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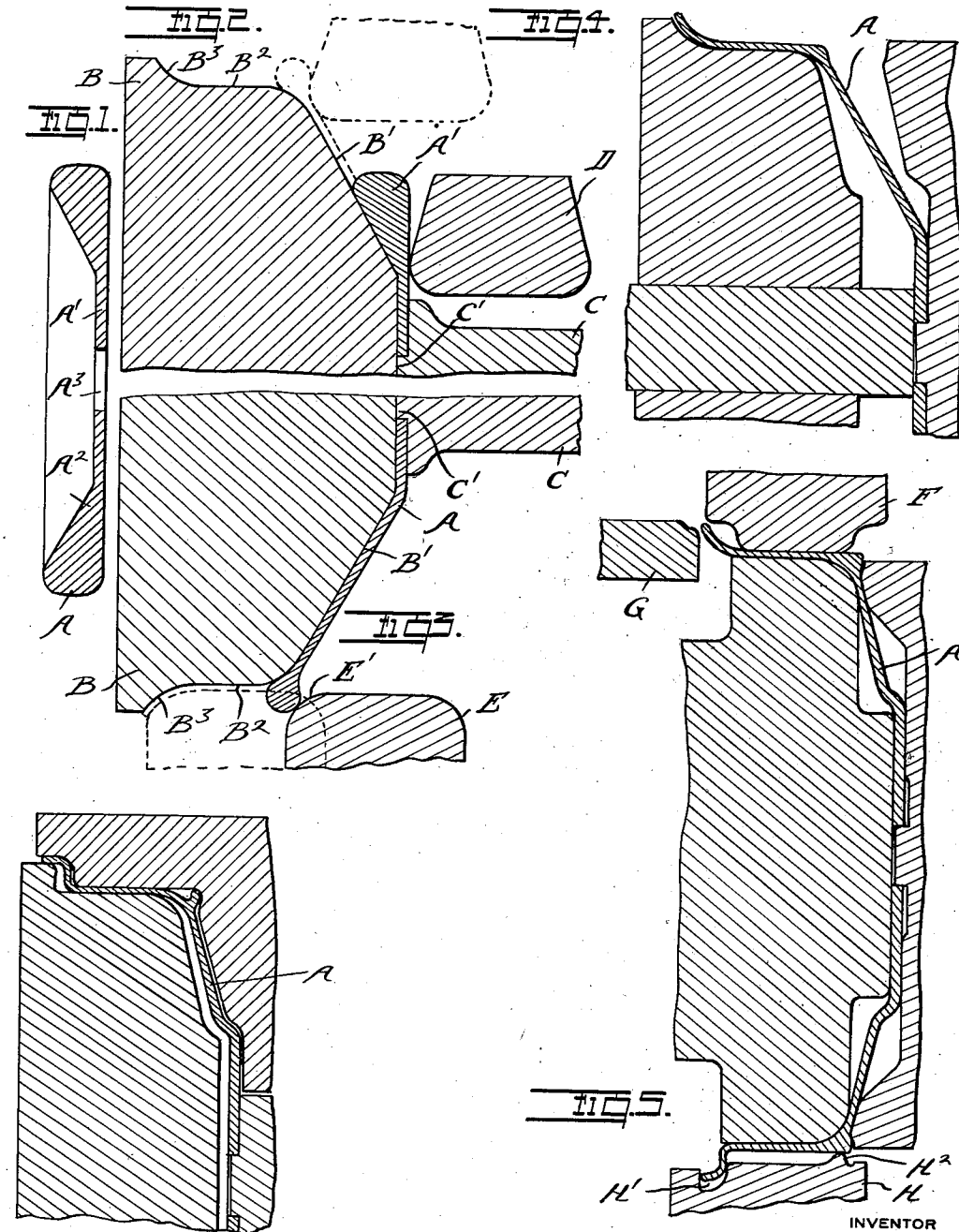
F. H. LE JEUNE

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METHOD OF FORMING VEHICLE WHEELS

