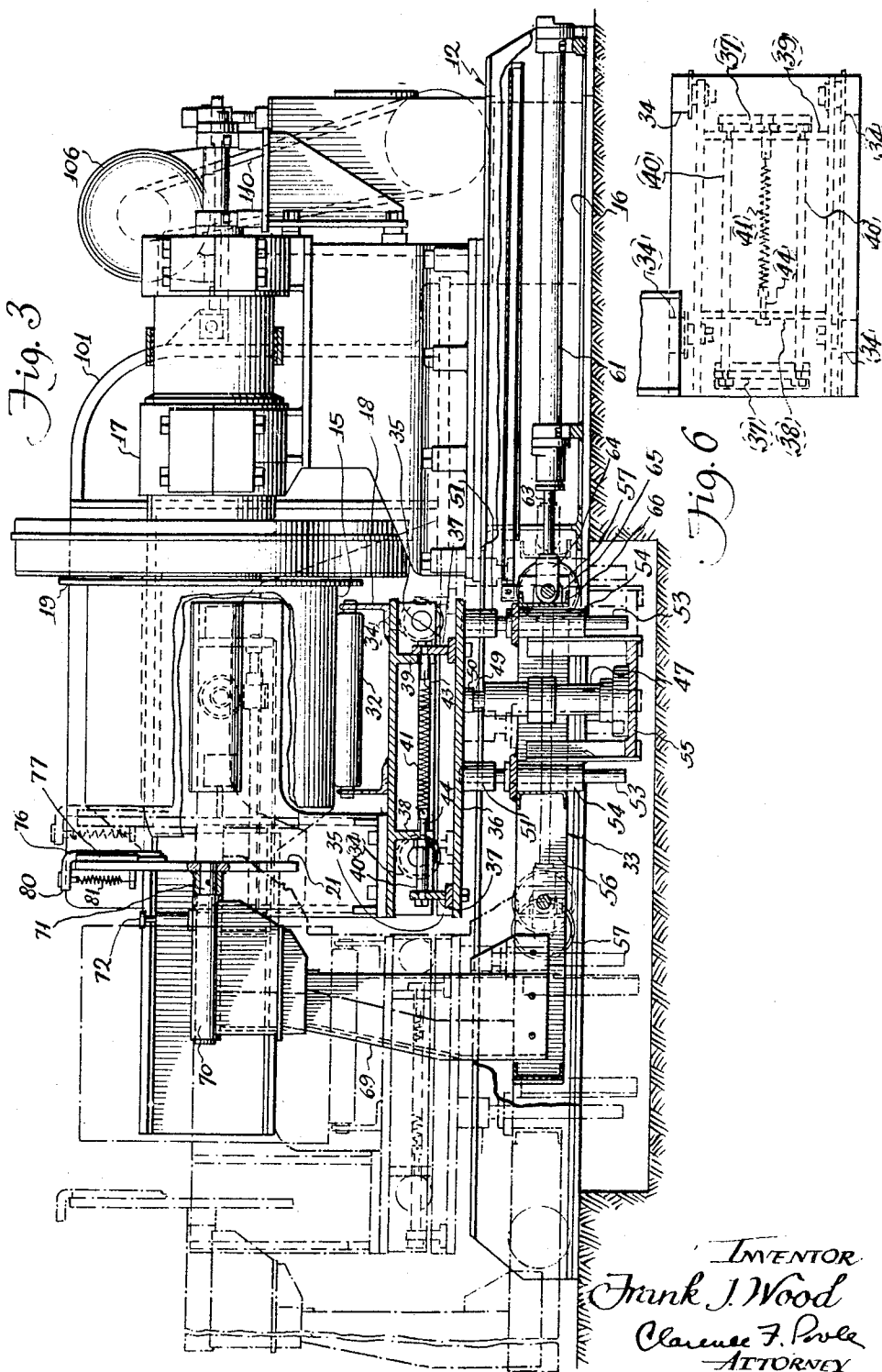
F. J. WOOD

2,419,699

LOADING AND FEEDING APPARATUS FOR COILS OF STRIP METAL

Filed June 8, 1944

5 Sheets-Sheet 2



April 29, 1947.

