

Sept. 1, 1942.

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2,294,466

METHOD OF MANUFACTURING BRAKE DRUMS

Filed Nov. 25, 1940

2 Sheets-Sheet 1

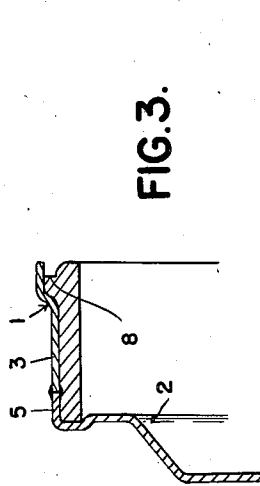


FIG. 3.

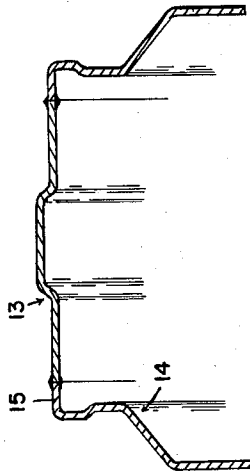


FIG. 7.

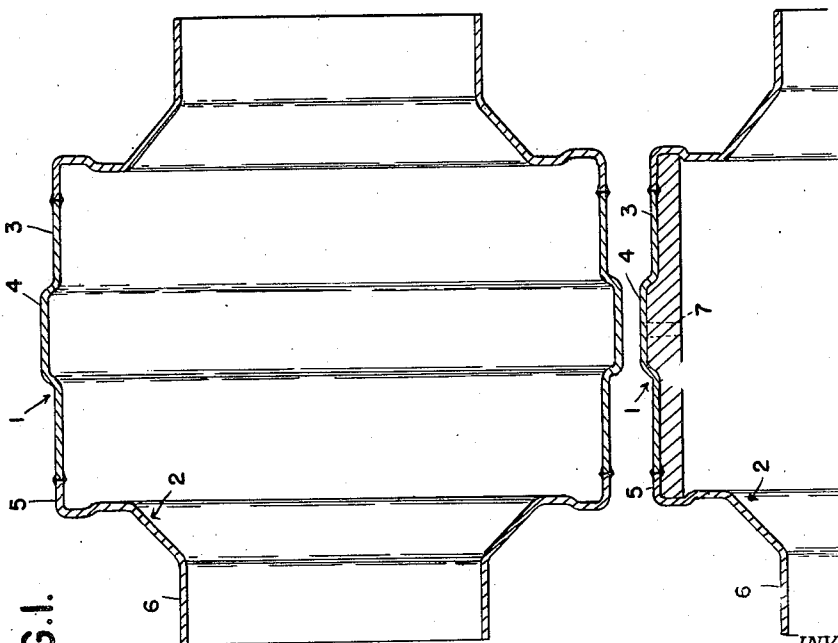


FIG. 1.

FIG. 2.

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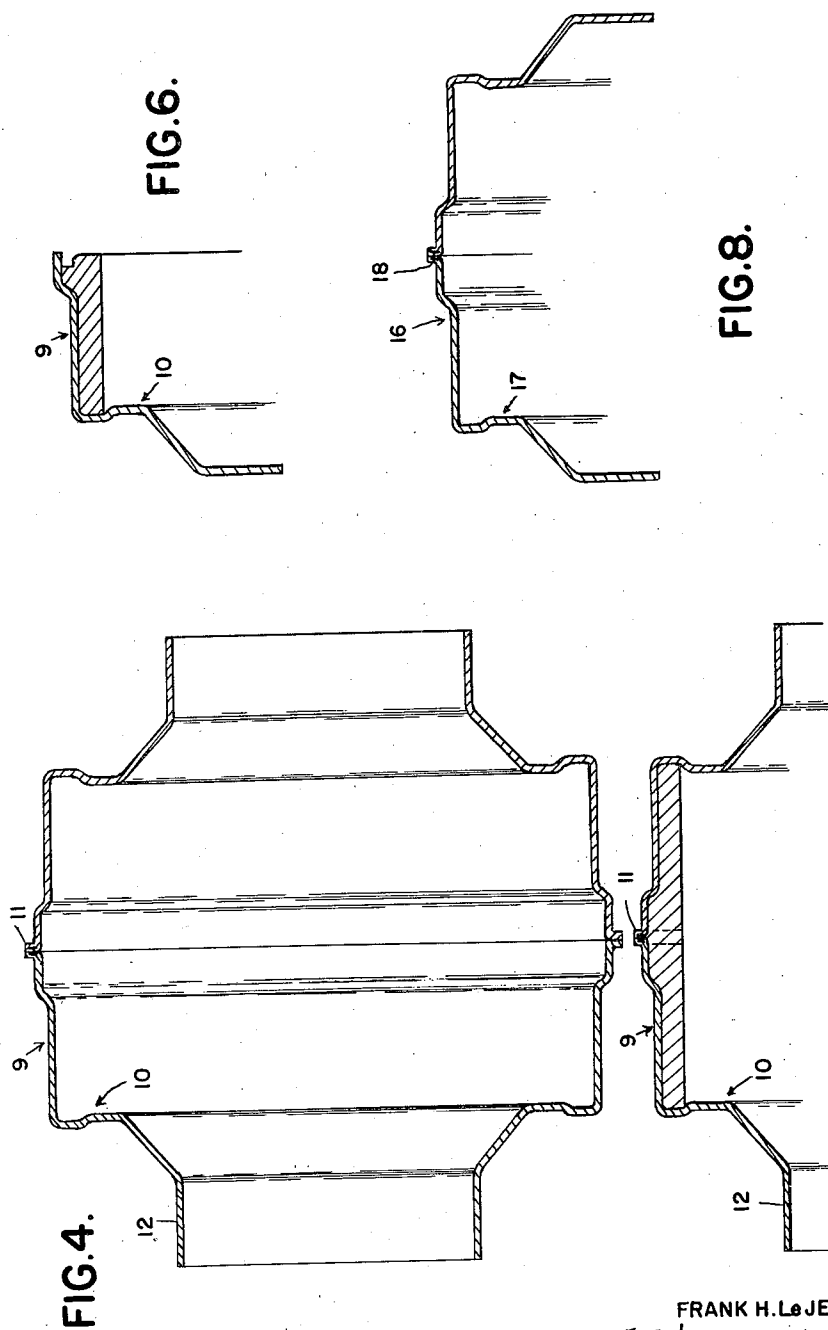
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METHOD OF MANUFACTURING BRAKE DRUMS

