

May 26, 1931.

E. R. KNAPP

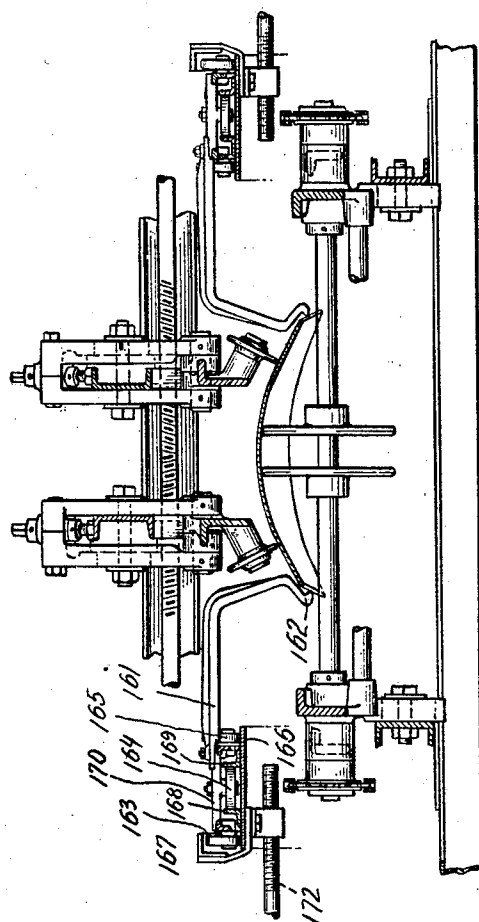
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APPARATUS FOR TREATING METAL SHEETS

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4 Sheets-Sheet 1

Fig. 1.



