To all whom it may concern:

Be it known that we, CHARLES SCHENCK and LEWIS FINE, citizens of the United States, residing at Bethlehem, Northampton County, Pennsylvania, have jointly invented new and useful Improvements in the Manufacture of Metal Wheels, of which the following is a specification, reference being had to the accompanying drawing, in which—

Fig. 1 is a plan of apparatus suitable for use in carrying out our invention; Fig. 2 is a side elevation thereof; Fig. 3 is a section on lines III—III of Fig. 1; Fig. 4 is a detail enlargement of the bending mechanism; and Fig. 5 is a section on lines V—V of Fig. 4.

Our invention relates to the manufacture of metal wheels from flanged beams or sheets, in which the flange is converted into the wheel rim and the spokes are formed from the web of the beam or sheet. Our invention comprises particularly the bending of a wheel blank made from such beam or sheet into a complete wheel, and the enclosing of a spoke spacing member or separator in the wheel during the bending operation. Our invention also consists in various features which we shall hereinafter describe and claim.

Referring to the drawings, the work piece as shown is a wheel blank having flanges a, a web b, and alternately bent spokes c having ends d of keystone shape.

The housing 2 has secured thereto a stationary die block or anvil 3, which has the idler rollers or other anti-friction devices 4 mounted therein and arranged closely together in the form of a quadrant. Also mounted in the housing 2 are the split dies 5, which have concave inner faces 6 to provide clearance for the alternately bent spokes of the wheel blank and also a space 7 for the web of the blank adjacent its flange. The split dies 5 are secured to the crossheads 8, which extend through the sides of the housing 2 in the bearings or guides 9 and are operated by the piston rod 10 of the pistons in the die actuating cylinders 11. Each movable die 5 has a curved face corresponding to the face of the anvil 3, upon which are arranged the sets of rollers 12 also in the form of a quadrant.

Adjoining the housing 2 is a bed 13 equipped with guides 14 for centering and guiding the wheel blank as it is forced forward into the slots 15 between the rollers 4 and 12. At the end of the bed 13 opposite the housing is a cylinder 16 with a ram or piston rod 17 intended to engage an end of the wheel blank and force it forwardly through the slots 15 between the rollers 4 and 12 and thereby effect the bending of the blank. A spoke spacing member e is also shown, which acts to space apart the alternately bent spokes and which becomes incorporated in the wheel during the bending operation.

In operation the spoke spacing member e is placed in position upon the rods or mandrels 18, which are secured to the dies 5, and the dies 5 are then moved toward each other and into operating positions by means of the crossheads 8 and pistons 10. The T-head or flange portion a of the wheel blank is placed upon the bed 13 of the machine and between the guides 14. The piston 17 is then brought into contact with the end of the wheel blank, and upon actuation the blank moves forward, its flanges a entering the slots 15 between the sets of rollers 4 and 12 and the spokes c enter the cut-out portions 6 of the split dies 5 and lie either side the spacer e, which has been previously placed in the machine and which is accurately positioned so as to occupy the center of the wheel. As the wheel blank is forced inwardly its flanged portion a will bend into the form of a circle and the spokes c will thereby occupy the position of radii of the circle, the spokes having been so cut that the sides of their ends d will be almost or substantially in contact with each other in each of the two sets, so that when the blank has been pushed in to the full extent the spoke ends will form substantially a continuous ring of metal on each side of the spacer e and the flanged portion a will have been bent by its passage through the rollers 4 and 12 between the anvil 3 and dies 5 substantially into true wheel form.

The terms and expressions which we have employed are used as terms of description and not of limitation, and we have no intention in the use of such terms and expressions, of excluding any mechanical equivalents of the features shown and described, or portions thereof, but recognize
that various structural modifications are possible within the scope of the invention claimed.

What we claim is:

1. In apparatus for forming metal wheels from flanged blanks with integral spokes, an anvil in the shape of a quadrant, dies spaced apart from the said anvil and from each other, having a quadrant-shaped periphery, antifriction means in the quadrant faces of said anvil and dies, and means for forcing the flanged portion of the wheel blank between the quadrant faces.

2. In apparatus for forming metal wheels from flanged blanks with integral spokes, dies having complementary quadrant-shaped faces and a slot therebetween for the reception of the flanges of said wheel blank and clearance spaces between two of said dies to permit the passage of the wheel spokes, and means for forcing the flanged portion of the wheel blank through the said slot.

3. In apparatus for forming metal wheels from flanged blanks with integral spokes, dies having complementary quadrant-shaped faces and a slot therebetween for the reception of the flanges of said wheel blank, means for supporting a spoke spacing member between two of said dies, and mechanism for forcing the flanged portion of the wheel blank through said slot and the spokes about said spoke spacing member.

4. The process of making metal wheels from flanged metal blanks having integral spokes attached thereto, which comprises forcing the metal blank through a quadrant-shaped channel whereby at one operation the flanged part of the blank is bent substantially into the form of a circle and the spokes assume positions of radii of the circle and are substantially in side contact with each other at their inner ends.

5. The process of making metal wheels from flanged metal blanks having integral, alternately bent spokes attached thereto, which comprises forcing the metal blank through a quadrant-shaped channel whereby at one operation the flanged part of the blank is bent substantially into the form of a circle and the spokes assume positions of radii of the circle and are substantially in side contact with each other at their inner ends, and enclose between them a spoke spacing member.

CHARLES SCHENCK.
LEWIS FINE.