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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METHOD OF MANUFACTURING BRAKE
DRUMS

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4 Claims. (Cl. 29—152.2)

The invention relates to the manufacture of brake drums and refers more particularly to the manufacture of composite brake drums.

The invention has for one object to provide an improved method of manufacturing composite brake drums which is economical and secures improved heat conduction between the brake engaging material and the back of the shell.

The invention has for another object to provide a method of manufacture which makes provision for and facilitates the insertion of the brake engaging material through the back of a brake drum shell.

These and other objects of the invention will become apparent from the following description, taken in connection with the accompanying drawings, in which

Figure 1 is a diametral section illustrating the article at one stage in its manufacture;

Figure 2 is a sectional view illustrating the article at another stage in the manufacture;

Figure 3 is a similar view illustrating the completed brake drum;

Figures 4, 5 and 6 are views similar to Figures 1, 2 and 3, respectively, illustrating another method of manufacture of a composite brake drum;

Figures 7 and 8 are views similar to Figure 1 illustrating other methods of manufacture of the brake drum.

Referring to Figures 1, 2 and 3, the first steps in the manufacture comprise the forming from strip stock and, more particularly, strip sheet steel of the annulus 1 and the backs 2. In the forming of the annulus and each of the backs the strip stock is hooped and its ends are welded and the flash removed, after which the hoops are fashioned either by means of rolls or dies. The annulus 1 has the substantially cylindrical edge portions 3 and the central enlarged portion 4. Each of the backs 2 has the peripheral flange 5 of the same diameter as the edge portions 3 of the annulus and also has the generally axially extending central portion 6. The backs are secured to the annulus by registering the peripheral flanges 5 with the edge portions 3 and uniting them by flash welding the two together. The generally axially extending central portion forms an enlarged central opening providing for and facilitating the insertion of the liner material therethrough. The article at this time comprises, in effect, two opposed brake drum shells integral with each other, as illustrated in Figure 1.

The next step comprises placing the article in a suitable revoluble fixture and during the rota-

tion of the article inserting the liner material, which is preferably cast iron, through one of the enlarged central openings formed by one of the generally axially extending central portions of the back. The pouring of the brake engaging material is carried out with the temperatures of the brake engaging material and the brake drum shells such that the brake engaging material will fuse with the annulus over its inner surface and also fuse with the peripheral flanges of the backs over their inner surfaces and with the adjacent radial portions of the backs over their axially inner surfaces. Figure 2 illustrates the lined article. By reason of flash welding the backs to the annulus, good heat conduction is secured therebetween and by reason of fusing the brake engaging material or the liner material to the annulus and the peripheral flanges and the adjacent radial portions of the backs, good heat conduction is secured between the brake engaging material and the annulus and the back.

After the lining operation, the brake drums are separated by severing the annulus and the brake engaging or liner material substantially midway of the backs. This severing is accomplished by a suitable machining operation which radially cuts the enlarged portion of the annulus and the brake engaging material between the lines 7. After the separation, the free edge of the brake engaging material of both lined shells is further cut to form the annular sealing groove 8 which is adapted to receive an annular flange on the backing plate.