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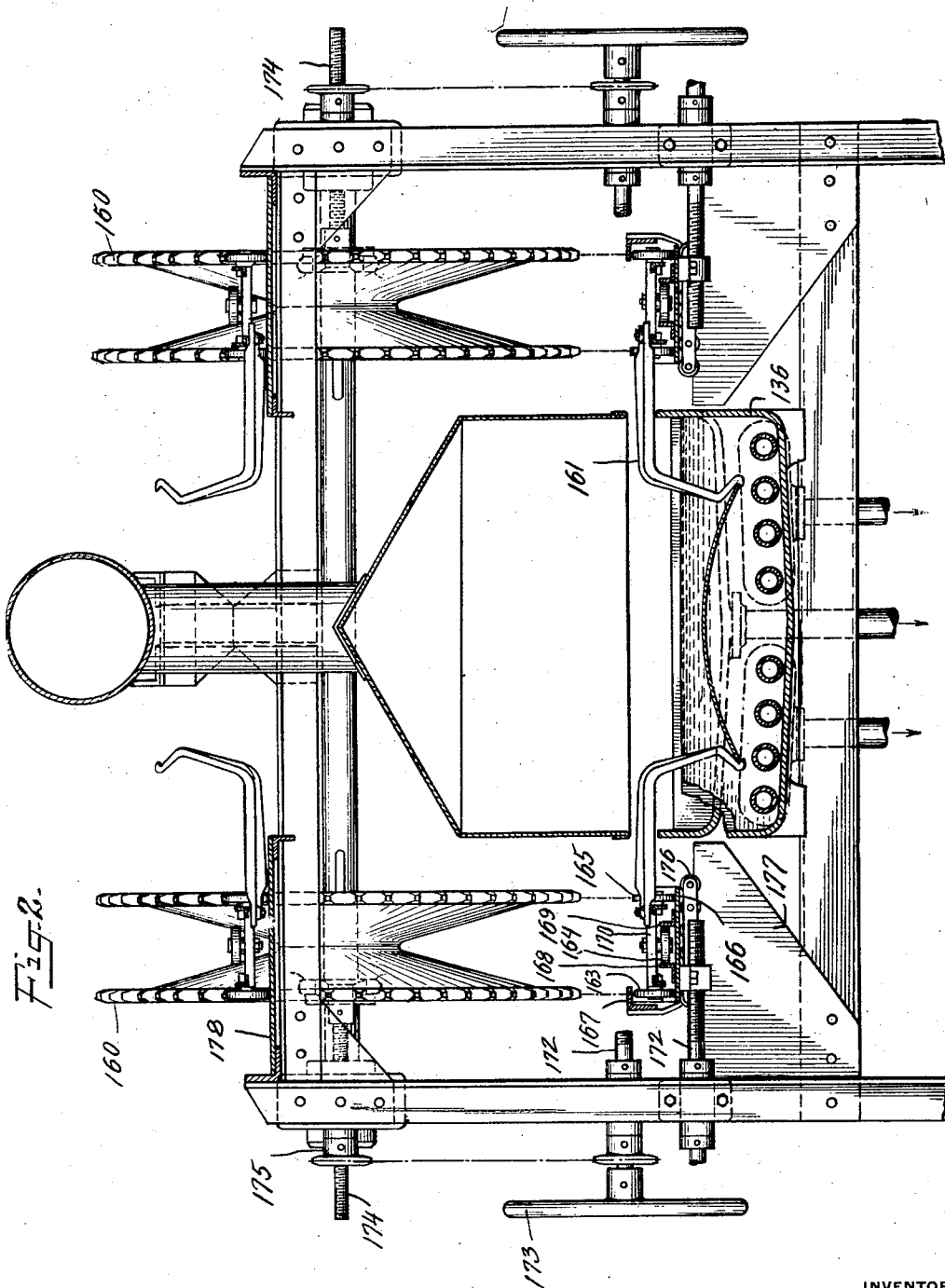
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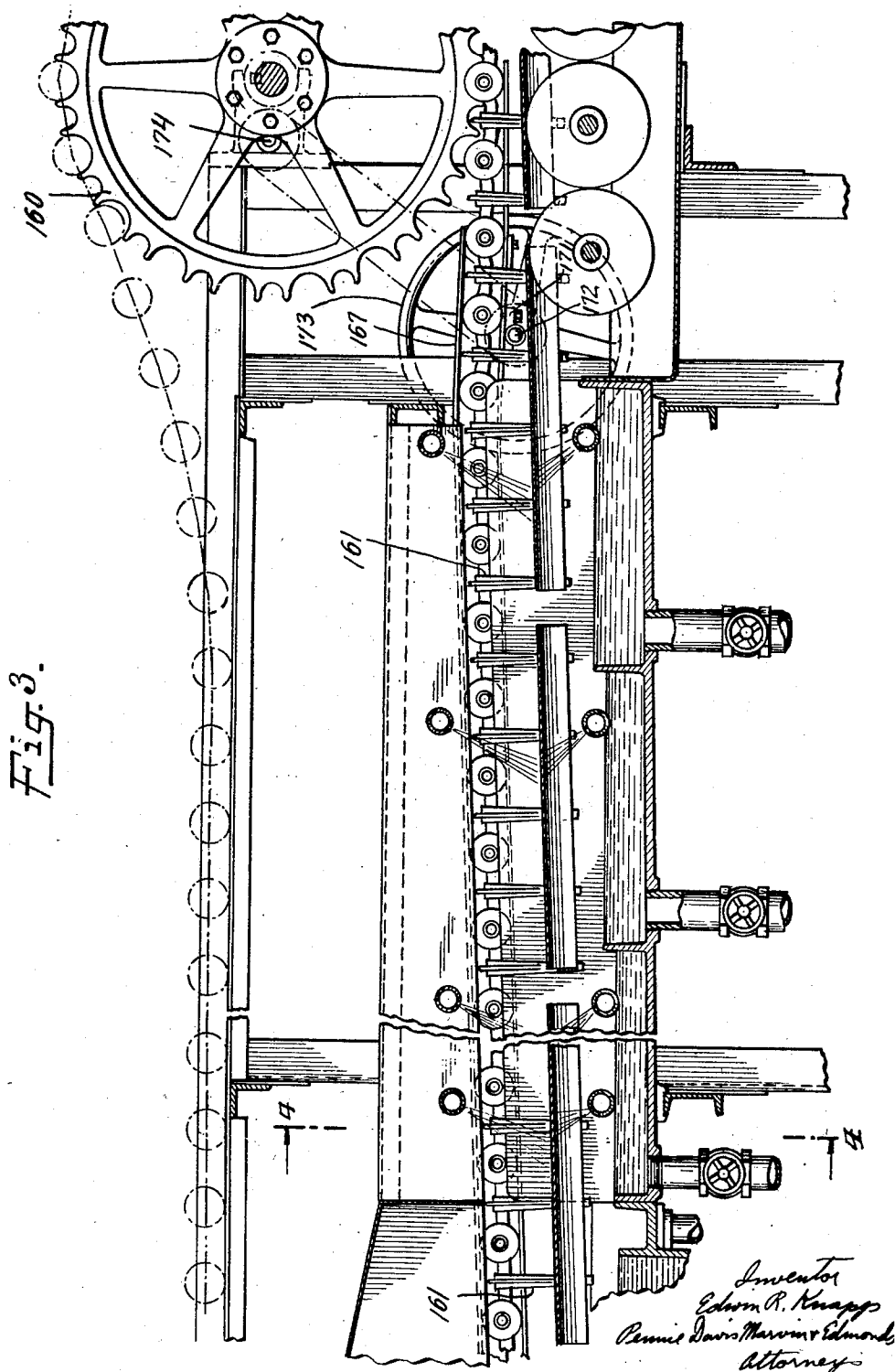
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APPARATUS FOR TREATING METAL SHEETS

