Aug. 23, 1927. 1,639,648

J. O. CARREY

COMPRESSOR HOUSING

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Fig. 1

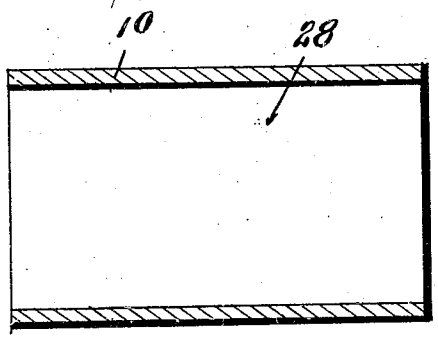


Fig. 2

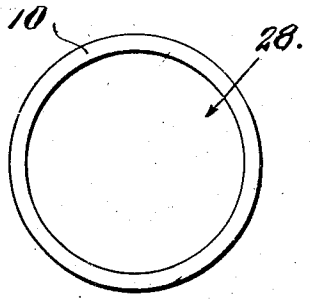


Fig. 3

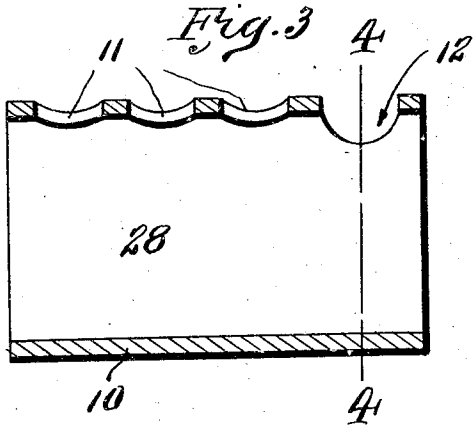


Fig. 4

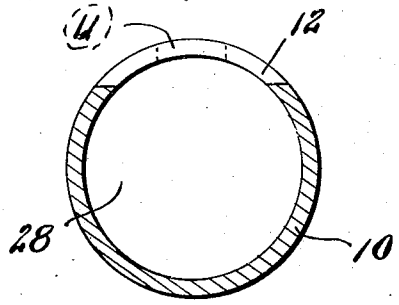


Fig. 5

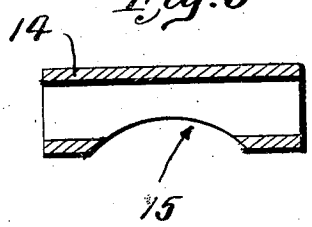
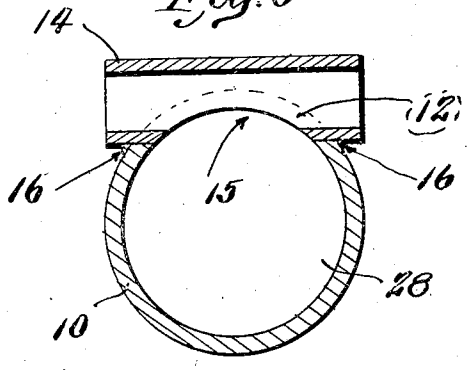


Fig. 6



Inventor
John O. Carrey
By Cornwall, Bradell & Janus
Attys.

