July 7, 1925. 1,544,715

J. H. AVERY

METHOD OF PRODUCING RING TRAVELERS

Filed Feb. 5, 1924

Fig. 1

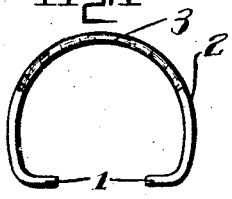


Fig. 2

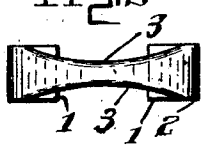


Fig. 3

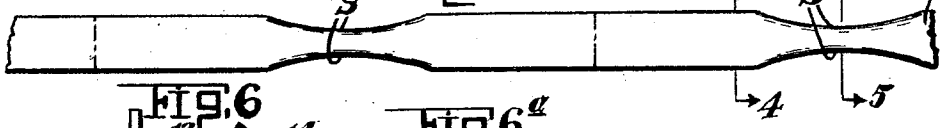


Fig. 6

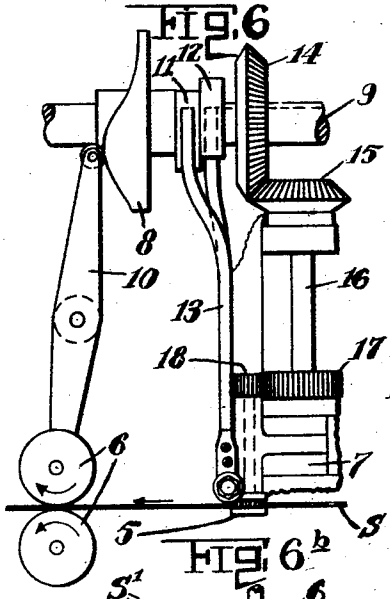


Fig. 6a

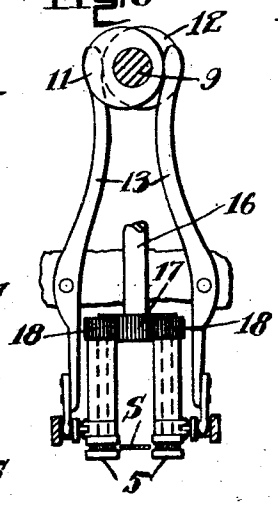


Fig. 4

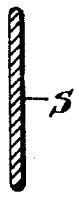


Fig. 5

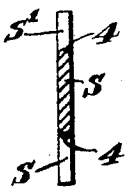


Fig. 6b

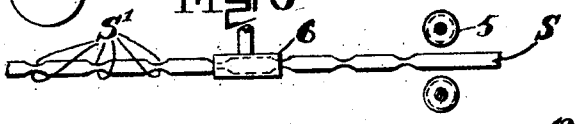


Fig. 7a



Fig. 6c

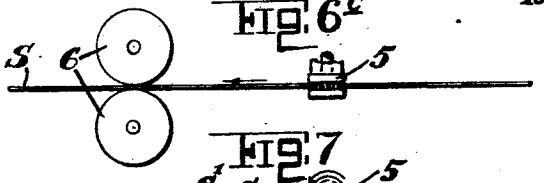
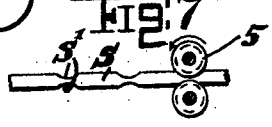


Fig. 7



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UNITED STATES PATENT OFFICE.

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METHOD OF PRODUCING RING TRAVELERS.

Application filed February 5, 1924. Serial No. 690,876.

To all whom it may concern:

Be it known that I, JAMES H. AVERY, a citizen of the United States, residing at Franklin, county of Norfolk, Commonwealth of Massachusetts, have invented certain new and useful Improvements in Methods of Producing Ring Travelers, of which the following is a specification.

In my present invention I contemplate a novel method of producing a ring traveler in which the bow portion is of reduced width. Such a traveler forms the subject matter of Patent No. 1,512,254 granted October 21, 1924 to Philip C. Wentworth to the commercial production of which my present invention more particularly relates.

