

(No Model.)

W. FAWCETT.

CHILL.

No. 390,290.

Patented Oct. 2, 1888.

Fig 1

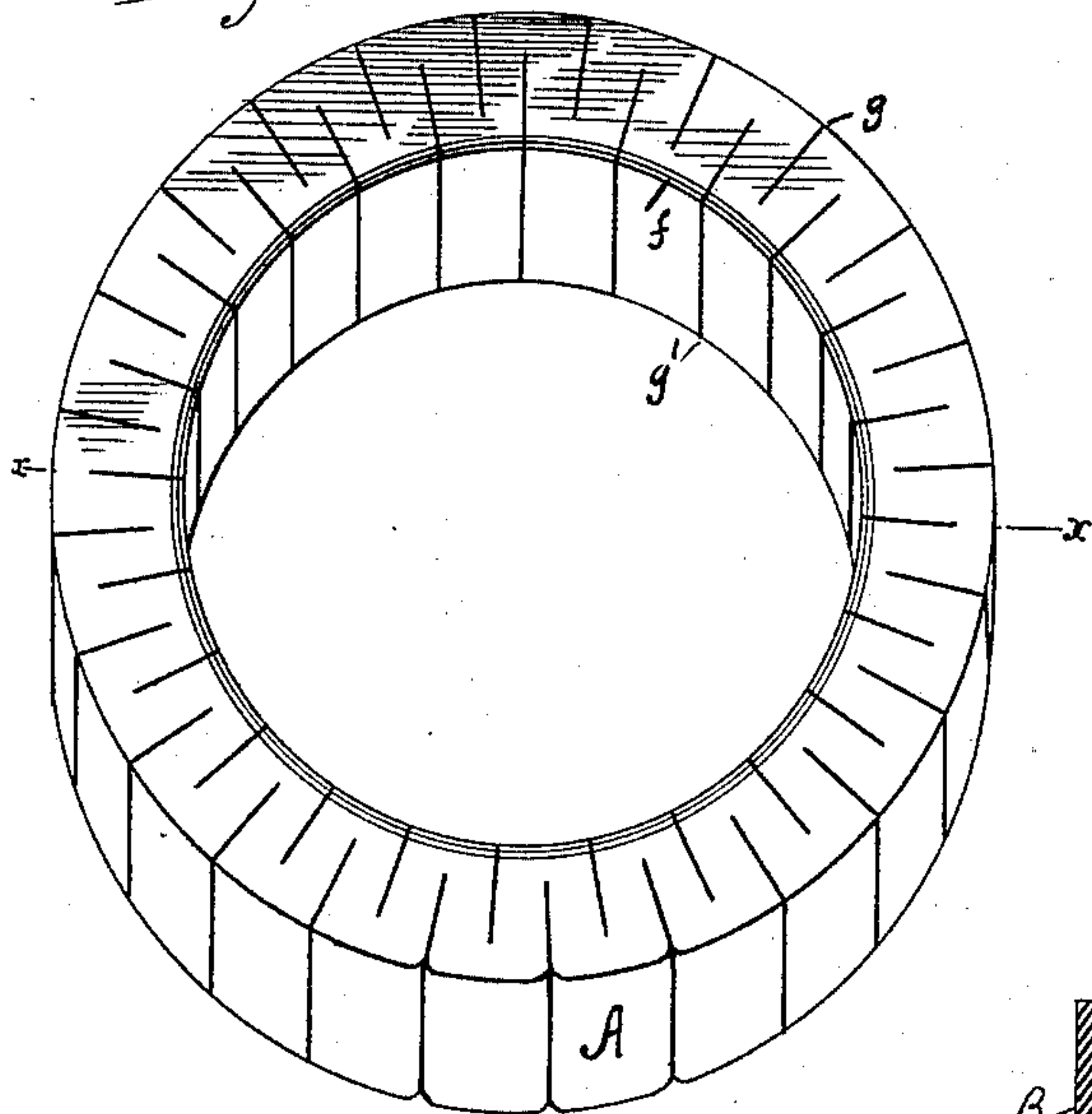


Fig 3

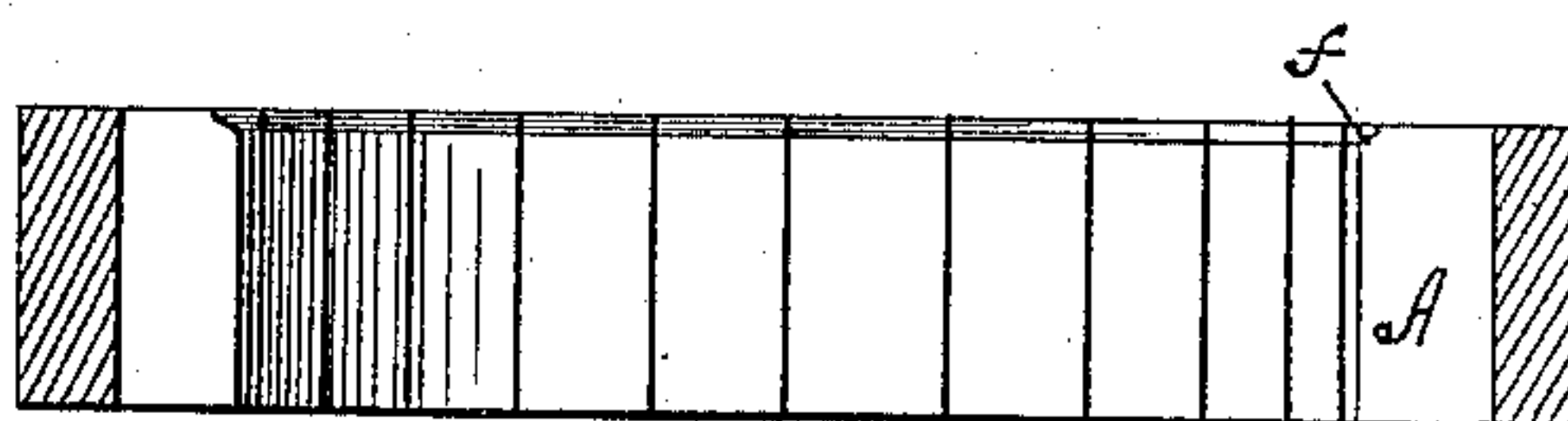


