

No. 725,999.

PATENTED APR. 21, 1903.

J. SLATTERY.

WHEEL AND METHOD OF CASTING SAME OR OTHER METAL OBJECTS.

APPLICATION FILED SEPT. 16, 1902.

NO MODEL.

Fig. 1,

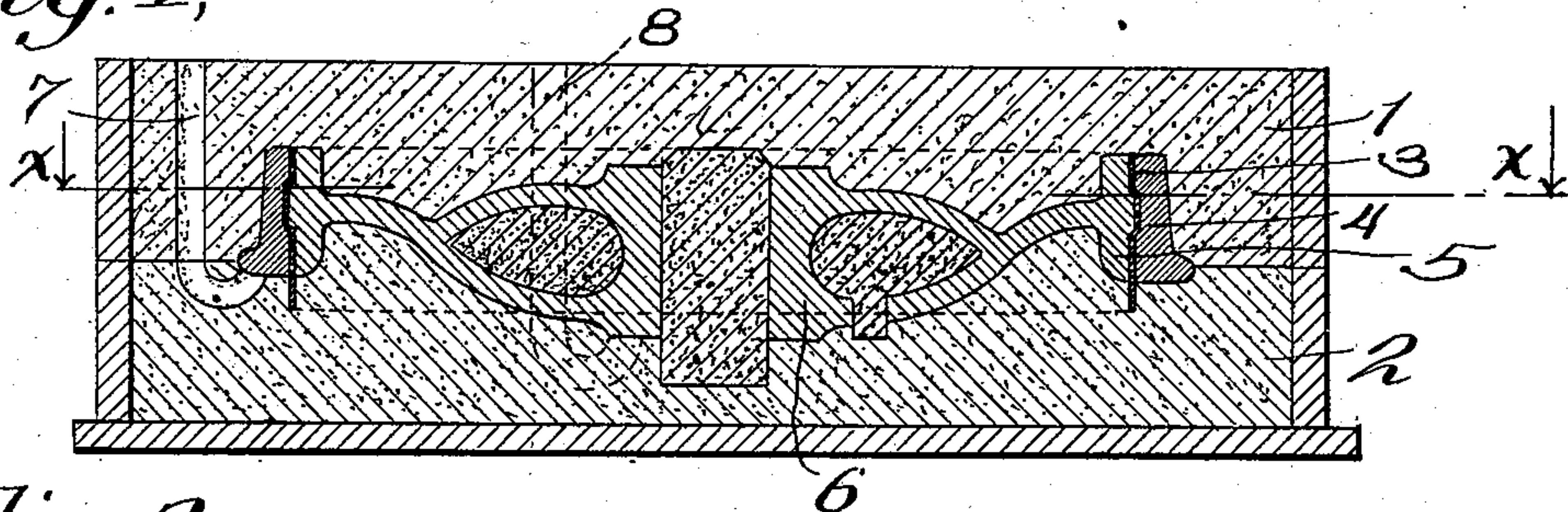


Fig. 2,

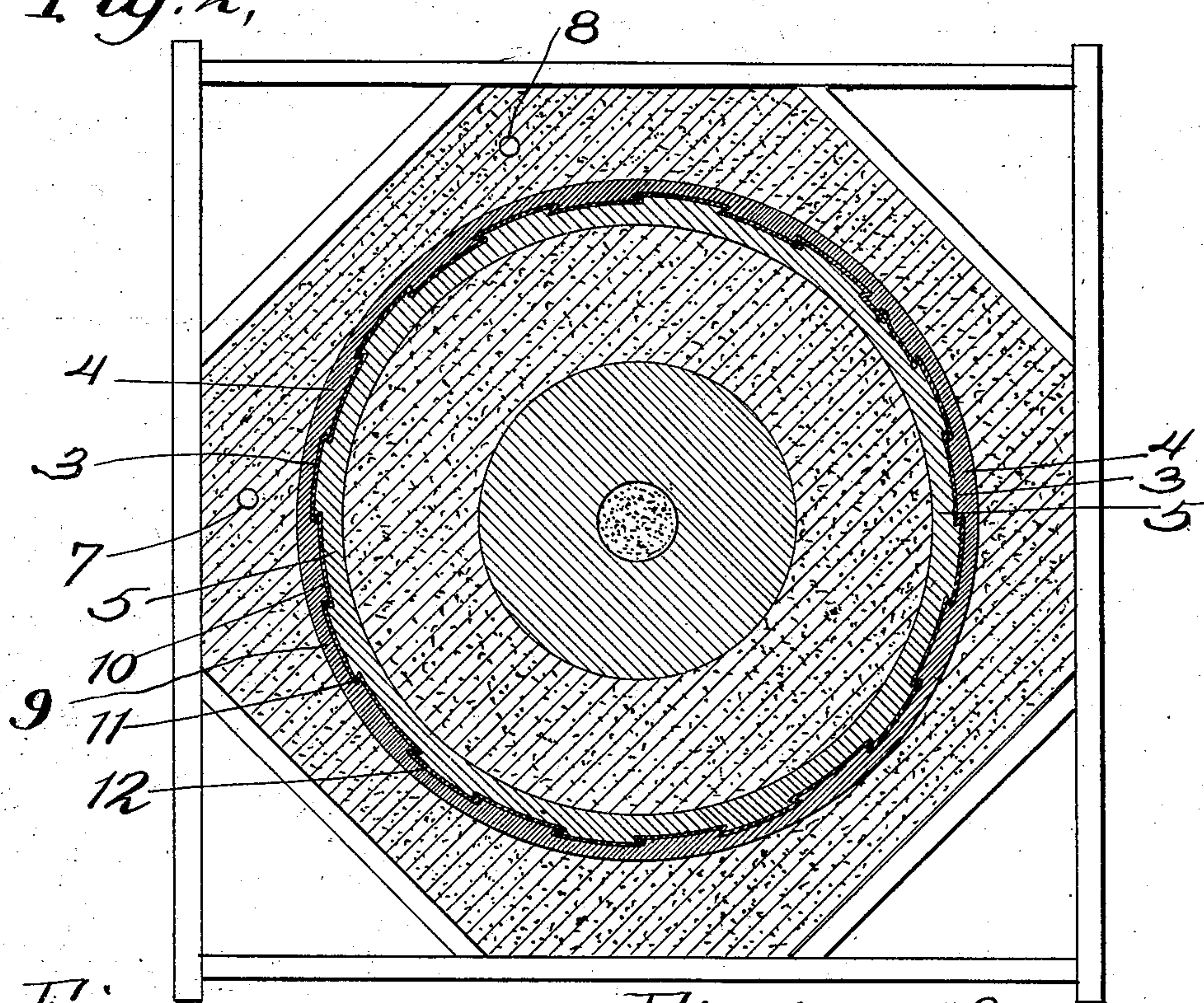