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Fig. 7

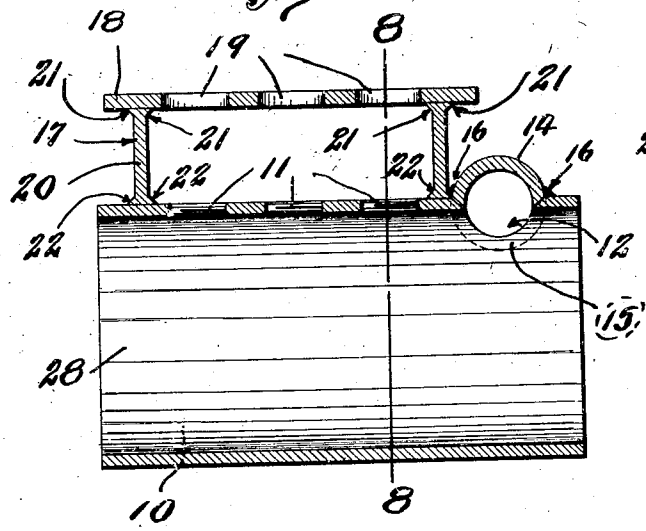


Fig. 8

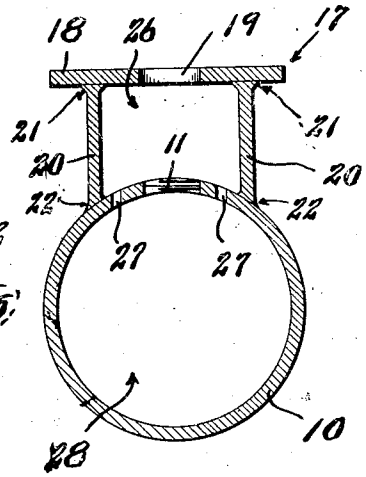


Fig. 9

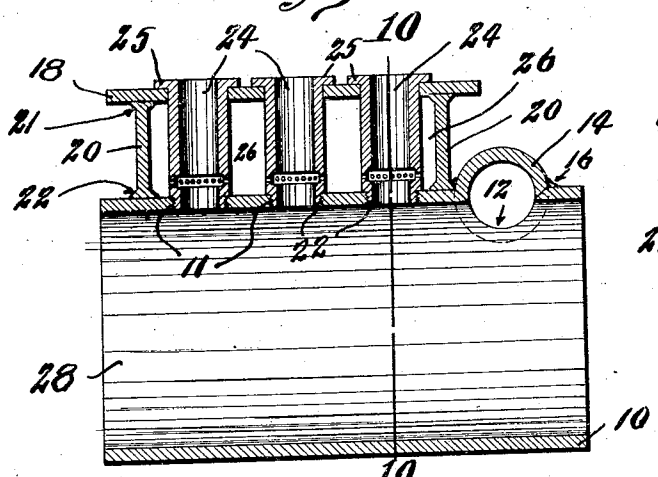
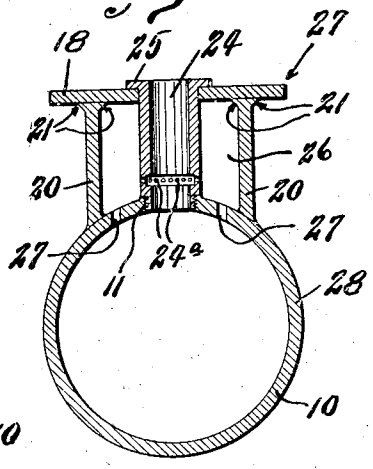


Fig. 10



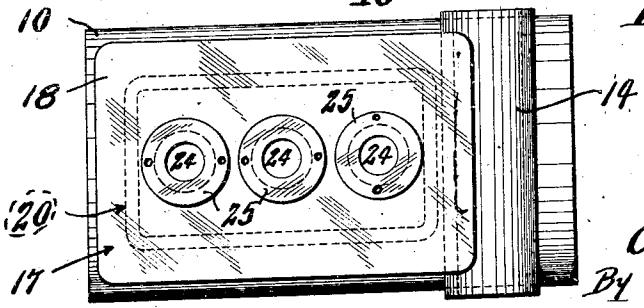


Fig. 11

Inventor
John O. Carrey
Cornwall, Bidell & Janne
Atty's.

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Fig. 13

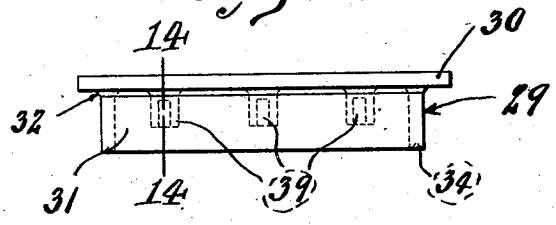


Fig. 12

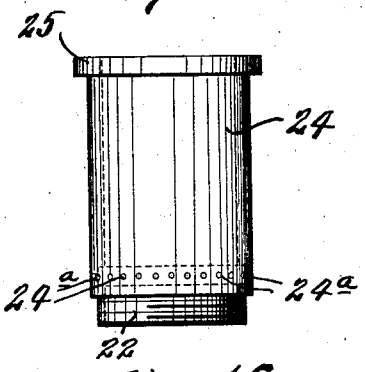


Fig. 14

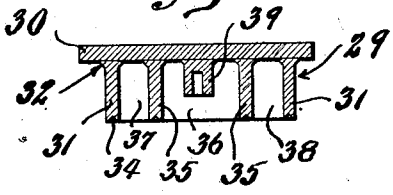


Fig. 16.