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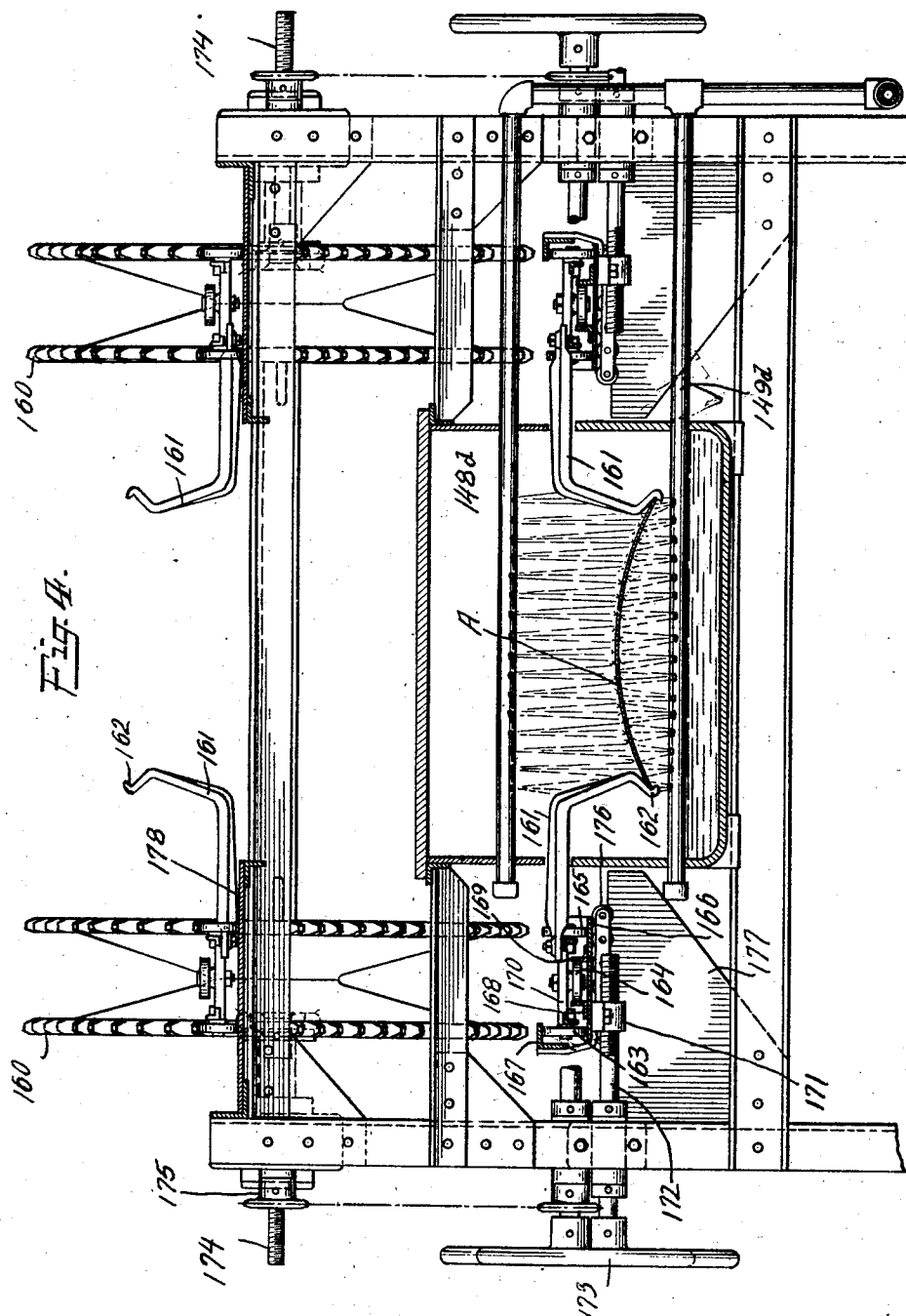
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4 Sheets-Sheet 4



