May 9, 1933. J. L. GERBER 1,908,597

TUMBLING PICKLER

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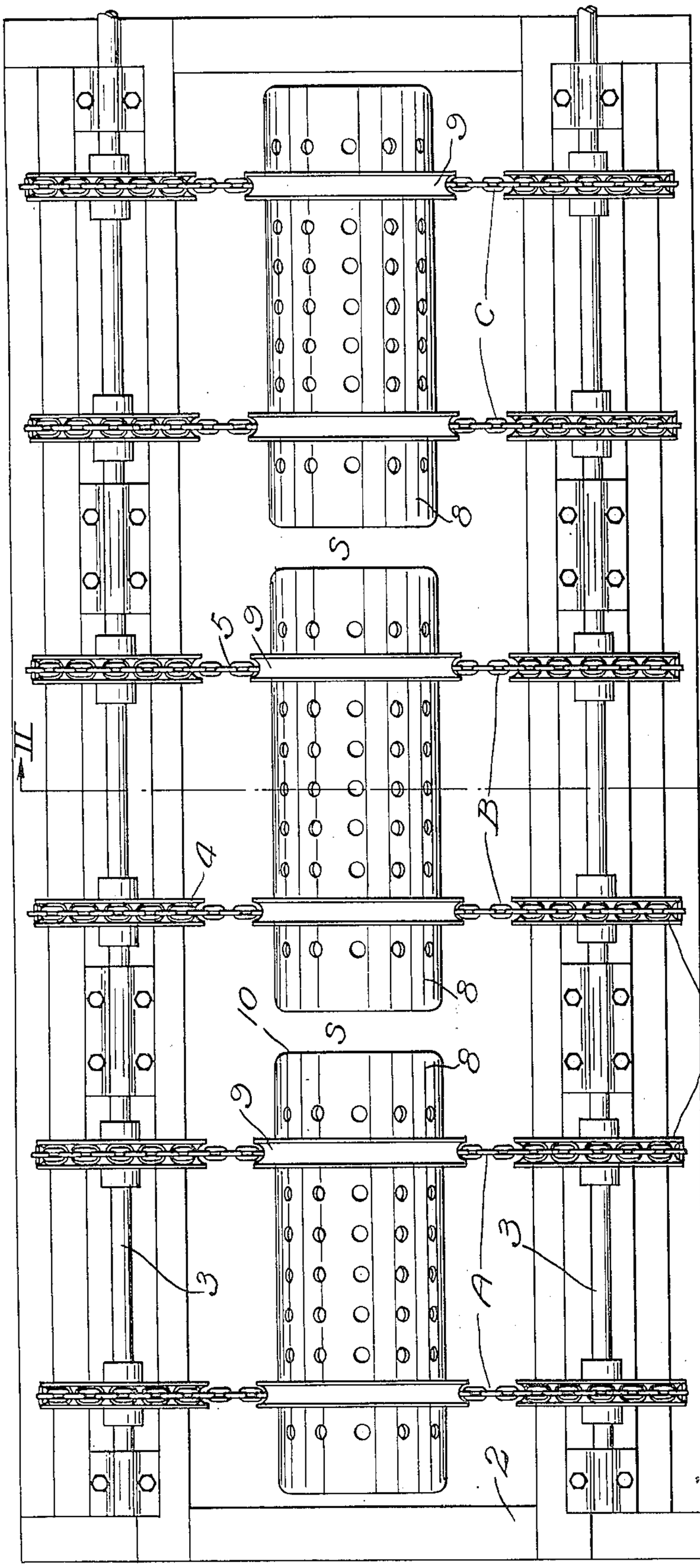

Fig. 1.

