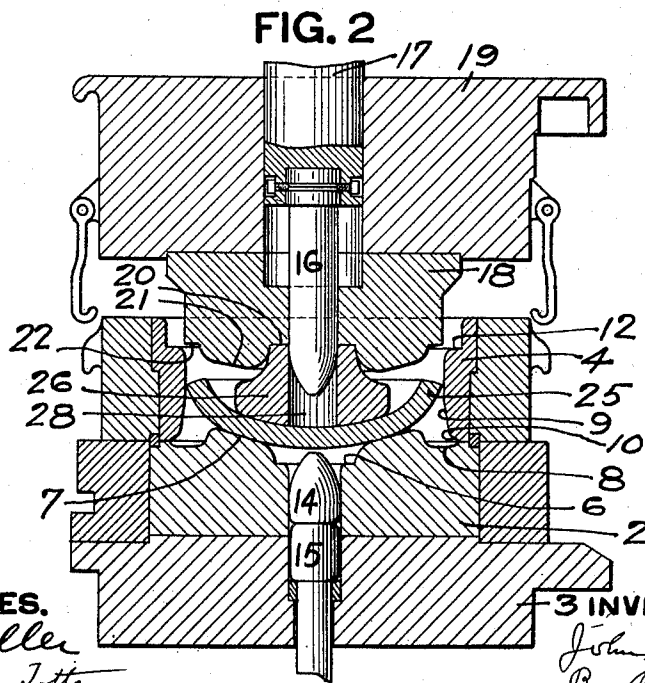
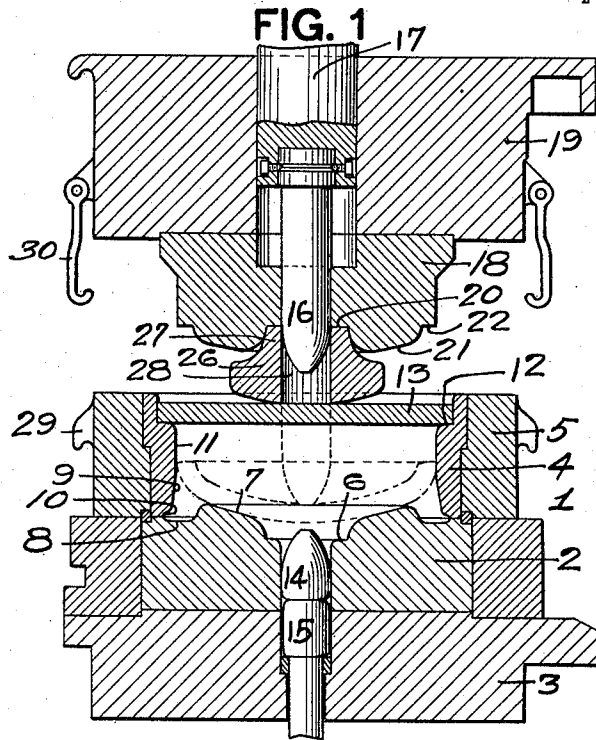


J. M. HANSEN.
MANUFACTURE OF CAR WHEELS.
APPLICATION FILED NOV. 11, 1909.

1,007,945.

Patented Nov. 7, 1911.

2 SHEETS-SHEET 1.



WITNESSES.

J. R. Keller
Robert C. Lottan

INVENTOR.

