May 12, 1925. 1,537,501

C. A. SELEY ET AL

APPARATUS FOR STRAIGHTENING METAL ARTICLES

Filed Oct. 21, 1921 2 Sheets-Sheet 1

Fig. 1.

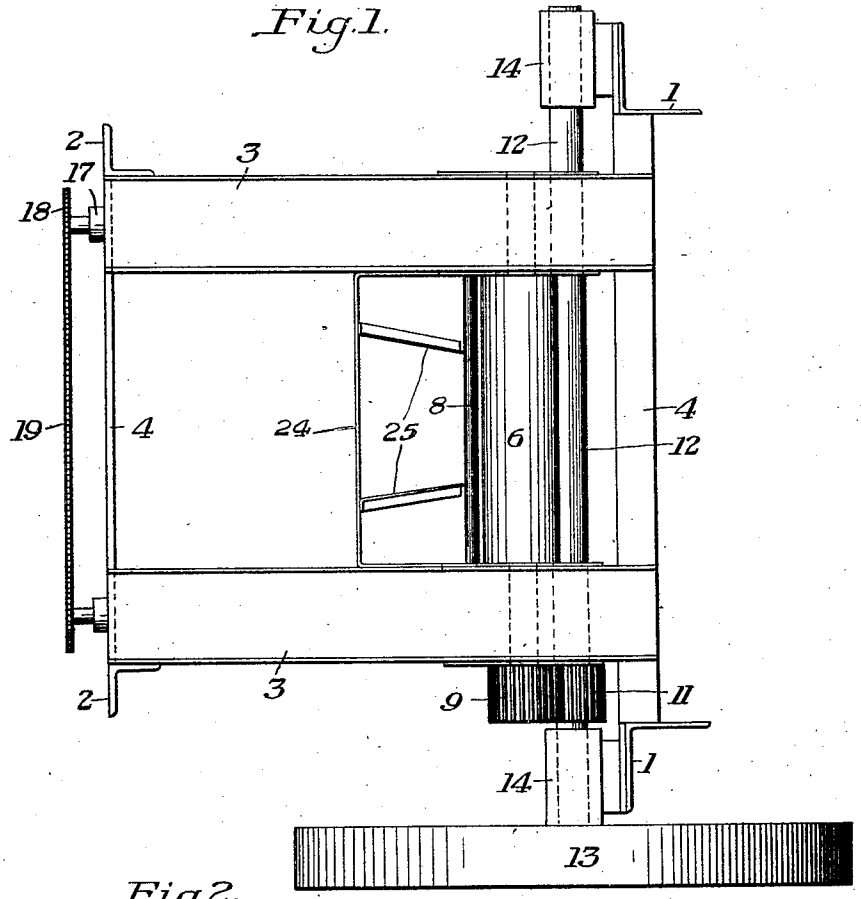


Fig. 2.

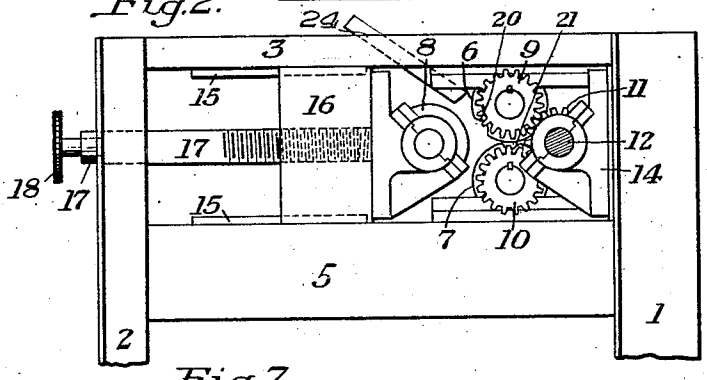
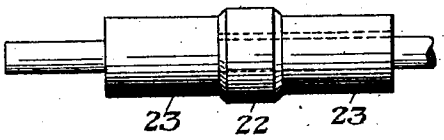


Fig. 7.