F. J. WOOD

2,419,699

LOADING AND FEEDING APPARATUS FOR COILS OF STRIP METAL

Filed June 8, 1944

5 Sheets-Sheet 3

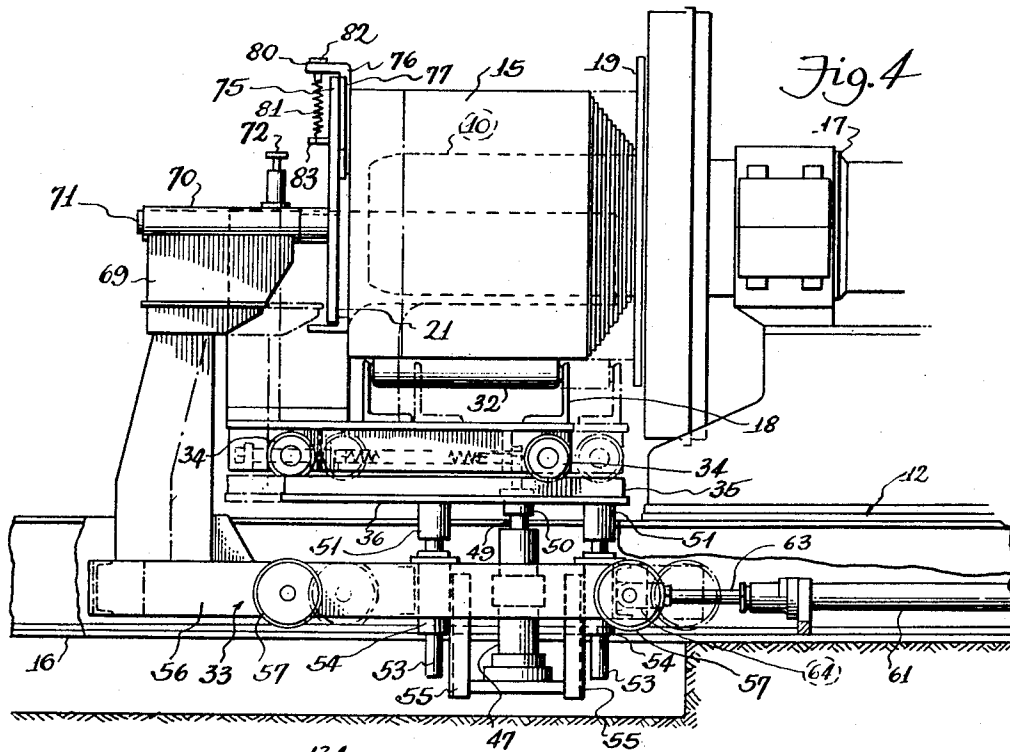


Fig. 4

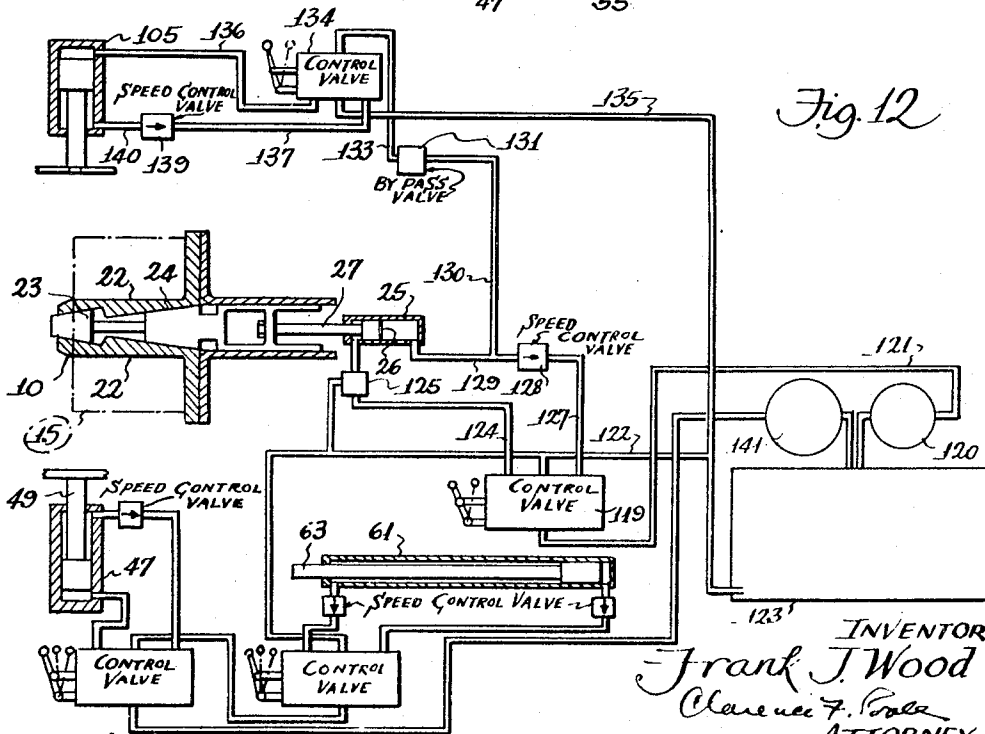


Fig. 12

INVENTOR
Frank J. Wood
 Charles F. Foster
 ATTORNEY

April 29, 1947.

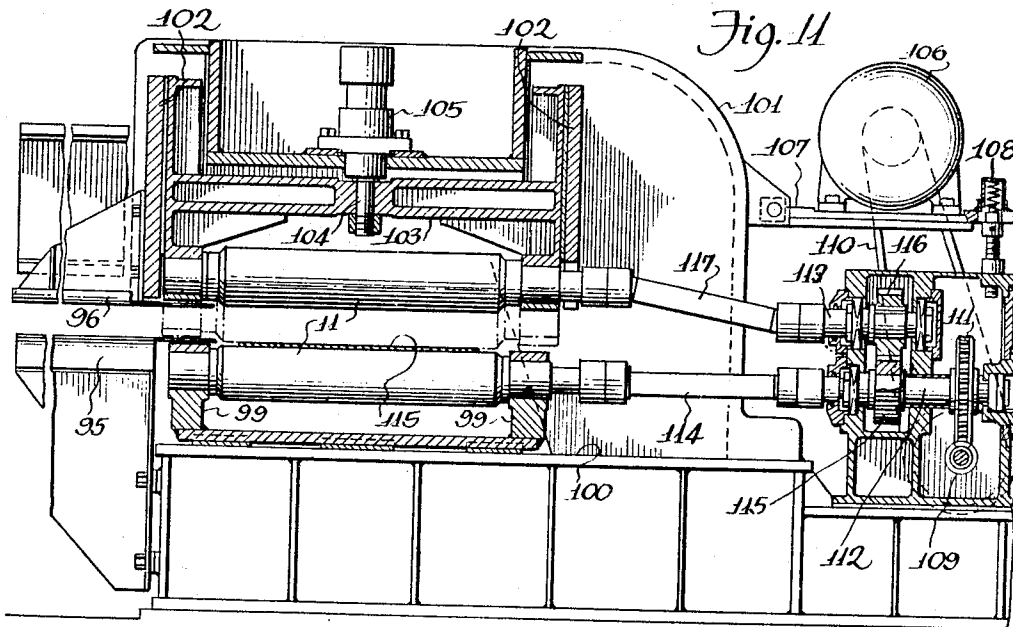
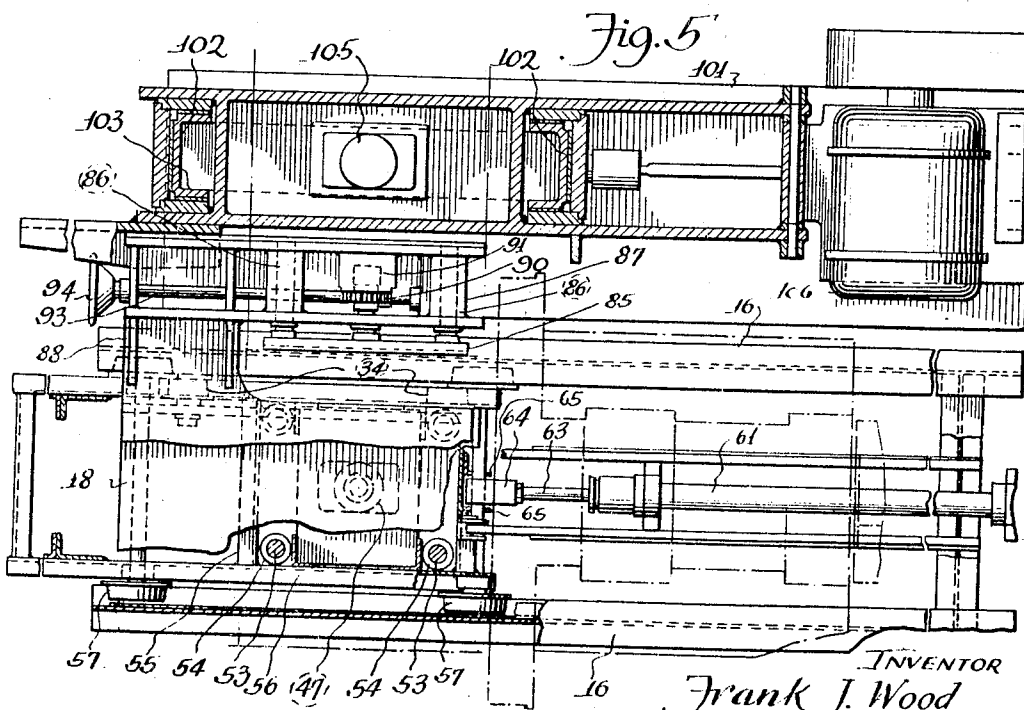
F. J. WOOD

