

May 22, 1956

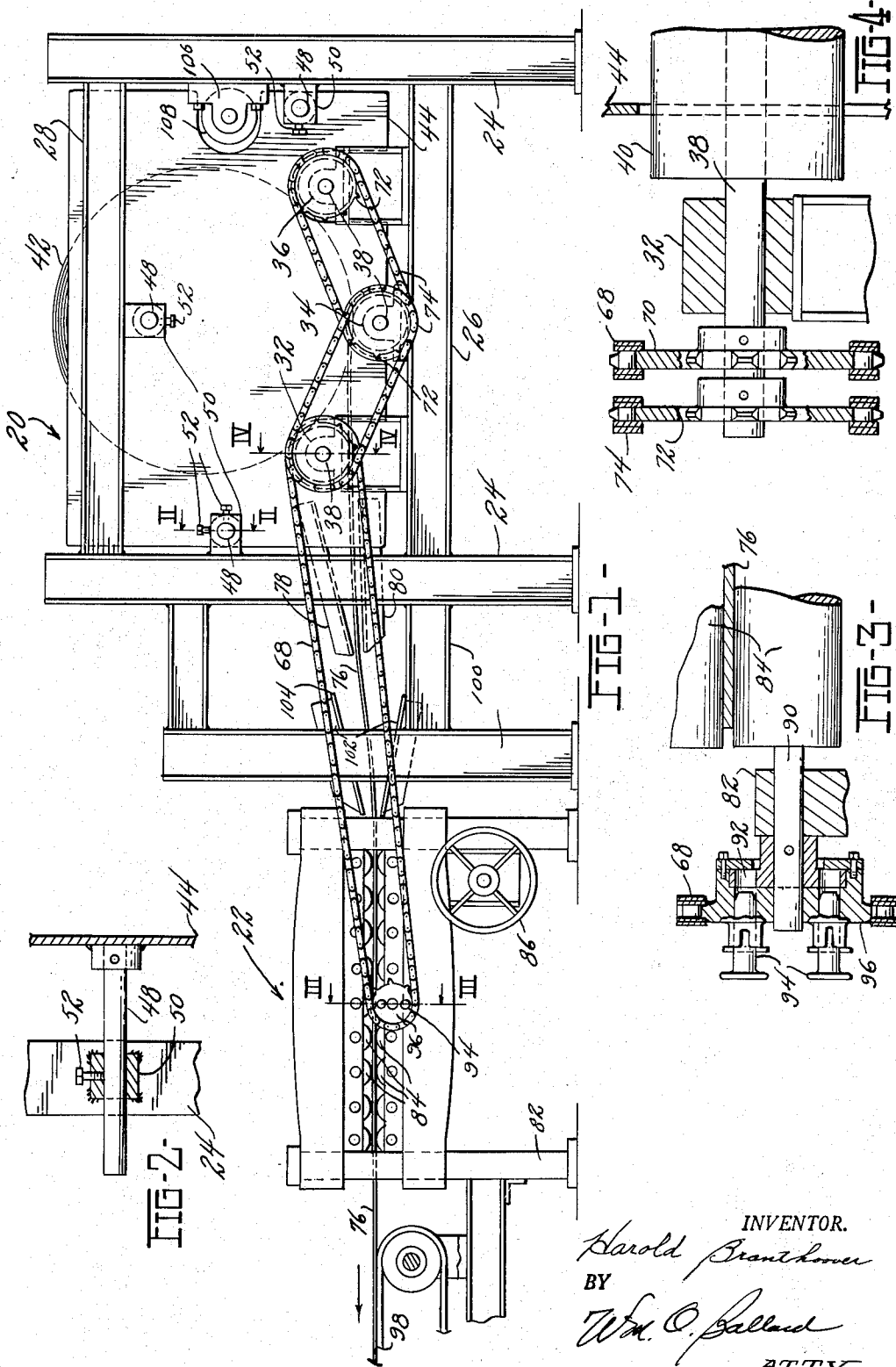
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APPARATUS FOR UNWINDING COILS

