June 7, 1927.

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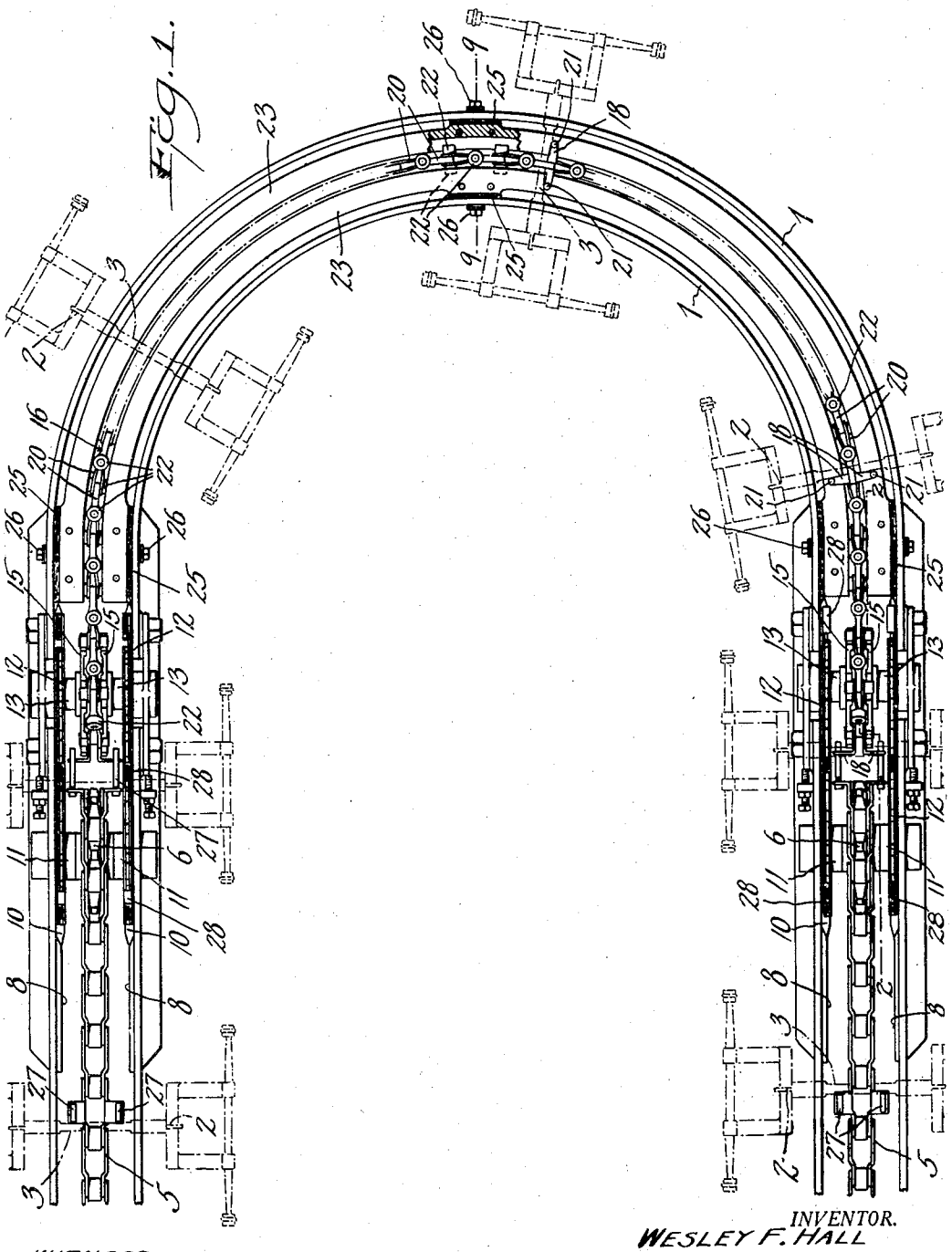
W. F. HALL

CONVEYER

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4 Sheets-Sheet 1

Fig. 1.