2,419,699

LOADING AND FEEDING APPARATUS FOR COILS OF STRIP METAL

Filed June 8, 1944

5 Sheets-Sheet 4



INVENTOR
Frank J. Wood
Clarence V. Poole
ATTORNEY

April 29, 1947.

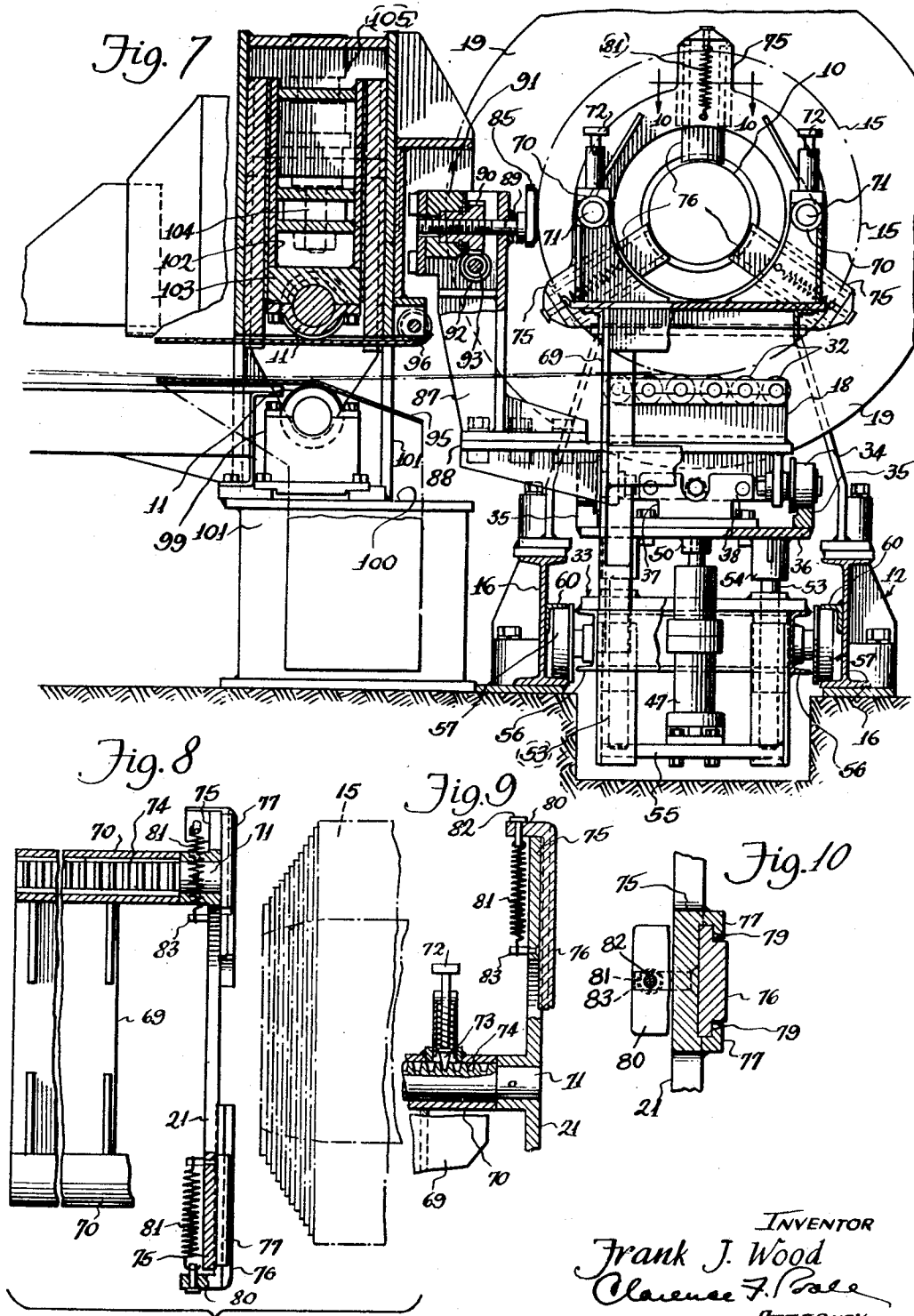
F. J. WOOD

2,419,699

LOADING AND FEEDING APPARATUS FOR COILS OF STRIP METAL

Filed June 8, 1944

5 Sheets-Sheet 5



INVENTOR
Frank J. Wood
Clarence F. Pale
ATTORNEY

UNITED STATES PATENT OFFICE

2,419,699

LOADING AND FEEDING APPARATUS FOR
COILS OF STRIP METAL

Frank J. Wood, Riverside, Ill., assignor to Goodman Manufacturing Company, Chicago, Ill., a corporation of Illinois

Application June 8, 1944, Serial No. 539,368

9 Claims. (Cl. 242-79)

1

This invention relates to improvements in loading and feeding apparatus for coils of strip metal.

