

(No Model.)

T. BROWN.
HUB BAND.

3 Sheets—Sheet 1.

No. 321,792.

Patented July 7, 1885.

Fig. 1.



Fig. 2.



Fig. 3.

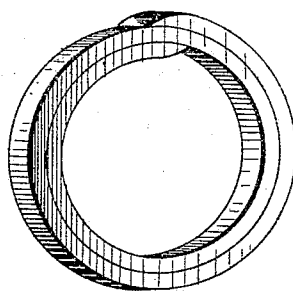


Fig. 4.

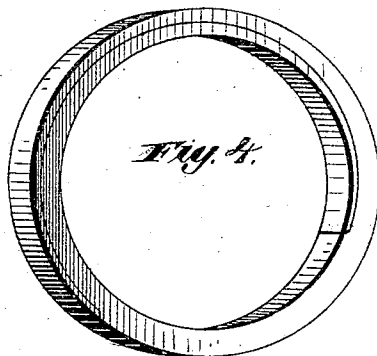
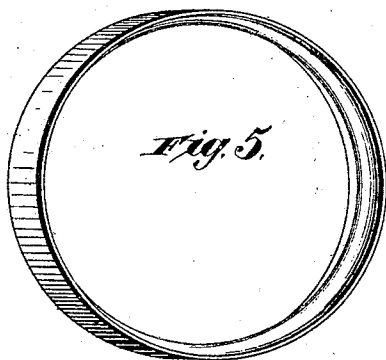


Fig. 5.



Witnesses.

Robert Everett,
J. A. Rutherford

Fig. 6.



Inventor.

Thomas Brown.

By James L. Norris,
Atty.

(No Model.)

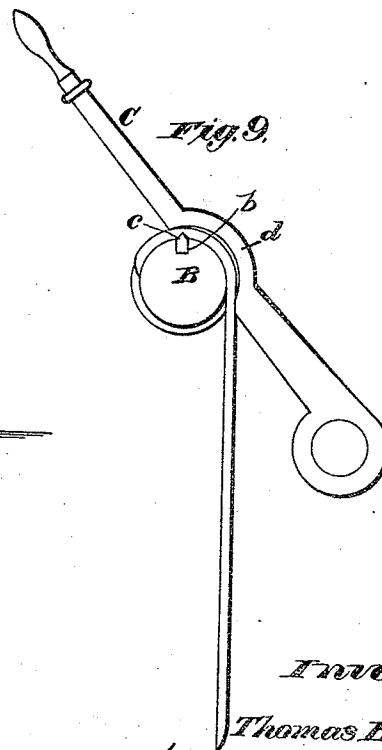
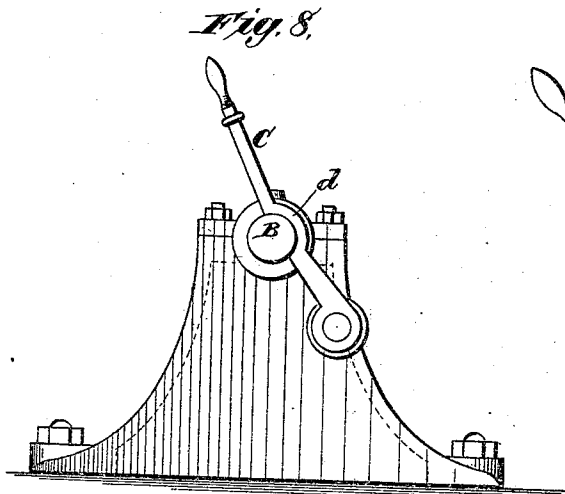
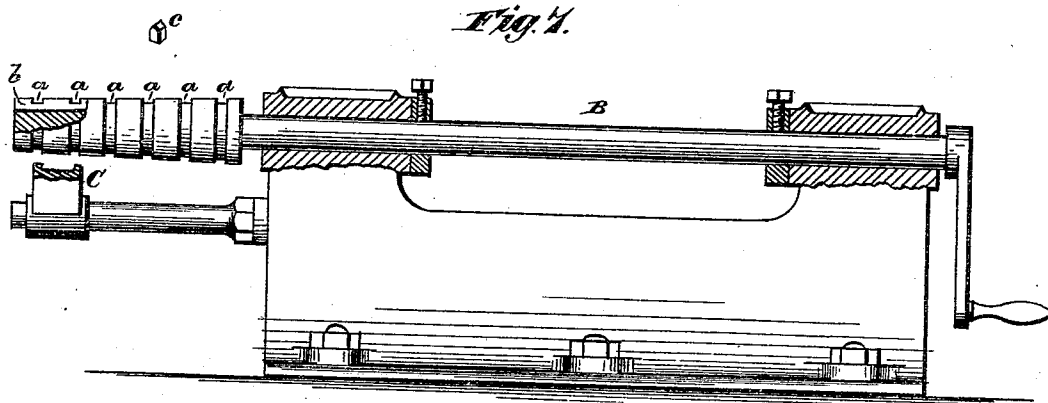
T. BROWN.

