

(No Model.)

2 Sheets—Sheet 1.

J. R. LITTLE.
DIE FOR MAKING METAL WHEELS.

No. 488,127.

Patented Dec. 13, 1892.

Fig. 1.

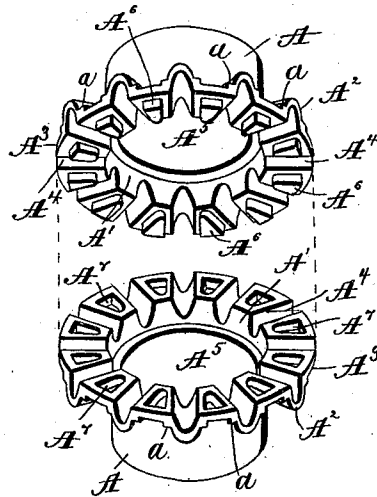
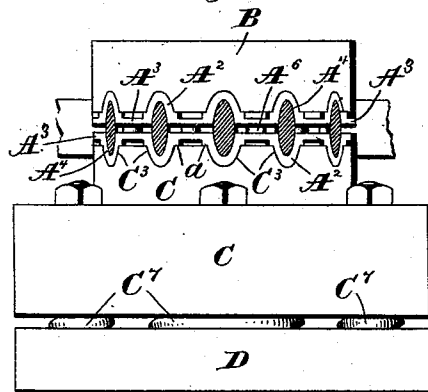


Fig. 2.



Witnesses:

Jas. E. Hutchinson.

Henry C. Hazard.

Inventor.

James R. Little

by *Pinckney and Russell*
his Attorneys

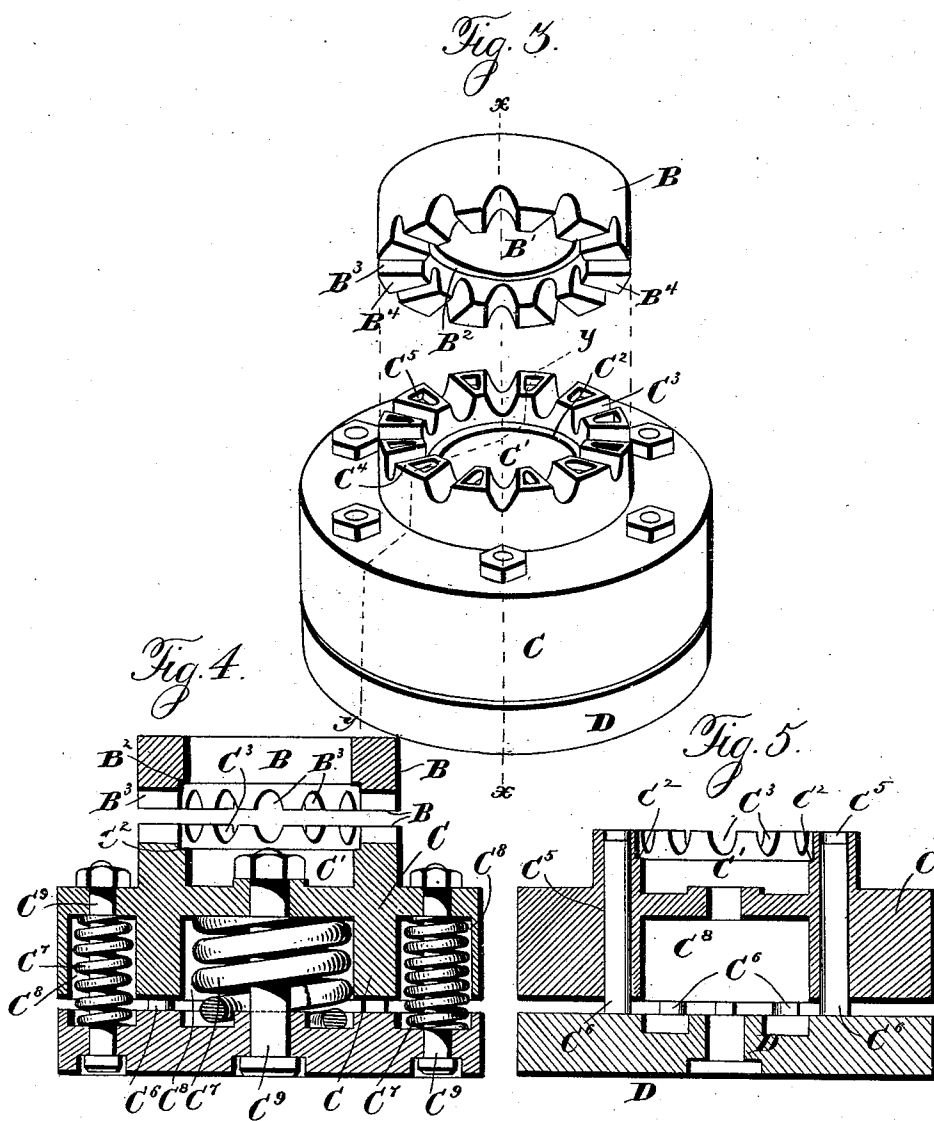
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Witnesses:

James Hutchinson
Henry C. Hazard

Inventor.

James R. Little
By *Smith and Russell*
his Attorney

UNITED STATES PATENT OFFICE.

JAMES R. LITTLE, OF QUINCY, ILLINOIS.

DIE FOR MAKING METAL WHEELS.

SPECIFICATION forming part of Letters Patent No. 488,127, dated December 13, 1892.

Application filed March 14, 1892. Serial No. 424,855. (No model.)

To all whom it may concern:

Be it known that I, JAMES R. LITTLE, a citizen of the United States, residing at Quincy, in the county of Adams, and in the State of Illinois, have invented certain new and useful Improvements in Dies for Making Metal Wheels; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 shows a perspective view of the two hub-halves upon which my die is intended to operate; Fig. 2, a view in elevation of my die with the hub-halves having the spokes inserted between them placed between the hub-engaging die parts ready for a compressing operation; Fig. 3, a perspective view showing the top and middle parts of the die separated; Fig. 4, a view of a section on line *x x* of Fig. 3; Fig. 5, a view of a section on line *y y* of Fig. 3 with the springs for holding the middle die part away from the base and the limiting-bolts removed.

Letters of like name and kind refer to like parts in each of the figures.

The object of my invention has been to provide an improved die for use in the manufacture of metal wheels in which the hub, being made in parts, has such parts riveted together and compressed upon the spokes to firmly secure the latter to it; and to this end my invention consists in the die constructed and arranged as hereinafter specified.

In my pending application for United States patent, Serial No. 424,854, I set forth as an improvement in the manufacture of metal wheels a process in the carrying out of which the hub is formed in two parts, both having in their opposing faces series of cavities for receiving the spokes, and one having riveting pins or projections to enter corresponding rivet-openings in the other. The forms of these hub parts which are preferred are shown in Figs. 1 and 2 of the drawings of the present case. Each has a cylindrical body *A* to constitute one end of the completed hub, the annular enlargement *A'* from which a series of part bosses *A² A²* extend outward, longitudinal shoulders *a a* on the outer sides of the latter, flat web-like portions *A³ A³* between the part bosses, radial spoke-receiving cavities *A⁴ A⁴*, extending from the central bore *A⁵* outward