Heretofore coils of strip metal have been loaded onto rotatable expansible coil supporting blocks or mandrels by power, by mounting the coil on a movable carriage and elevating the coil so its open center can be moved onto the mandrel. The mandrel is then expanded after the coil has been fully mounted thereon. As the coil is loaded onto the mandrel, its tail end, which projects outwardly from the coil, is moved sideways with the coil between a pair of pinch rolls. These pinch rolls are adapted to grip said tail end of the coil and feed it to a cropping shear, or a processing apparatus such as a roll stand, slit, brushing unit, pickling and cleaning unit, or any other type of processing apparatus. The coils of metal when so loaded are frequently sprung out of alignment so the coil telescopes to one side or the other, and no means has heretofore been provided which will load, center and align the coil so the coil will evenly pay off of its supporting block. Also, the pinch rolls frequently grip the metal and unwind the coil before it is fully expanded. This causes the coil to spring and unwind to such an extent that the mandrel cannot be sufficiently expanded to fully grip the inside of the coil, resulting in further springing and unwinding of the coil and making it necessary to remove and rewind the coil before processing.

The object of my invention is to provide a new and improved loading and feeding means for coiled strip metal, which is so arranged as to load and center the coil on an expansible mandrel, and to align the edges of the coil, so the coil may be evenly fed from the mandrel.

Other objects of my invention will appear from time to time as the following specification proceeds and with reference to the accompanying drawings wherein:

Figure 1 is a top plan view of a coil feeding and loading device constructed in accordance with my invention;

Figure 2 is a view in side elevation of the device shown in Figure 1;

Figure 3 is an enlarged end view of the device shown in Figure 1 with certain parts broken away and certain other parts shown in transverse section, and showing the coil telescoped outwardly adjacent the outer end of the mandrel;

Figure 4 is a fragmentary view in side elevation drawn to substantially the same scale as Figure 3, showing the coil telescoped to extend from

2

its end adjacent the inner end of the mandrel, and illustrating one manner of aligning the edges of the coil;

Figure 5 is an enlarged fragmentary plan view of the coil loading device, with certain parts broken away and certain other parts shown in horizontal section;

Figure 6 is an enlarged detail fragmentary partial plan view with parts removed and broken away, in order to show certain details of the coil supporting carriage not shown in Figure 3;

Figure 7 is a fragmentary substantially longitudinal sectional view showing certain details of the coil loading device and the pinch roll stand for feeding the coil for processing;

Figure 8 is an enlarged fragmentary detail view of the means for aligning the edges of the coil, with certain parts shown in transverse section in order to illustrate certain details thereof;

Figure 9 is a detail fragmentary transverse sectional view of the means for aligning the edges of the coil, showing certain other details not shown in Figure 8;

Figure 10 is an enlarged fragmentary detail sectional view taken substantially along line 10-10 of Figure 7;

Figure 11 is an enlarged transverse sectional view taken through the pinch roll stand, in order to show the adjusting and drive means for the pinch rolls; and

Figure 12 is a diagrammatic view showing the fluid diagram for operating the coil loading and feeding means of my invention.

In the drawings, an expansible mandrel 10 is shown as being rotatably mounted on a base frame 12 at the entering end of a pair of pinch rolls 11, 11. Said mandrel serves to support a coil of strip metal 15 for unwinding, and said pinch rolls serve to grip and unwind the strip metal and feed it to a suitable processing device such as a flying shear 13, which is adapted to crop the ends thereof, before the metal passes to a pickling and cleaning device or other processing apparatus (not shown). Said flying shear is shown in the drawings for illustrative purposes only and is no part of my present invention so will not herein be shown or described in detail.

The base frame 12 is mounted on a suitable foundation and includes a pair of parallel spaced connected I-beams 16, 16 extending parallel to the axis of the mandrel 10. Said mandrel is suitably mounted on said base frame in a mandrel housing 17 and extends along said frame between said I-beams. Said mandrel housing is mounted on the top sides of said I-beams and projects up-

wardly therefrom, and said mandrel is journaled in said mandrel housing in overhanging relation with respect thereto, so the open center of the coil of strip metal 15, carried on a coil supporting carriage 18, may be placed on its free end. A rotatable abutment plate 19 is mounted on said mandrel housing and abuts the end of said mandrel adjacent said housing. Said abutment plate is adapted to be engaged by one edge of the coil of metal, to permit alignment of the edges of the coil of metal by a coil aligning plate 21, in a manner which will hereinafter more clearly appear as this specification proceeds.

The expanding mandrel 10 may be of any well known form and is not herein shown or described in detail, since its detailed construction forms no part of my present invention. Figure 12 of the drawings diagrammatically shows this mandrel as including a plurality of segments 22, 22 expanded by wedges 23 and 24, which are actuated by a fluid cylinder 25 and piston 26 through a piston rod 27. The admission of fluid under pressure to the head end of said cylinder causes the wedges 23, 24 to coact with the segments 22, 22, to expand said mandrel outwardly to engage the interior of the coil of strip metal 15.

The coil of strip metal 15 is conveyed down a roller conveyer 31 by gravity onto the coil supporting carriage 18, and is supported on said carriage on a plurality of rollers 32, 32 extending parallel to the axis of said coil and suitably mounted on said carriage at their ends. The coil supporting carriage 18 is mounted on flanged wheels 34, 34, mounted for movement along ways 35, 35 extending along the upper side of a platform 36. Said platform is mounted on a carriage 33, for vertical adjustment with respect thereto to elevate the coil so its open center will be in alignment with the mandrel 10. Movement of the carriage 18 along the ways 35, 35 of the platform 36 is limited by a pair of spaced stops 37, 37 projecting upwardly from said platform and adapted to be engaged by a pair of spaced webs 38, 39 depending from the bottom of said carriage. A pair of parallel spaced guide rods 40, 40 are mounted at their ends in said stops and extend through suitable apertured portions of the webs 38, 39, for rectilinearly guiding said coil supporting carriage for movement along said platform.

