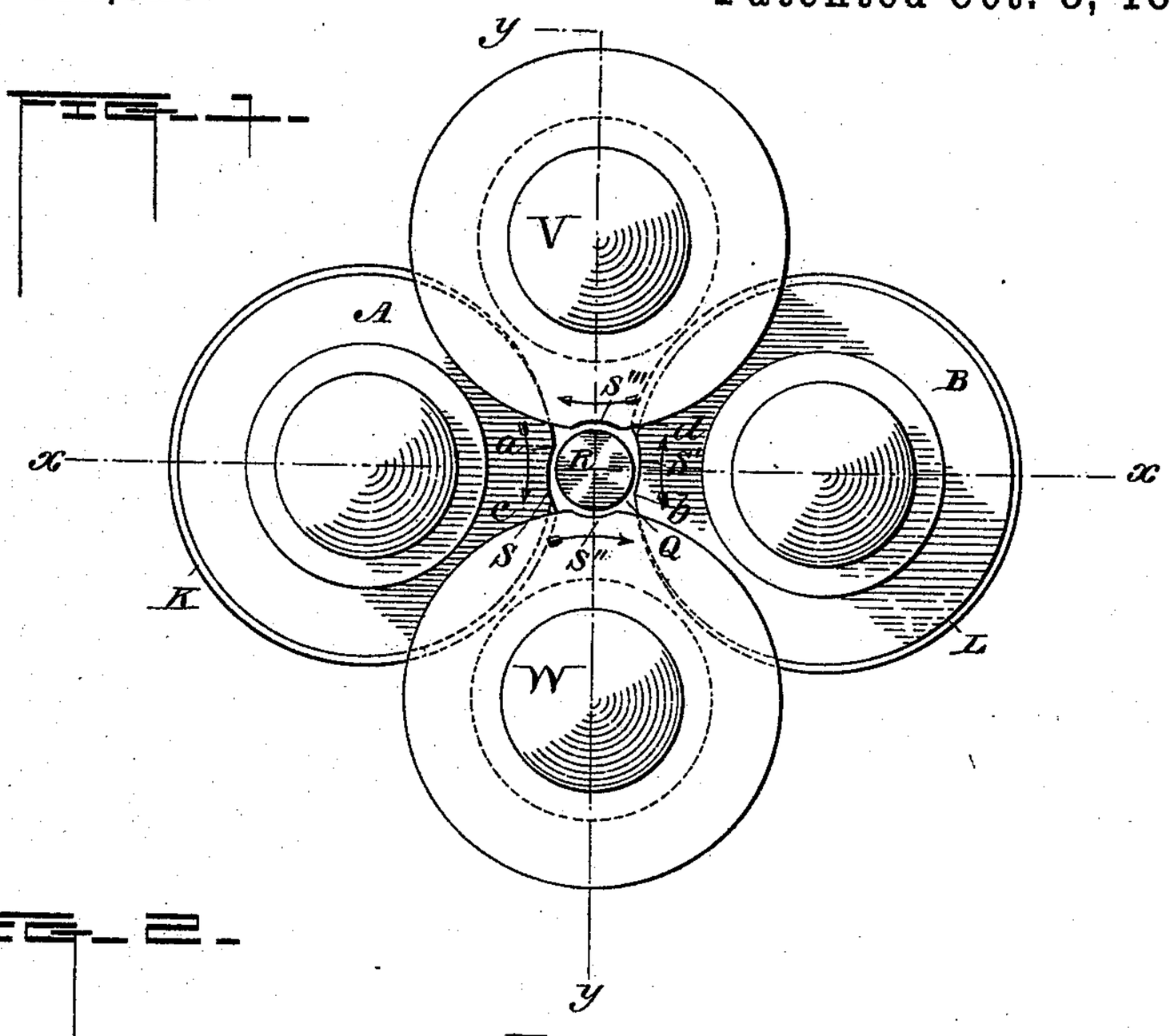
(No Model.) 2 Sheets—Sheet 1.

J. R. JONES.

MACHINE FOR FORMING AXLE JOURNALS.

No. 412,626. Patented Oct. 8, 1889.



Witnesses
L. G. Connor Jr.
J. P. Davis.

Inventor:
John R. Jones,
By his Attorney
R. H. Duncan

(No Model.) 2 Sheets—Sheet 2.