INVENTORS

Charles A. Seley
Milo M. McCallister
by their attorneys
Byron, Stubbin, Burgess & Pannell

May 12, 1925. 1,537,501

C. A. SELEY ET AL

APPARATUS FOR STRAIGHTENING METAL ARTICLES

Filed Oct. 21, 1921 2 Sheets-Sheet 2

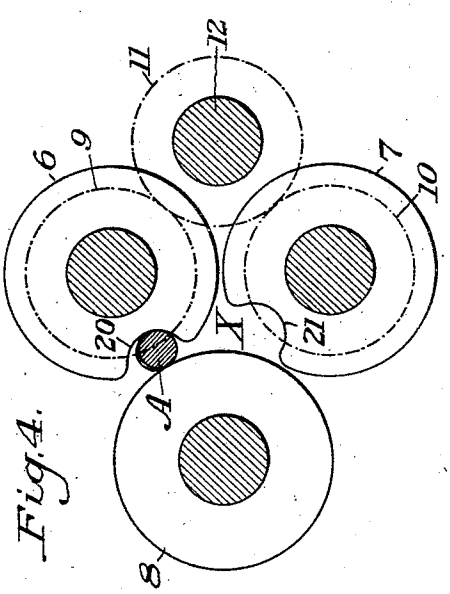


Fig.4.

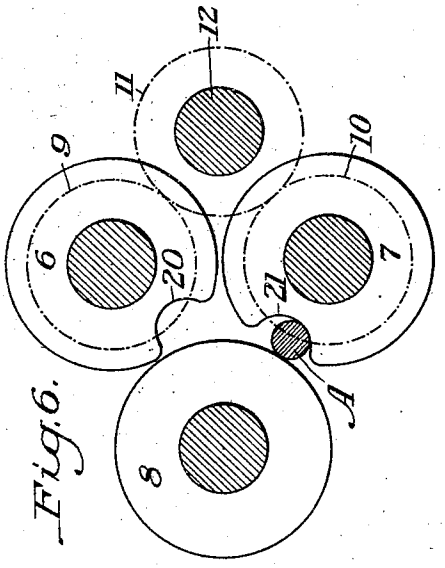


Fig.6.

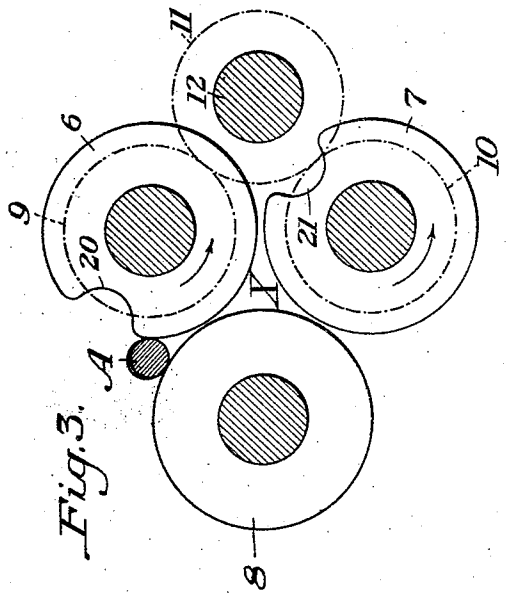


Fig.3.

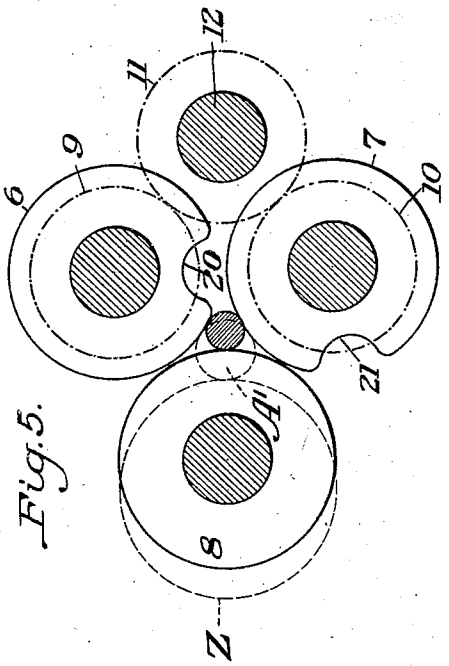


Fig.5.

INVENTORS

Charles A. Seley

Milo M. McCallister

by their attorneys

Byrnes, Stubbins, Burgess & Semmes

Patented May 12, 1925. 1,537,501

UNITED STATES PATENT OFFICE.