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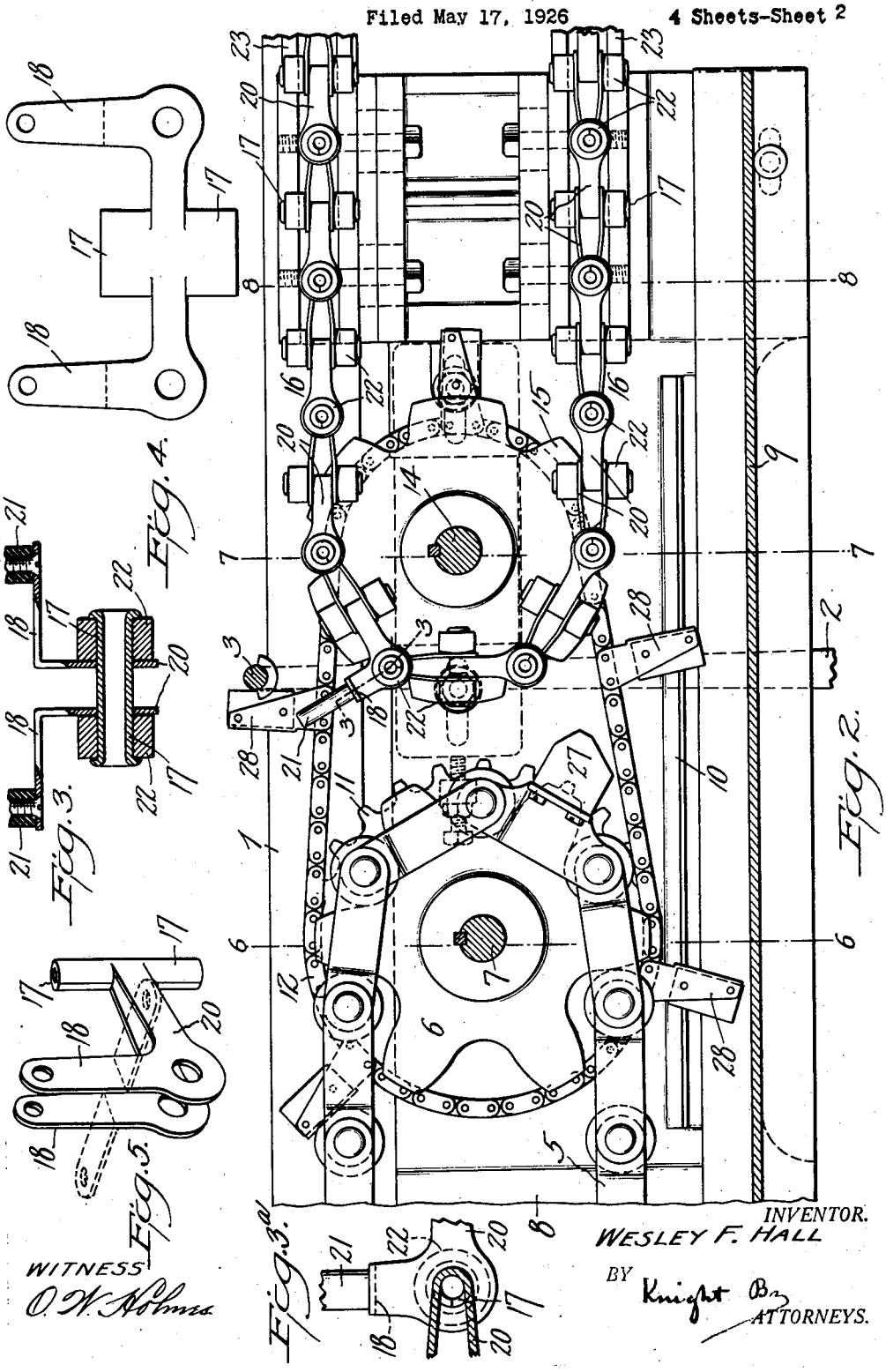


Fig. 2.

Fig. 4.

Fig. 3.

Fig. 5.

Fig. 3a.

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Fig. 7.