Fig 4

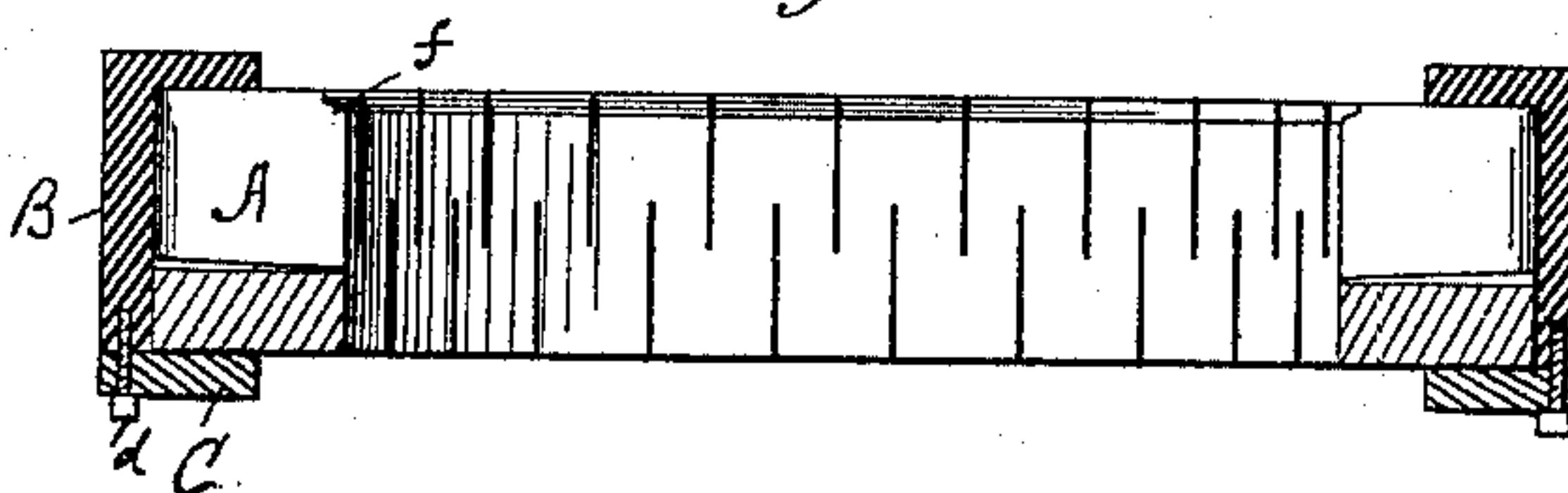


Fig 2

