July 13, 1948. C. O. BRUESTLE 2,445,261

TUBULAR REEL STRANDER

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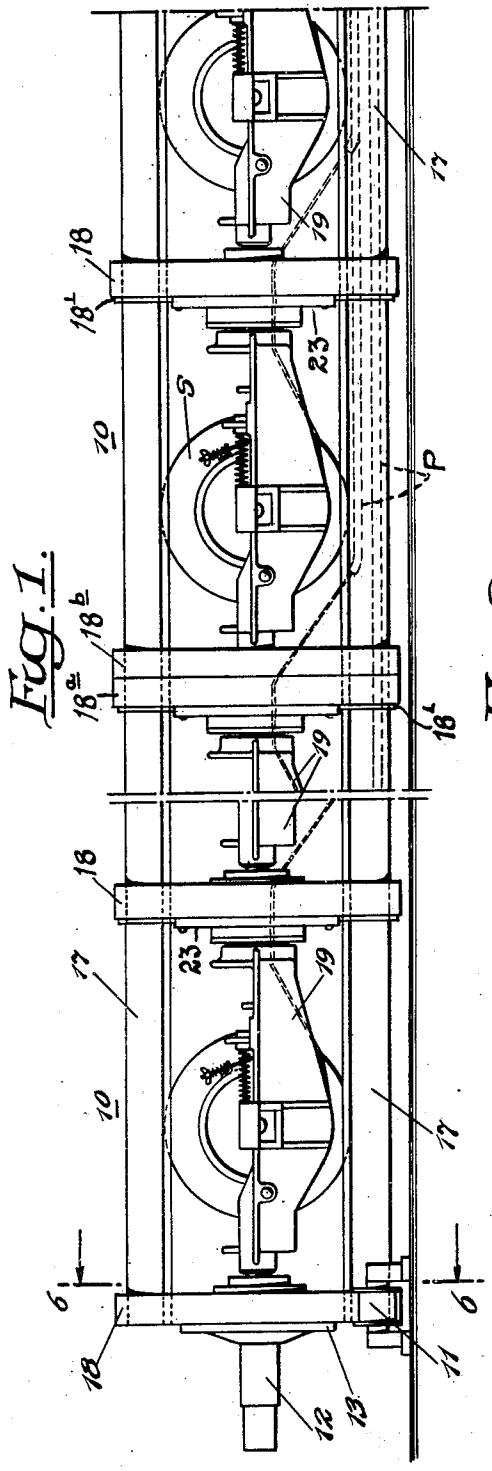


Fig. 1.

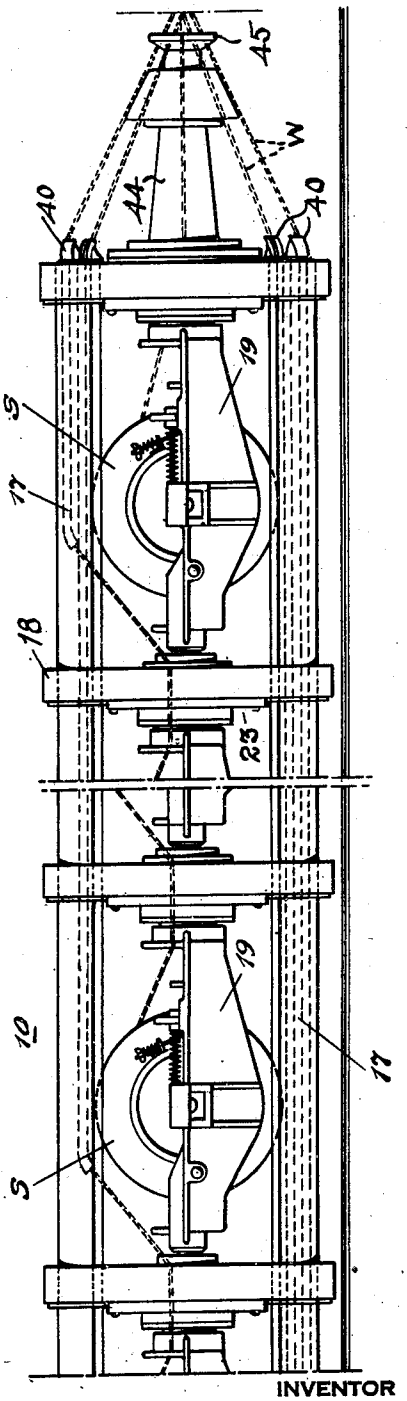


Fig. 2.