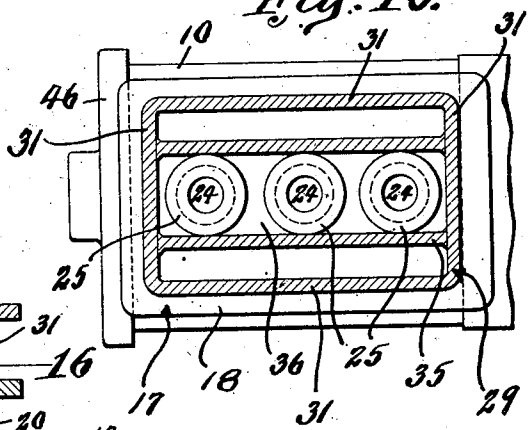
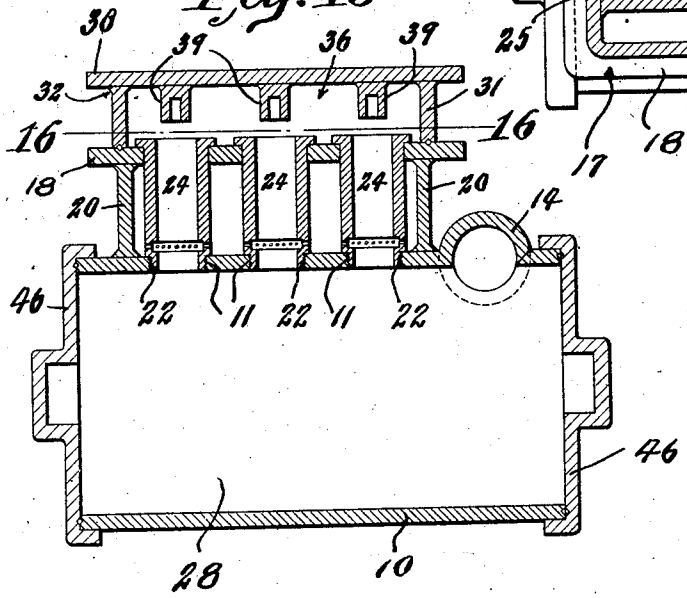


Fig. 15



Inventor
John O. Carrey
By Cornwall, Bidell & James Attys.