The carriage 18 is urged into a position to engage the web 39 with the stop 37 which is adjacent the abutment plate 19, by a suitable means which is herein shown as being a tension spring 41. Said tension spring is secured at one of its ends to a rod 43, mounted on the forward stop 37, and is secured at its opposite end to a rod 44 mounted on the web 38. Said tension spring will thus move the carriage 18 in a direction towards the mandrel 10 when the weight of the coil 15 is relieved therefrom. The purpose of this arrangement is to permit the rollers 32, 32 to remain in centered relation with respect to the outer run of the coil, during the operation of aligning the edges of the coil, as will hereinafter more clearly appear as this specification proceeds.

The platform 36 is moved vertically with respect to the carriage 33 by a fluid cylinder 47 having a piston rod 49 extensible therefrom. Said cylinder is mounted at its lower end in a cross frame member 55 of the carriage 33, connected between side frame members 56, 56 of said carriage. Said piston rod extends upwardly from said cylinder and is mounted at its upper end in a lug 50, depending from the bottom of said

platform. Said platform is also provided with four bosses 51, 51 depending from opposite sides of said cylinder 47 and horizontally spaced from said cylinder in transverse and longitudinal directions (see Figures 3 and 5). Guide shafts 53, 53 are mounted in said bosses and depend therefrom, and are slidably guided in vertically extending guide members 54, 54 formed in the cross frame 55 of the carriage 33. Said guide means forms a means for guiding the platform 36 and carriage 18 for vertical rectilinear movement with respect to the carriage 33, so said carriage 18 may elevate the coil in position so its open center is in alignment with the center of the mandrel 10, to permit the coil to be loaded onto said mandrel by movement of the carriage 33 along the frame 12.

The carriage 33 is mounted on flanged wheels 57, 57, which ride on the inner flanges of the I-beams 16, 16. Angles 60, 60 are secured to and extend along the webs of said I-beams, and the horizontal legs thereof project inwardly therefrom and are spaced slightly above the treads of the flanged wheels 57, 57, to provide clearance to permit said wheels to move along said I-beams and to serve as retaining members, to retain said flanged wheels on the inner webs of said I-beams.

The carriage 33 is moved along the I-beams 16, 16 by means of a cylinder 61 mounted in the frame 12 between said I-beams and extending therealong. A piston rod 63 is extensible from said cylinder and has a connecting member 64 projecting from its outer end, which interleaves and is pivotally secured between the vertical legs of a pair of spaced angles 65, 65 secured to the web of a cross channel 66 of the cross frame 55.

A supporting standard 69 is mounted on the upper sides of the side frame members 56, 56 of the carriage 33, at the end thereof opposite from the cylinder 61, and projects upwardly therefrom. Said standard has a pair of horizontally spaced parallel hollow supporting bosses 70, 70 at its upper end, which extend in the direction of the axis of the mandrel 10 and are spaced on opposite sides thereof. Said supporting bosses each have a shaft 71 slidably mounted therein for adjustment with respect thereto in a direction towards or from the mandrel 10, and form an adjustable support for the coil aligning plate 21.

The coil aligning plate 21 and shafts 71, 71 are held in various positions of adjustment with respect to the mandrel 10 by means of spring pressed detents 73, 73. Said detents are adapted to engage the space between any one of a number of teeth 74, 74 cut on the upper sides of said shafts, and are moved out of engagement with said teeth by means of hand grips 72, 72 on the outer ends thereof.

The aligning plate 21, as herein shown, is of a substantially annular formation and is provided with three radially spaced projections 75, 75 projecting outwardly from the periphery thereof, which are herein shown as being equally spaced around said aligning plate. Said projections are radially channelled and have engaging members 76, 76 slidably guided in the channelled portions thereof. Retaining members 77, 77 are secured to said plate and projections and extend along opposite sides of said channels and form gibbed guides engaging shouldered portions 79, 79 of said engaging members.

Each engaging member 76 is provided with an outer outwardly turned end 80, which is adapted to engage the outer end of the projection 75,

5

when the engaging member 76 is in an extreme inward position with respect to its guide, to act as a stop for said engaging member. Said engaging member is yieldably held in an inward position by means of a tension spring 81, secured to a headed pin 82 at one of its ends, and secured to a pin 83 at its opposite end. Said headed pin 82 is mounted in and extends through the outwardly turned end 80 of said engaging member. Said pin 83 is riveted to the aligning plate 21 and extends therefrom, in a direction away from the mandrel 10.

The engaging members 76, 76 are adapted to engage an adjacent edge of the coil of strip metal 15 during movement of said coil onto the mandrel 10, by movement of the carriage 33 towards said mandrel, and their purpose is to spring the telescoped side of the coil inwardly and align the sides of the coil.

When the coil has been fully loaded on the mandrel 10 so that its edge adjacent the abutment plate 19 is in engagement with said plate, and is telescoped to project to its side adjacent the aligning plate 21, as shown by broken lines in Figure 8, the engaging members 76, 76 will first engage the innermost turn of the outwardly telescoped portion of the coil and push said turn and the next succeeding turns of said coil inwardly along the mandrel 10 until the edges of said coil are in alignment.

It should here be understood that said mandrel is collapsed during the operation of aligning the edges of the coil, and that during this operation, the coil is wholly supported on the rollers 32, 32 on the carriage 18. During this aligning operation the plate 21 is moved inwardly towards the plate 19 by movement of the carriage 33 along the way formed by the I-beams 16, 16. As said carriage is moved along said way to align the edges of the coil, the carriage 18, which is still supporting the coil, will remain stationary. As said plate and engaging members 76, 76 move inwardly towards the abutment plate 19, said engaging members engage the curved outer advance surface of said mandrel at their inner ends. This will expand said engaging members outwardly and permit them to move along said mandrel. When the edges of the coil have been aligned, said engaging members are held in engagement with the coil until said mandrel has been fully expanded to grip the inside of the coil. Expansion of said mandrel will move said engaging members outwardly along the guides 77, 77, and their yieldable mounting will permit them to be moved away from the coil, after the mandrel has been completely expanded and it is desired to unwind the coil for cropping or other processing.