Fig. 3,

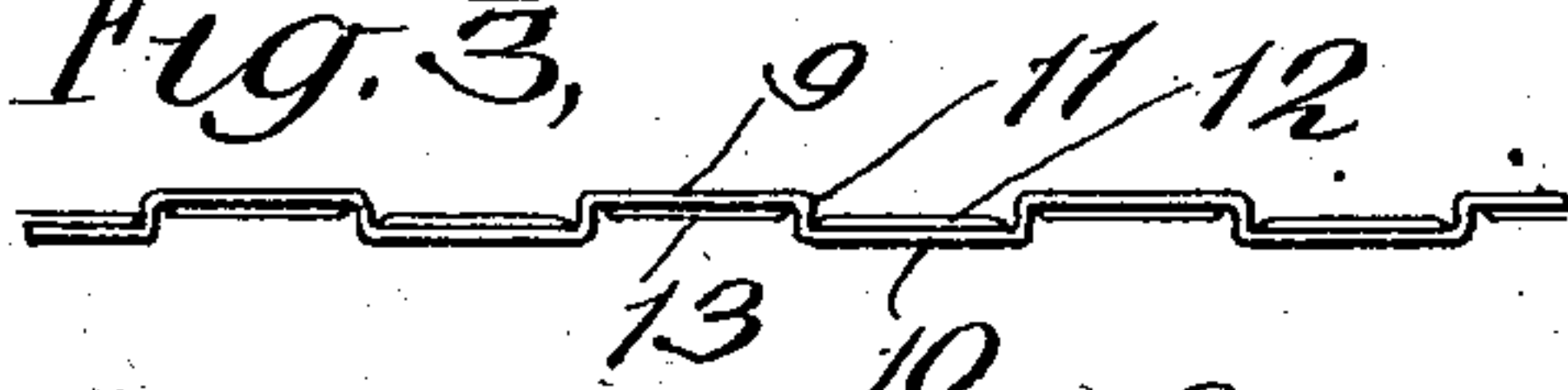


Fig. 4,

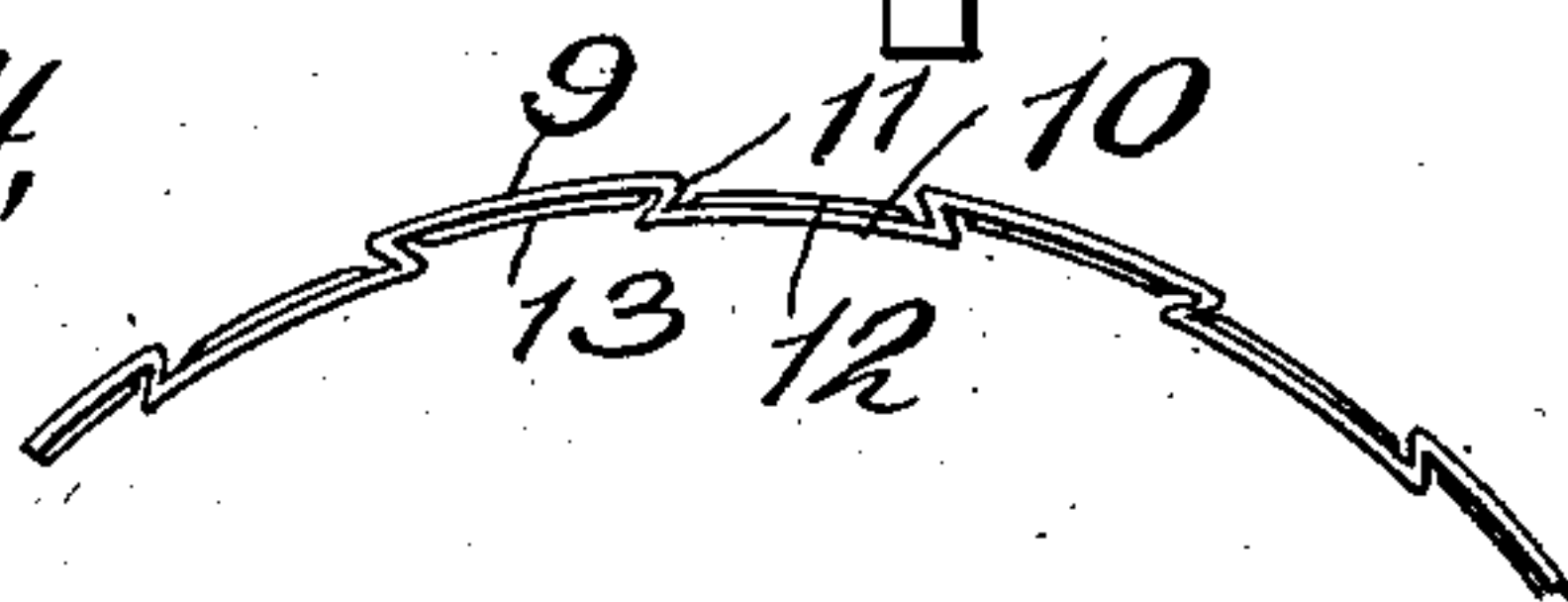