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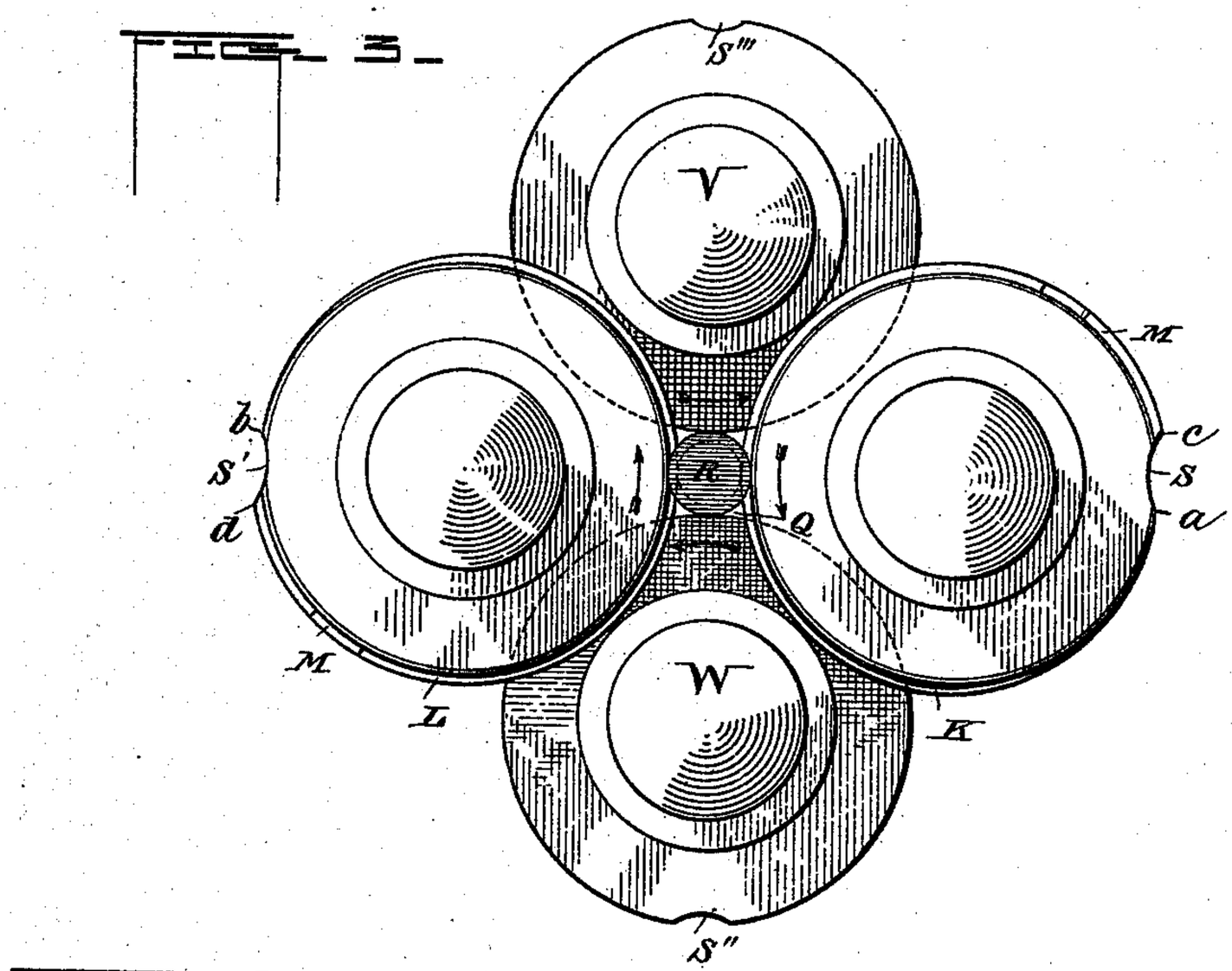