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TUBULAR REEL STRANDER

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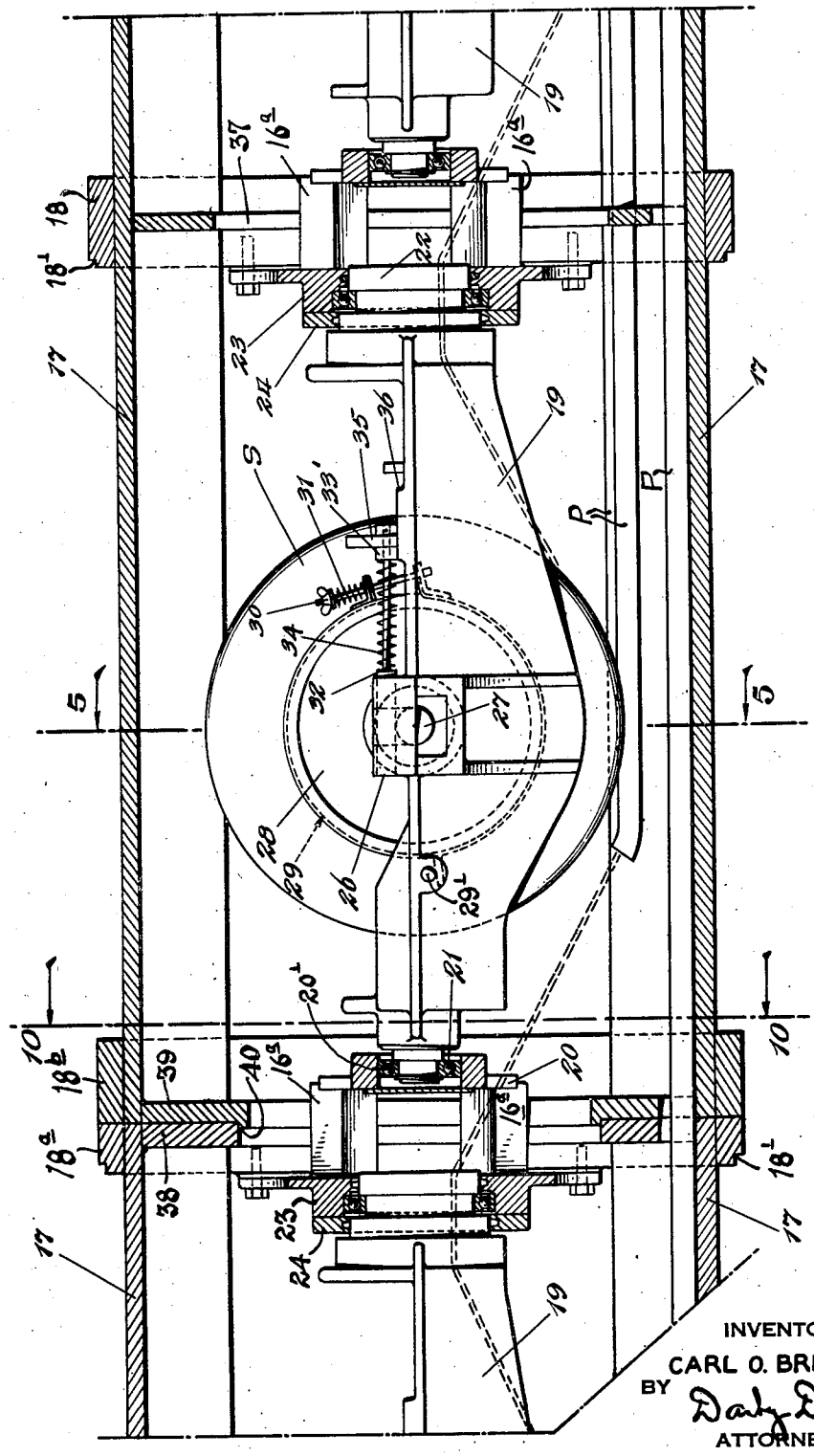


Fig. 3.