To complete the brake drums, the generally axially extending portions 6 are bent inwardly toward the axes of their respective brake drums to extend generally radially. During this bending, the metal is progressively upset toward the axis. Figure 3 illustrates the completed composite brake drum.

As illustrated in Figures 4, 5 and 6, the brake drums are formed from two pieces of strip stock and, more particularly, strip sheet steel. In this case the strip stock used in forming each brake drum shell has a width sufficient to take care of both the annulus 9 and the back 10 of the shell. The annulus has the enlarged portion 11 at the free edge of which is the radially extending flange 12. The back has the generally axially extending central portion 13 which provides an enlarged central hole facilitating the insertion of the brake engaging or liner material into the brake drum shells and against the inner surfaces of the annular flanges and the adjacent surfaces of the backs. After the brake drum

shells are formed, their radially extending flanges 11 are welded together, as illustrated in Figure 4, and the brake engaging material, which is preferably cast iron, is poured into the brake drum shells while they are being rotated with both the brake drum shells and the material at temperatures such that the brake engaging material fuses with the brake drum shells. The resulting product is illustrated in Figure 5.

After the lining operation, the radially extending flanges 11 and also the radially aligned central portion of the brake engaging material are cut away to separate the brake drums. Then the annular sealing grooves in the free edges of the brake engaging material and the generally axially extending central portions of the backs are bent inwardly into generally radially extending position to form the completed brake drum, as shown in Figure 6.

As illustrated in Figure 7, the brake drums instead of being manufactured as illustrated in Figures 1, 2 and 3, may be formed of the annulus 13 made from strip sheet steel and the backs 14 in the nature of sheet steel stampings. The backs have the peripheral flanges 15 of a size to register with and be flash welded to the edge portions of the annulus and have their central mounting portion extending substantially radially. The pouring of the brake engaging material and the separating of the brake drums is carried out in the same manner as described with reference to Figures 1, 2 and 3.

Figure 8 discloses another method of manufacturing brake drums differing from that illustrated in Figures 4, 5 and 6, in that two stampings are made each forming the annulus 16 and the back 17 of a brake drum shell. The annulus has at its free edge the radially extending flange 18, while the central mounting portion of each back extends generally radially. After the forming of the steel shells, the annular flanges 18 are welded together. The brake engaging material is poured into the shells and against the inner surfaces of the annuli during rotation of the shells and then the annular flanges 18 and the adjacent portion of the brake engaging material are removed and machined, as described with reference to Figures 4, 5 and 6.

What I claim as my invention is:

1. The method of manufacturing composite brake drums comprising shaping brake drum shell elements with apertured backs and integral annular flanges at the peripheries of the backs and positioning the apertured portion of one back so that it is axially offset from its final position to form a large pouring aperture, securing the shell elements in opposed relation with the annular flanges thereof substantially aligned and with the backs thereof axially spaced, pouring fluid brake engaging material through

the large pouring aperture and against the inner surfaces of the annular flanges to line the shell elements, separating the lined shell elements and bending the axially offset apertured portion to final position and reducing the aperture therein.

2. The method of manufacturing composite brake drums comprising shaping brake drum shell elements with apertured backs and integral annular flanges at the peripheries of the backs and positioning the apertured portion of one back to extend generally axially to form a large pouring aperture, securing the shell elements in opposed relation with the annular flanges thereof substantially aligned and with the backs thereof axially spaced, rotating the shell elements, pouring fluid brake engaging material through the large pouring aperture and against the inner surfaces of the annular flanges during the rotation of the shell elements to line the shell elements, separating the lined shell elements and bending the generally axially extending apertured portion to final position and reducing the aperture therein.

3. The method of manufacturing composite brake drums comprising shaping from strip stock brake drum shells with apertured backs and integral annular flanges at the peripheries of the backs and positioning the apertured portion of one back so that it is axially offset from its final position to form a large pouring aperture, securing the shells in opposed relation with the annular flanges thereof substantially aligned and with the backs thereof axially spaced, pouring fluid brake engaging material through the large pouring aperture and against the inner surfaces of the annular flanges while rotating the shells, severing the annular flanges and the brake engaging material substantially midway of the backs, and bending the axially offset apertured portion to final position and reducing the aperture therein.

4. The method of manufacturing composite brake drums comprising shaping an annulus from strip stock, shaping other elements from strip stock with apertured backs and integral annular flanges at the peripheries of the backs and positioning the apertured portion of one back so that it is axially offset from its final position to form a large pouring aperture, welding the annular flanges to the annulus, pouring fluid brake engaging material through the large pouring aperture and against the inner surfaces of the annulus and annular flanges while rotating the annulus and other elements, severing the annulus and brake engaging material substantially midway of the backs, and bending the axially offset apertured portion to final position and reducing the aperture therein.

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