along the part bosses, and an offset from the bore *A⁵* within the enlargement *A'* preferably of such depth as to bring the inner wall of the latter to or outside of the plane of the periphery of the portion *A*. One of the hub parts which I call the "male" half is provided with the riveting pins or projection *A⁶*, situated upon the webs *A³ A³*, which are adapted to enter the correspondingly-placed rivet-openings *A⁷ A⁷* on the female half. These pins are shown as integral with the male hub-half, but can without departure from my invention be made separate from and attached to or connected with the latter in any desired way. The two hub-halves, constructed as shown and described, are to be riveted together and compressed upon the portions of the spokes inserted between them in their cavities in the manner fully set forth in my said pending application. In order that this operation may be most readily and conveniently performed, so as to best secure the firmest and most uniform compression of the hub-halves upon the spokes, I have invented a die which with one movement of a press can be made to perform not only the desired riveting of the hub-halves together, but also the compression of the latter, with their bosses, upon and around the spokes. Such die consists of the top part *B*, which, as shown, has the central opening *B'* to receive the cylindrical part *A* of the male half of the hub, the recess or rabbet *B²* to receive the enlargement *A'* and engage the shoulder at the outer end or side thereof, and the cavities *B³ B³*, radiating from such rabbet, adapted to receive the half-bosses on the hub-half. Between said cavities and adjoining their edges are plane faces *B⁴ B⁴* to engage the shoulders *a a* on the sides of the said half-bosses. The middle part *C* of the die has, like part *B*, the central opening *C'* for portion *A* of the female hub-half, the rabbet *C²* to receive and engage the enlargement *A'* on the latter, the cavities *C³ C³* to receive the half-bosses on said hub-half, and plane faces *C⁴ C⁴*, adjoining the cavity-edges, to engage half-boss shoulders *a a*. Between the cavities are openings which form the upper ends of passages *C⁵ C⁵*, which extend down through the die part *C* and in which are the plungers *C⁶ C⁶*, made longer than the passages, so that they will project beyond one end or the other

thereof. The base D below part C serves as a support for the lower ends of these plungers and as an abutment for the bottoms of springs C⁷ C⁷, which, situated in recesses C⁸ C⁸, press
 5 against the tops thereof and serve to force and hold the die part C normally away from the base, as shown in the drawings. Bolts C⁹ C⁹, connected with the base and passing up
 10 through portions of the die part C, serve to guide the movements of the latter and limit its travel under stress of the springs. Of the latter I prefer to have several placed in a series of recesses outside of the central or
 15 main portion of die part C and a larger central one situated in a corresponding recess in said central portion, though I do not limit myself to such construction and arrangement. The shape of the plungers C⁶ C⁶ in cross-section is best made to agree with that of the
 20 riveting pins or projections on the male hub-half, though such similarity in shape is not necessary or essential to the operation of the die to produce the desired result.

While I do not limit myself to any particular form and construction of the bolts C⁹ C⁹ for guiding and limiting the motion of the die part C, I prefer to have them as shown in Fig. 4 of the drawings—that is, with their
 25 shanks passing through openings in the base and part C and the centers of the springs C⁷ C⁷ and their ends provided with heads and nuts, respectively, to engage the outer sides of the portions of parts C and D through
 30 which they pass.

The operation of my die is as follows: The halves of the hub, shaped as shown and described, with portions of the spokes between them situated in their spoke-receiving cavities, and the riveting pins or projections of the male hub-half entering the rivet-openings in the female half, are placed between the parts B and C of the die, with the female half resting in and engaged by the latter, so that its half-bosses rest in the cavities C³ C³,
 35 and the rivet-openings are directly over the ends of the plungers C⁶ C⁶, which, until the springs C⁷ C⁷ are compressed by the downward movement of part C, stand below the plane of the faces on the latter between the
 40 cavity-edges, as already indicated and shown in Fig. 4 of the drawings. As pressure is applied to the die, the hub-halves will first be pressed toward each other to come in close contact with the spoke portions between them and cause the riveting pins or projections on the male hub-half to pass through the openings therefor in the female half, and then, as the pressure overcomes the stress of the
 45 springs C⁷ C⁷, both parts B and C of the die, with the hub-halves clasped firmly between them, will descend toward the base D. This movement of part C causes the plungers C⁶ C⁶, supported on the base, as described, to project at their upper ends above the pas-
 50 sages C⁵ C⁵, so as to engage and rivet or head down the ends of the pins or projections A⁶ A⁶ to securely fasten the hub-halves together.

