

No. 726,000.

PATENTED APR. 21, 1903.

J. SLATTERY.
SEPARATOR.

APPLICATION FILED SEPT. 16, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1,

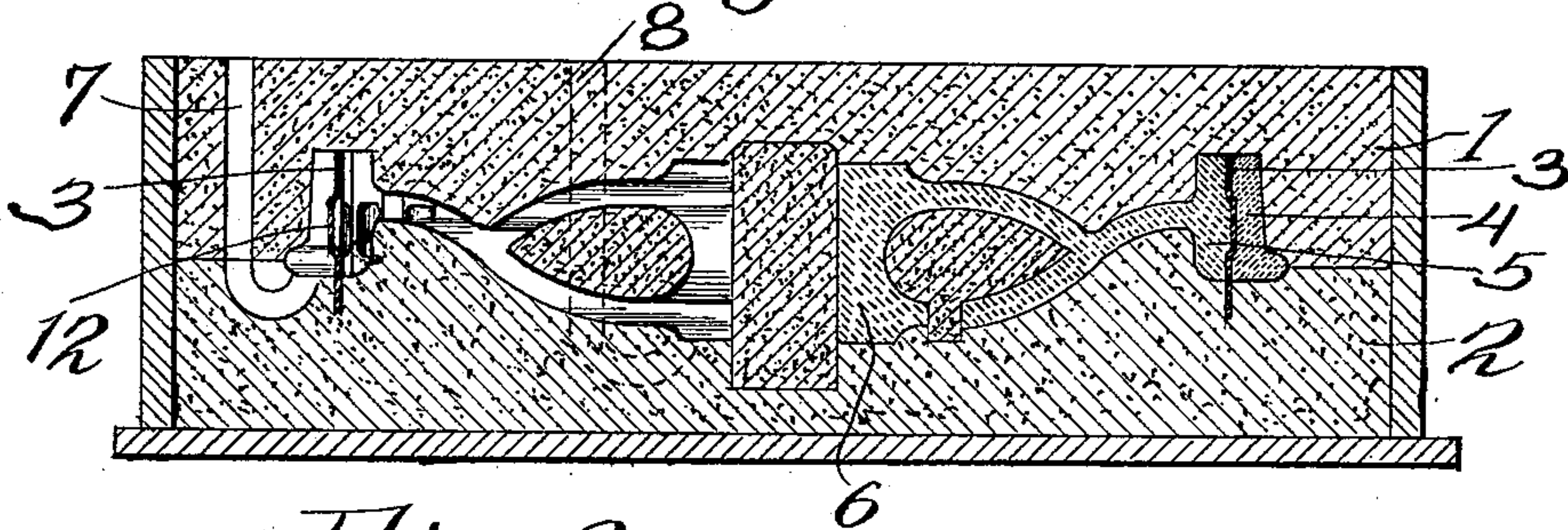
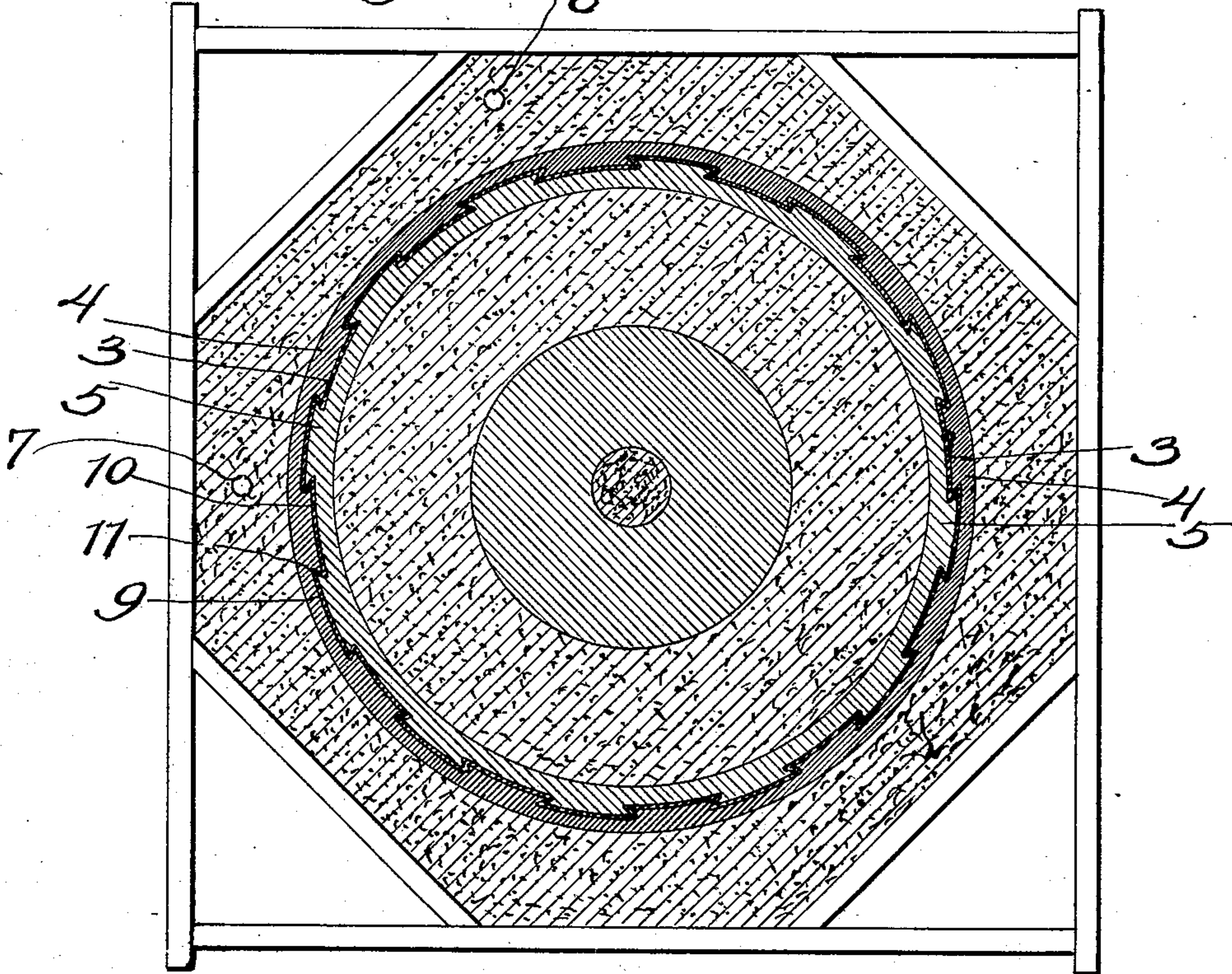