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TUBULAR REEL STRANDER

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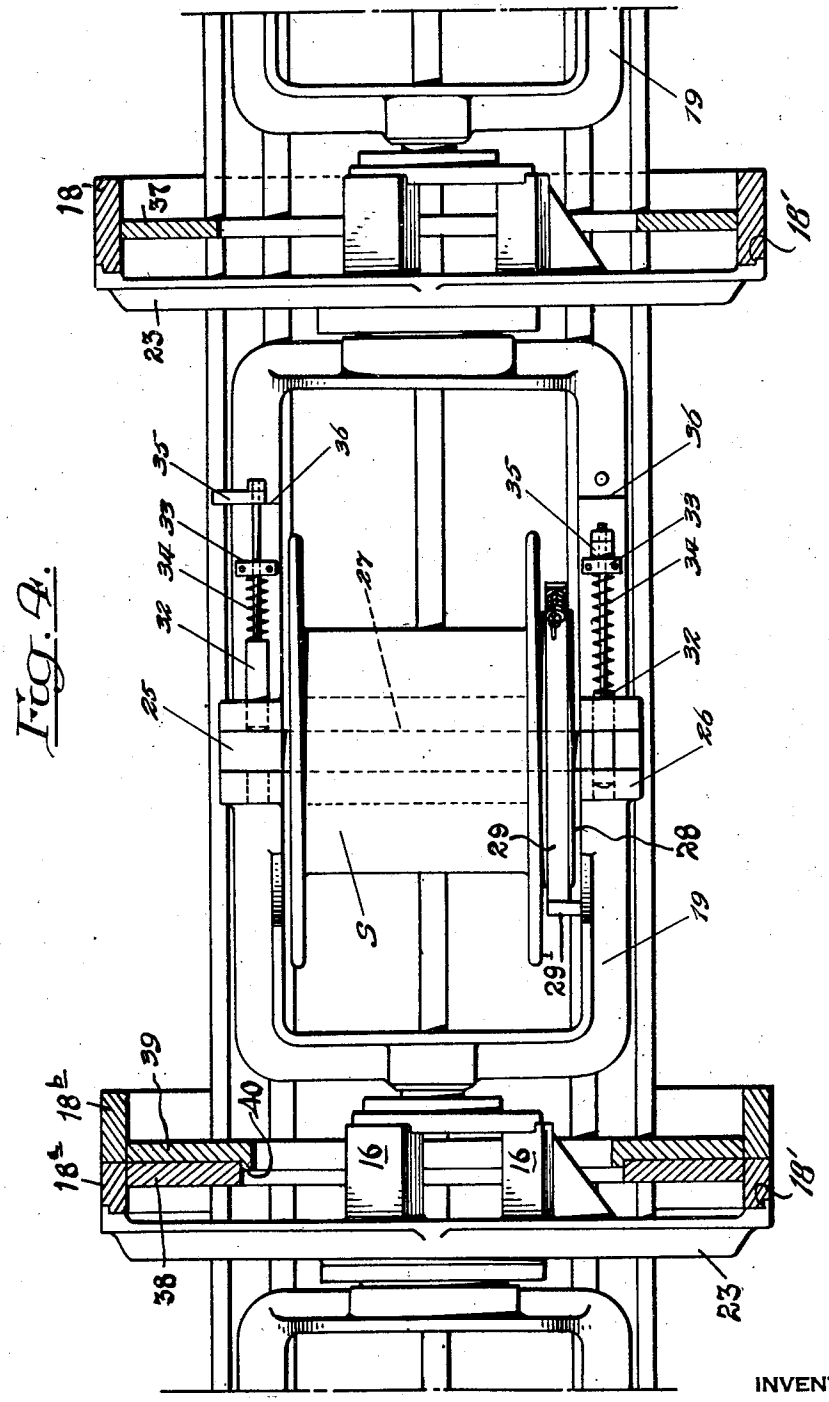


Fig. 4.

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Fig. 5.