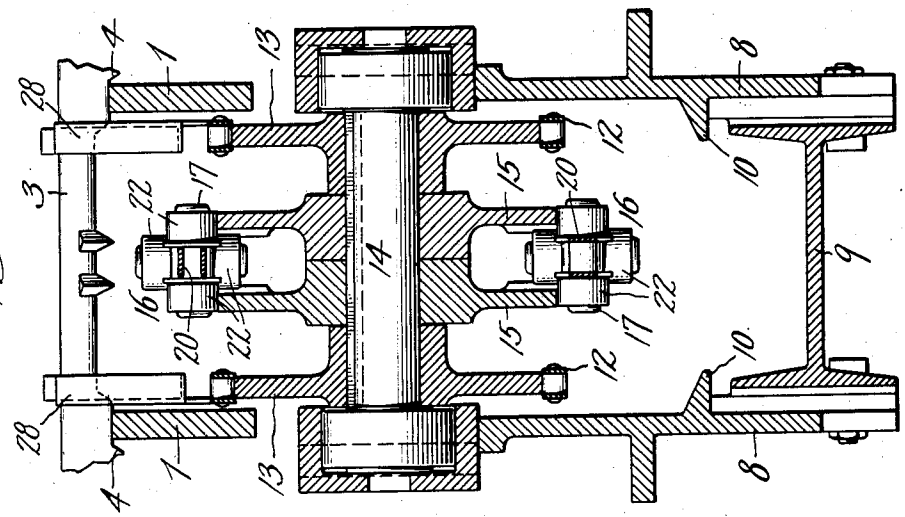
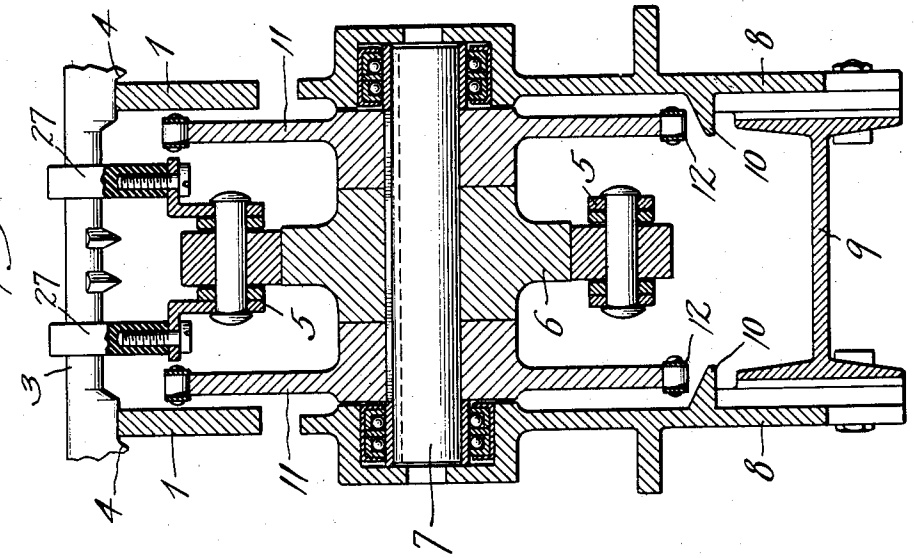


Fig. 6.



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Fig. 9.

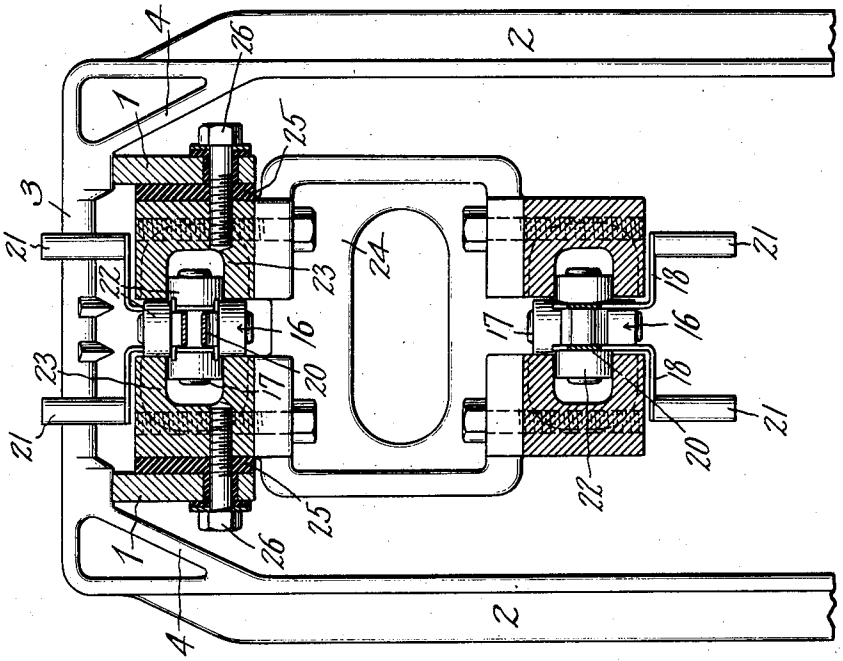
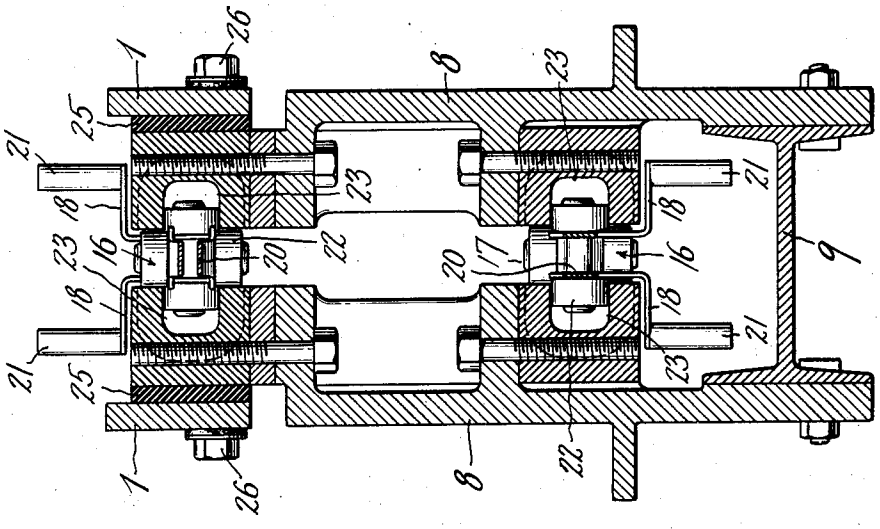