CHARLES A. SELEY, OF SEWICKLEY, AND MILO M. McCALLISTER, OF ERIE, PENNSYLVANIA, ASSIGNORS TO AMERICAN FLEXIBLE BOLT COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

APPARATUS FOR STRAIGHTENING METAL ARTICLES.

Application filed October 21, 1921. Serial No. 509,368.

To all whom it may concern:

Be it known that we, CHARLES A. SELEY and MILO M. McCALLISTER, both citizens of the United States, residing, respectively, at Sewickley, in the county of Allegheny and State of Pennsylvania, and at Erie, in the county of Erie and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Straightening Metal Articles, of which the following is a full, clear, and exact description.

Our invention relates to apparatus for rolling metal articles of various lengths and diameters for the purpose of straightening the said articles and removing surface irregularities therefrom.

Our invention employs the principle of straightening and smoothing the articles by rolling them between a plurality of surfaces so as to closely confine articles of different sizes within the straightening space defined by said surfaces. Means are provided for adjusting the surfaces relative to each other to accommodate articles of different diameters; and means are also provided whereby the articles may be readily introduced into the straightening space and removed therefrom without substantially changing the dimensions of the straightening space between the surfaces. Our invention preferably involves the use of a plurality of cylindrical members or rolls, one of which is adjustable with respect to the others. In the preferred embodiment of our invention, we also provide one of the cylinders with a longitudinal depression through which the article being rolled is introduced into the straightening space, and another one of said rolls is provided with a similar longitudinal depression through which the straightened article is discharged from the straightening space.

Our invention will be better understood by reading the following description taken in connection with the accompanying drawings showing one embodiment of our invention, and in which:

Figure 1 is a plan view of a machine embodying our invention;

Fig. 2 is an end elevation of a part of the machine;

Fig. 3 is a diagram illustrating the feeding position of the rolls;

Fig. 4 is a similar diagram showing the entering position of the rolls;

Fig. 5 is a similar diagram showing the rolling or straightening position of the rolls;

Fig. 6 is a similar diagram showing the discharging position of the rolls; and

Fig. 7 shows a special roll in elevation.

Referring to the drawings, the machine comprises a frame structure composed of the upright members 1 and 2 joined together at the top by the members 3, 4, and 5. Mounted in the frame are three rolls, 6, 7, and 8. The rolls 6 and 7 are provided on their ends with gears 9 and 10. Meshing with the gears 9 and 10 is a gear 11 mounted on a power shaft 12, on one end of which is fixed a pulley 13. The shaft 12 is journaled at 14.

The members 3 and 5 are provided with guides 15. These guides carry journal blocks 16, one of which is shown in Fig. 2. The journal blocks 16 carry the roll 8 which co-operates with the rolls 6 and 7. The blocks 16 are screwthreaded, and adjusting screws 17 are screwed into the blocks 16. One end of each of the adjusting screws 17 is provided with a sprocket 18 over which a chain 19 runs and by which the two screws are operatively connected together.

The parts 16, 17 and 18 are provided for the purpose of adjusting the roll 8 relative to the rolls 6 and 7, and for a reason which will appear later.

The roll 6 is provided with a depression 20, and the roll 7 is provided with a depression 21. The depressions 20 and 21 run longitudinally of the rolls and are for the purpose, respectively, of introducing and discharging articles to and from the rolling or straightening space.

It is sometimes advisable to provide special rolls conforming generally to the outline of the article to be rolled for straightening or for other purposes. Fig. 7 shows the form of roll for use in rolling stay bolts having a reduced body portion joined to the heads by frusto-conical portions. It will be understood that each of the rolls 6, 7 and 8 will have the same general shape as the roll shown in Fig. 7. In that event, the part 22 engages the reduced body portion of the bolt, and the parts 23 of the rolls engage

the heads of the stay bolt, so that all parts of the stay bolt come in direct contact with the rolls during the rolling operation, whereby the bolt is straightened and any slight surface irregularities are corrected or removed.

A hopper or chute 24 carries the article to the straightening rolls. Guides 25 are also provided. These guides are of importance in connection with the form of roll shown in Fig. 7, since they insure the placing of the article in the proper position longitudinally of the rolls. The guides 25 are preferably converging as shown in Fig. 1, since this insures a proper positioning of the article to be straightened even though the operator drops the article onto the chute 24 with no more care than is usual in rapid production. It is only necessary for the operator to drop the articles on the chute 24, from which they will be carried by gravity against the roll 6 and thereafter carried to the straightening position at the proper moment.