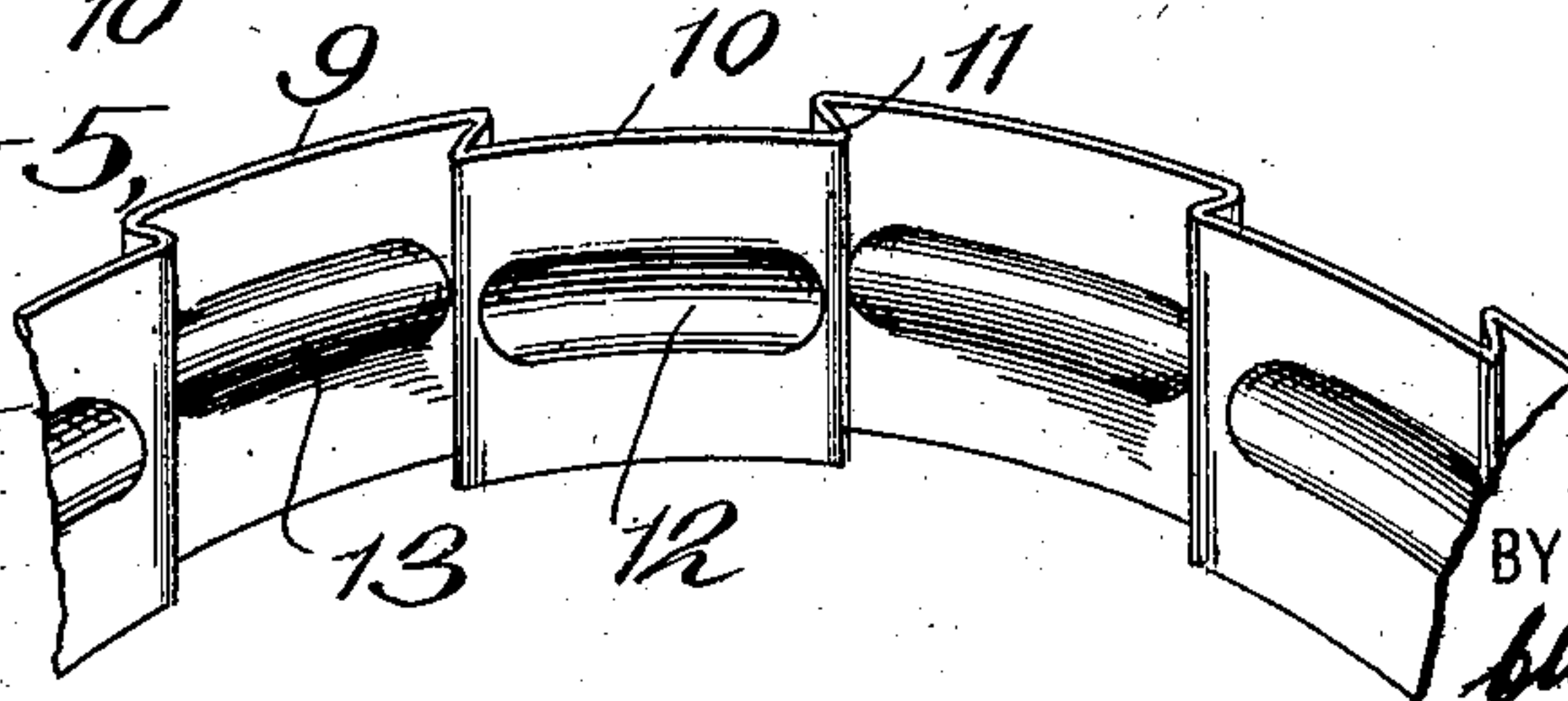


Fig. 5,



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# UNITED STATES PATENT OFFICE.