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APPARATUS FOR TREATING METAL SHEETS

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This invention relates to conveyors and more particularly to a conveyor adapted for conveying arched metal sheets. In the embodiment of the invention herein shown and described I provide a pair of conveyor sections, each of which is provided with arms extending toward the other section and having gripping means at the free end of each arm for engaging an edge of an arched sheet. I further provide a track support for each conveyor section together with means for adjusting the position of the track supports to accommodate sheets of different widths.

The invention is particularly adapted for conveying arched metal sheets through tanks of liquid, such as pickling tanks and through spray apparatus, such as washing devices associated with pickling tanks and is adapted to individually convey the metal sheets in arched form through the pickling and washing apparatus so that the sheets will be more uniformly pickled than in the heretofore employed method of pickling sheets in packs.

In the accompanying drawings, Figure 1 is a fragmentary transverse section view of the conveyor adjacent one end showing it about to receive an arched sheet from an arching mechanism.

Figure 2 is a transverse section view of a pickling apparatus showing the operation of the conveyor carrying a sheet through the pickling tank.

Figure 3 is a longitudinal section view of washing apparatus associated with the pickling apparatus.

Figure 4 is a transverse section view taken on line 4—4 of Figure 3.

The conveyor which serves to carry the individual sheets through the acid bath in arched form is preferably constructed so that only the conveyor fingers which engage the edges of the sheets pass through the acid. The sheets are engaged along their edges only, thus insuring adequate exposure of all portions of the sheet surfaces to the action of the acid and to the subsequent action of the washing apparatus. The conveyor illustrated in the accompanying drawings is made in two sections, one for engaging each side of each of the sheets as it is delivered from

the arching mechanism. Each section of the conveyor is carried by double sprocket wheels mounted on a suitable supporting structure. The sprocket wheels 160, at one end of the conveyor are shown in Fig. 2 of the drawings. Each conveyor section is made up of a number of links best illustrated in Figure 2. As shown in this figure, each link includes a bent arm 161, having a rearwardly projecting bent finger 162 adapted to engage the edge of a sheet A. The opposed conveyor arms 161 on the two conveyor sections are formed in such a manner that they are adapted to engage the edges of each sheet as it is delivered from the arching mechanism. The sheets expand slightly as they are being delivered from the arching mechanism until they engage the conveyor arms.

