

No. 831,727.

PATENTED SEPT. 25, 1906.

J. LOOMIS.
HOT MILL ROLL.

APPLICATION FILED APR. 24, 1905. RENEWED JAN. 26, 1906.

Fig. 1.

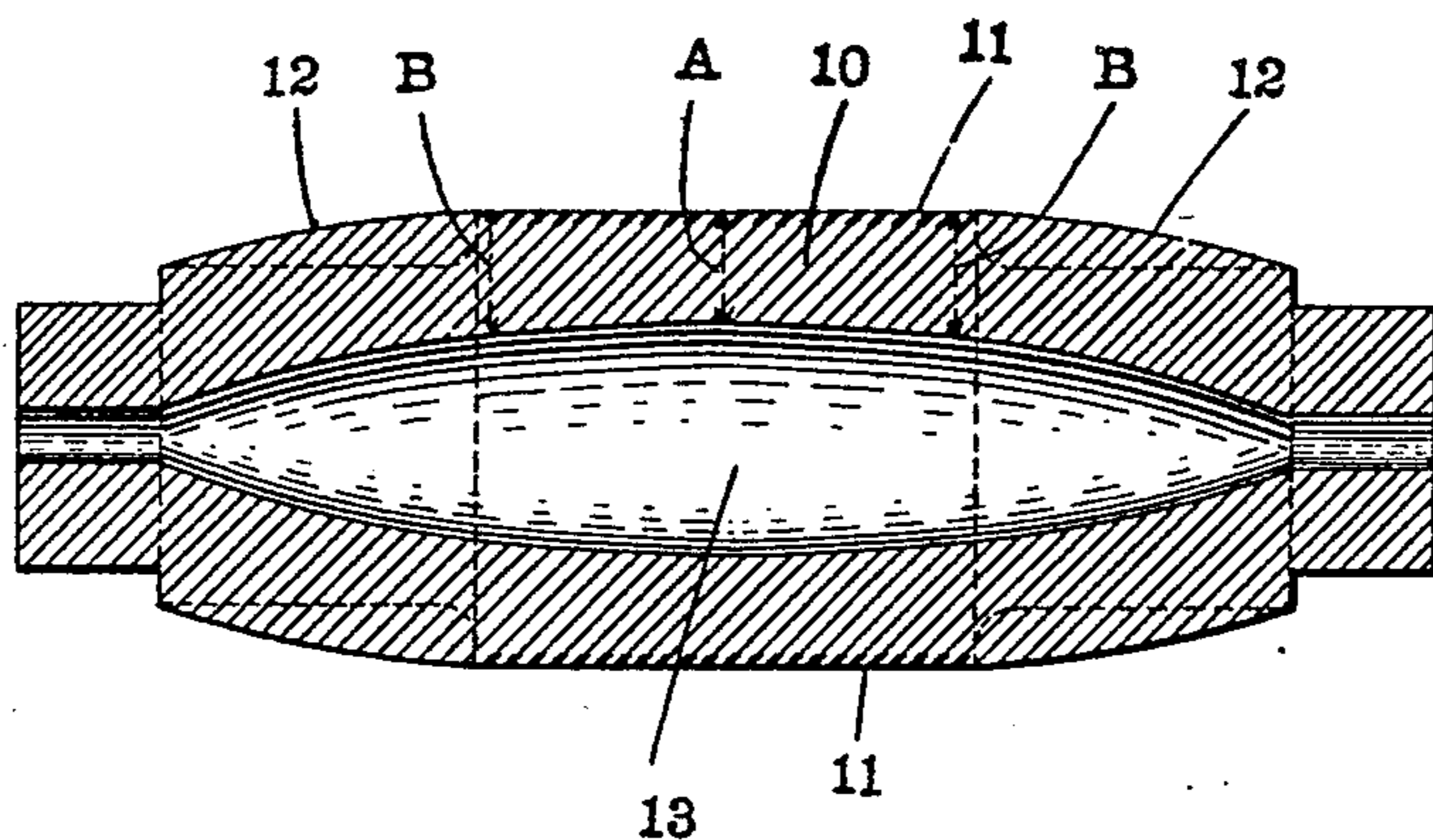