Fig. 8.



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UNITED STATES PATENT OFFICE.

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CONVEYER.

Application filed May 17, 1926. Serial No. 109,721.

This invention relates to conveyers for electroplating or dipping machines of that class where articles are conveyed through tanks first along one side and then returned along the other side, and more particularly to that sub-class in which provision is made for keeping the articles from colliding as they are carried around the end of the tank. In general, the articles which may, for example, take the form of baskets adapted to carry in bulk articles to be plated or dipped, follow each other along the sides of the tank too closely to permit of their making the narrow turn at the end of the tank without interference. It becomes necessary, therefore, to provide some means for increasing the distance between them as they make the turn.

The object of the present invention is to accomplish this spreading out of the articles at the turn by novel and improved mechanism.

The invention comprises the combination with the usual longitudinal conveyers of separate turning conveyers geared to run at such an increased speed compared with the side conveyers as to give the necessary increase in distance between articles suspended from the conveyer as they make the end turn.

The invention further comprises certain other novel mechanical combinations more particularly described below and pointed out in the claims.

In the accompanying drawing:

Figure 1 is a plan view of the conveying apparatus;

Figure 2 is a vertical longitudinal section on line 2—2 of Figure 1;

Figure 3 is a section on line 3—3 of Figure 2, through the pivot of one of the sprocket chain links;

Figure 3ª is a longitudinal section through the sprocket chain at right angles to Figure 3;

Figure 4 is a plan view of the blank from which the sprocket chain links are made;

Figure 5 is a perspective view of the link after its first folding operation;

Figure 6 is a section on line 6—6 of Figure 2;

Figure 7 is a section on line 7—7 of Figure 2;

Figure 8 is a section on line 8—8 of Figure 2; and

Figure 9 is a section on line 9—9 of Figure 1.

The numerals 1 indicate cathode rails or bars, which extend longitudinally over the dipping or electroplating tank and are curved around the end of the tank so as to make a continuous track. The rails are in pairs and are adapted to be straddled by cathode supporting frames or work carriers 2. These frames have side members extending down into the tank, to which side members articles to be plated or baskets containing articles to be plated may be attached. The two side members are united by a cross member 3 at the top, which bridges the cathode rails 1 and rides thereon. The side members of the frame 2 are inclined inwardly at the top, as shown at 4, to aid in keeping them centrally placed on the cathode rails 1. To push the cathode supporting frames 2 along the rails, I make use of three separate propelling means. Along the side of the tanks the means consist of sprocket chains 5 driven or carried by pulleys or sprocket wheels 6, mounted on shaft 7, journalled in longitudinal frames 8, as shown in Figure 6. The frames 8 are united by a longitudinal I-beam 9, so that the frames 8 and I-beam 9 make a rigid structure which is properly supported in any desired manner from below. I prefer to make the frames with interior flanges 10, which will form an oil drip so that all oil falling from the chains, sprocket wheels or journals, will be collected in the I-beam as a trough and prevent it from falling into the tanks. Shaft 7 not only carries the sprocket wheels 6 but also carries and drives pulleys or sprocket wheels 11, one on each side of the sprocket wheel 6 and upon sprocket wheels 11 are mounted sprocket chains 12. These latter sprocket chains engage at their other end with pulleys or sprocket wheels 13 mounted on shaft 14 also journalled in the side frames, the wheels 13 being of smaller diameter than the wheels 11 so that the shaft 14 will travel at a greater rate of speed than the shaft 7. Upon the center of the shaft 14 are mounted a pair of pulleys or sprocket wheels 15 carrying a chain 16. The sprocket wheels 15 are larger in diameter than