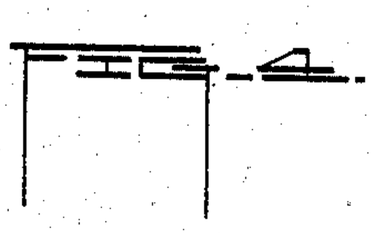

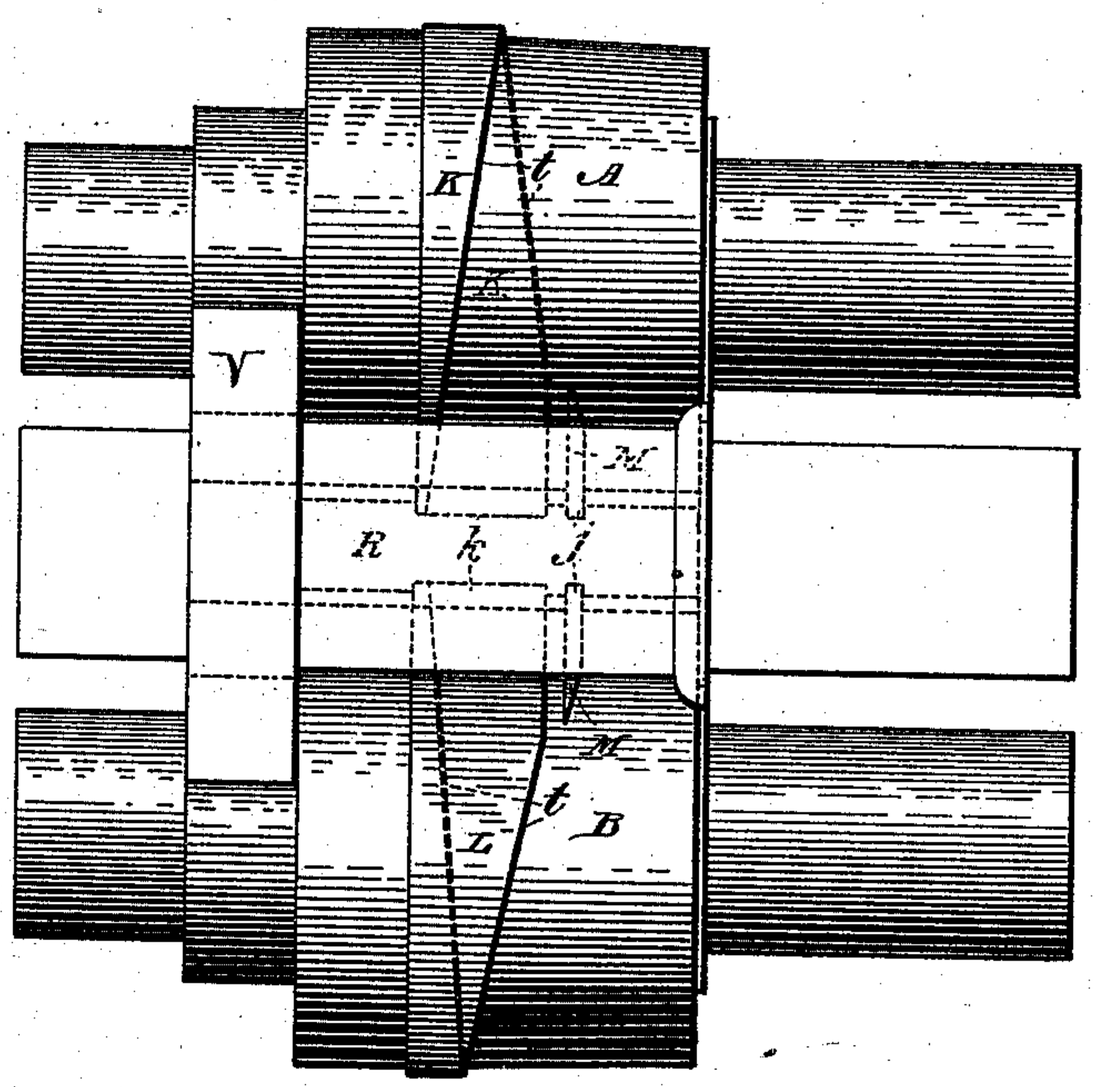

Witnesses
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Inventor:
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UNITED STATES PATENT OFFICE.

JOHN R. JONES, OF PHILADELPHIA, PENNSYLVANIA.

MACHINE FOR FORMING AXLE-JOURNALS.

SPECIFICATION forming part of Letters Patent No. 412,626, dated October 8, 1889.

Application filed August 20, 1889. Serial No. 321,369. (No model.)

To all whom it may concern:

Be it known that I, JOHN R. JONES, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Forming Axle-Journals; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to a device for forming journals upon axles; and the object of it is to produce a much more simple, cheap, and durable mechanism with which to accomplish this result.

With this purpose in view my invention consists in the peculiar features and combinations of parts more fully described hereinafter, and pointed out in the claims.

In the accompanying drawings, Figure 1 represents an end view of the four rolls employed, the axle being shown in position to be acted upon; Fig. 2, a plan view of the rolls when they are in the position shown in Fig. 1; Fig. 3, an end view in which the rolls are shown in the act of forming the journal, and Fig. 4 a plan showing the position of the rolls when the journal is completed.