Filed April 7, 1952

4 Sheets-Sheet 1



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4 Sheets-Sheet 2

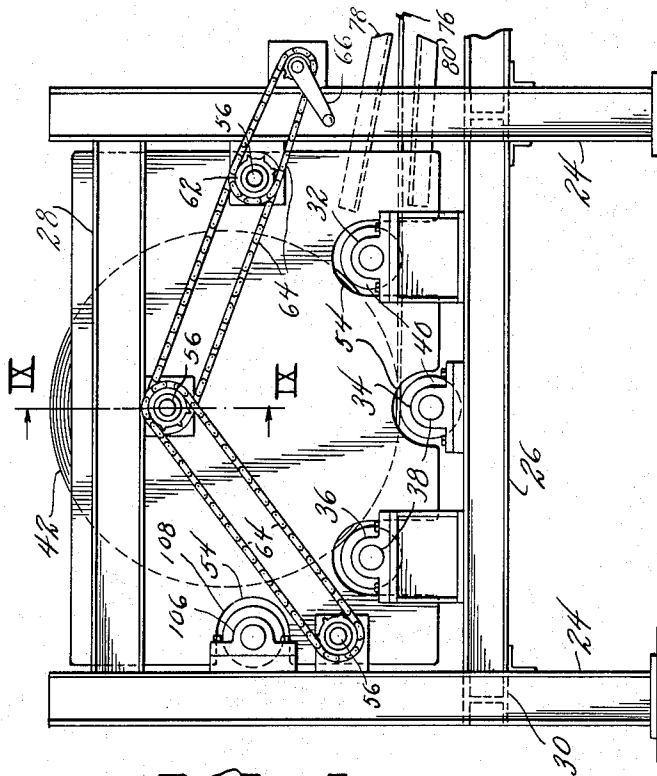


FIG. 7-

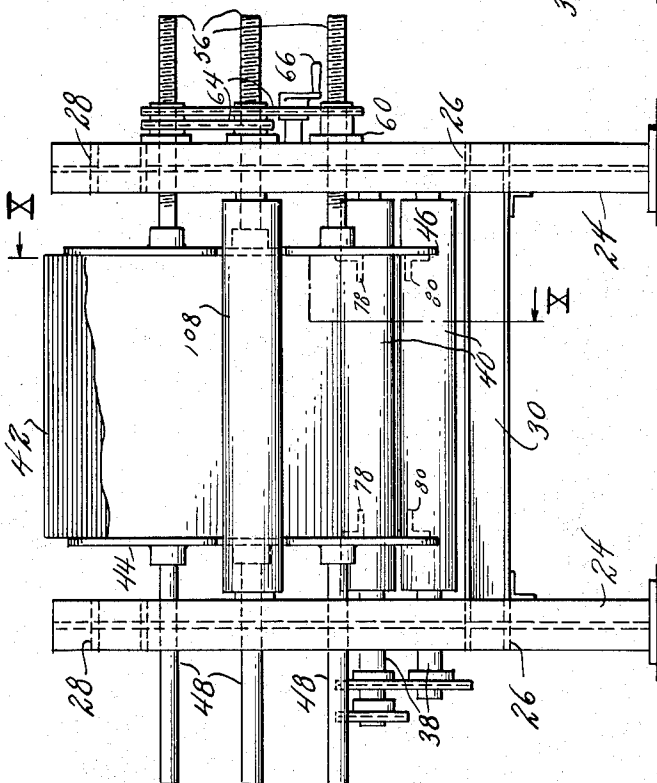


FIG. 8-