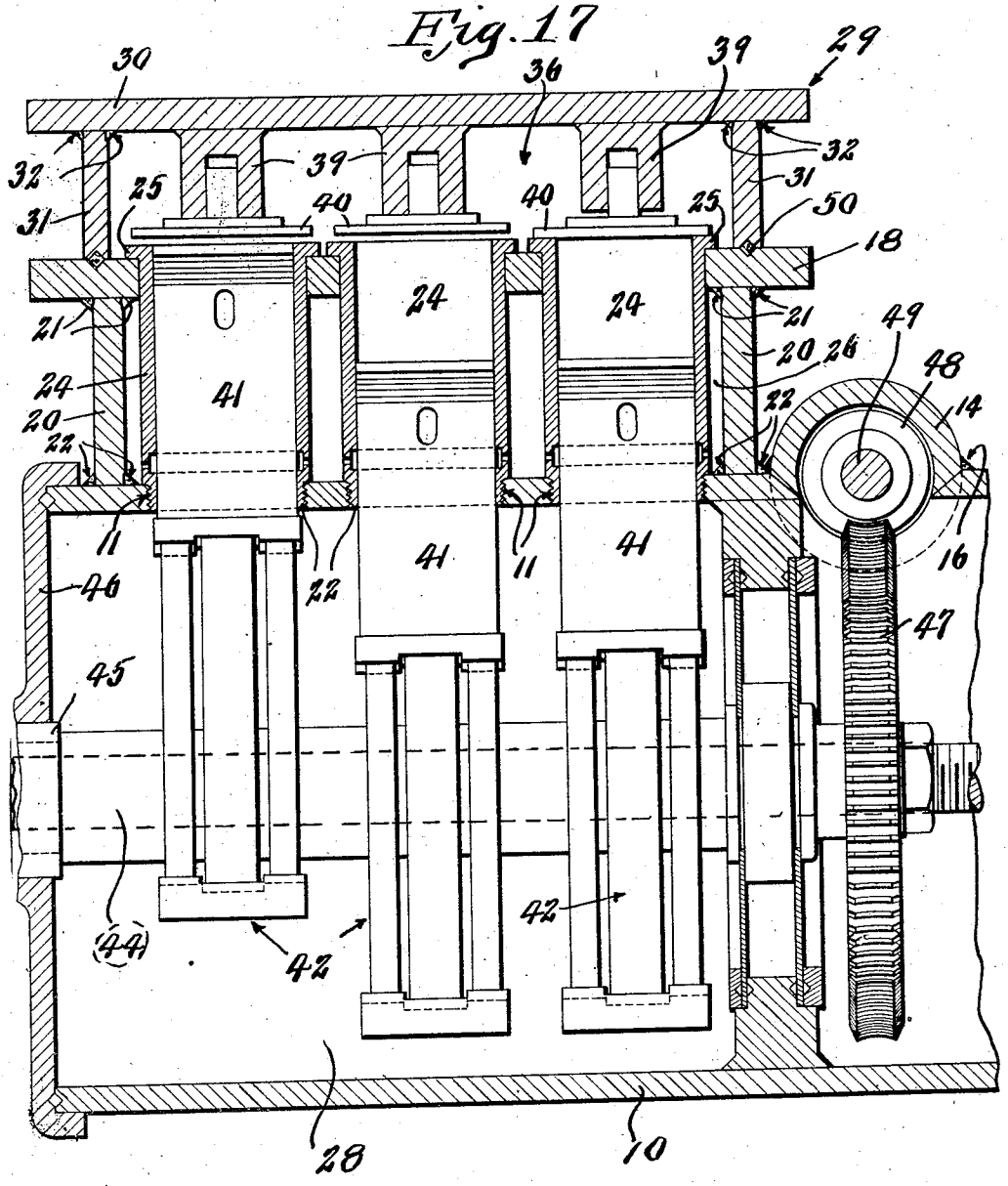
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J. O. CARREY

COMPRESSOR HOUSING

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Fig. 17



Inventor
John O. Carrey
By Cornwall, Bridell & James
Attys.

Patented Aug. 23, 1927. 1,639,648

UNITED STATES PATENT OFFICE.

JOHN O. CARREY, OF ST. LOUIS, MISSOURI, ASSIGNOR TO CARREY-MORSE ENGINEERING COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

COMPRESSOR HOUSING.

Application filed August 29, 1925. Serial No. 53,441.

This invention relates to new and useful improvements in compressor housings. Heretofore, the housings for compressors, particularly such as are used in household refrigerating systems, have been made from cast iron or cast steel. In the commercial manufacture of such housings, a large percentage thereof has to be discarded on account of air holes and other defects in the casting caused by the present method of manufacture. Furthermore, in refrigerating systems the compressor usually operates under a comparatively high pressure and inasmuch as castings are more or less porous, this pressure causes the refrigerant to escape from such a housing through the pores of the casting.

It is the object of the present invention to manufacture the compressor housing from material of comparatively great density in order to prevent the escape of the refrigerant through the walls of the housing.

Further objects of the invention are to make the housing in sections of rolled, pressed, or forged metal, and to weld or braze these sections together to form the completed housing.

Other objects of the invention are to simplify the method and cheapen the cost of manufacture of the compressor housings, and to provide a housing which is not porous but is fluid-tight and can successfully retain the refrigerant when the latter is placed under pressure.

With these and other objects in view, my invention consists in certain novel features of construction and arrangement of parts, hereinafter more fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section taken through a tubular member which is to form the body portion of the housing.