Fig. 2,



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2 SHEETS—SHEET 2.

Fig. 3.

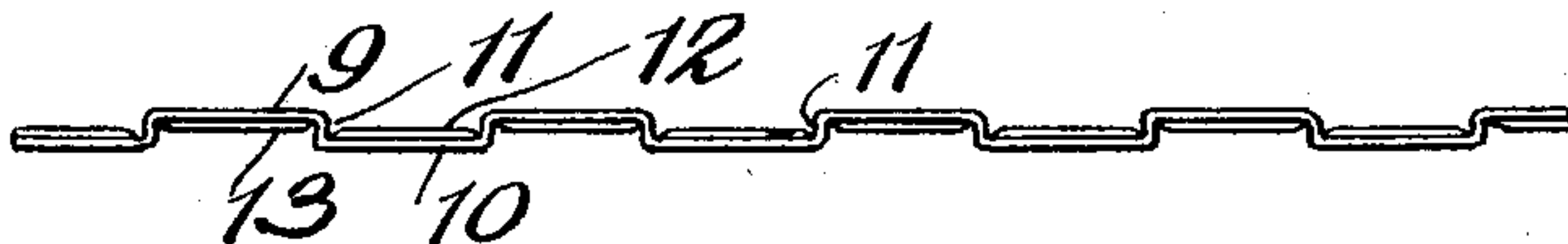


Fig. 4.