the sprocket wheels 13 so that the chain 16 will travel at a greater speed than the chain 12. The chain 16 is intended to carry or push the cathode bars 2 around the curved end portions of the tracks 1. For this purpose it is made double-jointed, for it not only has to pass in a vertical curve around the sprocket wheels, but also in a horizontal curve around the track. I prefer to make the chain as shown in Figures 3 to 5. A blank of sheet metal is first stamped out in the shape shown in Figure 4. This is then bent around a median line until the central ears 17 are formed into a cylindrical shape, as shown in Figure 5. The ears 18 are then folded over at right angles to the main link members 20, the said ears being for the purpose of carrying pusher pins 21. The cylindrical parts 17 are made long enough to pass through the rollers 22 (see Figure 3) and the ends of the cylindrical portions 17 are then folded over or expanded, as shown in Figure 3, to retain the rollers in place. It is to be understood that only certain ones of the links have the ears 18 and the pusher pins 21, the intermediate links being plain. The rollers 22 form a means of supporting and guiding the chain both horizontally and vertically (see Figures 8 and 9) in channel members 23, which are made coextensive with the curved part of the track and are supported by frames 8 at their ends. The intermediate portions of the members 23 are rigidly held together by bridge pieces 24 (see Figure 9). The upper members 23 are fastened to the conducting cathode rails 1 by intermediate insulation 25 and bolts 26. The longitudinal side chains 5 have at fixed distances projecting lugs 27 which extend up a sufficient distance to engage behind the cross bar 3 of the cathode support to push the same along on the rails 1. When it has been so pushed as far as the chains 5 can move it, other lugs 28 properly spaced apart on the intermediate following chains 12 propel the cathode support a further distance along the rail and deliver it within range of pins 21 on the universal chain. From here on the pins 21 propel the cathode supports around the curved end of the track to deliver them in turn to the intermediate chain 12 on the other side of the tank.

The primary means for driving the longitudinal conveyers are not shown, and may be of any usual or preferred construction. Various changes can be made in the mechanism shown without departing from the scope of the invention as set forth in the appended claims. For example, in some cases only one of the rails 1 may be electrically connected to operate as a cathode.

From the above description it will be seen that as the cathode carriers move from the side conveyers to the intermediate conveyers, they are pushed along at a greater speed with the result that the distance between them is increased and that when the carriers move from the intermediate conveyers to the curved end conveyers their motion is again accelerated so as to still further increase the distance between carriers. The intermediate conveyers serve to divide the acceleration into steps so that the change in speed will come about with less of a shock. As the carriers reach the end of the curved part of the track they are passed onto the intermediate conveyer on the other side of the tank and from thence onto the return longitudinal conveyer, the changes in speed in this instance being such that the movement is slowed down and the carriers again brought near together so as to economize space. The intermediate conveyers may be dispensed with and the transfer made direct from the longitudinal conveyers to the curved end conveyers.

I claim:—

1. In a conveyer of the class described, the combination comprising straight longitudinal conveyers, propelling means therefor, curved end conveyers, and propelling means therefor, the latter adapted to drive the end conveyers at a greater speed than the longitudinal conveyers.

2. In a conveyer of the class described, the combination comprising straight longitudinal conveyers, and curved end conveyers, the latter geared to the former so that the end conveyers will travel at a greater speed than the longitudinal conveyers.

3. In a conveyer of the class described, the combination comprising side conveyers, rotary driving means for said conveyers, end conveyers flexible in two planes, rotary driving means for said end conveyers, and connecting mechanism whereby the peripheral speed of the means driving the end conveyers will be greater than the peripheral speed of the means driving the side conveyers.

4. In a conveyer of the class described, the combination comprising straight longitudinal conveyers, end conveyers, the latter geared to the former so that the end conveyers will travel at a greater speed than the longitudinal conveyers, and curved guides for said end conveyers.

5. In a conveyer of the class described, the combination comprising straight longitudinal conveyers, end conveyers flexible in two planes, the latter geared to the former so that the end conveyers will travel at a greater speed than the longitudinal conveyers, and curved guides for said end conveyers having vertical and horizontal guiding surfaces.

6. In a conveyer of the class described, the combination comprising side conveyers, rotary driving means for said conveyers, end conveyers flexible in two planes, rotary driving means for said end conveyers, connecting

mechanism whereby the peripheral speed of the means driving the end conveyers will be greater than the peripheral speed of the means driving the side conveyers, and intermediate conveyers connecting the side and end conveyers and adapted to travel at an intermediate speed.

7. In a conveyer of the class described, the combination of carrying rails having straight and curved portions, work carriers straddling and carried by said rails, and means for propelling the work carriers at one rate of speed along the straight portion of the rails and at an increased rate of speed along the curved portion thereof.

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