Figure 2 is an end elevational view of the same.

Figure 3 shows one of the steps in the manufacture of the housing.

Figure 4 is a transverse cross section taken on line 4—4 of Figure 3.

Figure 5 is a cross section taken longitudinally through a member utilized to enclose the driving member of the compressor.

Figure 6 is a transverse cross section through the body portion and showing said member welded or secured in position thereon.

Figure 7 is a longitudinal cross section through the body portion and showing another step in the manufacture of the housing, namely, that of securing the cylinder casing thereto and forming in the proper walls coaxial openings for receiving the cylinders.

Figure 8 is a transverse cross section taken on line 8—8 of Figure 7.

Figure 9 is a view similar to Figure 7 but showing the cylinders in position therein.

Figure 10 is a transverse cross section taken on line 10—10 of Figure 9.

Figure 11 is a top plan view of the parts shown in Figures 9 and 10.

Figure 12 is an enlarged elevational view of one of the cylinders.

Figure 13 is a side elevational view of the cylinder head used in conjunction with my housing.

Figure 14 is a vertical cross section taken on line 14—14 of Figure 13.

Figure 15 is a longitudinal cross section through the housing, showing the cylinder head and the end plates attached thereto.

Figure 16 is a horizontal cross section taken on line 16—16 of Figure 15.

Figure 17 is a longitudinal cross section through the compressor housing and showing the operating mechanism arranged therein.

In practising my invention, the various sections which enter into the construction of the compressor housing are cut to proper lengths and are bored or cut away where necessary and are then welded or brazed together so as to form a unitary structure and provide fluid-tight joints.

The section which forms the body portion or that portion which is to contain the operating mechanism is shown in Figures 1 to 6 inclusive, and comprises a tubular member 10 which may be formed of commercial tubing. This member is provided with openings 11 arranged in alignment with the longitudinal axis of said member and is formed with a concave transversely disposed seat 12 near one end for receiving a comparatively small tubular section 14 having a concave seat 15 which when member 14 is arranged transversely on member 10 coincides with the internal bore of said tubular

member 10 and provides an unobstructed passage between the bores of the two members. Member 14 is secured in position on member 10 by welding or brazing as indicated at 16, thereby providing a fluid-tight joint between the two members. A cylinder casing 17 is now secured to member 10 adjacent to member 14 and this casing encloses openings 11 as shown in Figure 7. This cylinder casing consists of a top plate 18 which is made of sheet metal of suitable thickness cut to proper shape and size and which has formed therein openings 19 which are in axial alignment with the respective openings 11.

The side walls 20 are formed separately from plate 18 and are made in one piece, bent preferably into rectangular shape and are welded or brazed to plate 18 as indicated at 21. After wall section 20 has been secured to plate 18, the lower edges of wall 20 are welded or brazed to the peripheral face of member 10, as indicated at 22, thereby permanently attaching the cylinder casing 17 to the body portion 10. If so desired, openings 11 can be formed in the member 10 after section 17 has been placed in position thereon in order to insure perfect alignment of openings 11 and 19. These openings 11 are threaded for receiving the threaded ends 23 of cylinders 24 which are formed separate from casing 17 and which are provided at their upper ends with annular flanges 25 whereby when said cylinders are screwed in position, said flanges bear against the upper face of plate 18. Walls 20 are spaced a suitable distance from cylinders 24, thereby providing a chamber 26 which may be used to receive the returning refrigerant and separate and collect the oil absorbed by the refrigerant and return the oil through openings 27 to the main chamber 28 in which the operating mechanism is located.

The upper ends of cylinders 24 are enclosed by a cylinder head 29 which consists of a plate 30 and a wall section 31, the upper edge of the latter being welded or brazed to the underside of said plate, as indicated at 32, while the lower edge of said wall is provided with a V-shaped downwardly presented groove 34 for receiving packing material. A pair of plates 35 are disposed longitudinally in the cylinder head and separate the interior thereof into a central high pressure chamber 36 and discharge and intake chambers 37 and 38 respectively. Plates 35 are secured in position by welding or brazing the edges thereof to the respective faces of walls 31 and plate 30. Bosses 39 are brazed or welded to plate 30 and occupy positions in chamber 36 in axial alignment with cylinders 24 when cylinder head 29 is secured in position on the housing. These bosses which depend from the underside of plate 30 are adapted to receive check valves 40 which are used to close the upper ends of cylinders 24 during the suction stroke of pistons 41, which latter operate in said cylinders.