The reference-letters A and B represent a pair of twin rolls arranged opposite each other, with an intervening pass O for the reception of the axle R. The peripheries of the rolls are each provided with tapering embossments K L, which gradually become thicker and wider as they recede from the periphery of the rolls, beginning at one edge of the transverse recesses S S and passing around the rolls and ending at the opposite edge of the recesses. These recesses are provided for the purpose of facilitating the entrance of the axle, so that it will not come in contact with the shaping-rolls until they are rotated. In order to hold the axle in true alignment with the axes of the shaping-rolls and to assist in rotating the axle, a pair of twin retaining-rolls are placed one above the other in such position relative to the shaping-rolls that a vertical line *y y* through their axes will be at right angles to the line *x x* through the axes of the shaping-rolls. These retaining-rolls are also provided with oppositely-located recesses in their peripheries, which recesses are given a depth sufficient to permit the blank to be easily inserted between the four rolls, but which will allow the latter, when rotated, to engage the opposite faces of the axle while the shaping-rolls are at work, thereby holding the axle in true diametrical position to the action of the shaping-rolls. The narrowest and shallowest portion of the embossments K R commence, respectively, at the upper and lower edges *a b* of the recesses, and grow wider and deeper as they extend backward until they reach the points *c d*, where the increase in width and depth ceases, and the edge runs parallel with the direction of the rolls, terminating at opposite edges of the recesses S S′, as will be more clearly seen in Fig. 1. Thus it will be noticed that these embossments commence and terminate on the opposite sides of the axle-receiving recesses, and when the rolls are in position to receive the axle the starting-points *a b* are diagonally opposite each other.

Located just off the terminus of the main embossments K L are a pair of smaller and narrower embossments M, which commence at the points *c d*, where the spread of the embossments K L leaves off, and grow wider and deeper as they recede backward. These embossments are much narrower and shorter than the main ones, and are for the purpose of forming the groove *j* in the end of the axle between the wider groove *k* and the outer extremity of the axle, or they can be extended so as to completely sever the axle.

It will be noticed that the vertical faces *t t* of the embossments extend spirally around the periphery of the rolls.

At the right-hand end of the shaping-rolls, where the taper of the embossments ceases, the rolls themselves are made to taper slightly toward their right-hand ends. This formation is given to allow the metal to move freely outward toward the ends of the rolls when it becomes expanded by the compression of the embossments.

The compression and lateral crowding of the metal by the rolls improve its texture by working out any flaws that may be in it, and thereby strengthen the axle.

The preferred mode of constructing my machine having been set forth, I will now proceed to describe its operation.

The shaping and retaining rolls are so timed as to bring all the recesses S S′ S″ S‴ into coincidence to form the pass Q, in order to enlarge the latter for the free reception of the axle, whereupon the latter is inserted into the pass, as shown more clearly in Fig. 2. The rolls, being now set in motion, will all rotate in the same direction, and as soon as they begin to revolve the points of the main embossments commence to engage the opposite sides of the axle, gradually sinking deeper and deeper into its surface and spreading the metal laterally or endwise toward the end of the axle, and this action continues until the straight portion of the embossment is reached. At this point the auxiliary embossments M commence to act upon the end of the axle which has just been extended, and they perform the same functions in producing the second groove. When the rolls have completed a single revolution, both grooves will be formed in the axle, as shown in Fig. 4. During the shaping operation the opposite edges of the retaining-rolls engage the opposite sides of the axle and hold it in the proper adjustment for the perfect action of the shaping-rolls, and also help to rotate the axle, so that the shaping-rolls will work around it. When the rolls have completed the shaping operation, the recesses S S′ S″ S‴ are brought into coincidence and the bar can be removed; but if it is desired to give a still better finish the operation can be repeated. Hence it will be observed that the edges of the embossments are spiral-shaped and act upon the metal like a screw to crowd it laterally toward the end of the axle.

Any suitable driving-gear which will cause all the rolls to rotate in unison in the same direction may be employed, and it has not been deemed necessary to show such means in the drawings.

It is evident that many slight changes which might suggest themselves to a skilled mechanic could be resorted to without departing from the scope and spirit of my invention. Therefore I do not limit myself to the exact construction herein shown.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for forming axle-journals, a pair of shaping-rolls provided with embossments for crowding the metal laterally, in combination with a pair of retaining-rolls adapted to hold the axle to the action of the shaping-rolls, in the manner and for the purpose substantially as described.

2. In a machine for forming axle-journals, one or more shaping-rolls, in combination with retaining-rolls arranged to hold the axle to the action of the shaping-rolls, in the manner and for the purpose substantially as described.

3. In a machine for forming axle-journals, a pair of twin shaping-rolls provided with tapering or spiral embossments, in combination with retaining-rolls for holding the axle to the action of the shaping-rolls, in the manner and for the purpose described.

4. In a machine for forming axle-journals, a pair of twin rolls provided with tapering embossments for crowding the metal laterally to form a groove, in combination with a smaller auxiliary tapering embossment located upon one side of the main embossment, and being so arranged as to commence acting upon the axle when the main embossment ceases, in the manner and for the purpose set forth.

5. In a machine for forming axle-journals, a pair of shaping-rolls provided with transverse recesses in their peripheries to facilitate the entrance of the axle, in combination with retaining-rolls for holding the axle to the action of the shaping-rolls, substantially as described.

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

JOHN R. JONES.

Witnesses:
SAML. H. RALSTON,
HARRY L. FIRTH.