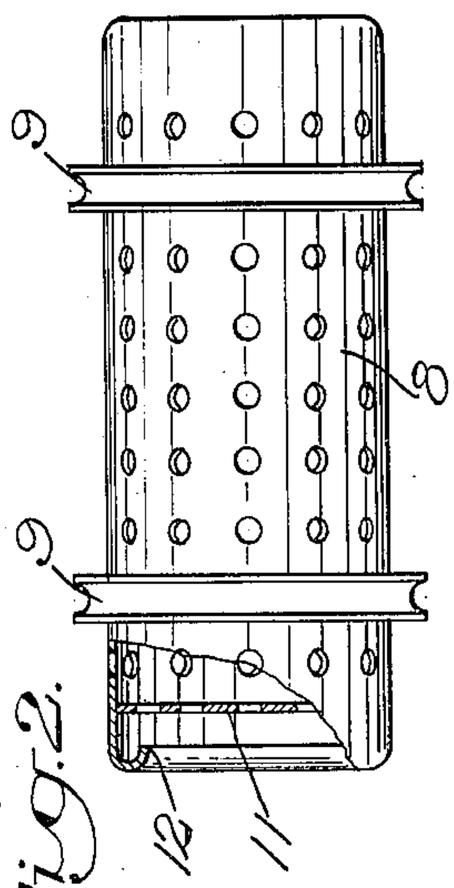

Fig. 2.

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Fig. 3.