An adjustable aligning means or stop 85 is adapted to engage the outer side of the coil and move said coil horizontally so its open center may be horizontally aligned with the mandrel 10 (see Figures 5 and 7). Said stop is also adapted to engage and stop the coil when being slid down the roller conveyer 31 onto the supporting rollers 32, 32 of the carriage 18. Said stop is herein shown as being mounted on a pair of laterally spaced horizontal shafts 86, 86, which are slidably mounted in an upright outboard support 87 mounted on a support plate 88 extending from the carriage 18 in a direction towards the pinch rolls 11, 11. Said outboard support is spaced upwardly from and overhangs said plate and extends horizontally from said plate in a direction towards the mandrel 10. A threaded shaft 89

6

is secured to the central portion of said stop and is slidably guided in said outboard support. A worm gear 90 is threaded on said shaft, rectilinearly moving said shaft along said outboard support. Said worm gear is suitably mounted in a bearing support member 91, secured to the outboard support 87, and is suitably held from movement with respect to said bearing support member in the direction of its axis. A worm 92 on a transverse shaft 93 meshes with said worm gear, for rotating said worm gear and moving said adjustable stop towards or from the axis of the coil 15. A hand wheel 94 is provided on the end of said shaft, to enable said stop to be adjusted by hand, to take care of the varying diameters of the coils and to horizontally align said coils with respect to said mandrel.

It should here be noted with particular reference to Figures 3, 4 and 8, that when it is desired to load a coil mounted on the rollers 32, 32 onto the mandrel 10, and said coil is horizontally aligned with respect to said mandrel, that the coil is first elevated by means of the cylinder 47 and piston rod 49 until it is in vertical alignment with said mandrel. Fluid under pressure is then admitted to the piston rod end of the cylinder 61 to move the carriages 33 and 18 towards said mandrel and to move the coil onto said mandrel until it engages the abutment plate 19.

Where the coil is telescoped to extend outwardly towards the aligning plate 21, as is shown by broken lines in Figure 8, the carriage 33 is moved a further distance after said coil has been loaded onto said mandrel and is in engagement with the abutment plate 19, to cause said aligning plate to align the telescoped edges of the coil. During this movement, the carriage 18 carrying the weight of the coil will remain stationary and the carriage 33 will be moved with respect to said carriage to the position shown by dotted lines in this figure, to maintain the coil in a central position with reference to the rollers 32, 32, during the operation of aligning the edges of the coil.

Where the coil is telescoped to extend in a direction towards the abutment plate 19 as is shown in Figure 4, the coil 15 supported on the rollers 32, 32 of the carriage 18 in centered relation with respect to its outer run, will be moved as a unit with said carriage and the carriage 33, until the sides of said coil have been aligned with the sides of the outer run thereof. During this operation the engaging members 76, 76 of the aligning plate 21 will first engage the outer edge of the outer turn of the coil. After the coil has been moved onto the mandrel so that its sprung inner turn is in engagement with the abutment plate 19, the carriages 18 and 33 will continue to move as a unit with the coil. Said engaging members 76 engaging the outer turn of the coil will push this turn and the next succeeding turns inwardly towards the abutment plate 19 until the edges of the coil are aligned.

When the edges of the coil are aligned and the mandrel 10 has been expanded to grip the inside of the coil, the carriage 18 is lowered under control of the cylinder 47 and piston rod 49, to permit the cylinder 61 and piston rod 63 to move the two carriages and the aligning plate 21 back to a position into alignment with the roller conveyer 31, to position the carriage 18 to receive the next succeeding coil of metal.

During the operation of centering and loading the coil 15 onto the mandrel 10, the tail end of the coil, which is its leading end when being paid off of the mandrel 10, projects in a direc-

tion towards the pinch rolls 11, 11 and rests on an inclined guide plate 95. Said inclined guide plate is mounted on the pinch roll stand and extends in a horizontal direction away from the entering end of said pinch roll stand to a position in alignment with the carriage 18, when said carriage is in position to receive a coil from the roller conveyer 31. During movement of the carriage 18 towards the mandrel 10, said tail end of the coil will slide along the upper surface of said guide plate and beneath a guide plate 96, extending in the direction of said guide plate 95 and mounted above said guide plate on said pinch roll stand, and will be guided by said guide plates between the pinch rolls 11, 11.

The lower pinch roll 11 is mounted adjacent its opposite ends in suitable bearing supports 99, projecting upwardly from a bottom plate 100 of a frame 101 of the pinch roll stand. Said frame is of a substantially C-shaped formation opening towards the guide plates 95 and 96, to permit the insertion of the tail end of the coil between said pinch rolls as the coil is loaded onto the mandrel 10. The upper portion of said frame 101 is provided with a pair of laterally spaced vertically extended channelled guides 102, 102, within which is guided a frame 103 having the upper pinch roll 11 suitably journaled therein, adjacent its opposite ends. A piston rod 104 extensible from a cylinder 105 is secured to the frame 103 for moving said frame vertically, to engage the upper pinch roll 11 with the upper surface of the metal and to pay the metal off of the mandrel 10 upon rotation of said pinch rolls.

The pinch rolls 11, 11 are both driven from a motor 106 mounted on a support bracket 107, herein shown as being pivotally connected to the frame 101 adjacent its inner end and projecting laterally therefrom. The opposite end of said bracket is supported on a yieldable member 108 which provides a floating mounting for said motor. Said motor has drive connection with a worm 109 through a suitable drive connection which is herein shown as being a V-belt drive indicated generally by reference character 110. The worm 109 meshes with a worm gear 111 on a shaft 112 substantially coaxial with the lower roll 11. Said shaft 112 has connection with the lower pinch roll 11 by means of a flexible drive connection indicated by reference character 114, herein shown as being a well known form of roller mill drive connection. A spur gear 115 on the shaft 112 meshes with and drives a spur gear 116 on a parallel shaft 113. Said shaft is flexibly connected with the upper pinch roll 11 by means of a suitable roller mill drive connection 117.