Filed March 26, 1934

3 Sheets-Sheet 1



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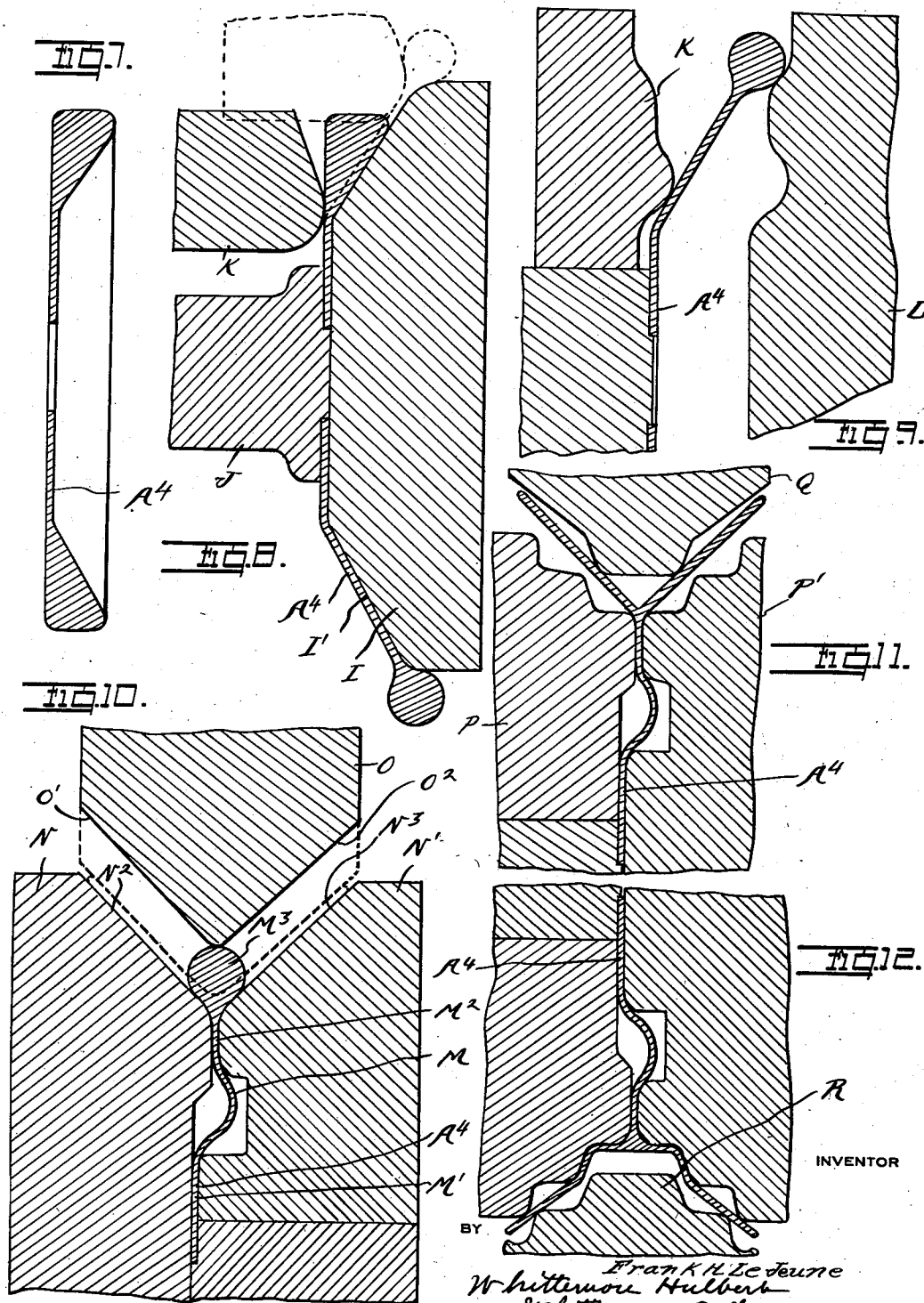
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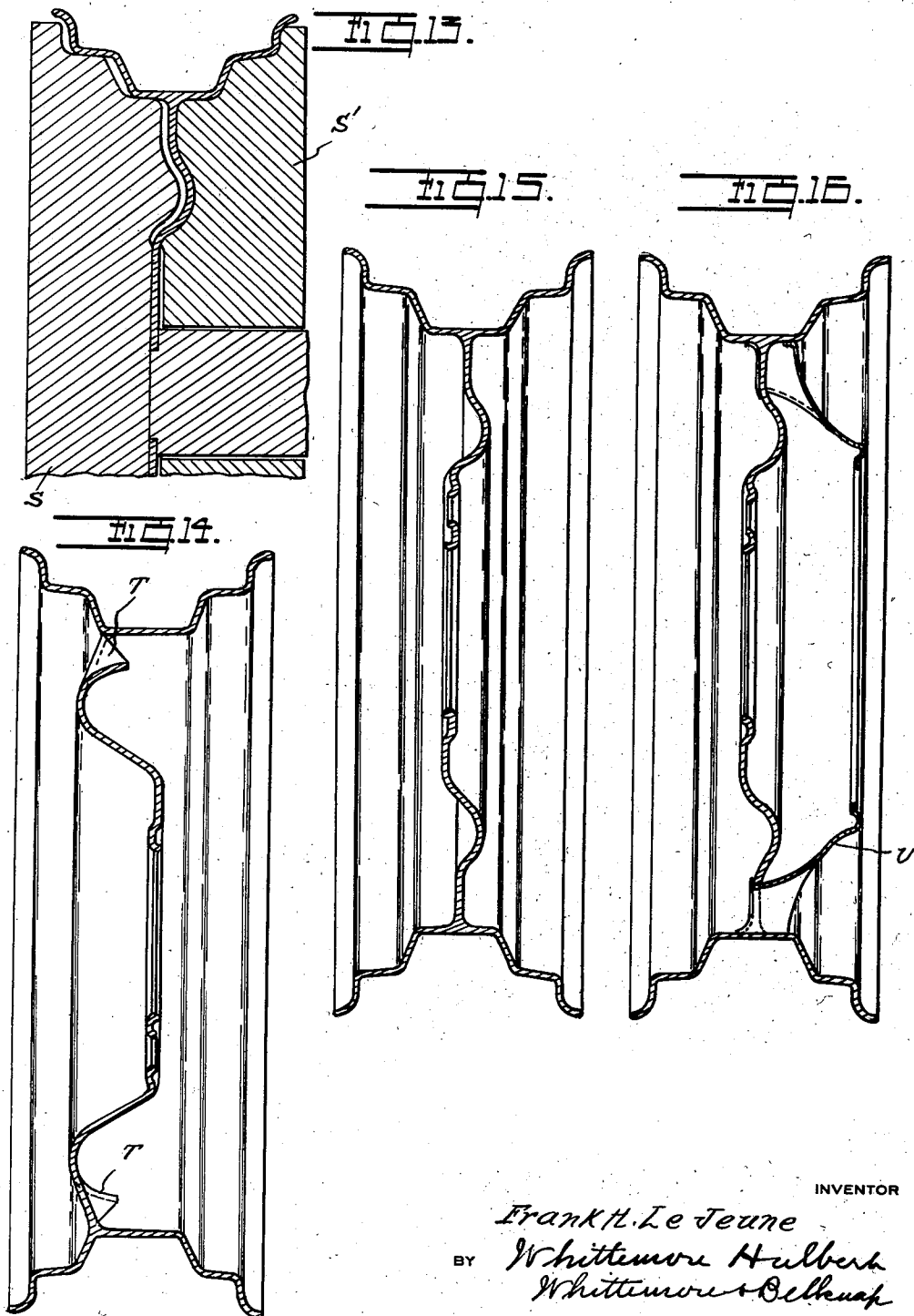
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METHOD OF FORMING VEHICLE WHEELS