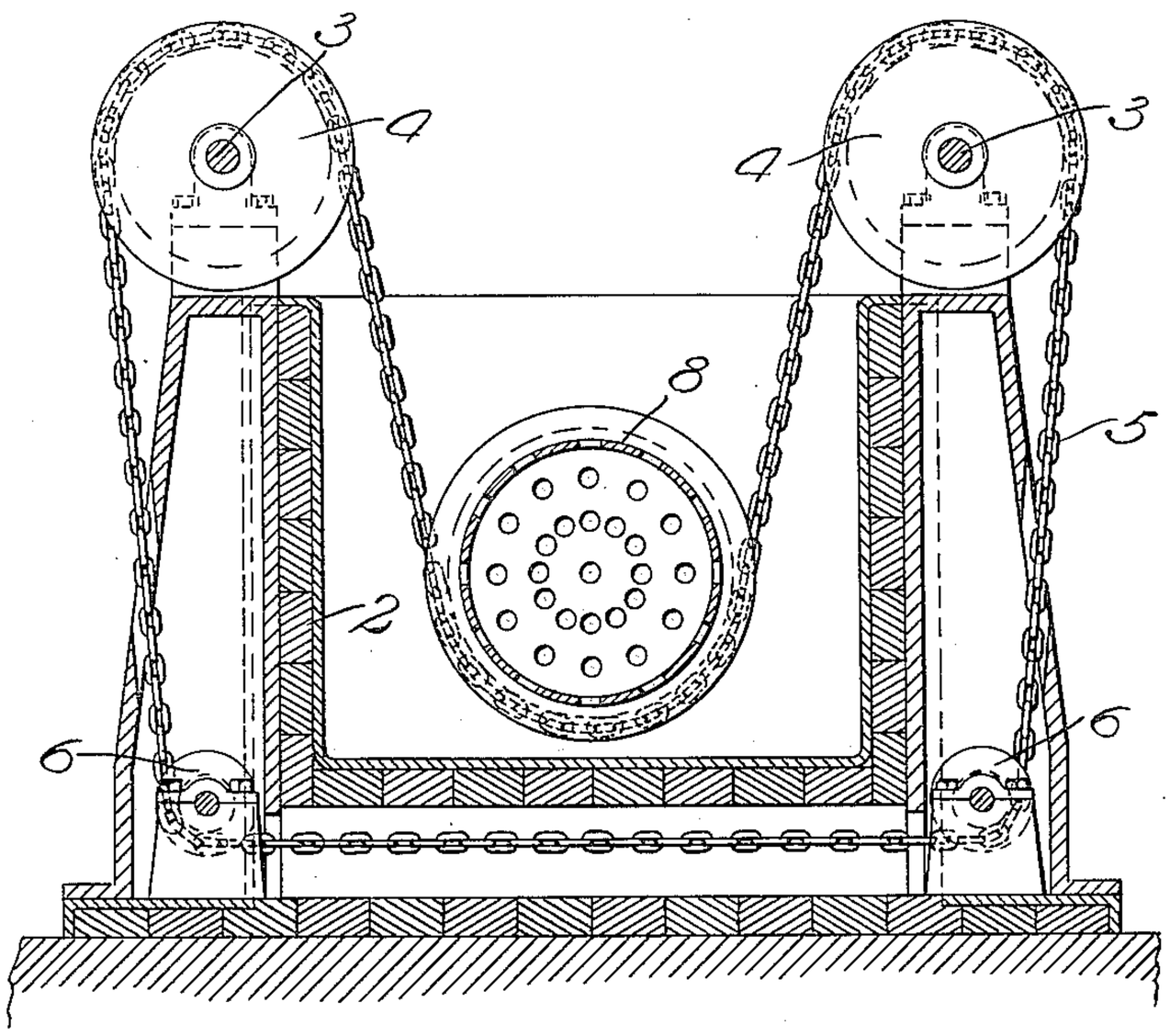
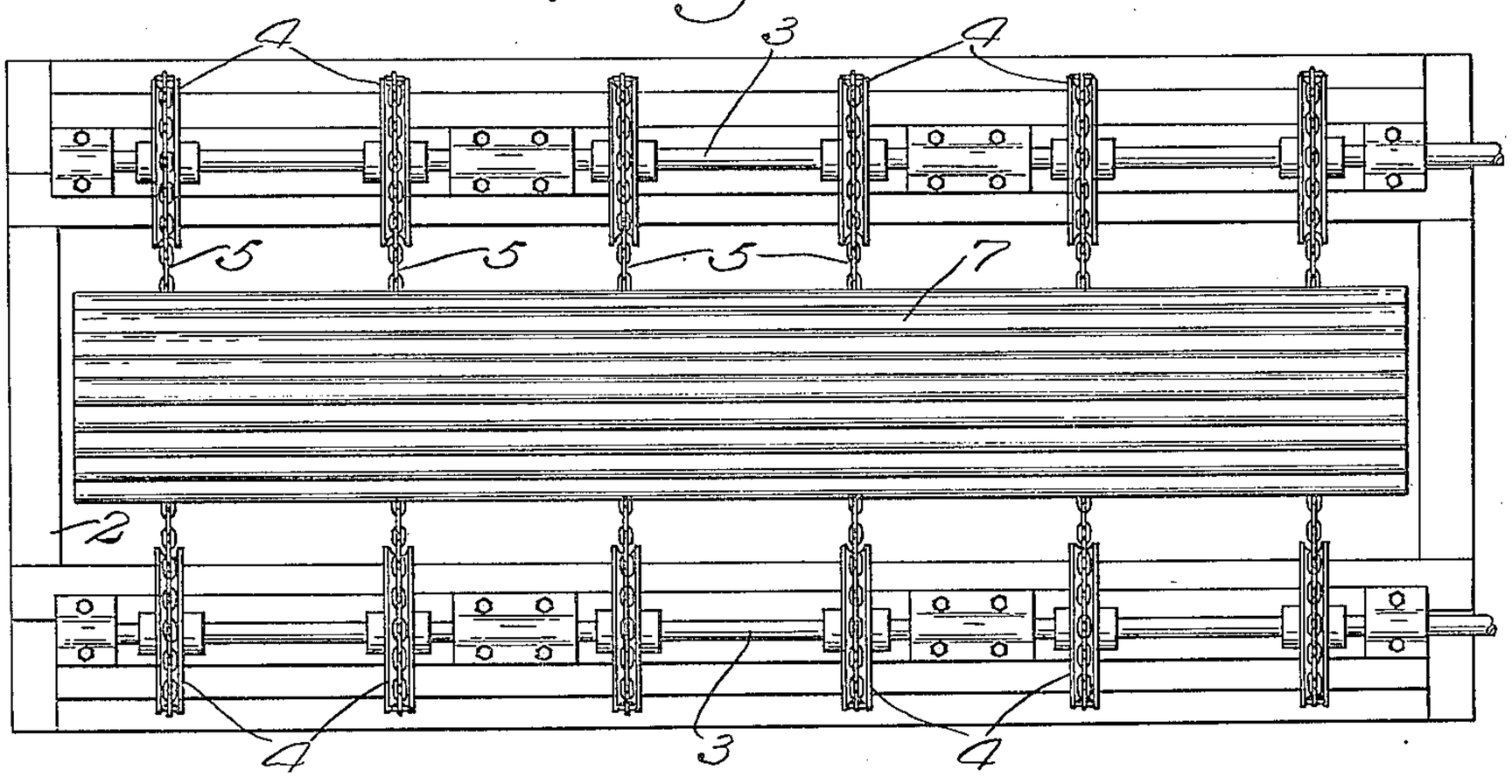


Fig. 4.



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UNITED STATES PATENT OFFICE

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TUMBLING PICKLER

Application filed July 17, 1931. Serial No. 551,362.

