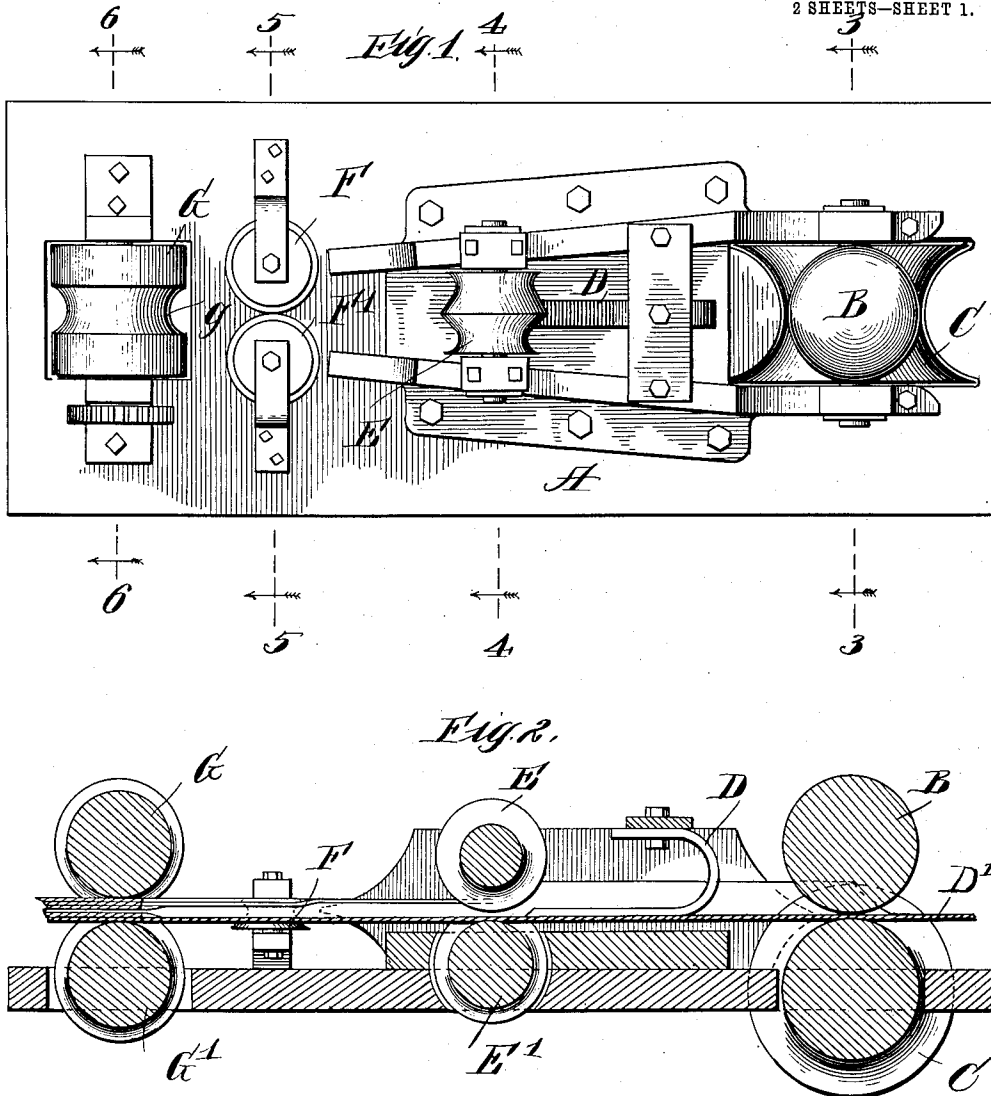


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MACHINE FOR FORMING BARS OR ROUNDS FROM METAL PLATES.
APPLICATION FILED MAR. 30, 1908.

909,644.

Patented Jan. 12, 1909.

2 SHEETS—SHEET 1.



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MACHINE FOR FORMING BARS OR ROUNDS FROM METAL PLATES.

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2 SHEETS—SHEET 2.

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UNITED STATES PATENT OFFICE.