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5 Claims. (Cl. 29—159.01)

The invention relates to the manufacture of vehicle wheels of the type comprising a tire engaging rim and a body formed of a fashioned web. Usually the rim and the body portion of the wheel are separately formed and by different methods, the rim being formed from a rolled section and the body from pressed sheet metal. It is the primary object of the present invention to simplify the process of manufacture and it is a further object to obtain an improved product. To this end the invention consists, first, in the method of forming both body and rim from a single forged or cast blank; second, in the method of expanding and fashioning this blank to the desired form and third, in various novel features as will be hereinafter set forth.

In the drawings:

Fig. 1 is a cross section of the forged blank from which the wheel is to be formed;

Figs. 2, 3, 4, 5 and 6 illustrate the successive steps in the enlargement and fashioning of the blank to form the body and rim of a wheel of one construction;

Figs. 7 to 13 inclusive are views similar to Figs. 1 to 6 inclusive, showing the successive steps of forming a modified construction of wheel body and rim;

Figs. 14, 15 and 16 are sections through different modifications of the completed wheel.

As shown in Figs. 1 to 6, A is the blank which is forged from a billet of metal cut off to the proper length and which has a central web portion A' and an annular portion A² of outwardly enlarged cross section. This blank is then punched to form a central aperture A³ therein, preferably of rectangular form, after which the heated blank is mounted on a spinning machine. This comprises a head B having a truncated conical end portion B' and a substantially cylindrical peripheral portion B² terminating in a rounding flange portion B³. The blank is clamped to this head by a member C having an end portion C' for engaging the square aperture A³. Both members B and C are then revolved and the enlarged annular portion A² of the blank is spun outward over the portion B' by the operation of a spinning roll D. This forces the bulging portion of the blank out beyond the portion B² of the head B after which a spinning roll E is moved substantially parallel to the portion B², spreading the metal thereover while the rounded end E' of the roll forms a flange parallel to the portion B³. The blank thus formed is then pressed as shown in Figs. 4 and 5 to fashion the web portion thereof, after which it is rolled by

the rollers F, G and H to fashion the rim portion. The latter roll is provided with a groove H' which fashions the flange of the rim and a projecting rib H² which forms the groove for engaging the locking rim.