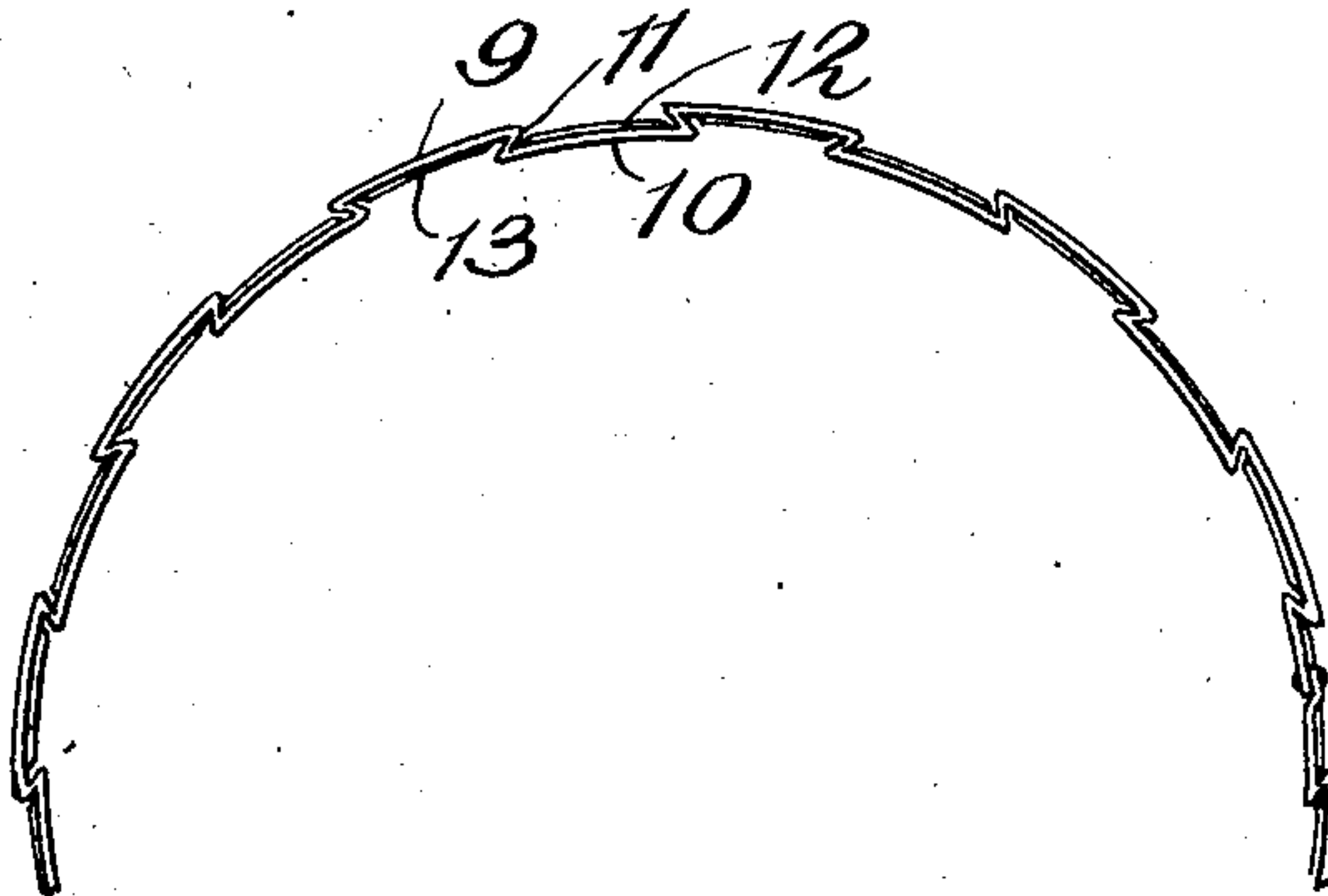
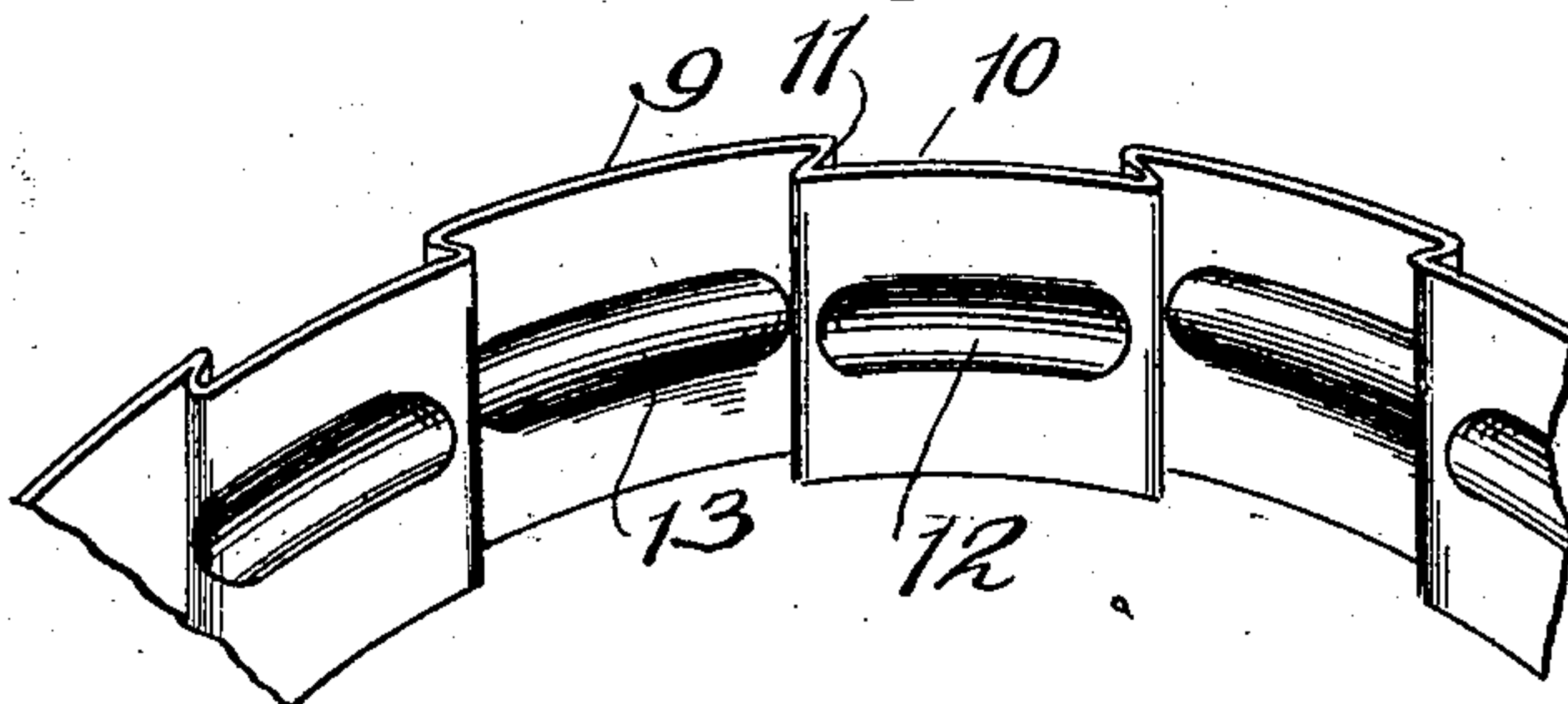