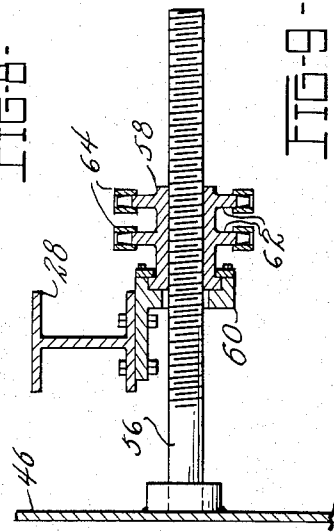


FIG. 9-

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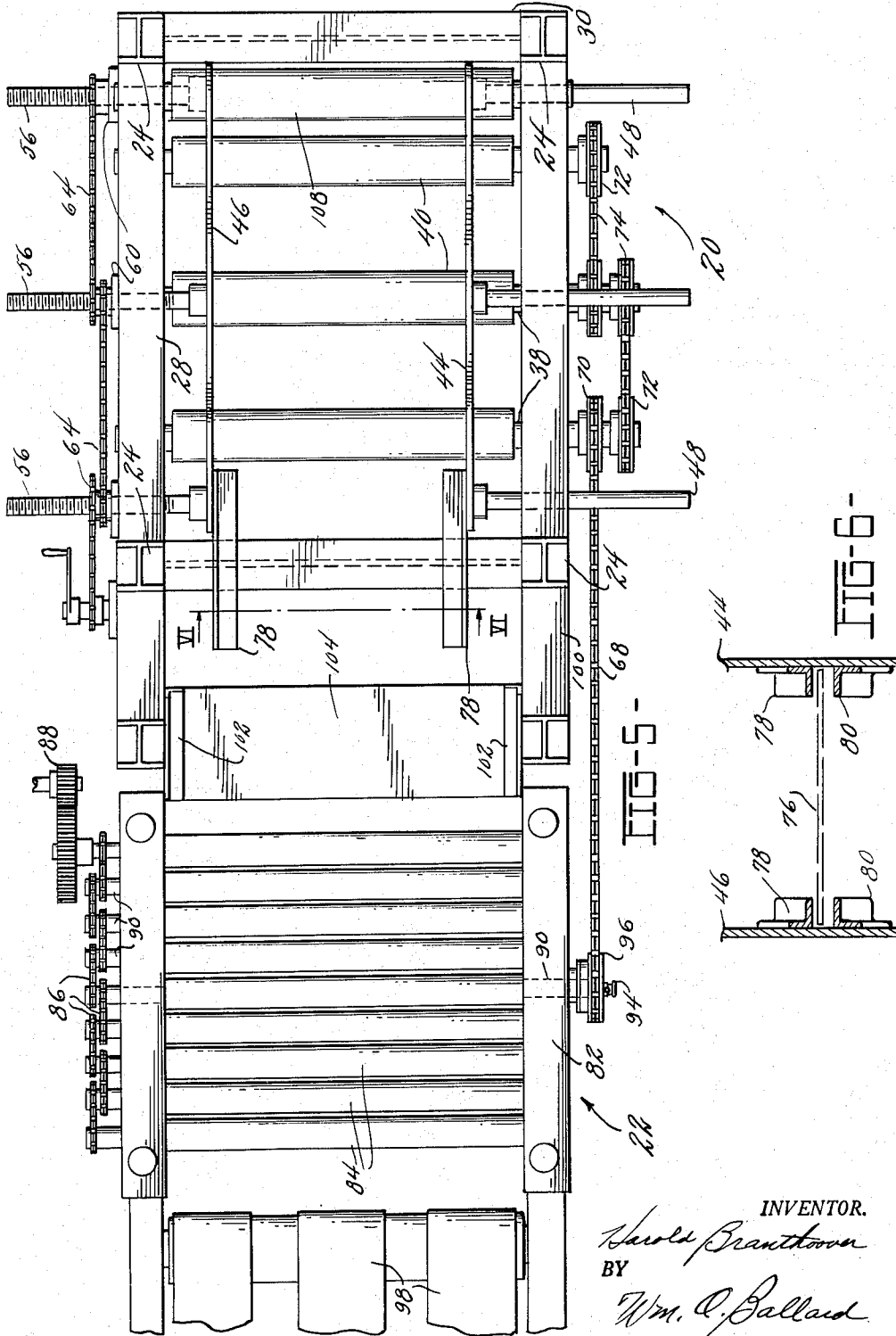
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4 Sheets-Sheet 3