3 Sheets—Sheet 2.

HUB BAND.

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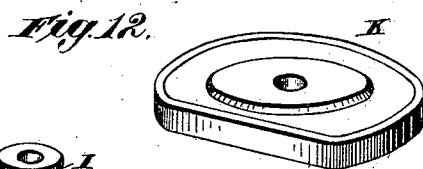
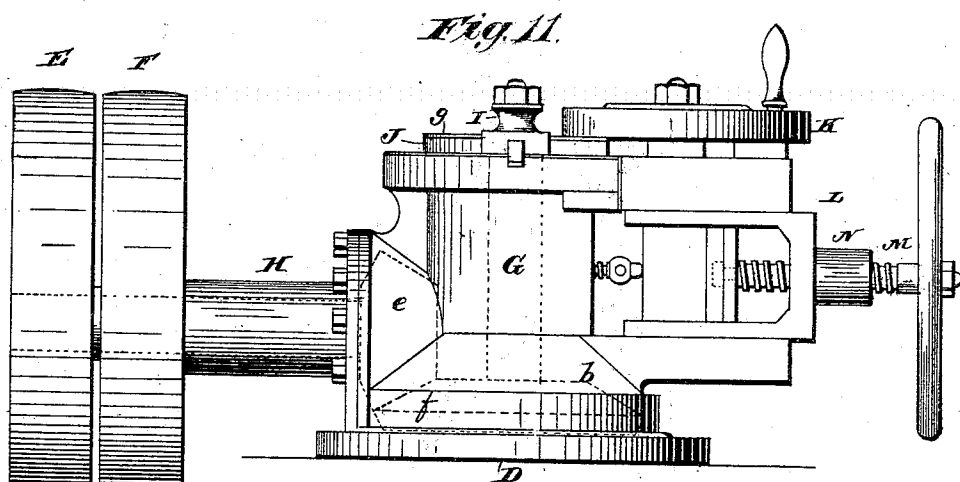
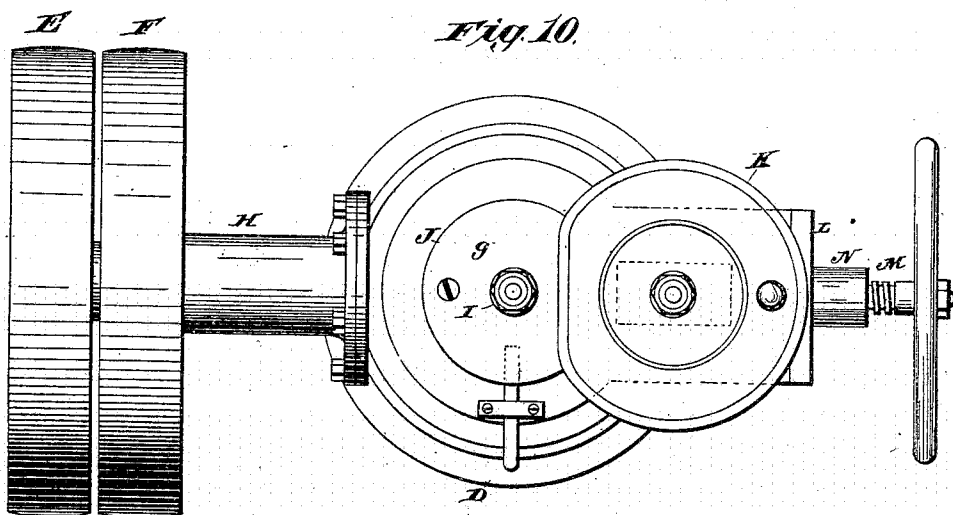
3 Sheets—Sheet 3.

T. BROWN.

HUB BAND.

No. 321,792.

Patented July 7, 1885.



Witnesses,
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J. A. Rutherford

Inventor,
Thomas Brown.

By James L. Norris,
Atty.

UNITED STATES PATENT OFFICE.

THOMAS BROWN, OF DAYTON, OHIO, ASSIGNOR TO S. N. BROWN & CO., OF
SAME PLACE.