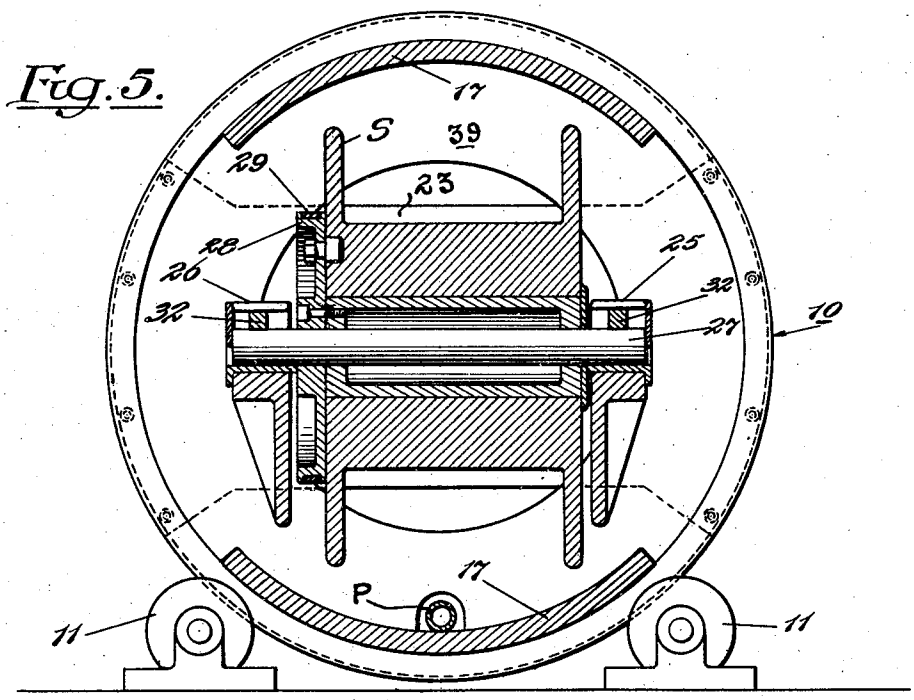


Fig. 6.

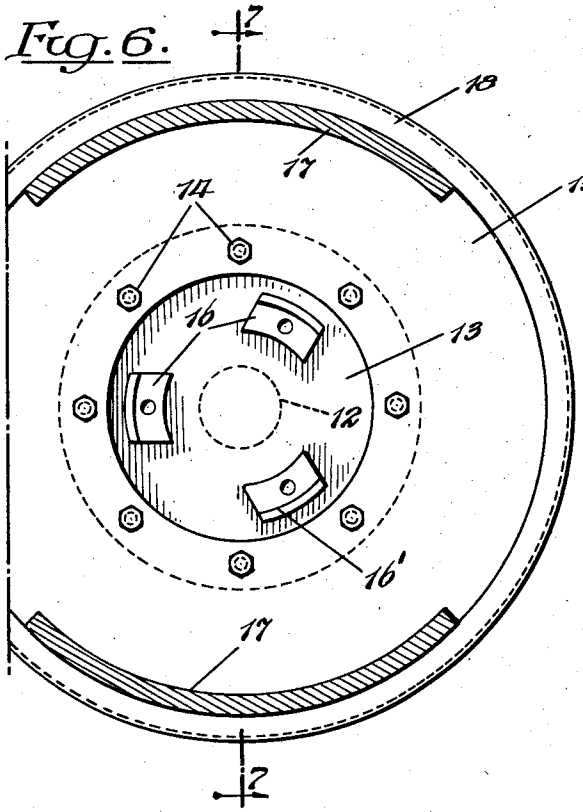
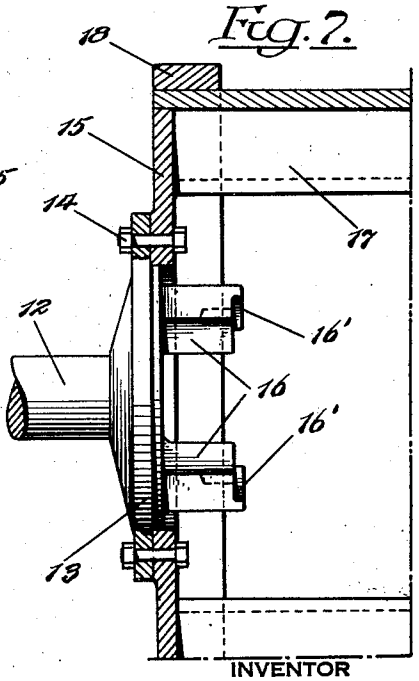


Fig. 7.