The operation of our device is as follows:

Power is applied to the pulley 13 and is transmitted to the rolls 6 and 7 through gears 9 and 10. This causes the rolls 6 and 7 to rotate in the same angular direction, as shown by the arrows in Fig. 3. The roll 6 is provided with a groove 20, and as the roll rotates, the groove 20 permits the article A to pass between the bottom of the groove and the circumference of the roll 8 and into the straightening space X, as shown in Fig. 4. When the rolls reach the position shown in Fig. 5, the article A has dropped into contact with the circumferences of the rolls 7 and 8, and as the roll 6 continues to rotate, the circumference of that roll also engages the exterior of the article and the same is rolled between the surfaces of the rolls 6, 7, and 8 until the groove 21 in the roll 7 comes to substantially the position shown in Fig. 6, whereupon the straightened article is discharged from the straightening space. It will be noted that the article is introduced into the straightening space, is rolled therein and straightened, and discharged from the space automatically and without necessitating a change of the axes of rotation of the rolls relative to each other.

In Fig. 5, the roll 8 has been adjusted to a position indicated by the dotted lines Z, and an article A′ of considerably greater diameter than the article A is to be treated. The operation is the same, regardless of the diameter of the article being straightened, the position of the roll 8 being determined by the proper manipulation of the adjusting screws 17.

It will be noted that the generating radius of the grooves 20 and 21 is equal to the radius of the largest article to be treated with any given set of rolls. This is for the purpose of permitting the articles to pass between the bottom of the depression and the circumference of the adjustable roll 8. It will also be noted that the grooves 20 and 21 are so related one to the other that when the article is introduced into the straightening space through the groove 20, the groove 21 is in such a position that the article will not enter the groove 21 until the rolls have made substantially a complete revolution. This arrangement affords the advantage of supplying only one article to the straightening space at a time, and of positively discharging one article before another enters the space. By this arrangement, the maximum rolling effect is given to the article being rolled, so as to insure the success of the process. By the arrangement shown, the article is given several revolutions during one revolution of the rolls; and the direction of rotation of the rolls 6 and 7 is such as to prevent the article remaining in the depression 20 after the roll reaches substantially the position shown in Fig. 5.

Our invention has many advantages, among which may be noted that the articles are automatically introduced into the straightening space, are automatically straightened, and automatically discharged, without changing the axes of rotation of the rolls relative to each other. Simple means are provided for adjusting one of the straightening rolls so that the machine will accommodate articles of a great variety of diameters. The machine is composed of few and simple parts so arranged that only one article may enter the straightening space at a time, and that this article is automatically discharged therefrom before another may be introduced.

Many changes may be made in the details of our invention without departing from the spirit thereof.

We claim:

1. In a machine for straightening metal articles, the combination of a frame, a plurality of rolls mounted in said frame, means for introducing an article between said rolls with its axis substantially parallel to the axes of the rolls, said means being adapted to position the article against one of said rolls, and also including a depression in said rolls into which the article passes from said introducing means, and means for adjusting said rolls relative to each other for straightening articles of different sizes, substantially as described.

2. A machine for straightening metal articles having a varying circular cross-section, comprising a plurality of rolls of varying cross-section to correspond to the article to be straightened, said rolls being adapted to simultaneously rotate in contact with the article, means for introducing the article to

the rolls with its axis substantially parallel to the axes of the rolls, and guide means for positioning the article longitudinally of the rolls, substantially as described.

3. A machine for straightening metal articles having a varying circular cross-section, comprising a plurality of rolls of varying cross-section to correspond to the article to be straightened, said rolls being adapted to simultaneously rotate in contact with the article, means for introducing the article to the rolls with its axis substantially parallel to the axes of the rolls, and converging guide means for positioning the article longitudinally of the rolls, substantially as described.

4. A machine for straightening metal articles having a varying circular cross-section, comprising a plurality of rolls of varying cross-section to correspond to the article to be straightened, said rolls being adapted to simultaneously rotate in contact with the article, means including an inclined chute for introducing the article to the rolls with its axis substantially parallel to the axes of the rolls, and converging guide means for positioning the article longitudinally of the rolls, substantially as described.

In testimony whereof, we have hereunto set our hands.

CHARLES A. SELEY.
MILO M. McCALLISTER.