The present invention relates broadly to the art of pickling, and more particularly to apparatus of this character for use in the pickling of pipe, rods and other objects having an appreciable length, as well as smaller objects such as pipe fittings and the like.

Still another object of the invention is to provide an apparatus of the character referred to of such construction that it may be readily changed as required to accommodate it to the handling of any particular articles or shapes which it is desired to pickle.

A still further object of the invention is to provide means for effectively tumbling pipes, rods and other relatively long articles, as well as smaller articles of such shape that individual handling thereof would be difficult.

In the accompanying drawings I have shown for purposes of illustration only a preferred embodiment of the present invention, in which—

Figure 1 is a top plan view of one form of apparatus embodying the invention;

Figure 2 is a detail view partly in elevation and partly broken away, illustrating one form of tumbling barrel utilized in accordance with the present invention;

Figure 3 is a transverse sectional view on the line III—III of Figure 1; and

Figure 4 is a view similar to Figure 2, illustrating the invention utilized in connection with the pickling or tumbling of rods, bars or pipes.

Referring more particularly to Figures 1, 2 and 3 of the drawings, there is illustrated a pickling apparatus comprising a tank 2 of any desired construction having shafts 3 extending along the side walls thereof and provided with chain sprockets 4 around which pass endless chains 5. These chains are of such length as to extend downwardly around idlers 6 mounted adjacent the bottom edges of the tank and thence completely underneath the tank through suitable openings or chain receiving spaces, and to extend downwardly from the sprockets 4 to a point adjacent the bottom of the tank 2 and well within any solution provided within the same.

The shafts 3, or either of them may be driven in any desired manner at a predetermined speed, the construction of the sprockets 4 being such that the chains 5 are all uniformly moved in the same direction, thus causing portions thereof to travel downwardly into the bath and thence upwardly out of same and around the tank to the starting point.

It is one of the features of the present invention that the construction shall be such as to permit it to handle a wide variety of different articles and different shapes. In the form illustrated in Figure 4, it is shown as handling a plurality of rods, pipes, or similar sections 7 of such length that they are adapted to extend across a plurality of the supporting chains 5. In the case of smaller articles, however, such as pipe fittings, for example, it is obviously impossible to handle them in the same manner. For this purpose I provide a series of tumbling barrels 8, three of which are shown in Figure 1 in end to end relationship upon the chains 5. Each of the tumbling barrels is of such construction that it is adapted to cooperate with an adjacent pair of chains, and the over-all length of the tumbling barrels is such that a given tank is adapted at any time to receive half as many barrels as it has chains. To this end, the chain sprockets 4 are all uniformly spaced along their respective shafts, thus producing an equal spacing of the chains themselves, although if it is desired the construction may be modified to the extent of varying the distance between adjacent pairs of chains while maintaining a constant distance between the chains constituting each pair.

In Figure 1 the former construction is shown, each of the tumbling barrels being provided with a pair of circular chain ways 9 adapted to roll on the chains during the travel thereof. The chain ways are shown as being spaced a distance exactly equal to the distance between the chains of a given pair, whereby one barrel cooperates with the pair of chains A, a second barrel with the pair B and a third barrel with the pair C. It is further necessary that each of the barrels be of such construction that the distance between an end 10 of the barrel and the track

way 9 be less than half the distance between chains of adjacent pairs, thus maintaining a free space S between adjacent pairs of barrels. Not only should this space be sufficient to prevent the barrels during their tumbling or rotative movements from interfering one with the other, but to permit the passage of crane hooks therebetween for lifting any barrel at will from the pickling bath.

As illustrated in Figure 2, each barrel comprises a perforated cylindrical casing within which are mounted perforated ends 11, the casing extending an appreciable distance beyond the ends and formed with inturned hook engaging portions 12 within which crane hooks are adapted to be inserted. By reason of this construction, each barrel by having suitable filling openings and closure plates therefor may be filled with the desired number and character of individual objects, placed on its proper pair of chains, and then tumbled for the required time interval. Thereafter any barrel may be removed at will independently of the other barrels, and a freshly charged barrel substituted in lieu thereof, the relationship between the chain spacing, the barrel lengths and the position of the track-ways being such as to insure the desired tumbling operation of the maximum number of barrels for which the apparatus is designed without possibility of one barrel interfering with another.