JOHN SLATTERY, OF BROOKLYN, NEW YORK, ASSIGNOR TO CHROME STEEL WORKS, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

WHEEL AND METHOD OF CASTING SAME OR OTHER METAL OBJECTS.

SPECIFICATION forming part of Letters Patent No. 725,999, dated April 21, 1903.

Application filed September 16, 1902. Serial No. 123,583. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN SLATTERY, a citizen of the United States, and a resident of the borough of Brooklyn, city of New York, State of New York, have invented a certain new and useful Wheel and Method of Casting the Same or other Metal Objects; and I do hereby declare the following to be a specification thereof, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to cast wheels, and especially to cast-steel car-wheels.

My invention consists in a wheel comprising two concentric portions, one of which is usually a rim and the other a body, said portions having interlocking projections fitting into corresponding recesses by which the parts of the wheel are mechanically interlocked and held together.

Car-wheels carry heavy loads, are subjected to severe shocks—as, for example, when a heavily-loaded car passes rapidly over switches and crossings—and are also subjected to wear through the action of brake-shoes upon them. Heretofore the wheels most commonly used have been chilled cast-iron wheels; but it has been found that cast-iron has not the strength desirable for the metal of wheels for modern heavy tonnage cars. Moreover, chilled cast-iron, although hard, is not tough and wears away more rapidly than is desirable under the action of the brake-shoes, and, furthermore, such wheels often contain soft places which wear away rapidly, producing flat wheels. Cast-steel possesses the strength and toughness desirable in the material from which to make car-wheels; but it is necessary that the tread portion of the wheel shall be formed of a hard grade of steel which will resist wear and the blows due to passing over rail-joints, switches, and crossings, and that the hub portion of the wheel shall be formed of a softer grade of steel, which may be bored readily for the reception of the axle, and which is tough and strong. It is also necessary that the parts of the wheel formed from these different grades of steel shall be so fastened together that it shall be impossible for them to separate or for parts of the outer hard rim to fly off.

By the method of casting wheels herein described a wheel is produced having a rim or tread portion composed of a steel of any desired hardness and a body portion and hub composed of steel of any desired softness, the two portions of the wheel being so interlocked mechanically that it is impossible for them to be separated.

The objects of my invention are to improve the construction of cast wheels, and particularly of car-wheels, to produce a cast wheel having a relatively hard outer or tread surface and a body portion formed of softer material, and to interlock the parts of the wheel firmly and prevent accidental separation thereof.

The accompanying drawings illustrate how car-wheels embodying my invention may be made.

In the drawings, Figure 1 shows a cross-section of a car-wheel mold and of a car-wheel therein, the different grades of steel from which the wheel is formed being indicated by different sectioning and the hereinafter-mentioned separator being also indicated. Fig. 2 shows a horizontal section through the line *xx* of Fig. 1 of the upper portion of the mold, showing the separator therein. Fig. 3 shows a top view of this separator as first formed and before it is bent. Fig. 4 shows a similar view of a portion of the separator after it has been bent into a circle. Fig. 5 shows a perspective view of the separator.