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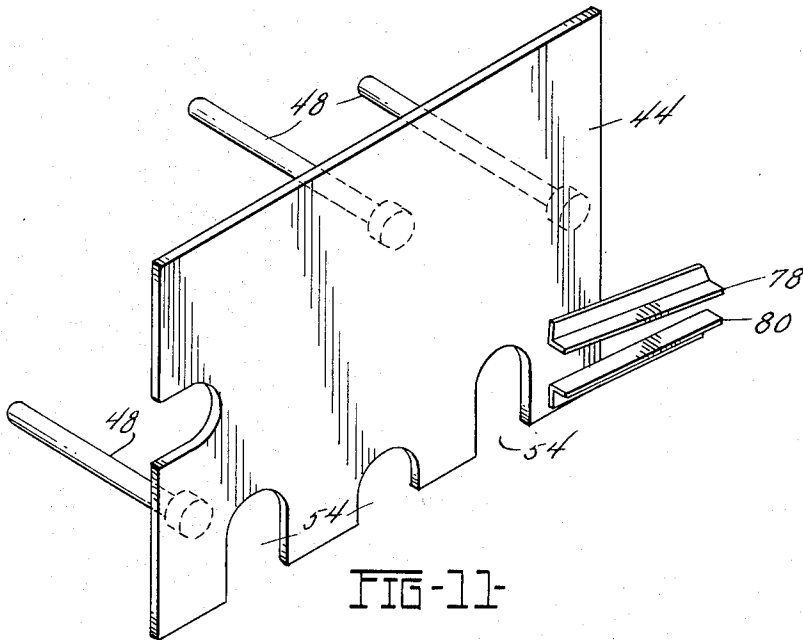
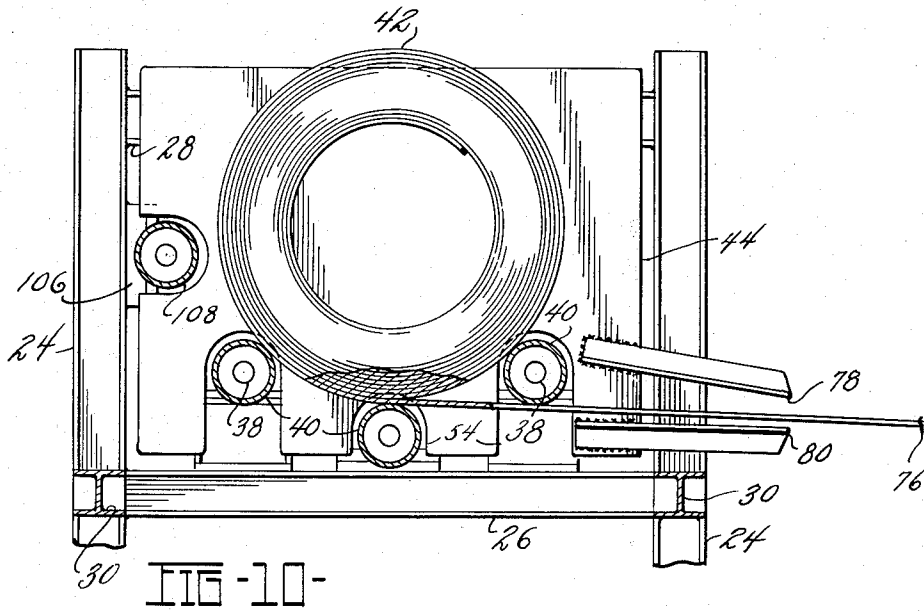
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APPARATUS FOR UNWINDING COILS

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4 Sheets-Sheet 4



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2,746,511

APPARATUS FOR UNWINDING COILS

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Application April 7, 1952, Serial No. 280,958

1 Claim. (Cl. 153—54)

This invention relates to apparatus for the uncoiling of mill rolls of sheet metal and the feeding of the metal strip therefrom to shearing or other fabricating machines.

An object of this invention is to provide a support for a mill roll of strip material and to effect a controlled uncoiling thereof.

Another object of this invention is to provide an adjustable frame for holding various size rolls of sheet material from which the discharge of a strip therefrom is kept under full control.

Another object of this invention is to provide an uncoiling apparatus wherein the rate of feed therefrom is nicely controlled and the strip is maintained within a predetermined path.

And another object of this invention is to provide an apparatus for handling heavy coils of sheet stock, to evenly and smoothly uncoil the same and deliver the feed thereof to other apparatus at a controlled rate and through a confined path.

