This invention relates to improvements in the process of making pressed steel car wheels, and more especially to the process of making such wheels particularly adapted for use on hand cars, power or hand-propelled section cars, and the like.

One of the features of my invention is the dispensing with all annealing operations, at the same time making the wheel hard and strong. In the practice of my invention, during the formation of the wheel, the metal is thickened, thus making it harder and more resistant to wear. By the use of my invention, a strong, durable, hard, superior wheel may be easily and quickly manufactured.

Another feature of my invention is the means for thickening the metal in the tread adjacent the flange where the greatest amount of wear occurs.

Other features and advantages of my invention will appear more fully as I proceed with my specification.

In the drawings accompanying the specification and forming a part thereof, Figure 1 is a view in perspective of a completed wheel; Figs. 2, 3 and 4 are vertical sectional views of wheel and dies showing steps in the process of manufacture; and Fig. 5 is a vertical sectional view on an enlarged scale of a part of the wheel and die shown in Fig. 4.

In the practice of my invention, a flat piece of sheet steel 10 is first drawn by means of a die as shown in Fig. 2 to form the tread 10° of the wheel and to thicken the sheet steel at 15°. The die sections are indicated by 11, 11°, 12, 12°. It will be noted that die section 12° is recessed at 12° so that the sheet steel will not be held between die sections 11 and 12° during the last third of depth of draw, thus permitting it to draw in freely and thicken very rapidly at 15°.

The metal is then placed in another deeper die 13, 13° and die section 14 applied to press and draw the tread 10° and form an annular extension 10° thereon. This pressing and drawing of the metal thickens the same and makes it harder. I have found that thus thickening the metal not only hardens the surface but also hardens the interior of the metal. In fact, I have found that such hardening of the metal by thickening the same is in all respects superior to annealing.

I then place the metal in a third die 15, 15° and superimpose die section 16 which operates on the margin of the extension 10° to bend the same on itself to form the flange of the wheel. The die 15, it is to be noted, is somewhat relieved, as indicated at 15°, so that as die section 16 operates, the portion of the tread adjacent the flange is slightly thickened. This thickening occurs at the point subjected to the greatest wear in operation.

It is to be particularly noted that I procure the necessary hardness of the metal by thickening the same and accomplish this at the same time that the wheel is being formed in the die. It is obvious, however, that such thickening may be accomplished in other ways. For example, an ordinary wheel manufactured by the annealing process could be hardened afterwards by rolling the same with a hard roll. Rolling the metal in this manner by the application of a hard roll would serve to harden the metal.

While I have shown and described certain embodiments of my invention, it is to be understood that it is capable of many modifications; changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention disclosed in the appended claims, in which it is my intention to claim all novelty in my invention as broadly as possible, in view of the prior art.

What I claim as new, and desire to secure by Letters Patent, is:

1. The process of making a pressed steel car wheel consisting of first dishing the metal to form the tread, then pressing and drawing the metal to thicken the tread and form an annular extension thereon, then bending the extension on itself to form the flange.

2. The process of making a pressed steel car wheel consisting of first dishing the
metal to form the tread, then pressing and
drawing the metal to thicken the tread and
form an annular extension thereon, then
pressing on the margin of the extension to
bend the same on itself to form the flange,
said pressing also operating to thicken the
portion of the tread adjacent the flange.

3. The process of making a pressed steel
car wheel consisting of first dishing the
metal to form the tread, then pressing and
drawing the metal to harden the tread and
form an annular extension thereon, and
then pressing on the margin of the exten-
sion to bend the same on itself to form the
flange, said pressing also operating to
thicken the portion of the tread adjacent
the flange.

In witness whereof, I have hereunto set
my hand this 3rd day of December, A. D.
1928.

JOHN R. WINTER.