In his application as in his previous patents he provided for a traveler in which a certain differential temper or hardness exists in the bow portion as distinguished from the so-called horns, as considered in the spinning traveler. In producing these travelers one requirement is that the stock shall be uniform in physical character so that the delicate variations may be possible in accordance with his invention.

Considering for example a case in which the traveler is of uniform stock or say of uniform carbon content throughout, there must be no substantial physical change in material condition by way of hardening or softening locally if certain of his concepts are to apply. My problem was therefore complicated.

These travelers are made in very small sizes, the ribbon stock from which they are formed being rolled from very fine wire. The problem of so economically producing such a traveler that it can be available for the general trade is a difficult one. The stock is so small and delicate and the specifications so exacting that any operation such as the reduction of the stock involves the utmost mechanical finesse.

Furthermore, and in addition to the specifications as to size, weight and hardness, it is essential that the ultimate contour of the bow be perfectly smooth so as not to catch the fibres of the thread and also that the physical character of the body of the metal be undisturbed so that the delicate difference in temper sought shall not be precluded or made more difficult.

For the purposes of this application I shall merely illustrate my invention in its relation to the ring traveler of the "horseshoe" type, comprising terminal horns and a connecting bow. It is to be understood, however, that such treatment is purely illustrative and in no way limiting, and that the term "ring traveler" is to be construed in its broadest sense as referring to any traveler whether for ring spinning or twisting, which travels about a ring, and so construed to cover either the "horseshoe" or the vertical type of traveler.

It has been old to form travelers from a continuous strip of uniform thickness and width throughout. According to my method I utilize this practice but I remove equal opposite portions at the longitudinal edges of the strip by simultaneously bringing thereagainst while the strip is stationary, a pair of relatively removable cutters of special design which revolve at the same surface speed, but in opposite directions.

These cutters form equal opposite formative notches, which notches are located at exactly the center of the traveler bow when the strip is severed and the individual travelers bent to form, thereby insuring that the traveler when formed will be properly balanced.

The method of practicing my method, together with a characteristic ring traveler produced thereby is described and illustrated in the accompanying specification and drawings, and the particular features of novelty are pointed out in the appended claims. Throughout the specification and drawings like reference characters are correspondingly applied, and in the drawings:

Fig. 1 is an end view of a ring traveler produced by my method.

Fig. 2 is a plan view thereof.

Fig. 3 is a development of the strip from which the travelers are formed.

Fig. 4 is a section on the line 4—4, Fig. 3.

Fig. 5 is a section on the line 5—5, Fig. 3, and

Figs. 6, 6^a, 6^b, 6^c, 7, and 7^a are fragmentary views illustrating apparatus for the practice of my method.

I have indicated at 1 (Figs. 1 and 2) the terminal horns of a characteristic ring traveler as conceived by Mr. Wentworth to the production of which my invention applies. The bow portion 2 of said traveler has equal opposite portions at its opposite edges removed, as indicated at 3, substantially cen-

trally thereof, the metal included within the notches 3 being rounded as indicated at 4 in Fig. 5, to correspond with the remainder of the bow which is slightly rounding at its edge as shown in Fig. 4.

The travelers are formed from a continuous strip of stock S of uniform thickness and width throughout rolled from a wire of standardized gage. This strip is equally and oppositely notched as indicated at S^1, Fig. 3, at a plurality of definitely spaced portions along its longitudinal edges to locate the cutaway portions 3 in the traveler bow at approximately the center of said bow when the strip is severed and the individual traveler bent to form. The lines of severance of the strip are indicated by the dotted lines in Fig. 3.

According to my method, the strip S is intermittently fed to the severing and bending instrumentalities and the notching instrumentalities are brought against the longitudinal edges to remove therefrom equal and opposite portions at desired intervals on the non-feeding phase of the stock feed mechanism to permit the strip to feed forwardly. As contemplated herein, the notching operation is performed by a pair of oppositely disposed spaced milling cutters 5 of special design between which the strip S is adapted to feed.