Other objects and advantages of this invention relating to the arrangement, operation and function of the related elements of the structure, to various details of construction, to combinations of parts and to economies of manufacture, will be apparent to those skilled in the art upon consideration of the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts to the several views.

Referring to the drawings:

Fig. 1 is a side elevation of the apparatus from the drive side thereof;

Fig. 2 is a view on the line II—II, Fig. 1;

Fig. 3 is a view on the line III—III, Fig. 1;

Fig. 4 is a view on the line IV—IV, Fig. 1;

Fig. 5 is a plan view of the apparatus;

Fig. 6 is a view on the line VI—VI, Fig. 5;

Fig. 7 is an end view of the apparatus, looking from the right of Fig. 1;

Fig. 8 is a partial side view of the apparatus from the right of Fig. 7;

Fig. 9 is a view on the line IX—IX, Fig. 8;

Fig. 10 is a view on the line X—X, Fig. 7; and

Fig. 11 is a perspective view of one of the side plates used within the apparatus.

For purposes of description, the machine herein may be considered as having two major sections, a cradle 20 and an ironer 22.

The cradle

The cradle 20 includes a box-type frame constructed from heavy I-beams capable of supporting weights measured in tons. The frame includes corner posts 24 connected by and supporting an opposing pair of lower side beams 26 and a pair of upper side beams 28. End beams 30 connect and extend between the sides.

The pair of lower side beams 26 mount three aligned pairs of bearings 32, 34, 36, each pair in turn mounting

a shaft 38 which is an axle for a roller 40. The bearings are so dimensioned that the three rollers 40 mounted thereby are disposed on a common arc to provide a seat into which may be deposited a coiled mill roll 42 of sheet metal such as steel. Raw stock such as sheet metal, especially steel, is usually received from the mills in the form of coils 42 which are wound strips of various widths. Such material is stored in this form and later when withdrawn from storage to be fabricated into finished products, the coil is subjected to a cleansing treatment such as a pickling bath and then conveyed to the machine herein disclosed which unwraps the coil and feeds the same in the form of a continuous strip to an initial fabricating apparatus such as a shear which cuts the strip into usable lengths or blanks suitable for additional fabrication.

The tremendous weights involved and the tensions developed within the coil and in the individual wraps advance problems in the uncoiling and it is the purpose of the machine herein to overcome these difficulties.

When the coil 42 is deposited upon the rollers 40, it is desirable to hold the coil against lateral movement during the uncoiling operation, prevent self-uncoiling, and restrain outward pyramiding of inner wraps. It is desirable to feed the strip therefrom only in a predetermined controlled manner both as to direction and rate.

To this end, a pair of side plates 44, 46, are provided, vertically extending upwardly from the rollers 40, in opposing relationship between the pairs of side beams 26, 28, to thereby provide a pocket or bin for the coil 42.

In that the coils are of various widths, these plates 44, 46, are adjustable toward and from each other. The plate 44 has a plurality of rods 48 terminally fixed thereto and extending outwardly therefrom through bearings 50 mounted on the frame members 24, 28. The plate 44, as so supported may be manually shifted laterally in the frame and when set at a predetermined position, usually against or very close to one side of the coil 42, set screws 52, in the bearings 50, may lock the plate 44 in its predetermined position. This plate 44 may be initially set as the guide for gauging the deposit of the coil 42 onto the rollers 40.

The plates 44, 46, are provided with cut-out portions 54 for the rollers 40.

The plate 46 is also provided with a plurality of outwardly extending mounting rods 56 which are threaded into and mounted by nuts 58 supported in brackets 60 mounted on the frame members 24 and 28.

These nuts 58 also mount sprockets 62 which are connected by chains 64. An additional nut and sprocket are mounted on a member 24 and in turn mount a crank 66. Rotation of the crank 66 drives the chains 64, which in turn, rotate the nuts 58 to laterally shift the plate 46 toward and from the plate 44.

There is thus provided a roughly adjustable plate 44 and a finely adjustable plate 46, manually controlled so that the spacing of the plates may be readily and nicely effected.