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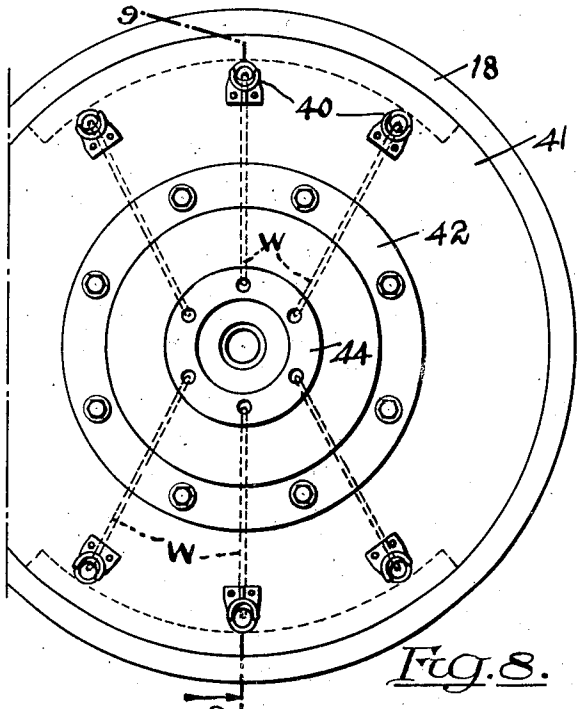


Fig. 8.

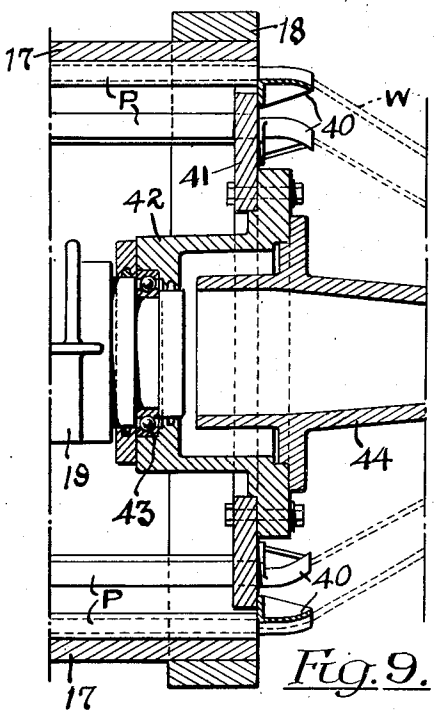


Fig. 9.

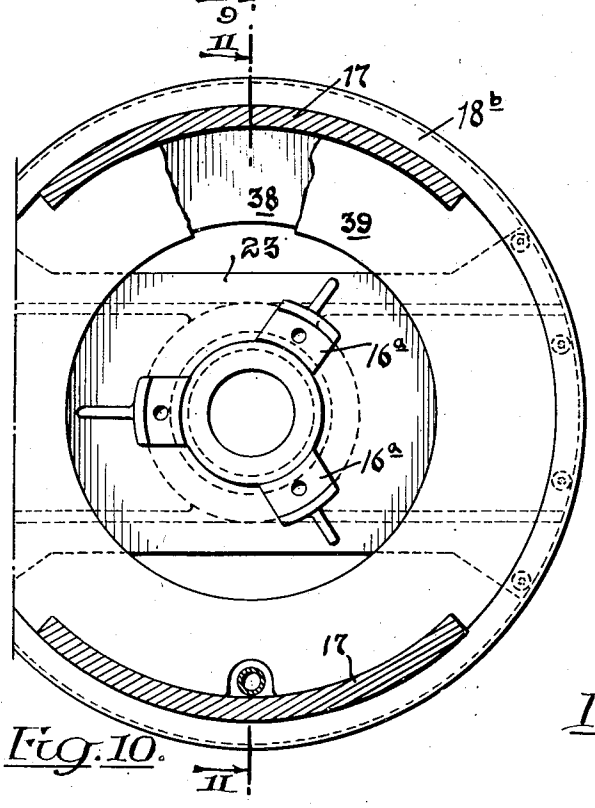


Fig. 10.

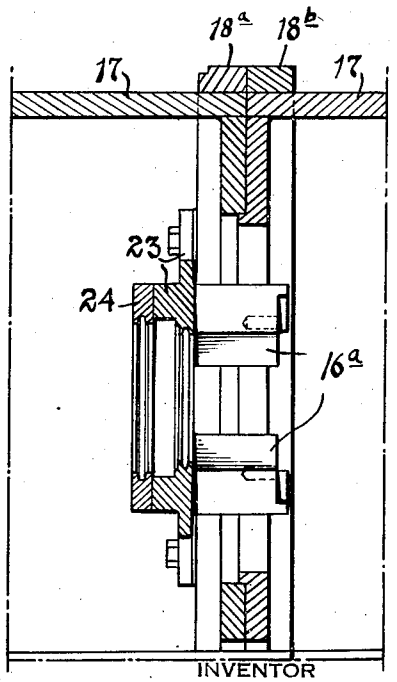


Fig. 11.