These cutters 5 are mounted on either side of the feed way through which the stock is intermittently drawn by a pair of oppositely rotating feed rolls 6 and are adapted to be moved towards the stock so as to notch it while the stock is stationary and to be withdrawn from the stock on the feeding phase of the feed rolls. To this end, the cutters 5 may be pivoted or otherwise relatively movable to a casting or other suitable support 7 whereby to open and close relative to the stock in times relation to the intermittent operation of the feed rolls.

As here shown, the feed rolls 6 are intermittently actuated from a feed cam 8 on the cam shaft 9 of the machine by a bell crank lever 10 and suitable operating connections, and the opening and closing movement of the cutters is effected from a double cam 11—12 on said cam shaft which simultaneously actuates a pair of pivoted rocker arms 13 connected with the cutters.

The cutters themselves are continuously rotated but in opposite directions from said cam shaft at increased speed by a suitable gear train 14, 15, shaft 16, gear 17 and pinion 18 on the arbors of the cutters, Figs. 6 and 6^a. Preferably the cutting faces of the cutters are concaved or grooved as indicated at 19, Fig. 7^a, so as to round off the edges 4 of the stock of the notches 3 and to remove the stock in the form of equal opposite segments of a circle.

The cutter support 7 may be mounted for longitudinal adjustment relative to the feed rolls to vary the intervals at which the notches S^1 are formed in the strip, and the cutters themselves may be mounted on their rocker arms 13 for independent lateral adjustment relative to each other, as indicated in Fig. 6^a.

It will be seen that by such production the stock is subjected to a minimum of physical change and thus to preserve the balance of factors necessary to the final product in which the ultimate differential temper is preserved.

Various modifications in my method of production may obviously be resorted to within the limits of the appended claims.

What I therefore claim and desire to secure by Letters Patent is:—

1. The method of producing a ring traveler of the class described, consisting in rolling from round wire stock a flat ribbon of uniform width and thickness having a slightly rounded edge and in simultaneously forming on opposite sides of the stock equal similar rounded edge scallops by progressive cuttings in opposite directions.

2. The method of producing a ring traveler of the class described, consisting in rolling from round wire stock a flat ribbon of uniform width and thickness having a slightly rounded edge and in simultaneously forming on opposite sides of the stock at predetermined intervals equal similar rounded edge scallops by progressive cuttings in opposite directions.

3. The method of producing a ring traveler consisting in bringing a pair of oppositely rotating concaved milling cutters against the opposite longitudinal edges of a continuous strip of stock at predetermined intervals to mill therefrom equal opposite portions, in severing the strip intermediate of the milled out portions to form the traveler blank, and in bending the blank to form the traveler.

4. The method of producing a ring traveler consisting in bringing a pair of oppositely rotating milling cutters against the opposite longitudinal edges of said strip at predetermined intervals and on the non-feeding phase of the stock feed mechanism, to mill from said strip equal opposite portions, in separating said cutters on the feeding phase of the stock feed mechanism to permit the stock to advance therebetween in severing the strip intermediate of the milled out portions to form the traveler blank, and in bending the blank to form the traveler.

5. The method of producing a ring traveler consisting in intermittently feeding a continuous strip of stock of uniform thickness and width throughout, in bringing a pair of oppositely rotating concaved milling cutters located in advance of said stock

feed mechanism against the longitudinal edges of said strip at predetermined intervals and on the non-feeding phase of the stock feed mechanism to mill from said strip equal opposite segmental portions, in separating said cutters on the feeding phase of the stock feed mechanism to permit the stock to advance therebetween, in severing the strip intermediate of the milled out portions to form the traveler blank, and in bending the blank to form the traveler.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES H. AVERY.

Witnesses:
P. C. WENTWORTH,
M. C. THOMAS.