With the modified construction illustrated in Figs. 7 to 13 the first steps are substantially the same as just described. Thus a forged blank A⁴ having a central aperture punched therein, is engaged with the spinning head I and clamping member J, and is then rotated and subjected to the operation of a roll K which forces the annular portion of enlarged cross section outward in conformity to the truncated conical surface I'. The web portion is then pressed as shown in Fig. 9 by the operation of complementary dies K and L to form in the web of the blank an annular corrugation M with portions M' and M² extending substantially perpendicular to the axis of the blank. The web portion is then clamped between members N and N' of a spinning head, said members being formed with the oppositely angling conical portions N² and N³. A roll O is then engaged with the annular portion M³ of the blank, said roll having conical faces O' and O² at the same angle to each other as the portions N² and N³ of the heads N and N'. The roll O is then pressed inward to bifurcate the portion M³, forcing the furcations thereof outward in conformity to the faces N² and N³. The blank is then transferred into engagement with complementary spinning heads P and P' and is subjected successively to the operation of rolls Q and R which fashion the rim to the desired form. The blank is re-struck between dies S and S' as shown in Fig. 13 after which it is heat treated to normalize the metal and is expanded cold to size and shape the same. The wheel may then be finished according to the particular style desired, Fig. 14 showing portions T sheared and struck out from the web to form imitation spokes and Figs. 15 and 16 showing the construction which is completed by a member U of thin pressed sheet metal giving the desired ornamental appearance.

The essential steps of the process as illustrated in Figs. 1 to 6 inclusive are the forging of the blank, the spinning of the same in conformity to a fashioned head, and the refashioning to the desired form. In the process as illustrated in Figs. 7 to 13 the essential steps are the forging of the blank, spinning and pressing to form the web portion of the wheel, bifurcating the annular enlargement at the outer end of the web portion to

form opposite portions of the rim and refashioning to desired form.

What I claim as my invention is:

1. The method of forming vehicle wheels comprising the forging of a blank having a central web portion and an annular peripheral portion of enlarged cross section, rolling the annular portion by a roller having its axis substantially radial with respect to the axis of the blank and relatively traveling around the latter to expand the diameter of the blank and further rolling to form a laterally extending rim.

2. In a process of forming vehicle wheels, the steps of forging a blank with a central web portion and an annular peripheral portion of enlarged cross section, mounting the blank upon a spinning head having a truncated conical portion and a substantially cylindrical peripheral portion, rolling the annular peripheral portion of said blank to enlarge the diameter thereof and to conform the same to the truncated conical portion of the head, and further rolling the expanded annular portion of said blank to conform the same to the cylindrical portion of said head.

3. In a process of forming vehicle wheels, the steps of forging a blank with a central web portion and an annular peripheral portion of enlarged cross section, mounting the blank upon a spinning head having a truncated conical portion, rolling the annular portion of said blank to enlarge the diameter thereof and to conform the same to said truncated conical portion of the spinning head, refashioning the web portion of the blank, clamping the web portion of the refashioned blank between spinning heads having

oppositely extending truncated conical portions and with the annular peripheral portion of the blank in the space between said conical portions, and rolling the peripheral portion of the blank to bifurcate the same and to conform the furcations thereof to said truncated conical portions of the spinning head.

4. In a process of forming vehicle wheels, the steps of forming the blank with a central web portion and an annular peripheral portion of enlarged cross section, clamping the web portion of said blank between complementary members of the spinning head having oppositely angling truncated conical portions and with the enlarged peripheral portion of the blank in the space between said conical portions, rolling the peripheral portion of the blank by a roller having its axis substantially parallel with respect to the axis of the blank and relatively traveling around the latter to bifurcate and conform the same to said truncated conical portions of the spinning head, and refashioning the conical furcations to form the desired cross section for the rim of the wheel.

5. In a process for forming vehicle wheels, the steps of forging a blank having a central web portion and an annular peripheral portion of enlarged cross section, mounting said blank upon a spinning head, rolling the annular peripheral portion of said blank to expand the diameter and to conform the same to the contour of said spinning head, refashioning the blank to form a rim and web of desired cross section and shearing and stamping the web portion to produce the appearance of spokes.

FRANK H. LE JEUNE.