SIDNEY McCLOUD, OF CHICAGO, ILLINOIS.

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No. 909,644.

Specification of Letters Patent.

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Application filed March 30, 1908. Serial No. 424,038.

To all whom it may concern:

Be it known that I, SIDNEY McCLOUD, a citizen of the United States, and a resident of Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Machines for Forming Bars or Rounds from Metal Plates, of which the following is a description.

My invention has for its object the production of a machine for rolling bars or rounds from metal plates, from which bars or rounds springs or other articles may be formed, and which are much stronger and more durable than the material out of which said articles are made at the present time.

It is a well known fact that the bars from which springs or the like are at present made are not of exactly the same composition throughout, there being spots which contain too much or too little carbon, and where there is an excess of carbon the material is more brittle and will break more readily, thereby rendering the bar, or the article formed therefrom, useless. For the purpose of overcoming this difficulty I have designed a machine for forming bars or rounds from metal plates by rolling or winding said plates around themselves.

In carrying out this invention I contemplate rolling a single plate upon itself or rolling a plurality of plates together. As will be observed in the drawing when the bar is completed it is composed of a plurality of layers, and in case of a shock or jar sufficient to break the bar at a weak spot, one layer only will be broken and the remainder of the layers will remain intact, and the bar is not materially weakened. The metal out of which these bars or rolls are made being wound or wrapped at a heat which does not weld the same together allows a modicum of friction between the layers, thereby producing a bar of greater compression and tensile strength.

In the accompanying drawings forming part of this specification, and in which like letters of reference indicate corresponding parts I have illustrated one form of device illustrating the principle of my invention, although the same may be carried into effect in other ways without departing from the spirit thereof, and in these drawings: Figure 1 is a top plan view of a machine em-

bodifying my invention; Fig. 2 is a vertical longitudinal section taken through the center of Fig. 1; Fig. 3 is a sectional view taken on the line 3—3 of Fig. 1; Fig. 4 is a sectional view taken on the line 4—4 of Fig. 1; Fig. 5 is a sectional view taken on the line 5—5 of Fig. 1; Fig. 6 is a sectional view taken on the line 6—6 of Fig. 1; Fig. 7 is a perspective view of a bar or round formed by winding a plate of metal spirally upon itself.

Upon the bed A of the machine and within suitable journal bearings are sustained the rolls B and C, which receive the plates of metal from which the bars or rounds are to be formed, and which give to such plates a concavo-convex shape when passed therethrough.

The roll B is preferably of spherical contour and the roll C has its periphery formed with a groove corresponding in outline to the surface of the roll B. These rolls B and C are driven by suitable gearing, arranged in any well known manner.

After the plate has passed through the rolls B and C and has been bent transversely of the plate, it passes into a former by which a further bending is effected, as hereinafter described.

D is a guide supported above the bed A of the machine, and which extends above the path of the plate D' as it leaves the rolls B and C. At the end of this guide D are the forming rolls E, E'. The roll E' is provided upon the periphery thereof with a groove corresponding in outline to the bottom of the plate D' after it has been bent to the concavo-convex form by the rolls B and C.

The roll E is provided upon the periphery thereof with two circumferential grooves, one of which is smaller than the other. As the metal plate D' leaves the bending rolls B and C it passes between the forming rolls E, E', the edges *e*, *e'* of said plate being turned inwardly by the grooves upon the former E, and folded so that one edge overlaps the other, as shown more clearly in Fig. 5.

At the rear of the forming rolls E, E', I have arranged a pair of reducing rolls F, F', which are supported vertically in suitable bearings above the bed A and which are

driven by appropriate gearing. Each of said rolls has a circumferential groove f, f' , through which the curved plate is passed as shown more clearly in Fig. 5. The curved metal plate is further turned upon itself between these rolls and crowded more closely together. The compressing and finishing rolls G, G' , are suitably mounted at the rear of the machine and are arranged at a proper distance from the reducing rolls F, F' . These rolls are provided with grooves g, g' upon the periphery thereof. After the metal plate has been formed into a spiral and is passed to the finishing rolls the layers of the metal plate are wound closely together as shown at H in Fig. 6 so that as the bar leaves the machine it is coiled as shown in Fig. 7. The different rolls may be made adjustable with relation to each other in any desired manner so that when it is desired to roll a bar or round of metal which shall not be tightly coiled upon itself as shown in Fig. 7 the said metal plate may be wound so that a hollow is left in the center thereof throughout the entire length of the bar.