Referring now in particular to the fluid diagram shown in Figure 12 and the interlocking connection between the mandrel 10 and the cylinder 105 for engaging the pinch rolls with the strip metal, a control valve 119 is provided to control the admission and release of fluid under pressure to the cylinder 25, for expanding and retracting the mandrel 10. Said control valve is connected with a fluid pump 120 by means of a pressure line 121. A return line 122 leads from said control valve to a fluid storage tank 123. A pressure line 124 leads from said control valve to the piston rod end of the cylinder 25, to supply fluid under pressure to said end of said cylinder and move the wedges 23 and 24 in a direction to permit said mandrel to retract. A relief valve 125 is provided in said pressure line

to relieve excessive pressures from said pressure line and said cylinder 25. A pressure line 127 leads from the control valve 119 to a speed control valve 128. A pressure line 129 leads from said speed control valve to the head end of the cylinder 25 for supplying fluid under pressure thereto, to move the wedges 23 and 24 in a direction to expand the mandrel 10. The speed control valve 128 may be a reduced return valve of a well known form, to restrict the passage of fluid from the head end of said cylinder to the return, to retard the speed of travel of the piston 26 when moving in a direction to permit said mandrel to contract.

A pressure line 130 connects the pressure line 129 with a by-pass valve 131. A pressure line 133 connects said by-pass valve with a control valve 134. A return line 135 connects said control valve with the tank 123. A pressure line 136 connects said control valve with the head end of the cylinder 105, to supply fluid under pressure thereto and to move the upper pinch roll in a direction to engage the upper surface of the strip metal and to hold said pinch roll in engagement therewith. A pressure line 137 connects the control valve 134 with a speed control valve 139. A pressure line 140 connects said speed control valve with the piston rod end of the cylinder 105, for supplying fluid under pressure thereto and moving the upper pinch roll 11 in a direction to release pressure from the upper surface of the metal. Said speed control valve 139 like the speed control valve 128 may be a reduced return valve, and is provided to reduce and control the speed of engagement of the upper pinch roll with the strip metal. The by-pass valve 131 is provided to hold pressure in the line 130 until a predetermined pressure is reached therein, at which time the mandrel 10 will be in a fully expanded condition and will be held in engagement with the inside of the coil 15. This valve therefore prevents the upper pinch roll 11 from being moved into engagement with the upper surface of the metal until the mandrel 10 has been fully expanded.

A pump 141 is provided to supply fluid under pressure to the head and piston rod ends of the cylinders 61 and 47, to move the carriage 33 in one direction or another along the I-beams 16, 16 and to elevate or lower the carriage 18. The fluid and control connections from said pumps to said cylinders may be of any well known form and are no part of my present invention so will not herein be described in detail.

While I have herein shown and described one form in which my invention may be embodied, it will be understood that the construction thereof and the arrangement of the various parts may be altered without departing from the spirit and scope thereof. Furthermore, I do not wish to be construed as limiting my invention to the specific embodiment illustrated, excepting as it may be limited in the appended claims.

I claim as my invention:

1. In a device for feeding strip metal and in combination with a rotatable expansible mandrel, means for loading a coil of strip metal onto said mandrel comprising a carriage mounted for movement in the direction of the axis of said mandrel, another carriage mounted on said carriage for movement with respect thereto in the same direction as said first mentioned carriage, and forming a support for said coil, means for elevating said second mentioned carriage to elevate the coil of strip metal into position for loading

onto said mandrel, engaging means on said first mentioned carriage for engaging the edge of said coil opposite from said mandrel, and means for moving said carriages towards said mandrel for loading said coil onto said mandrel, said means being adapted to move said first carriage after said coil has been loaded onto said mandrel, while said second carriage remains in a stationary position, to cause said engaging means to align the edges of the turns of said coil while said coil is supported on said second carriage.

2. In a device for feeding strip metal and in combination with a rotatable expansible mandrel, means for loading a coil of strip metal onto said mandrel comprising a carriage mounted for movement in the direction of the axis of said mandrel, another carriage mounted on said carriage for movement with respect thereto in the same direction as said first mentioned carriage and forming a support for said coil, means for elevating said second mentioned carriage, to elevate said coil into position for loading onto said mandrel, means on said first mentioned carriage for engaging the edge of said coil opposite said mandrel, and means for moving said carriages towards said mandrel, for loading said coil onto said mandrel, said means being adapted to move said first carriage after said coil has been loaded onto said mandrel, while said second carriage remains in a stationary position, to cause said engaging means to align the edges of the turns of said coil while said coil is supported on said second carriage in alignment therewith, and means for returning said second carriage to a loading position with respect to said first carriage after the weight of said coil has been relieved therefrom.

3. In a device for feeding strip metal and in combination with a rotatable expansible mandrel, means for loading a coil of strip metal onto said mandrel comprising a carriage mounted for movement in the direction of the axis of said mandrel, another carriage mounted on said carriage for movement with respect thereto in the same direction as said first mentioned carriage and forming a support for said coil, means for elevating said second mentioned carriage to elevate said coil into position for loading onto said mandrel, engaging means on said first mentioned carriage for engaging the edge of said coil opposite said mandrel, and means for moving said carriages towards said mandrel for loading said coil onto said mandrel, said means being adapted to move said first carriage after said coil has been loaded onto said mandrel, while said second carriage remains in a stationary position, to cause said engaging means to align the edges of the turns of said coil while said coil is supported on said second carriage in alignment therewith, and yieldable means connected between said carriages for returning said second carriage to an initial loading position with respect to said first carriage after the weight of said coil has been relieved therefrom.

4. In a device for feeding strip metal and in combination with a rotatable expansible mandrel, means for loading a coil of strip metal onto said mandrel comprising a carriage mounted on ways for movement towards and from said mandrel in the direction of the axis of said mandrel, a coil supporting carriage having a plurality of rollers thereon for supporting a coil of strip metal, said coil supporting carriage being mounted on said first mentioned carriage for movement in the direction of the axis of said mandrel, means for

elevating said coil supporting carriage to elevate said coil into position for loading onto said mandrel, an aligning plate mounted on said first mentioned carriage and having engagement with the edge of said coil opposite from said mandrel, and means for moving said carriages and aligning plate towards said mandrel, for loading said coil onto said mandrel, said means being adapted to move said first mentioned carriage and said aligning plate with respect to said mandrel after said coil has been loaded onto said mandrel, to align the edges of the turns of said coil.