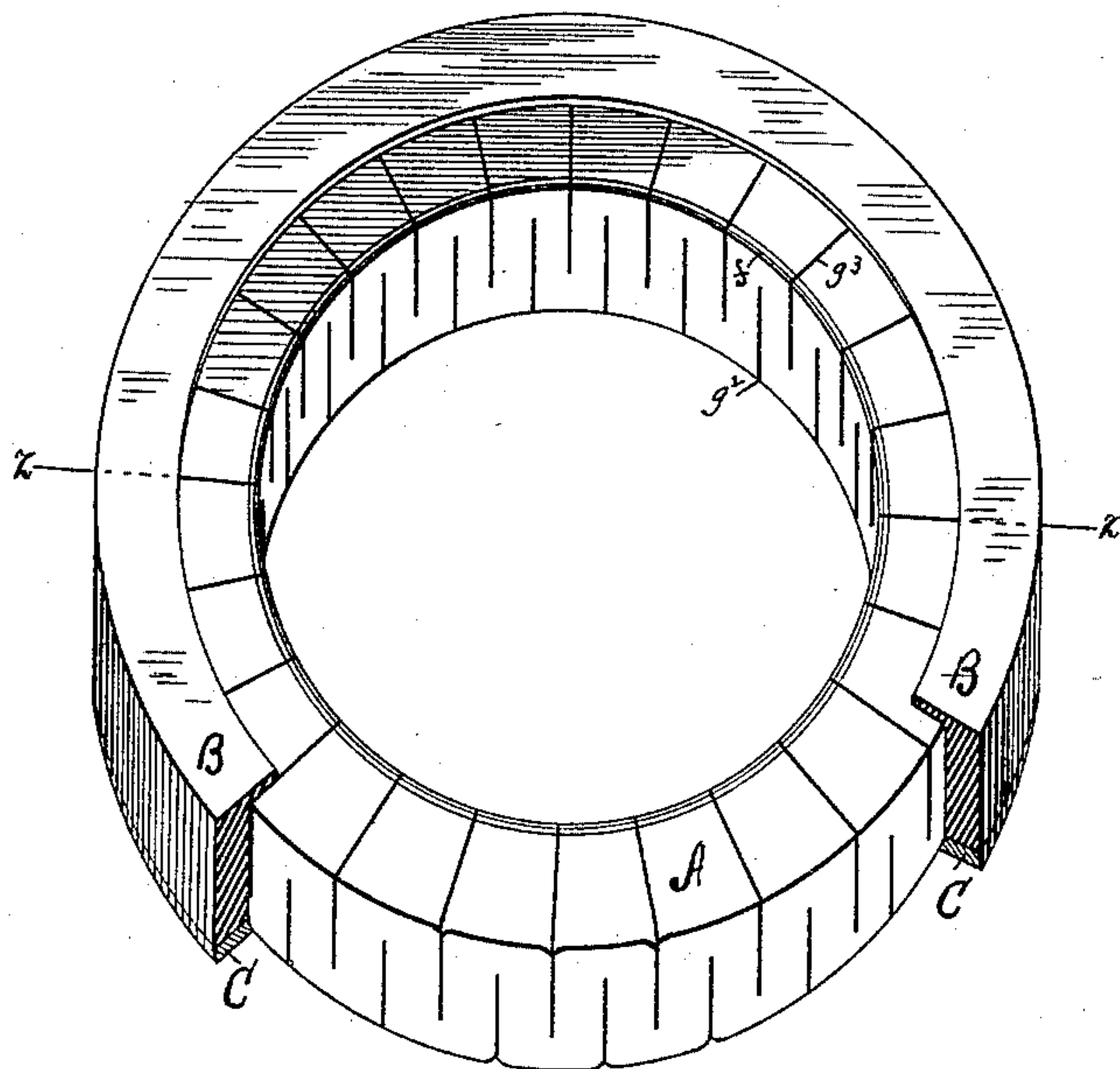
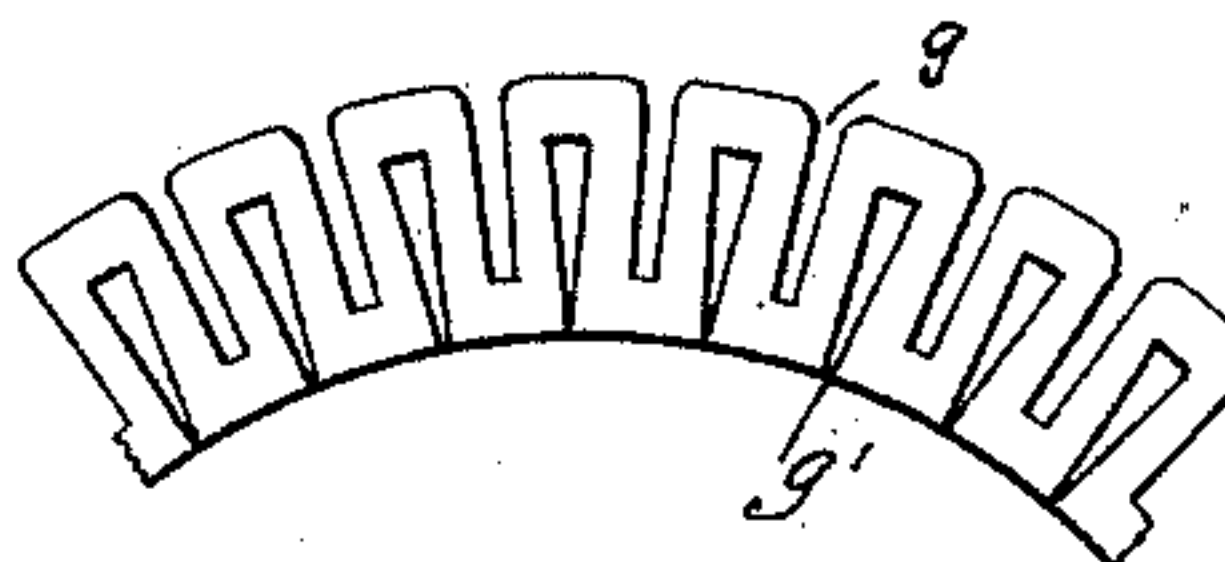


