

H. JANSSEN & R. C. RAHM.
BRAIDING MACHINE.
APPLICATION FILED FEB. 14, 1910.

979,502.

Patented Dec. 27, 1910.

Fig. 1.

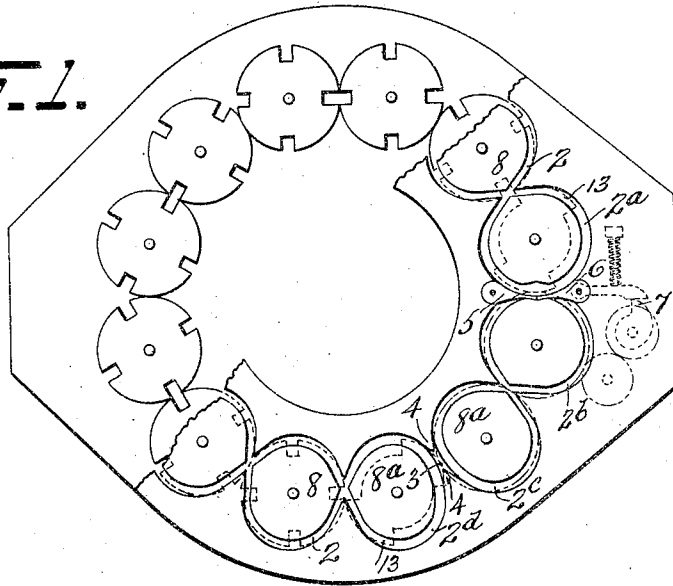


Fig. 2.

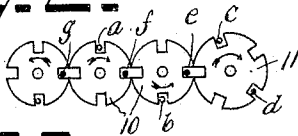


Fig. 3.

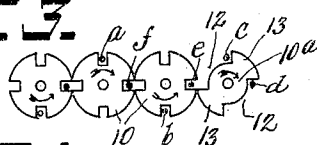


Fig. 4.

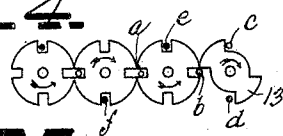


Fig. 5.

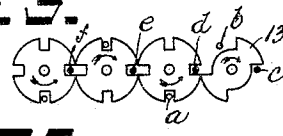


Fig. 6.

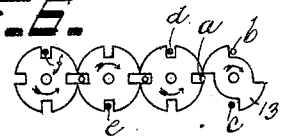


Fig. 7.

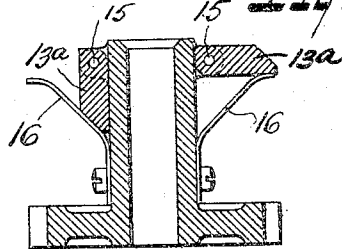
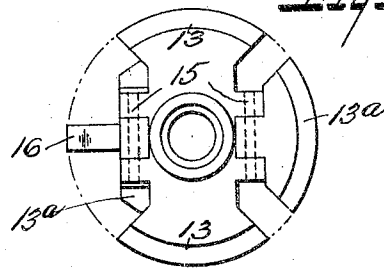


Fig. 8.



Henry Janssen
Robert Carl Rahm
and Inventors

Witnesses
Caleb J. Pieber
Don Stewart

By

[Signature]

Attorney

UNITED STATES PATENT OFFICE.

HENRY JANSSEN AND ROBERT CARL RAHM, OF WYOMISSING BOROUGH, PENNSYLVANIA, ASSIGNORS TO TEXTILE MACHINE WORKS, OF WYOMISSING, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

BRAIDING-MACHINE.

979,502.

Specification of Letters Patent. Patented Dec. 27, 1910.

Application filed February 14, 1910. Serial No. 543,743.

To all whom it may concern:

Be it known that we, HENRY JANSSEN and ROBERT CARL RAHM, both citizens of the United States, and residents of the borough of Wyomissing, in the county of Berks and State of Pennsylvania, have invented certain new and useful Improvements in Braiding-Machines, of which the following is a specification.