John M. Hansen
By Kay & Lottan
attorney

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FIG. 3

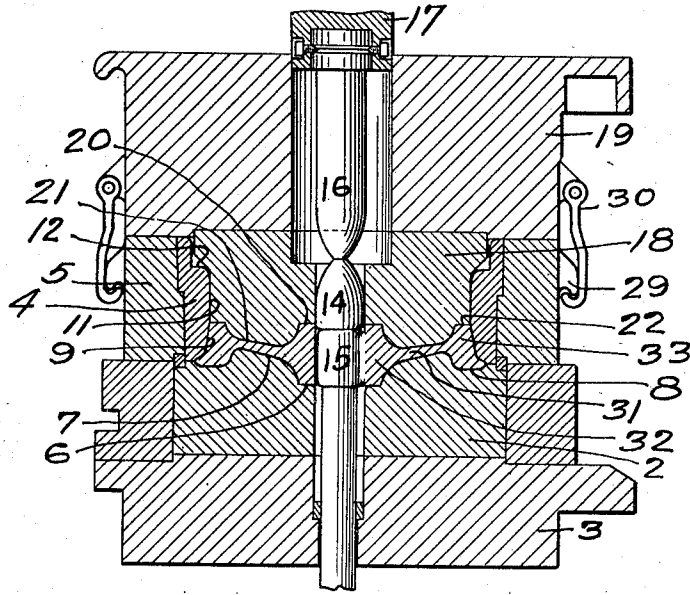
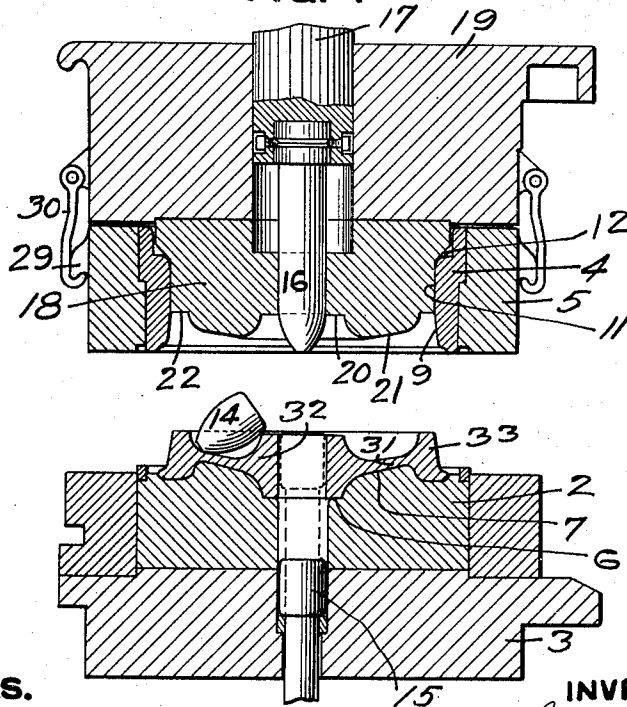


FIG. 4



WITNESSES.

J. B. Keller
Robert C. Fottner

INVENTOR.

John M. Hansen
By Kay & Fottner
Attorneys

UNITED STATES PATENT OFFICE.

JOHN M. HANSEN, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO FORGED STEEL WHEEL COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

MANUFACTURE OF CAR-WHEELS.

1,007,945.

Specification of Letters Patent.

Patented Nov. 7, 1911.

Application filed November 11, 1909. Serial No. 527,485.

To all whom it may concern:

Be it known that I, JOHN M. HANSEN, a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have
5 invented a new and useful Improvement in the Manufacture of Car-Wheels; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to the manufacture
10 of forged steel car and like wheels, its object being to produce the same at a single heat from a suitable blank and in a simple form of dies requiring only the use of a central mandrel and a single reciprocating die surrounding the same, so simplifying the
15 mechanism while making it possible to produce car and like wheels in what is practically a single operation of the mechanism.

It consists, generally stated, in bending a
20 heated blank into bowl form within a matrix die, and then forging such heated blank within said matrix between two opposing die faces to finished shape; the preliminary bending being preferably carried out by
25 means of a removable bending block acting to carry the blank down into the matrix die which can then be removed, so providing the proper die faces for the completion of the forging operation.

30 In the accompanying drawings Figure 1 illustrates the invention, the preferred form of dies for the practice of the same and showing the position of the parts prior to the bending of the blank; Fig. 2 illustrates
35 the bending operation; Fig. 3 shows the completion of the forging stroke and Fig. 4 shows the dies opened for the removal of the finished wheel.

In the practice of the invention I employ
40 a suitable forging press having a matrix 1 which, as illustrated, is formed of the bottom die 2 resting on the anvil 3 and the removable ring die 4 held within the annular die holder 5 which as shown rests upon the
45 bottom die 2. The bottom die 2 has the hub forming cavity 6 and beyond the same the web forming face 7 and the rim forming face 8 while the lower portion of the ring die 4 provides the thread forming face 9 which
50 is shown as formed on an incline, the dies 2 and 4 meeting and having the flange forming recess 10. The upper portion of the ring die 4 is formed with vertical walls 11 to confine the blank during the forging operation.
55 The ring die 4 has also the seat 12 for re-