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Patented July 13, 1948 2,445,261

UNITED STATES PATENT OFFICE

2,445,261

TUBULAR REEL STRANDER

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Application March 13, 1947, Serial No. 734,524

4 Claims. (Cl. 57—59)

1

This invention relates to improvements in stranding machines of the fabricated tubular type in which a plurality of spools are rotatably supported in cradles in a rotating framework and are employed for twisting a plurality of strands of wire, hemp and the like into a cable.

The broad object of this invention is to provide structural improvements in devices of this type whereby considerable economies in materials and manufacturing costs involved in the construction thereof are effected.

An important object of this invention is to provide a rotatable tubular framework for a machine of this type which is adequate in strength to meet normal operating conditions but yet is relatively light in weight.

Another object of this invention is to provide a rotatable tubular framework for a device of this type having novel features of construction which contribute to and facilitate manufacturing processes by reason of simplification and economy of time in manufacture.

Another object of this invention is to attain greater constructional accuracy with simple machining processeses.

Other and more detailed objects of the invention will be apparent from the following description in detail, and the embodiment thereof selected for purposes of illustration herein is represented pictorially by the drawings.

This invention resides substantially in the combination, construction, arrangement and relative location of parts, all as will be described in detail below.

In the accompanying drawings,

Figures 1 and 2 taken together show those portions of a tubular reel strander which include the features of novelty herein disclosed, from which figures are omitted some of the parts which go into a complete machine of this type;

Figure 3 is a longitudinal, central, cross-sectional enlarged view through one section of the machine, showing some parts in elevation;

Figure 4 is a view similar to that of Figure 3 taken on a plane at right angles to that of Figure 3, showing some parts in elevation;

Figure 5 is a cross-sectional view taken on the line 5—5 of Figure 3;

Figure 6 is a cross-sectional view taken on the line 6—6 of Figure 1;

Figure 7 is a cross sectional view taken on the line 7—7 of Figure 6;

Figure 8 is a front end elevational view of the tubular frame at the delivery or cable twisting end of the machine;

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Figure 9 is a cross-sectional view taken on the line 9—9 of Figure 8;

Figure 10 is a cross-sectional view taken on the line 10—10 of Figure 3; and

Figure 11 is a cross-sectional view taken on the line 11—11 of Figure 10.

Cable stranding or twisting machines of the type to which this invention relates are common articles of industry. They are relatively massive heavy machines and in the past have used as the rotatable tubular frame of the machine a large heavy steel tube which of necessity has been difficult and expensive to manufacture because of the machining operations necessary to true it up and adapt it for such use. In prior practice it has been necessary to turn the exterior of such a tube and bore the interior thereof to secure accurate centricity. As is usual in such machines, the cable reels or strands are supported within the tube on cradles about which the tube rotates. This necessitates cutting large openings in the massive steel tube at each reeling station to facilitate insertion and removal of the reels. Internal spiders for supporting the reel cables had to be accurately made at the expense of much machining the tube and spiders which are then laboriously worked into the tube to proper position.

It can be stated as a general object of this invention that all of these difficulties are avoided by means of the improvements about to be described.

The rotatable tubular reel housing is generally indicated by the reference numeral 10 in Figures 1 and 2, which must be taken together as representing a side elevational view of a single machine from which some sections have been broken away as indicated, as the missing sections are but duplicates of the sections illustrated. This tubular housing 10 is illustrated as supported on idler rollers 11 (see Figs. 1 and 5) which are distributed throughout the length thereof so as to properly support the housing for rotation. Only one set of these rollers has been illustrated since they are commonly used in machines of this type. The housing comprises two or more sections each of which consists of a pair of diametrically opposed transversely curved steel plates 17 of the proper thickness. The plates 17 do run throughout the length of each section of the machine. In the machine illustrated each pair of sections meet at the rings 18^a and 18^b (Figs. 1 and 3). The plates 17 are held concentric with the axis of rotation of the housing by a series of discs 37 which have arcuate peripheral slots (see Figs. 5 and 6)

in which the plates 17 lie. At the lefthand end of the machine the circular plate 15 is similar to but somewhat different from the circular plates 37 in that the plate 15 is provided with a smaller central opening. Concentric with this opening is a heavy supporting disc 13 bolted to the disc 15 as at 14, and provided with an extending shaft 12 adapted to be mounted in a supporting bearing, not shown, at one end of the machine. The drive motor, not shown, for the housing 10 is connected in any suitable manner to shaft 12 to effect rotation thereof. Fitted over the plates 17 at the region of disc 15 and discs 37 are the rings 18.