10 Our invention relates to braiding machines and particularly to improved carrier-reversing means therefor adapted to permit the ready conversion of a tubular braider into a flat braider.

15 In tubular braiders, where the carriers are constantly traversed in one direction by the series of intermeshing drive-gears with their carrier-engaging horns, the race-circles and drive-gears may be made uniform throughout; but where it is required that the carriers be reversed, as in flat or plain braiding, terminal circles and gears of different diameter from those of the main course are commonly employed for the purpose of changing
25 the relation of the reversely moving carriers so as to avoid collisions.

An important object attained by our invention is that such a change in the terminal circles and gears may be avoided, and
30 that a tubular machine may be made readily convertible into a flat braider in which any desired race-circles of the course, with the drive gears therefor, may be made to serve as terminals.

35 The essential features of the invention and of its practical application are fully described in connection with the accompanying drawings.

Figure 1 is a diagrammatic view indicating the race-way of an ordinary tubular machine provided with means for disconnecting certain of the race-circles as may be required in applying our improved carrier reversing means. Fig. 2 is a diagrammatic
40 view indicating a series of carrier drive-gears with a reversing terminal such as is ordinarily employed for flat braiding. Fig. 3 is a corresponding view indicating our convertible drive-gear adapted to serve as a terminal in connection with the disconnected
50 race-circle terminal of Fig. 1. Figs. 4, 5 and 6 are similar views to Fig. 3, indicating

the gears of Fig. 3 rotated respectively one, two and three horn-spacings to show the setting-back effect of the carrier clearance ways provided in our improved terminal gear. Figs. 7 and 8 show our improved terminal gear as preferably formed.

The carrier race-way indicated in Fig. 1 is that of an ordinary tubular machine, being made up of a circular series of intersecting or connected race-circles 2, 2^a, 2^b, 2^c, 2^d, of uniform diameter forming normally a continuous circular course. In connection with this ordinary race-way are shown means for disconnecting certain of the race-circles as desired in carrying out the present invention. Such means consist, as shown between the race-circles 2^a and 2^c, of an inserted partition piece 3 fitted between the points 4, 4 of the grooved bed plate so as to close said race-circles as in the case of terminal circles; or instead of this switches may be provided to cut off communication between adjacent circles, as indicated between the race-circles 2^b and 2^a where 5 indicates a blind switch, and 6 a mechanically operated switch arranged to be thrown as required by a suitable cam 7. The disk or quoit 8 of the regular course circles may be changed to the usual rounded form 8^a for the terminal circles. It will be understood that the circles 2^b 2^c will be cut out of the flat course when 2^d is arranged for use as a terminal in connection with 2^a; but that they may be used as part of the course by making 2^b serve as a terminal instead of 2^d.

As indicated in Fig. 2 the ordinary flat braid course comprises a series of drive-gears 10, 10 with a special gear 11 as a terminal at each end upon which to reverse the carriers; said gears 10 being each provided with four horns as shown, and the terminal with five similar horns, while the relative positions and indicated movements of the carriers as guided in the different sized race-circles make clear the usual manner of reversing them without collision.

In Figs. 3, 4, 5 and 6 ordinary full-horned drive-gears 10, 10 like those of Fig. 2, are shown in connection with a terminal drive-gear 10^a which is of the same diameter as the gears 10 and differs from the latter only in having alternate horns removed so as to