The rollers 40 are positively driven at a common speed and this is accomplished through a transmission system including a drive chain 68 from the ironing unit 22, driving sprocket 70 fixed on the shaft 38 nearest the unit 22. Additional sprockets 72 and connecting chains 74 between the shafts 38 provide an interconnecting transmission.

The coil 42 is deposited by a suitable carrier into the cradle unit 20, to freely rest on the rollers 40. No axle device is required. The side plates 44, 46 are adjusted to adjacent the sides of the coil. The outer warp 76 of the coil is passed under the roller 40 carrying the sprocket 70 and between guides 78, 80 carried by the plates 44, 46. These guides comprise a pair of L-shaped angle strips

welded to the plates 44, 46 and converge toward each other to provide a pair of tapered throats defining a strip edge restraining guide to reduce any tendency of the strip 76 to buckle or shift out line in its movement from the coil 42 to the ironing unit 22.

The ironer

In aligned position with the unit 20, the ironer 22 includes a frame 82 mounting a series of opposing pairs of rollers 84 which may be adjusted as to each other by operation of hand wheel 86 to accommodate various thicknesses of sheet metal strips 76 which are smoothed therebetween. These rollers 84 are driven in unison by an interconnecting sprocket and chain transmission 86, in turn driven from a speed reduction transmission 88, driven by a motor (not shown). When the metal sheet leaves the coil 42, there remains therein a tendency to recoil, warp or buckle, which has been caused by internal stress set up during the original coiling and subsequent shipment and storage of the coil. By passing the strip between the series of leveling rollers 84, the recoil tendency is reduced to a minimum, so that the strip in leaving the ironer will lie flat on the conveyor 98, facilitating the subsequent handling at the cutter or other fabricating devices.

Each roller 84 is mounted on a shaft 90 and one of these shafts 90 has a ported plate 92 fixed therewith as part of a clutch mechanism 94 whereby a sprocket 96 may be engaged at will to be driven by the shaft 90. The sprocket 96 engages the chain 68 extending to the cradle unit 20.

When the sprocket 96 is driven by the shaft 90, the rollers 40 will be driven at a complementary speed with the rollers 84 so that the feed of the strip 76 from the coil 42 equals the capacity of the rollers 84. Thus a smooth movement of the strip is assured to and through the ironer 84.

The smoothed strip 76 passes from the rollers 84 on to a conveyor 98 which conveyor may carry the strip to a shearing or cutting apparatus serving as the initial step in the fabrication of the sheet stock into finished or end products.

Disposed between the units 20, 22 is an auxiliary frame 100 providing a mount for a second strip retaining guide. This frame 100 mounts a pair of converging brackets 102, one on each side thereof to provide strip edge retainers coacting with brackets 102 which mount a sheet hood 104 therebetween extending over the width of the strip 76. There is thus provided two sets of guides, one set as the strip leaves the coil and other as it enters the

ironer. This insures against any undue buckling of the strip during the transfer and retains a smooth feed thereof throughout the entire length of strip provided by any one coil.

The pulling of the outer wrap from the coil may create some disturbance of the coil body causing the same to rock from the cradle. To prevent undue movements of this type, the rear posts 24 may mount bearings 106 which in turn support an idler roller 108.

It is to be understood that the above detailed description of the present invention is intended to disclose an embodiment thereof to those skilled in the art, but that the invention is not to be construed as limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of being practiced and carried out in various ways without departing from the spirit of the invention. The language used in the specification relating to the operation and function of the elements of the invention is employed for purposes of description and not of limitation, and it is not intended to limit the scope of the following claim beyond the requirements of the prior art.

What is claimed and desired to be secured by United States Letters Patent:

Apparatus for unwinding coils of sheet metal strips embodying a frame, a plurality of rollers mounted in said frame providing a supporting cradle for the coil, means for driving said rollers in unison, a pair of vertical plates in said frame above said rollers, means for adjusting said plates toward and from each other laterally above said rollers, and strip edge retaining guides for the strip mounted by said plates and said retaining guides extending a substantial distance along the inner faces of said plates and continuing a substantial distance beyond the perimeter of said plates.

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