Fig. 5.



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SPECIFICATION forming part of Letters Patent No. 726,000, dated April 21, 1903.

Application filed September 16, 1902. Serial No. 123,584. (No model.)

To all whom it may concern:

Be it known that I, JOHN SLATTERY, a citizen of the United States, residing in the borough of Brooklyn, in the city of New York, State of New York, have invented certain new and useful Improvements in Separators; and I do hereby declare the following to be a specification of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to a separator to be used in the casting of cast-steel car-wheels and the like for separating the steel from which the rim is formed from that from which the body or hub portion of the wheel is formed; and it consists in the novel construction of such separator whereby the rim and body or hub portions of the wheel are interlocked when cast and in the combination of such separator with the mold.

The objects of my invention are to produce a cast-metal wheel having rim and body or hub portions cast from different grades or kinds of metal, but mechanically interlocked, so as to be incapable of separation, and to do this by simple and inexpensive apparatus.

I will now proceed to describe my invention with reference to the accompanying drawings, in which one form of my separator and the manner of using the same are illustrated, and will then point out the novel features in claims.

In the said drawings, Figure 1 shows a cross-section of a car-wheel mold and of my improved separator therein, one side of the mold being shown as if filled with metal, the different qualities of the metals on opposite sides of the separator being indicated by different sectioning. Fig. 2 shows a horizontal section of the upper portion of the mold, showing the separator therein. Fig. 3 shows a top view of a portion 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 a portion of the separator.

It is desirable that car-wheels shall be formed of some very tough and strong material and that they shall have a hard and durable tread-surface. This is because 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. So far as strength and toughness are concerned cast-steel is a desirable material for such wheels; but it is not practicable by any of the customary methods of casting to produce a steel wheel having a tread-surface hard enough to resist the wear and blows due to passing over rail-joints, switches, crossings, and the like and the wear of the brake-shoes and at the same time having a hub soft enough to be bored for the reception of the axle. For this and other reasons the wheel most commonly used is a cast-iron wheel having a chilled tread-surface; but it has been found that such wheels are not strong enough for modern heavy-tonnage cars, and, moreover, chilled cast-iron, though hard, is not tough and wears away more rapidly than is desirable under the action of the brake-shoes, and, moreover, chilled-cast-iron wheels often contain soft spots, which wear away rapidly, producing flat wheels.

According to my invention I cast the rim portion of the wheel from a harder grade of steel than that from which the body or hub portion is cast. The mold employed is made in the ordinary manner; but before the molten metal is poured a separator-ring is introduced into the rim portion of the mold in such manner as to divide the same into two portions, for which separate gates are provided. Both grades of steel are poured together, or nearly so, but the separator keeps them apart, confining the harder steel to the outer portion of the rim-mold. It is necessary that the two portions of the wheel thus formed shall be firmly united, so that separation thereof may be impossible. For this purpose the separator is provided with corrugations, forming recesses, by means of which interlocking serrations are formed in the adjacent faces of the rim and body portions of the wheel, and the separator is also provided with circumferential recesses and corresponding projecting bosses, by which lateral separation of the two parts of the wheel is prevented.