At the twisting or delivering end of the machine (see Fig. 9) the disc 41 is provided corresponding to the discs 15 and 37 but modified as necessary to provide for the utilities at that end. In this case, as before, the adjacent ends of the curved plates 17 lie in peripheral recesses and the whole is enclosed in a ring 18. The simple parts comprising these discs and rings can be easily machined by a simple operation, so that when the parts are assembled and welded together a concentric balanced structure results.

The main housing is broken up into two or more parts depending upon the length of the machine, the length being determined by the number of strands to be twisted. These sections are joined where, as shown in Figs. 1 and 3, a pair of rings 18^a and 18^b are brought together. At this point instead of the discs previously described, discs or annular rings 38 and 39 are provided. The ring 39 is turned to provide an annular shoulder 40 which insures that the parts of the housing will be brought together in concentricity. The plates 17 lie in peripherial recesses in the rings 38 and 39 (see Fig. 10) and the rings 18^a and 18^b surround these parts as before. When the two housing portions are brought together, rings at the annular joint are connected by cap screws 38'. The rings 18 and 18^a have an annular shoulder turned thereon, as indicated at 18' (Figs. 1 and 3) for a purpose to be later indicated.

Turning to Figures 6 and 7, it will be seen that the portion of the discs 13 exposed through the opening in disc 15 is provided with three heavy integral or attached standards or lugs 16 arranged on axes equi-spatially distributed about the center of rotation all provided with shoulders 16'. These standards 16 provide a seat as shown in Figure 4 for the bearing of the cradle 19 of the adjacent section. This bearing is just like the bearing 20' illustrated in Figure 3, which is mounted in a spider 20 which is detachably secured, as for example by bolts to the standards 16^a. At this point it may be noted that the standards 16^a are just like the standards 16 of Figure 6, but in this case are secured to or are integral with a diametrically extending plate 23 (see particularly Figs. 5 and 10). This plate is bolted to the adjacent ring 18^a, and is arranged so as to be centrally positioned by the annular shoulder 18' on that ring, see Figure 4.

As clearly illustrated in Figure 3, the plate 23 on the side opposite to the standards 16^a is provided with a bearing 22 for the opposite end of the cradle 19, which bearing is protected by means of a sealing plate 24 in accordance with well known practice.

The general configuration of the crade 19 is clear from Figures 3 and 4 and comprises an open rectangular framework provided with a pair of aligned stub shafts which are journaled in the bearings 20' and 22. This frame work in turn is

provided with a pair of bearings 25 and 26 in which a transversely extending reel shaft 27 is journaled. The reel is indicated at S and is mounted in the cradle by inserting a shaft 27 therein and mounting that shaft in the bearings 25 and 26. These bearings are open so that the shaft 27 can be dropped therein to the position shown in Figure 3. The shaft 27 is locked in these bearings by means of sliding lock bolts or pins 32 which are slidably mounted in guides 33 on the cradle frame. The ends of these pins are provided with handles 35 which cooperate with shoulders 36 formed in the cradle frame. A spring 34 encircles the pins 32 and acts to normally hold them in locked position, as shown in Figure 3. In order to release the shaft 27 the pins 32 are withdrawn compressing the springs 34 against the guides 33. These pins can be held in withdrawn position by engaging the handles 35 behind the shoulders 36, as shown for the upper pin 32 in Figure 4. As the pins 32 are of square cross-section, as shown in Figure 5, the handle 35 or the rod which connects it to the pin 32 is relatively rotatable so as to permit of these operations. The circumferential extent of the plates 17 is limited to the point where the reels S can be inserted and withdrawn from the housing sections through the resulting side openings. Each shaft 27 is provided with a brake drum 28 on which is mounted a brake band 29 having a tightening or adjusting means comprising a wing nut and bolt 30 and a compression spring 31.

The brake bands 29 are anchored to the cradle by means of pins 29' which engage a projection thereon (see Fig. 3). Thus the spool S and shaft 27 which are secured together in any suitable manner for conjoint rotation must rotate against the reaction of the brake band 29 on the brake drum 28 because the brake drum is also attached to the shaft 27. By adjusting the wing nut 30 any desired drag can be imposed on the reel so that the strand thereon is withdrawn from it under the desired tension. The cradle construction and its mounting at each section in the housing is the same.