form clearance ways 12, 12 between the remaining horns 13, 13. We have found that such a drive-gear, substituted for or converted from the ordinary gear by removal of alternate horns as stated, and used in connection with an ordinary course race-circle closed to form a terminal circle as indicated in Fig. 1, will operate upon the carriers in a manner equivalent to that of the ordinary special sized terminal circle and its gear 11. This will be understood by following the reversing action of our improved terminal upon the carriers as diagrammatically illustrated. In Fig. 3 the indicated positions of the bobbin carriers correspond with those of Fig. 2; the carriers *c* and *d* however being located in the clearance-ways of our improved terminal gear instead of being positively engaged between horns as in Fig. 2. In Fig. 4 each of the gears, including the terminal, is represented as rotated a quarter turn; the effect being that carrier *c* is moved rearwardly by gear 10 and carrier *b* is swung forward into the terminal race-circle without being engaged between horns of the terminal gear as heretofore, because of its being provided with clearance-way 12 instead of a horn. The two carriers *b* and *d* are thus located in the same clearance way 12, with the carrier *d* only in position to be positively operated by the gear horn, while the carrier *c* is in the other clearance-way. In Fig. 5 another quarter turn of the gears has taken place: The carrier *d* has now been swung in its reverse movement to the junction point of the circles. The carrier *b* which is represented in this position in Fig. 4 without apparent provision for moving it therefrom to make way for the reversed carrier *d*, is in fact moved onward to approximately the position indicated in Fig. 5 either by its own momentum, or by the action of the positively swung carrier *d* if the momentum alone does not do it. Following the successive positions of the carriers indicated, it will be noticed that each carrier thus delivered into a clearance-way of our improved terminal gear is so set back by the ineffective rotation of the latter as to secure the required passages of the terminal race-circle junction without collision.

To provide for most readily converting ordinary course drive gears into our terminal gears, as desired, the alternate horns 13^a of each gear which are to be eliminated, may be arranged so as to permit of conveniently throwing them into or out of operative position by pivoting them to the body of the gear as shown at 15, Figs. 7 and 8, and providing spring detents 16 adapted to hold them in either operative or inoperative position as determined. The only other change needed to convert a tubular braider into a flat braider, besides providing the additional bobbin carrier required as

usual, is to insert the partition piece 3 between the circles which are to serve as terminals; and this change may be avoided by providing the switches 5 and 6 at such point instead of using the fixed partition piece; or if it be desired to produce flat braids of reduced widths, certain of the race-circles may be cut out in like manner, as indicated in Fig. 1; or the full circular course may be divided into sections so as to provide for producing two or more narrow braids simultaneously as desired. Thus a simple tubular machine made up of a series of uniform diameter race-circles, may be readily adapted to also produce flat braids of any desired widths.

What we claim is:—

1. A braiding machine having a series of intersecting equal-sized race-circles, and intermeshing equal-sized drive-gears therefor the intermediate gears of which are full-horned and the end gears of which have alternate horns removed and serve as terminals.

2. A braiding machine having a carrier course comprising a series of four-horn drive-gears, and an intermeshing terminal drive-gear of like diameter having two opposite horns only and intervening carrier clearance-ways whereby it is adapted to serve as a terminal drive-gear substantially as set forth.

3. A braiding machine drive-gear having a pivotally mounted carrier-engaging horn and means for locking the same in operative or inoperative positions.

4. A braiding machine terminal drive-gear having a series of fixed carrier-engaging horns and intermediate pivotally mounted horns with means for locking the same in operative or inoperative positions.

5. A braiding machine having a race-way formed by connected race-circles, means for separating certain of said race-circles to form terminal circles; a series of full-horned carrier drive-gears for the connecting race-circles, and intermeshing terminal drive-gears of the same diameter for said terminal circles having alternate carrier-engaging horns removed to form carrier clearance-ways.

6. A braiding machine having a race-way formed by connected race-circles, means for separating certain adjacent race-circles to form terminal circles, a series of ordinary full-horned carrier drive-gears for the connecting race-circles, and intermeshing terminal drive-gears for said terminal circles having removably secured horn portions whereby to provide carrier clearance-ways to set back the reversing carriers.

7. A braiding machine having a race-way formed by connected race-circles, and insertible means for disconnecting certain

of said race-circles to form terminal circles, and a series of carrier drive-gears certain of which have removable horn-sections whereby they may be arranged to serve as
5 terminal gears.

8. A braiding machine having a race-way made up of a series of race-circles of equal diameters certain of which may be disconnected to form terminal circles, and
10 a corresponding series of drive-gears cer-

tain of which have alternate horns removed to form terminal gears.

In testimony whereof, we affix our signatures, in the presence of two witnesses.

HENRY JANSSEN.
ROBERT CARL RAHM.

Witnesses:

D. M. STEWART,
W. G. STEWART.