Referring now to the drawings, the mold shown in Fig. 1 is of ordinary construction, consisting 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 separator-ring 3 divides the rim portion of the mold into two concentric chambers 4 and 5, for which separate gates 7 and 8 are provided, the latter also supplying the metal to the hub-space 6. The separator is embedded preferably in the lower portion of the mold, so as to be supported thereby. This separator-ring may be formed of thin metal, preferably of sheet-iron, and is corrugated, as shown, having faces 9 and 10, the form of which is substantially that of arcs of circles concentric with the mold connected by angular reentrant portions 11. When the molten metal is poured into the mold on both sides of the separator, the adjacent faces of the parts of the wheel thus formed assume the form of interlocking fan-shaped serrations, which, in fact, dovetail the two parts of the wheel together. These serrations prevent rotary motion of one part of the wheel with respect to the other and also prevent any portion of the rim from flying off in case it should be broken. 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 movement.

In casting the wheel after the mold has been formed and the separator inserted molten metal of the character from which the hub portion of the wheel is to be formed is poured into the hub portion of the mold through the gate 8, and at the same time, or approximately so, the molten metal for the rim is poured into the mold through the gate 7. The separator keeps the two metals from mixing. It also acts as a mold to produce the interlocking serrations, by which the rim and body of the wheel are interlocked and secured together.

In practice a more or less perfect weld will 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 in this manner, and 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 necessary to interlock the parts, as above described. Because of the shape of the interlocking serrations and the contraction of the metal in cooling the parts of the wheel are secured together mechanically as firmly as could be the case, were there a perfect weld between them.

After the wheel is formed as above de-

scribed and removed from the mold the portion of the separator projecting therefrom may be removed. Ordinarily the wheel is then allowed to cool and is subsequently reheated and pressed between suitable dies.

The separator-ring is preferably formed by rolling or pressing it out of sheet metal in the shape shown in Fig. 3, the corrugations being rectangular. It is then bent into circular form and the ends riveted or otherwise fastened together, and as it is so bent the portions 11, connecting the faces 9 and 10, necessarily assume the reentrant positions shown.

It is obvious that the separator may be given various forms, that it may be used in the making of articles other than wheels, and that it is not restricted in its use to the casting of steel articles, but may be used for separating other metals as the same are cast and metals of different kinds. I do not limit myself, therefore, to the particular form of separator shown or to its use in making steel castings.

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

1. A separator for use in molds, consisting of a piece of thin metal having corrugations certain of which are reentrant and are thereby transverse to separation of articles, cast on opposite sides of said separator, in directions normal to the adjacent surfaces of articles so cast, said corrugations constituting projections which are transverse to motion in two other directions at right angles, said corrugations and their complementary recesses adapted to form interlocking serrations on the adjacent faces of articles cast on opposite sides of said separator.

2. A separator for use in molds, consisting of a piece of thin metal having reentrant corrugations or recesses adapted to form interlocking serrations on the adjacent faces of articles cast on opposite sides of said separator, and having also other recesses which, when filled by the molten metal in casting, key the articles so cast against separation in the direction of said corrugations.

3. The combination with a mold, of a separator therein having reentrant corrugations or recesses adapted to form interlocking serrations on the adjacent faces of articles cast on opposite sides of said separator, and having also other recesses which, when filled by the molten metal in casting, key the articles so cast against separation in the direction of said corrugations.

4. The combination, with a wheel-mold, of a separator-band therein, serving to prevent molten metal poured on opposite sides thereof from mixing, said separator consisting of a band of thin metal having corrugations forming projections which are transverse to relative circumferential or axial motion of one part of the wheel with respect to the other part, certain of said corrugations being reentrant, said corrugations and their comple-

mentary recesses adapted to form interlocking serrations on the adjacent faces of articles cast on the opposite side of said separator.

5 The combination, with a car-wheel mold, of a separator-band in the rim portion of said mold, serving to prevent molten metal poured on opposite sides thereof from mixing, said mold having gates leading to the spaces on both sides of said separator, and said separa-

tor having transverse reëntrant corrugations, 10 and other recesses, all arranged to be filled by the molten metal and thereby to bind together and mechanically interlock the two portions of the wheel so cast.

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Witnesses:

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