ceiving and supporting the blank 13 in position to be operated on by the dies. Centrally of the bottom die 2 and the hub cavity 6 is the piercing mandrel 14 operated by the plunger 15. The press has the central reciprocating mandrel 16 operated by the mandrel carrier 17 and around the same the annular die 18 operated by the mandrel carrier 19. The annular die 18 has the hub forming cavity 20 and beyond the same the web forming face 21 and the rim forming shoulder 22. The dies 2 and 18 thus provide opposing die faces corresponding in shape to the finished wheel, and adapted to the forging of the opposite faces thereof while
60 the metal is confined within the matrix. As, however, difficulty might be encountered in bending the blank within the matrix and bringing the outer edge 25 thereof into position to be operated upon by the outer portion of the annular die 18, particularly the
65 shoulder 22 thereof, I provide the removable bending block 26, the upper portion 27 of which fits within the hub cavity 20 of the upper die 18, the removable bending block
70 having a central opening or recess 28 within which the annular die 16 enters to center the bending block upon the blank, as shown in Fig. 1. The lower face of the bending block
75 26 is curved so as to correspond to the curve of the bowl shaped blank to be formed as illustrated in Fig. 2, and is preferably made of sufficient width to provide for a symmetrical bending of the blank within the matrix. The annular die holder 5 is shown
80 as having the hooks or lugs 29 to be engaged by the swinging hooks 30 by which said annular die holder and its ring die may be lifted to permit withdrawal of the blank.

In the practice of the invention with the
85 apparatus above described, the heated blank suitable for forming the wheel is seated in the seat in the matrix, and it is preliminarily bent into bowl shape within the matrix die, such as by a preliminary lowering of the reciprocating parts of the press or of the center mandrel thereof. To bring the blank to the most desirable shape I prefer to employ the bending block 26 as described, that block being placed upon the heated blank
90 supported in the seat 12, and the mandrel 16 and die 18 being lowered so as to center the bending block as illustrated in Fig. 1 and then the press being carried down sufficiently to bend the blank as illustrated in
95 100 105 110

Fig. 2, in this way the edge portion 25 of the blank being brought within the vertical walls 11 of the matrix die. The press is then opened by raising the mandrel 16 and die 18 and the removable bending block 26 removed, and then the mandrel 16 and the die 18 are forced down with great power, the result of which is that a part of the metal in the portion of the heated blank forming the web of the wheel is forced inwardly to aid in developing the hub of the blank, being thinned between the opposing faces 7 and 21, a small portion at the outer edges of said faces being forced outwardly, while the edge 25 of the blank is forced downwardly within the seat 8, face 9 and flange-forming cavity 10, so forming the rim 33 of the wheel, the metal being thus forged between two opposing die faces to shape and finish the entire wheel body and properly confine the same for the piercing of the hub portion by the mandrel 14 which is forced upwardly by the plunger 15; the completed wheel with its web portion 31, hub portion 32 and tread portion 33 being thus produced at a single heat and by a single manipulation of the dies. As the dies descend to their lowest position the hooks 30 engage with the annular die holder 5 and as the dies ascend lift such die holder with the ring die 4, so exposing the blank and permitting its withdrawal from the press. The ring die can then be lowered again into position upon the bottom die and the hooks 30 disengaged and the press opened ready for another operation. While I have described the preferred use of the removable bending block to preliminarily bend the heated blank, other means for accomplishing this may be provided, such for example as the use of the central mandrel 16 which may be projected a sufficient distance below the annular die 18 to carry the blank down into the matrix die into position to be operated upon by the forging faces of the die 18 and especially by the annular rim forming shoulder 22.

I am thus enabled to quickly forge car and like wheels by a very simple and rapid

operation, the operation of a simple form of dies having no complicated parts, by first bringing the blank into position to be operated upon by the opposing working faces of the main top and bottom dies while confined within the matrix.

What I claim is:

1. The improvement in the art of forging car and the like wheels, consisting in preliminarily bending a heated blank into bowl form within a matrix without thinning the blank, and then by a single stroke of opposing die forging faces forging said bowl shaped blank to develop the completed shape of hub web and tread.

2. The improvement in the art of forging car and the like wheels, consisting in preliminarily bending a heated blank into bowl form within a matrix without thinning the blank, and then by a single stroke of opposing die forging faces forcing a portion of the metal inwardly to develop the hub, forming the web, and forging the rim to completed shape of tread.

3. The improvement in the art of forging car and like wheels, consisting in subjecting a heated bowl-shaped blank of substantially the same thickness throughout to opposing die forging faces and thereby forcing a portion of the metal inwardly to develop the hub and completely forming the web portion of the wheel and the rim portion of the wheel, and piercing the blank while so confined to complete the formation of the hub.

4. The improvement in the art of forging car and like wheels, consisting in bending a heated blank into bowl form within a matrix by means of a removable bending block without thinning the blank, opening the dies and removing the bending block and then forging the blank to finished shape within the matrix between two opposing die faces.

In testimony whereof, I the said JOHN M. HANSEN have hereunto set my hand.

JOHN M. HANSEN.

Witnesses:

ROBERT C. TOTTEN,
J. F. WILL.