At the delivery end of the machine the disc 41 is provided with guides 40 aligned with openings in the disc 41 through which the strands W pass. The strands are guided from each reel to the guides 40 by means of tubes P which respectively extend back to the spools, as is clear from Figures 1, 2 and 3. The guide tubes P pass through cutouts in the various discs, as is clear from Figures 5 and 10, for example, and their delivery end is aligned with the guides 49. The disc 41 is provided with an enlarged central opening in which a casting 42 is mounted and which provides support for the bearing 43 for the stub shaft of the cradle 19 of the terminal section of the machine. Mounted on the axis of the housing is a tubular support 44 on which the nosepiece 45 and appurtenant elements are mounted for properly guiding the strands W to the die, not shown. As is usual one of the strands is fed on the axis of the housing and forms the central strand about which the outer strands W are wound or twisted.

From this detailed description it will be seen that this relatively massive housing is built up of a plurality of simple easily handled and easily machined parts which can be prepared and assembled and secured together in a relationship to insure a substantial dynamic balance when in use. The housing is adequately strong by reason of the type of construction and the manner of

assembling the structural units of which it is composed. The complete housing can be made in two or more parts which are not difficult to handle and can be assembled to insure concentricity with respect to the axis of rotation. The parts can be secured together by simple welding operations and the welds stress relieved in the usual way. Adequate openings for inserting and removing the reels are provided and at the same time the abject lightness consistent with strength is obtained.

One important feature of the invention needs emphasis. The manner in which the bearings for the cradles are mounted simplifies removal and insertion of the cradles. By removing the bolts, for example from one of the spiders **20** (see Fig. 3) it is possible to rotate the spider through an angle of 60° so that the three radial wings thereof which seat on the standards **16a** are moved out of alignment with those standards whereupon the spider may be pushed in inwardly to the base of these standards. By removing the guard **24** at the other bearing the bearing **22** can be withdrawn from the supporting plate **23** completely freeing the cradle **19** so that the entire assembly can be withdrawn through a side opening in the housing. This facilitates repair and replacement with a minimum of shut down time for the machine.

In view of the above detailed disclosure it will be apparent that the features of novelty herein disclosed contain substance capable of embodiment in various physical forms. I do not, therefore, desire to be limited to the physical form utilized for purposes of illustration, preferring to rely upon the scope of the claims granted me.

What is claimed is:

1. A tubular housing for a stranding machine composed of at least two parts, each of which in turn comprises at least two plates of arcuate cross-section, at least two discs having peripheral diametrically arranged slots in which said plates die, and rings surrounding said plates at said discs, at least one terminal disc of each part being provided with cooperating seats which when engaged cause the adjacent rings to abut.

2. In the combination of claim 1, diametrically extending plates detachably secured to said rings, each of said plates having a bearing housing on one side and concentrically arranged bearing standards on the other side, a detachable bearing spider secured to said standards, and a reel cradle having bearings mounted in said bearing housings and said spiders.

3. In a stranding machine, a tubular frame comprising at least two plates of arcuate cross section, a plurality of discs having diametrically opposed arcuate circumferential recesses in which said plates lie flush with the periphery thereof, rings surrounding said plates at said discs, and cradle reel bearing supports detachably secured to said rings, said bearing supports comprising diametrically extending plates each having a bearing housing on one side and a plurality of circumferentially arranged standards on the opposite side.

4. In a stranding machine, a tubular frame comprising at least two plates of arcuate cross section, a plurality of discs having diametrically opposed arcuate circumferential recesses in which said plates lie flush with the periphery thereof, rings surrounding said plates at said discs, cradle reel bearing supports detachably secured to said rings, said bearing supports comprising diametrically extending plates each having a bearing housing on one side and a plurality of circumferentially arranged standards on the opposite side, and a bearing spider detachably secured to said standards.

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REFERENCES CITED

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

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Number	Name	Date
1,636,466	Edwards et al.	July 19, 1927
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Certificate of Correction

July 13, 1948.

Patent No. 2,445,261.

CARL O. BRUESTLE

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Column 5, line 44, claim 1, for the word "die" read *lie*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 5th day of October, A. D. 1948.

[SEAL]

THOMAS F. MURPHY,
Assistant Commissioner of Patents.