Fig 5



WITNESSES:

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CHILL.

SPECIFICATION forming part of Letters Patent No. 390,290, dated October 2, 1888.

Application filed July 26, 1888. Serial No. 281,078. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM FAWCETT, of Jersey City, in the county of Hudson and State of New Jersey, a citizen of the United States of America, have invented a new and useful Improvement in Chills, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a view in perspective of a chill embodying my invention. Fig. 3 is a vertical cross-sectional view of the same on line *x x*, Fig. 1. Fig. 2 is a view in perspective of a second form of chill embodying my invention, showing the chill proper and also a portion of the clamping or retaining ring which I use. Fig. 4 is a vertical cross-sectional view of the devices, taken on line *z z*, Fig. 2, and Fig. 5 shows a slight modification of Fig. 1.

It is a well-known fact that in casting car-wheels and other articles which are to be chilled the depth of the chill depends largely upon the depth or thickness of the chill proper, and its evenness upon the evenness of the depth of metal of the chill; again, that if the metal varies in thickness, as it is heated by the molten metal it will expand unequally and vary in shape, thus producing castings imperfect in shape and unevenly chilled, those parts which have remained in contact with the chill the longer time being the more deeply chilled. To overcome these difficulties various forms of chill have been devised—some in which the chilling-surface consisted of segmental blocks which have been rigidly secured to continuous rings, and others in which a ring has been formed solid upon the exterior face, with its inner face divided into sections by numerous saw-cuts or divisions otherwise made, the theory being that these sectional parts upon being heated would expand toward the center, and thus remain in contact with the article being chilled, and to some extent they have been of use; but in all these cases the segments have been part of or secured to a rigid exterior ring, which could not of course contract, and which would therefore tend to draw away the segments when it expanded, and also prevent to a certain extent their so expanding as to follow the forming-wheel or other article as it cooled and contracted. This defect I have endeavored to remedy by the use of the chills shown

in the drawings. They are made without any rigidly-connected continuously-solid exterior ring to hold them, as mentioned, being in fact continuous annular or ring-like bands or belts provided with corrugations, which while they permit the ring to be constructed in a single piece also insure that its exterior surface shall be divided in a manner practically similar to that in which the inner face is divided.

The base-plate, drag, and cope may be of any of the well-known forms, and the ring itself is constructed in such form as though a piece of metal of a width equal to the desired depth or width of the chill were bent back and forth upon itself, either vertically, as shown in Fig. 2, or horizontally, as shown in Fig. 1, and then formed into a ring of the desired size for the chill, the bends being at distances apart equal to the width of the desired chill if bent vertically, or its depth if bent horizontally, the inner face in either case being turned to or formed in the shape necessary for producing the required form of chilled product. I say it is constructed in such form as though bent; but, if preferred, it may be itself cast into that form. The bends or corrugations are sufficiently abrupt to leave the walls thereof close enough together to prevent the escape of the molten metal, and yet open enough to permit the escape through the interstices of the heat, steam, and gases generated by the molten metal, whereby the heat from the central portion of the casting is prevented from neutralizing the chilling to be produced.

As is obvious, the exterior portion of the ring being in effect sectional as well as the interior portion, the whole ring may contract in exterior diameter, and will do so as the inwardly-projecting portions lengthen under the influence of the heat communicated to them from the molten mass without the hinderance which would be occasioned by the use of a solid exterior ring rigidly connected to the several sections; and at the same time, this form of ring being of substantially even depth throughout and not composed of slight webs supporting large chilling-surfaces, or of solid rings throughout which could not of course elongate toward the center because of applied heat, it causes a much more even depth of chill than previous forms of apparatus. I prefer, however, to also em-

ploy an exterior solid ring inclosing the corrugated ring, but not rigidly secured to it. The absence of such securing permits the ready and even expansion required, while the ring B, being separate, does not heat so quickly, and, furthermore, insures that the interior ring shall not expand exteriorly, the result being that the corrugated portion may expand toward the metal to be chilled, the result being that the chilling-surface follows and remains in contact with the surface to be chilled as that cools and contracts, easily adjusting itself to the changing casting, and at the same time is prevented from expanding exteriorly by reason of the rigid clamping-ring B.

The size and shape of the chill will of course depend upon the size and shape of the articles to be cast; but for ordinary car-wheels I have found that an exterior ring forty-three inches in diameter inside, forty-five inches outside, and provided with flanges extending inward

about two and one-half inches, together with a corrugated ring forty-three inches outside, thirty-three inches inside, and four inches wide, the corrugations being about an inch apart, produces excellent results.

What I claim as my invention, and desire to secure by Letters Patent, is--

1. A chill consisting of a corrugated band, substantially as and for the purpose set forth.

2. A chill consisting of a corrugated annulus, substantially as set forth.

3. A corrugated chill provided with slits extending across its interior and exterior faces from top to bottom, substantially as set forth.

4. A chill consisting of a corrugated annulus and a solid exterior clamping-ring, substantially as set forth.

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Witnesses:

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