When the part C has descended, so as to come in contact with the base D, so that it can yield no more, continued pressure upon the die will forcibly compress the hub-halves
 70 upon the spokes in such manner that they will be embraced and held most strongly and securely fastened to the hub. The heading down or upsetting of the riveting pins or pro-
 75 jections A⁶ A⁶ is continued during the compression of the spoke ends within the spoke-receiving parts of the hub-halves, so that the latter will be fixed in the condition in which they may be put by the action of the engag-
 80 ing die parts, and the hub and spokes will retain the shapes given them. With the plane faces on the die parts B and C adjoining the boss-receiving cavities therein engaging squarely the shoulders *a a* on the outer sides
 85 of the half-bosses the compression of the latter upon the spokes can be secured without any injurious wear on the cavity-edges, such as would be caused by the rubbing of these edges over the exteriors of the half-bosses in
 90 the absence of the overlapping shoulders *a a*, to be abutted against squarely by the die-faces adjoining such edges and to receive directly the pressure of the die parts applied to the bosses.

From the above description and from the drawings it will be seen that my die is automatic in its action and especially well adapted to secure with one operation of the press applied to it the clasping of the spokes firmly
 95 between the hub parts, the riveting of such parts together, and their compression upon and around the spokes, so that the latter will be most firmly compressed and held within the receiving-cavities, and there will be pro-
 100 duced a strong rigid hub with the spokes fastened most strongly and securely to it.

The die capable of acting in the manner and producing the desirable result above set forth is simple and strong in construction and not
 105 liable to be broken or to get out of order during long continued use for the purpose for which it is intended.

Having thus described my invention, what I claim is—

1. In a die, in combination with the two opposing parts having suitable cavities to receive and engage portions of the article to be compressed and the series of riveting-plungers made movable with reference to such parts,
 115 substantially as and for the purpose specified.

2. In a die, in combination with the two opposing parts having suitable cavities to receive and engage the portions of the article to be compressed, the series of the riveting-plungers made movable with reference to such die parts, and a suitable base against which the plungers rest and toward and from which the two opposing parts of the die can move, substantially as and for the purpose shown.
 125 130

3. In a die, in combination with the two opposite parts having suitable cavities to receive and engage the portions of the article to be compressed, a base toward and from which

such parts are movable, riveting-plungers in one of said parts having their outer ends engaging the base, and springs to hold the plunger-containing part normally away from the base, substantially as and for the purpose set forth.

4. In a die, in combination with the two opposing parts having their faces formed to receive and engage portions of the article to be compressed, the base, the riveting-plungers suitably guided in the die part adjoining the base, springs situated in recesses in such part and engaging the base, so as to force and hold the part normally away from the latter, and suitable guiding-bolts to guide said part in its movements toward and from the base and limit its motion from the latter, substantially as and for the purpose described.

5. In a die for compressing the halves of a divided wheel-hub upon the spokes and riveting such halves together, in combination with the base, the die part made movable with reference thereto, having in its upper face cavities to receive and engage a half of the hub with its spoke-receiving half-bosses to be compressed upon the spokes, the riveting-plungers guided in suitable passages in such die part and having their lower ends adapted to be engaged by the base, one or more springs to force and hold the part normally away from the latter, and the outer die part having its lower face provided with cavities to receive and engage the other half of

the hub, with its spoke-receiving half-bosses to be compressed upon the spokes, substantially as and for the purpose specified.

6. In a die for compressing the halves of a divided wheel-hub upon the spokes and riveting the halves together, in combination with the opposing parts of the die, each provided with a central recess to receive the outer end of the respective hub-half, a rabbet or offset from such opening, a series of radial cavities to receive the spoke-holding half-bosses on the hub-half, and plane faces adjoining the edges of such cavities, the riveting-plungers guided in suitable passages between the boss-receiving cavities on one of the opposing die parts, the stationary base with reference to which the two opposing parts of the die are movable engaging the outer ends of the riveting-plungers, and one or more springs for holding the plunger-containing part normally away from the base to allow the plungers to stand with upper ends below the surfaces between the boss-receiving cavities on the inner face of the latter die part, substantially as and for the purpose shown.

In testimony that I claim the foregoing I have hereunto set my hand this 19th day of February, A. D. 1892.

JAMES R. LITTLE.

Witnesses:

THEODORE B. PAPE,
JOSEPH N. CARTER.