5. In a device for feeding strip metal and in combination with a rotatable expansible mandrel, means for loading a coil of strip metal onto said mandrel comprising a carriage mounted on ways for movement towards and from said mandrel in the direction of the axis of said mandrel, a coil supporting carriage having a plurality of rollers thereon for supporting a coil of strip metal, said coil supporting carriage being mounted on said first mentioned carriage for movement in the direction of the axis of said mandrel, means for elevating said coil supporting carriage to elevate said coil into position for loading onto said mandrel, an aligning plate mounted on said first mentioned carriage and having engagement with the edge of said coil opposite from said mandrel, and means for moving said carriages and plate towards said mandrel, for loading said coil onto said mandrel, said means being adapted to move said first mentioned carriage and aligning plate towards said mandrel after said coil has been loaded thereon while said carriage remains in a stationary position, to cause said aligning plate to align the edges of the turns of said coil while said coil is supported in an aligned position on said coil supporting carriage, and means operable to return said coil supporting carriage to an initial position with respect to said first carriage after the weight of said coil has been removed therefrom.

6. In a device for feeding strip metal and in combination with a rotatable mandrel, means for loading a coil of strip metal onto said mandrel comprising a carriage mounted on ways for movement towards and from said mandrel in the direction of the axis of said mandrel, a coil supporting carriage having a plurality of rollers thereon for supporting a coil of strip metal, said coil supporting carriage being mounted on said first mentioned carriage for movement in the direction of the axis of said mandrel, means for elevating said coil supporting carriage, to elevate said coil into position for loading onto said mandrel, an aligning plate mounted on said first mentioned carriage and having engagement with the edge of said coil opposite from said mandrel, and means for moving said carriages and plate towards said mandrel, for loading said coil onto said mandrel, said means being adapted to move said first mentioned carriage and plate towards said mandrel after said coil has been loaded thereon while said carriage remains in a stationary position, to cause said plate to align the edges of the turns of said coil while said coil is supported in an aligned position on said coil supporting carriage, and means operable to return said coil supporting carriage to an initial position with respect to said first carriage after the weight of said coil has been removed therefrom, including yieldable means connected between said carriages.

7. In a device for feeding strip metal and in combination with a rotatable mandrel, an abutment plate at the end of said mandrel opposite

11

the receiving end thereof and adapted to rotate therewith and be engaged by an edge of the coil of strip metal, means for loading a coil of strip metal onto said mandrel comprising a carriage mounted on ways for movement towards and from said mandrel in the direction of the axis of said mandrel, a coil supporting carriage for supporting a coil of strip metal, said coil supporting carriage being mounted on said first mentioned carriage for movement in the direction of the axis of said mandrel, means for elevating said coil supporting carriage to elevate said coil into position for loading onto said mandrel, an aligning plate mounted on said first mentioned carriage and having engagement with the edge of said coil opposite from said abutment plate, and means for moving said carriages and aligning plate towards said abutment plate for loading said coil onto said mandrel and for moving said first mentioned carriage and plate with respect to said mandrel after said coil has been loaded onto said mandrel, for aligning the edges of the turns of said coil between said abutment plate and said aligning plate.

8. In a device for feeding strip metal and in combination with a rotatable mandrel, an abutment plate at the end of said mandrel opposite the receiving end thereof and adapted to rotate therewith and be engaged by an edge of the coil of strip metal, means for loading a coil of strip metal onto said mandrel comprising a carriage mounted on ways for movement towards and from said mandrel in the direction of the axis of said mandrel, a coil supporting carriage for supporting a coil of strip metal, said coil supporting carriage being mounted on said first mentioned carriage for movement in the direction of the axis of said mandrel, means for elevating said coil supporting carriage to elevate said coil into position for loading onto said mandrel, an aligning plate mounted on said first mentioned carriage and having engagement with the edge of said coil opposite from said abutment plate, and means for moving said carriages and aligning plate towards said abutment plate for loading said coil onto said mandrel and for moving said first mentioned carriage and plate with respect to said mandrel after said coil has been loaded onto said mandrel for aligning the edges of the turns of said coil between said abutment plate and said aligning plate, said coil supporting carriage being adapted to remain stationary during the operation of aligning the edges of the turns of said coil, to maintain said carriage in centered relation

12

with respect to said coil during said aligning operation, and means operable to return said coil supporting carriage to an initial position with respect to said first mentioned carriage after the weight of said coil has been removed therefrom.

9. In a device for feeding strip metal and in combination with a rotatable mandrel, an abutment plate at the end of said mandrel opposite the receiving end thereof and adapted to rotate therewith and be engaged by an end of the coil of strip metal, means for loading a coil of strip metal onto said mandrel comprising a carriage mounted on rails for movement towards and from said mandrel in the direction of the axis of said mandrel, a coil supporting carriage for supporting a coil of strip metal, said coil supporting carriage being mounted on said first mentioned carriage for movement in the direction of the axis of said mandrel, means for elevating said coil supporting carriage to elevate said coil into position for loading onto said mandrel, an aligning plate mounted on said first mentioned carriage and having engagement with the edge of said coil opposite from said abutment plate, and means for moving said carriages and aligning plate towards said abutment plate, for loading said coil onto said mandrel and for moving said first mentioned carriage and plate with respect to said mandrel after said coil has been loaded onto said mandrel, for aligning the edges of the turns of said coil between said abutment plate and said aligning plate, said coil supporting carriage being adapted to remain stationary during the operation of aligning the edges of the turns of said coil, to maintain said carriage in a centered position with respect to said coil, during said aligning operation, and yieldable means connected between said carriages to return said coil supporting carriage to an initial position with respect to said first mentioned carriage after the weight of said coil has been removed therefrom.

FRANK J. WOOD.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,175,755	Matteson	Oct. 10, 1939
2,228,477	Nash et al.	Jan. 14, 1941
2,266,067	Nyberg	Dec. 16, 1941
2,278,240	Calleson et al.	Mar. 31, 1942