HUB-BAND.

SPECIFICATION forming part of Letters Patent No. 321,792, dated July 7, 1885.

Application filed May 26, 1883. (No model.)

To all whom it may concern:

Be it known that I, THOMAS BROWN, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented new and useful Improvements in Hub-Bands, of which the following is a specification.

This invention relates to that class of metallic strengthening-bands which occupy annular grooves in the peripheries of wheel-hubs, and are held in place by compressing the bands after they have been set in grooves in the hub.

The object of the invention is to provide a hub-band which possesses great strength and can be easily and quickly manufactured, and is of such a character that it is not weakened or ruptured by the operation of compression necessary to confine it in the seat in the hub.

To these ends the invention consists in a hub-band which consists of a coiled strip of metal having several overlying layers, and provided with a plane or smooth exterior surface and an angular or projecting interior surface. The coiled or convoluted strip of metal is welded together to form a homogeneous annular band, in which the lines of welding are spiral to the circumference of the band, the object of such formation being to interpose a layer of solid metal between the welded ends of the strip constituting the band, thus giving great strength and durability to the band, and removing all liability of the latter being broken at the point of welding during the operations of compressing the band.

Hub-bands devised prior to my invention have been made either of cast metal annealed to allow it to be compressed, or else a solid homogeneous strip of metal has its ends overlapped and secured by welding. Bands thus made have not given complete satisfaction, because they lack the requisites of strength and durability, and bands possessing the usual lap-weld of a single bar are particularly liable to come apart at the point of welding by reason of the great pressure to which they are subjected in setting them in place. Hub-bands made in accordance with my invention are, however, perfectly exempt from all liability of rupture during the operation of compressing the same on the hub in a cold state, and

they are able to withstand the great pressure necessary to reduce the diameter of the band and the circumference lineally.

In order to enable my invention to be understood, I have illustrated the form of mechanism preferably employed by me for manufacturing my improved hub-bands. Such mechanism will form the subject-matter of a separate application for patent.

In the accompanying drawings, Figures 1 and 2 represent forms of strips or bars of wrought-iron employed by me in the manufacture of my improved hub-bands. Figs. 3 and 4 represent such strips or bars coiled into a ring shape ready for welding. Fig. 5 is a perspective view showing the lap welded from end to end of the coil, to form a homogeneous ring or band with a plane exterior surface and an interior projecting surface. Fig. 6 illustrates transverse sections of various forms which may be given to the compressed hub-band. Fig. 7 illustrates a vertical side elevation of a machine employed for acting on the straight strip or bar shown in Figs. 1 and 2, for bringing the same into the coiled state seen in Figs. 3 and 4. Fig. 8 is an end view of the same, the guiding or directing lever being shown as resting on the mandrel ready for coiling. Fig. 9 illustrates a strip or bar seated upon the mandrel ready for coiling, the parts being in section. Fig. 10 is a top or plan view of a machine employed for welding, compressing, and expanding the coiled band or ring. Fig. 11 is a side elevation of the same. Fig. 12 represents perspective views of the male and female dies used in said machine.

Referring to Figs. 1 and 2, the letter A represents a strip or bar of wrought metal having its length, width, and thickness dependent upon the diameter and size the completed band is to possess and the uses to which said band is to be applied. In Fig. 1 the strip is made smooth and of the same thickness throughout its entire length, while in Fig. 2 such strip is shown with its middle portion made thicker than its end portion, the terminals of the latter abutting against offsets on said middle portion when the strip is in the coiled state shown in Fig. 4. The strips or bars should be beveled or made tapering on one side at each end, so that when either of said strips

or bars is coiled, as shown in Figs. 3 and 4, the beveled or tapering portions will constitute the outer and inner terminals of the coiled strip or bar, with one or more layers of the strip or bar lying between said ends, so as to facilitate the welding operation and lessen the shock to the welding and compressing dies.