When it is desired to tumble rods, bars, pipes, or the like, the barrels are removed from the apparatus and the articles to be tumbled placed directly on the chains in the manner illustrated in Figure 4, and the chains thereupon driven in the manner described for subjecting all of the articles simultaneously to a tumbling operation.

It will thus be seen that I have provided a construction which is universally useful in the pickling or tumbling of a wide variety of different shapes by utilizing the chains directly as a supporting medium, or by utilizing the chains as a supporting means for tumbling barrels.

It will further be apparent to those skilled in the art that I may if desired simultaneously utilize the apparatus for both small shapes and pipes or the like, by removing the barrels 8, for example, from the pairs of chains A and B and supporting the elongated material directly thereon while maintaining smaller articles in position on the pair of chains C. In this manner, the full capacity of the apparatus may be utilized at all times, thus increasing the output of a given tank.

Certain advantages of the present invention arise from a pickling apparatus so constructed as to permit the same to be utilized for the pickling either of articles having a major axis many times greater than the minor axis, or in the pickling of articles which have substantially equal longitudinal and transverse axes or of such size as to preclude the individual pickling thereof.

Another advantage of the invention arises from the provision of a pickling apparatus in which the tumbling chains are disposed in such manner as to provide a predetermined number of pairs wherein the spacing between chains of each pair is constant and wherein the spacing has a predetermined relationship to the spacing between track-ways on individual tumbling barrels.

While I have herein illustrated and described a preferred embodiment of the present invention, it will be apparent that changes in the construction, mounting and relationship of the various parts may be made without departing either from the spirit of the invention or the scope of my broader claims.

I claim:

1. In an apparatus of the character described, the combination with a tank, of a plurality of substantially parallelly disposed chains therein arranged in pairs, and a tumbling barrel cooperating with each pair of chains, all of said tumbling barrels being in end to end relationship.

2. In an apparatus of the character described, the combination with a tank, of a plurality of chains therein arranged in pairs, and a tumbling barrel cooperating with each pair of chains, each of said tumbling barrels having chain track-ways formed thereon and spaced from each other a distance equal to more than twice the projection of the barrels beyond the track-ways.

3. In an apparatus of the character described, the combination with a tank, of a plurality of chains therein arranged in pairs, and a tumbling barrel cooperating with each pair of chains, each of said tumbling barrels having inturned end portions adapted to cooperate with lifting hooks.

4. An apparatus of the class described, comprising a tank, a plurality of material suspending chains extending transversely of the tank, said chains being arranged in a plurality of similar pairs, and a plurality of similar tumbling barrels mounted in end to end relationship on said chains with each of said barrels supported by an adjacent pair of chains.

5. An apparatus of the class described, comprising a tank, a plurality of material suspending chains extending transversely of and around the tank, said chains being arranged in a plurality of similar pairs, and a plurality of similar tumbling barrels mounted in end to end relationship on said chains with each of said barrels supported by an adjacent pair of chains.

6. In a pickling apparatus, a tank having shafts extending lengthwise of the side portions thereof, chain sprockets on said shafts, a plurality of chains extending transversely of said tank and extending into the same, said

chains being arranged in pairs in spaced relationship with the spacing between the chains of adjacent pairs equal to the spacing between track-ways on individual tumbling barrels, and individual tumbling barrels for cooperation therewith.

7. In a pickling apparatus, a tank having shafts extending lengthwise of the side portions thereof, chain sprockets on said shafts, a plurality of chains extending transversely of said tank and extending into the same, said chains being arranged in pairs in spaced relationship with the spacing between the chains of adjacent pairs equal to the spacing between track-ways on individual tumbling barrels, and individual tumbling barrels for cooperation therewith, said chains being adapted, upon removal of said tumbling barrels, to directly receive articles having a major axis many times greater than the minor axis.

8. In a pickling apparatus, a tank having shafts extending lengthwise of the side portions thereof, chain sprockets on said shafts, a plurality of chains extending transversely of said tank and extending into the same, said chains being arranged in pairs in spaced relationship with the spacing between track-ways on individual tumbling barrels, and individual tumbling barrels for cooperation therewith, said individual tumbling barrels being of such dimensions as to stand in end to end spaced relationship when supported on the chains.

In testimony whereof I have hereunto set my hand.

JOHN L. GERBER.