From the foregoing description it will be seen that the plate of metal from which the bar or round is to be formed passes through a plurality of stages in which it is gradually bent from a flat plate to a concavo-convex form, after which its edges are bent so that by pressure they will overlap each other, after which it is passed through the reducing rolls and the metal more closely wound upon itself. The compressing and finishing rolls then press the coils of the metal plate until the finished article is produced as shown in Fig. 7.

The precise details of construction above set out may be varied without departing from the spirit of my invention and to such details, therefore, I do not wish the invention to be understood as restricted. Thus, for example, while I have shown the rolls E as formed with two grooves, such roll might be formed with a single groove without departing from the spirit of my invention. So also, while I prefer that the circumferential grooves corresponding to the turned edges e, e' of the former should be formed in a roll, I would still regard it as within the scope of my invention to form such grooves in a non-revoluble body.

I claim:

1. In a machine of the character described, the combination of rolls for bending a metal plate transversely, means for curving the same to overlap the edges, and means for further curving and reducing the plate to the form of a coil, as set forth.

2. In a machine of the character described, the combination of means for bending a metal plate transversely, means for further curving the same to overlap the edges, and

reducing rolls for coiling said plate tightly upon itself.

3. In a machine of the character described, the combination of means for bending a metal plate transversely, means for further curving the same to overlap the edges, and reducing rolls for coiling said plate into a substantially solid bar.

4. In a machine of the character described, forming rolls comprising a suitable support for a metal plate, a grooved roll for overturning the edges of said plate, and means for further curving, coiling, and reducing said plate to a tightly coiled bar.

5. In a machine of the character described, forming rolls, a roll having grooves of different outline to overlap the edges of a metal plate, and means for further curving and reducing said plate to a tightly coiled bar.

6. In a machine of the character described, the combination of rolls for imparting a transverse curve to a metal plate, the former having a double grooved roll to unequally overturn the edges of said plate, and means for wrapping said metal upon itself into a tightly coiled bar.

7. In a machine of the character described, the combination of a former for unequally overturning the edges of a metal plate, and curving and reducing rolls for coiling said plate upon itself into a substantially solid form.

8. In a machine of the character described, the combination of bending rolls for metal plates, forming rolls for curving the edges of said plate towards each other, and a plurality of sets of reducing and finishing rolls for further coiling said plate upon itself into a substantially solid piece of metal.

9. In a machine of the character described, the combination of the bending rolls for metal plates, a guide at the rear of said rolls, forming rolls for turning the edges of the metal to overlap each other, and reducing and finishing rolls for further coiling said plate upon itself into a substantially solid piece of metal.

10. In a machine of the character described, the combination of bending rolls for metal plate, a guide holding the plate in position, grooved rolls for partially coiling the edges of said plate to overlap each other, and reducing and finishing rolls for further coiling said plate into a substantially solid piece of metal.

11. In a machine of the character described, the combination of a former for curving a plate of metal, a guide holding the plate to the bed of the machine, rolls for initially coiling said plate, and means for rolling said plate upon itself into a substantially solid piece of metal.

12. In a machine of the character described, the combination of rolls for bending

a metal plate transversely, a former comprising a roll having circumferential grooves upon the periphery thereof, one of said grooves being of different contour from the
5 other, said roll adapted to overturn the edges of said plate, and means for coiling, reducing and compacting said plate into a substantially solid piece of metal.

In testimony whereof I have hereunto signed this specification in the presence of 10 two subscribing witnesses.

SIDNEY McCLOUD.

Witnesses:

F. H. KING,

CHARLES I. COBB.