The conversion of the straight strips or bar into a coiled ring or band possessing two or more layers of metal is effected while the strip or bar is in a cold or hot state. In either event the strip or bar is placed upon the mandrel B, to which motion may be imparted by manual or machine power. This mandrel B is formed with a series of circumferential seats or grooves, *a*, varying in size as regards depth and width, as shown in Fig. 7, so as to form seats for bars or strips varying in width and thickness. A longitudinal groove, *b*, is formed in the base of the mandrel, in which groove is located a knife-edged projection, *c*, capable of being moved into either of the seats or grooves. This projection *c* is intended to connect by "biting" with one end of the strip or bar when the same is placed thereon, as shown in Fig. 9, and a slight blow of the hammer given thereto. The strip or bar thus connected with the mandrel will rotate therewith, and to cause it to coil thereon I provide a lever, C, which is suitably pivoted and is capable of being brought to bear upon the strip or bar just in rear of the projection *c*. Provision is made for moving the lever horizontally, so as to bring its semicircular portion into line with either of the seats or grooves when it is necessary to operate upon strips or bars of different widths. A seat, *d*, is formed on the under side of the semicircular portion of the lever, which serves to overlap the edges and cover the top of the strip or bar, and thereby hold the same in position on the mandrel and guide said strip or bar as it is coiled by the mandrel. The lever automatically compels the strip or bar to wind itself in layers, one directly upon the other, with the edges of the layers practically in line with each other, and at the same time the lever causes the adjacent surfaces of the layers to lie close together. A roller may be seated in the semicircular portion of the lever C, so constructed as to overlap the edges and cover the top of the strip or bar during the coiling operation, the result in both cases upon the strip or bar being the same, except that in one there is a sliding and in the other a rolling action.

It will be seen from the foregoing that I first produce from a strip or bar of wrought metal a ring or band consisting of two or more layers of metal, with the ends of the article beveled on the outer or exposed sides, for securing a starting or entrance point for the ring or band when it is placed between and subjected to the action of revolving or rotating dies for welding and compressing the same throughout its entire circumference. This welding and compressing of the coiled strip to form a complete ring or band is effected by the machine shown in

Figs. 10 to 12, inclusive. On a base, D, is mounted a vertical standard, G, in which a driving-shaft, H, has its bearings. This shaft has fast and loose pulleys E F and a pinion, *e*, which meshes into a master-wheel, *f*, the shaft of which carries and imparts rotary motion to a female die or former, I. The latter is of a circular shape, and has a continuous seat around its periphery of a form corresponding to the shape desired to be imparted to the interior of the completed band or ring.

Beneath the female die I is a disk-wheel, J, which serves as a fly-wheel for said die or former, and between the latter and the disk-wheel is a plate, *g*, for preventing the entrance of iron scales and the like between the disk-wheel and the welding and compressing die or roll K. The latter is fitted on a vertical shaft mounted upon a carriage, L, which moves in ways on the bed or base of the machine, to allow it to be adjusted to the female die or former by means of a screw-shaft, M, and housing N. The larger portion of the welding and compressing die or roll is of a true circular form, with a smooth plain continuous periphery or working-face, a slight portion or section of its periphery being removed, as seen in the drawings, so as to secure a space between it and the female die or former for the ready insertion into the seat of the female die of a coiled strip or blank, made as already described.

Motion is imparted to the welding and compressing die or roll solely by frictional contact between its periphery or working-face and the outer surface of the coiled strip or blank. When the driving-power acts on the female die or former, the coiled strip or blank placed therein is powerfully compressed by the entire circular portion or working-face of the welding and compressing die or roll, the latter continuously acting on the article, simultaneously welding the lap from end to end of the coil, and compressing and expanding the article throughout its entire circumference, causing it to partake of the form desired for use or for the market, perfectly free of all seams and joints, with the metal of the original strip evenly and uniformly compressed and distributed throughout the article. The article thus completed is ready for use for the market; but I prefer to subject the same to the action of smoothing or finishing and trimming dies, so as to remove any fins that might be present upon the article. To accomplish this, I employ a female die or former of the same construction as the female die or former I, and use a smoothing and finishing die or roll of the same form and construction as the welding and compressing die, except that said smoothing-die is provided on its periphery, near its sides, with projecting cutters or lips directly opposite and parallel with each other. These cutters are distant apart about equal to the width of the article as welded and compressed, so that they will remove from both edges any small fins, leaving the edges and the interior and exterior surfaces perfectly smooth,

and producing a hub, band, or ring for other analogous purposes which possesses the characteristics heretofore referred to—that is, great strength and solidity, and a non-liability
5 of the weld parting during the compression to fix it on the hub.

What I claim is—

As a new article of manufacture, a hub-
band or analogous ring-shaped article having
10 a plane exterior and a projecting interior surface, and consisting of a strip or bar of metal

coiled and welded to leave a layer of solid metal between the terminals of the strip on the inner and outer surfaces of such band or analogous article, substantially as described. 15

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

THOS. BROWN.

Witnesses:

JAMES L. NORRIS,
SAML. N. BROWN.