In the said drawings the mold shown consists of an upper portion or cope 1 and a lower portion or drag 2, the mold being arranged to part at the flange-line of the wheel, as is ordinarily the case. The pattern by which the mold is formed may be of any desired form, according to the form to be given to the wheel. The rim portion of the mold is divided into two separate chambers by a separator-ring 3, and separate gates are provided for conducting the molten metal into the outer chamber 4 and into the inner chamber 5 and the web and hub-space 6, said gates being numbered 7 and 8, respectively. The separator-ring 3 is formed of thin metal, preferably of sheet-iron, and is bedded in the bottom section of the mold, so as to be supported thereby. The separator-ring is corrugated,



as shown, having faces 9 and 10, having substantially the form of arcs of two circles concentric with the mold, connected by angular reentrant portions 11. When the molten  
 5 metal is poured into the mold on both sides of the separator, the adjacent faces of the cast metal assume the form of interlocking fan-shaped serrations, the two parts of the wheel being, in fact, dovetailed together.  
 10 The separator-ring is also provided with circumferential bosses 12 and corresponding recesses 13, which are filled by the molten metal, and thereby the two parts of the wheel are interlocked against separation by lateral  
 15 movement. In forming this separator-ring it is preferably rolled or pressed into the shape shown in Fig. 3, the corrugations being rectangular. It is then bent into circular form and the ends riveted or otherwise fastened  
 20 together, and as it is so bent the portions 11 connecting the faces 9 and 10 necessarily assume the reentrant position shown.

In casting the wheel after the mold has been formed and the separator inserted molten  
 25 metal of the character from which the hub portion of the wheel is to be formed is poured into the mold through the gate 8, and at the same time or shortly thereafter molten metal of the character from which the rim portion  
 30 of the wheel is to be formed is poured into the mold through the gate 7. The molten metal as it fills the mold conforms to the shape of the separator; but the latter keeps the two grades of molten metal apart and prevents  
 35 them from running together. Because of the shape of the corrugations in the separator interlocking serrations are formed on the adjacent sides of the rim and body portion of the wheel, which unite the two firmly.  
 40 The interlocking of the rim and body, which results from the filling of the recesses 13, likewise prevents the rim from separating from the body portion by a sidewise movement. In practice a more or less perfect weld will  
 45 usually be formed between the rim and body portions of the wheel and the separator, the latter being raised to the welding-point or even fused by the heat of the molten metal; but it is difficult to insure a perfect weld, and  
 50 since the slightest imperfection in the weld between the rim and body would render the wheel dangerous were not the parts locked together mechanically it is far better to rely upon the mechanical interlocking of the parts,  
 55 which because of the shape of the interlocking serrations and the contraction of the metal in cooling is as firm and secure as could be in-

sured by the most perfect weld. After the wheel is formed as above described it is removed from the mold and allowed to cool, 60 and subsequently it may be reheated and pressed between suitable dies to condense the metal and bring the wheel to perfect form and size. It is especially desirable to condense the metal of the rim to the greatest 65 practicable extent, as thereby the rim is made very tough and capable of enduring much service with little wear.

It is obvious that my invention is not limited to the making of car-wheels, but that 70 wheels of various classes may be made in the manner above described, and the process is not confined to the casting together of different grades of steel, but may be employed in casting articles from other metals and from 75 two or more different metals.

In another application for Letters Patent filed concurrently herewith I have claimed the separator employed as above described.

Having thus completely described my invention, what I claim, and desire to secure by Letters Patent, is— 80

1. As an article of manufacture, a wheel comprising two concentric portions each of which has radiating interlocking projections 85 fitting into corresponding recesses of the other, said projections being broader at the face than at the base, and serving to connect the parts of the wheel.

2. As an article of manufacture, a wheel 90 having a rim portion, an inner or hub portion, each of which portions has radiating interlocking projections fitting into the corresponding recesses of the other portion, said projections being broader at the face than at 95 the base, and serving to connect the hub and rim portions of the wheel.

3. As an article of manufacture, a wheel having a rim portion, and an inner or hub portion, each of which portions has interlocking 100 projections fitting into corresponding recesses of the other portion, said projections being broader at the face than at the base, and serving to connect the hub or rim portions of the wheel, one of the said portions of 105 the wheel having also circumferential projections fitting into corresponding recesses which interlock the portions of the wheel against lateral separation.

JOHN SLATTERY.

Witnesses:

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