Each of the conveyor arms 161 is carried by a small truck consisting of three wheels 163, 164, and 165. The wheels 163 and 165 are arranged in vertical planes and are adapted to roll along a horizontal track 166. An auxiliary upper track 167 is provided against which the wheels 163 may bear in the event that the arms 161 are for any reason forced downwardly so as to pivot about the wheels 165. The track 167 thus limits such displacement of the arms 161 without interfering with the normal operation of the conveyor. The wheels 164 are arranged in a horizontal plane and are adapted to engage vertical tracks 168 and 169. The wheels 164 and their cooperating tracks 168 and 169 prevent lateral displacement of the conveyor links. All of the wheels 163, 164 and 165 are suitably journaled on a support 170. A screw-threaded block 171 is fixed with respect to the above mentioned tracks and is engaged by an adjusting screw 172 connected to a hand wheel 173. By turning this hand wheel, the position of the tracks with respect to the acid container 136 can be varied to suit the requirements for sheets of various widths. This adjusting mechanism is provided for each of the conveyor sections.

Whenever the positions of the conveyor tracks are changed, it is necessary to change the positions of the sprocket wheels in a corresponding manner. I have illustrated these

sprocket wheels as being splined to their supporting shafts, and I have illustrated screw-threaded adjusting rods 174 connected to the sprocket wheels in such a manner that, by
 5 rotating the screw-threaded members 175, the positions of the sprocket wheels can be changed. The members 175 can be connected to the hand wheels 173 so that by merely turning the hand wheels, the conveyor tracks
 10 and the sprocket wheels can be simultaneously adjusted.

The tracks 166 are supported on grooved rollers 176, and these rollers are adapted to travel along supporting plates 177 carried by
 15 the framework of the apparatus. When the tracks are adjusted toward or away from the acid container, they simply move along on the rollers 176. Tracks 178 are arranged so as to support the conveyor links while they
 20 travel from the rear end of the acid bath to the forward end of the same.

It is desirable to have the sheets carried through the acid bath while in arched form, because the sheets can then be carried by
 25 means engaging the edges of the sheets only. It is desirable to retain the sheets in arched form during the washing operation, because the washing action is more effective than it would be if the sheets were all horizontal; the
 30 water readily drains off from the curved sheets, and as the sheets come into close proximity with the successive spray pipes, the acid is effectively removed. Depending aprons 179 and a cover plate 180 serve to en-
 35 close the washing apparatus.

I claim:

1. A conveyor for carrying metal sheets in arched form, comprising two conveyor sections, each provided with arms extending
 40 toward the other section, gripping means at the free end of each arm for engaging an edge of an arched sheet, a track support for each conveyor section, and means for adjusting the positions of the track supports.

45 2. A conveyor for metal sheets comprising two sections, supporting conveyor arms projecting from one section toward the other, the two sets of arms being adapted to carry the metal sheets between them, a pair of ver-
 50 tically arranged rollers and a horizontally arranged roller carried near one end of each of said arms, a pair of horizontal tracks engaging the vertical rollers, and a pair of ver-
 55 tical tracks engaging the horizontal roller, the said tracks and rollers being arranged so as to restrict lateral and angular movement of the conveyor arms while permitting free forward movements of the conveyor.

3. A conveyor for metal sheets comprising
 60 two sections, supporting conveyor arms projecting from one section toward the other, the two sets of arms being adapted to carry the metal sheets between them, a pair of ver-
 65 tically arranged rollers and a horizontally arranged roller carried near one end of each

of said arms, a pair of horizontal tracks en-
 70 gaging the vertical rollers, a pair of vertical tracks engaging the horizontal roller, the said tracks and rollers being arranged so as to restrict lateral and angular movement of
 75 the conveyor arms while permitting free forward movements of the conveyor, means for interconnecting the tracks of each conveyor section to form a track structure, roll-
 80 er bearings for each track structure, and means for adjusting the position of the track structure of one conveyor section with re-
 85 spect to that of the other conveyor section.

In testimony whereof I affix my signature.

EDWIN R. KNAPP.

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