An actuating mechanism 42 is operatively connected to pistons 41 and includes a shaft 44 which latter is longitudinally disposed in main chamber 28 and has its ends journaled in bearings 45. These bearings are carried or mounted in centrally disposed recesses formed in the end plates 46 and said end plates are removably secured to the ends of tubular member 10 and seal chamber 28. Shaft 44 is actuated in any suitable manner, such as worm gear 47 fixed thereto and a worm 48 carried by shaft 49 in member 14.

In the operation of the machine, the refrigerant enters cylinders 24 through inlet openings 24^a and is compressed in said cylinders by pistons 41 and is then discharged into the high pressure chamber 36 from which it passes to discharge chamber 37 and thence through the system and returns to intake chamber 38 from which it is conveyed to chamber 26. Cylinder head 29 is removable and suitable packing 50 is used to provide a fluid-tight joint between said cylinder head and plate 18 of cylinder casing 17, there being suitable V-shaped grooves formed in the upper face of plate 18 for registering with the V-shaped grooves 34 of the cylinder head.

By forming the various parts of tubing and sheet metal and then welding said parts together, I am enabled to use material of great density and strength and all danger of porosity or air-holes being formed in the walls of the housing is thereby eliminated, thus providing a housing which is comparatively light in weight, strong and durable in construction, cannot leak due to the inherent qualities of the material from which it is made, and which can be manufactured at low cost by virtue of the fact that the various parts entering into the manufacture of the completed housing can be produced by automatic machinery on a large scale and at a very low production cost.

I claim:

1. As a new article of manufacture, a compressor housing comprising an open-ended tubular body portion, a box-shaped cylinder casing disposed radially thereto and having the lower edges of its side walls permanently secured to the peripheral face of said body portion, a plurality of open-ended cylinders seated in the aligned openings formed in the upper face of said cylinder casing and in said tubular body portion, and a box-shaped cylinder head common to and enclosing all of the outer ends of said cylinders, the inner ends of the latter opening into said body portion.

2. As a new article of manufacture, a com-

pressor housing comprising an open-ended tubular body portion, a box-shaped cylinder casing extending radially therefrom and having the lower edges of its side walls welded to the peripheral face thereof and provided with a horizontally disposed annular flange, a plurality of open-ended cylinders disposed in said cylinder casing radially to said tubular body portion, each cylinder having its lower end seated in an opening formed in the peripheral wall of said tubular body portion and its upper end in an aligned opening formed in the top wall of said cylinder casing, a cylinder head removably secured to said top plate and common to and enclosing all of the upper ends of said cylinders, and end plates for closing the ends of said tubular body portion.

3. As a new article of manufacture, a compressor housing comprising a tubular body portion, a box-shaped cylinder casing disposed radially thereto and having the edges of its side walls permanently secured to the peripheral face of said body portion, a plurality of cylinders seated in the aligned openings formed in the face of said cylinder casing and said tubular body portion, a cylinder head for enclosing the outer ends of said cylinders, the inner ends of the latter opening into said body portion, and a driving mechanism casing secured to one end of said tubular body portion for enclosing the driving mechanism of the compressor.

4. As a new article of manufacture, a compressor housing comprising an open-ended tubular body portion, a box-shaped cylinder casing extending radially therefrom and having the edges of its side walls welded or brazed to the peripheral face thereof, a plurality of cylinders disposed in said cylinder casing radially to said tubular body portion, each cylinder having its lower end seated in the opening formed in the peripheral wall of said tubular body portion and its upper end in the top wall of said cylinder casing, a cylinder head removably secured to said top plate for enclosing the upper ends of said cylinders, end plates for closing the ends of said tubular body portion, and a casing welded to said tubular portion near one end thereof for containing the driving mechanism of the compressor.

In testimony whereof I hereunto affix my signature this fifteenth day of July, 1925.

JOHN O. CARREY.