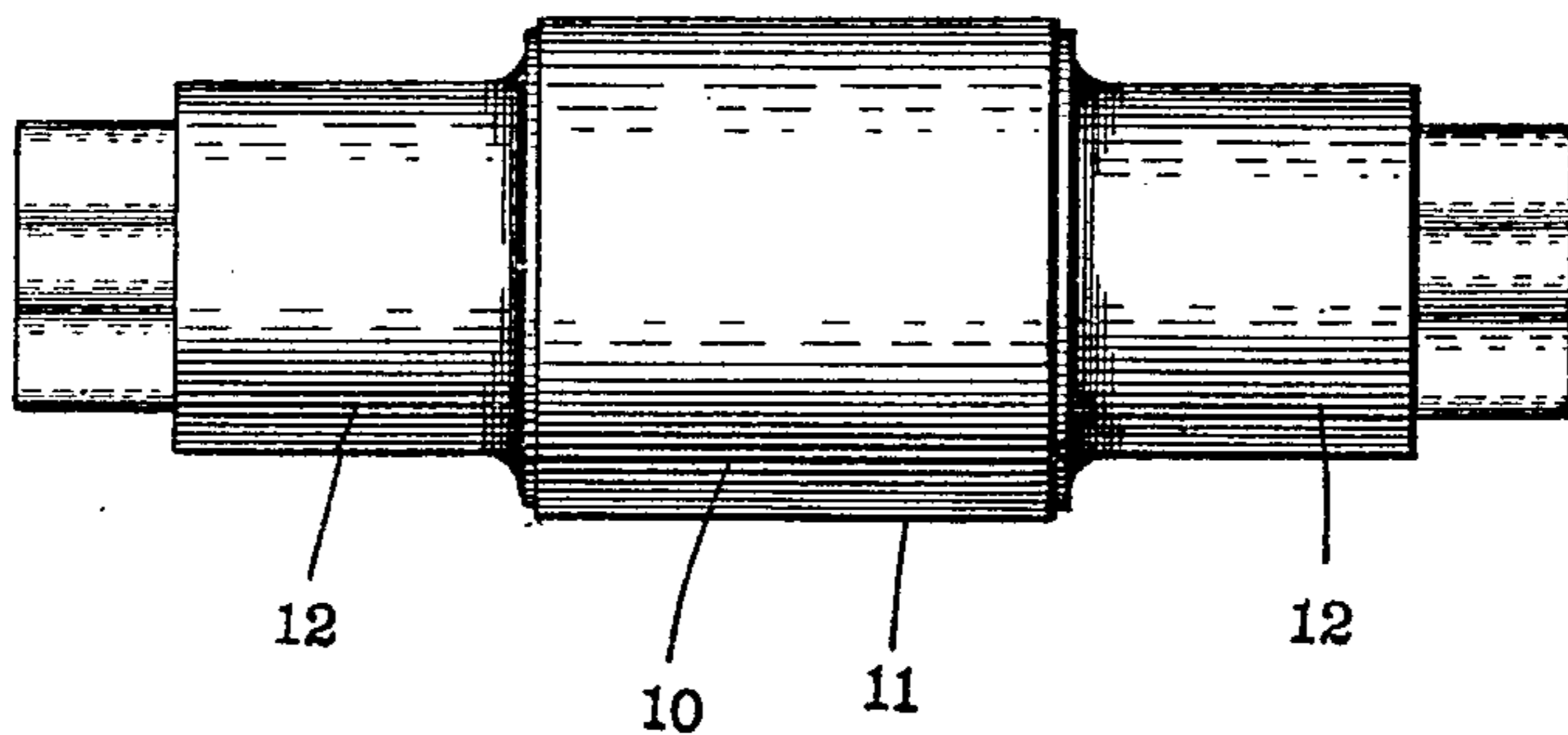


Fig. 2.



Witnesses
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JACOB LOOMIS, OF ELWOOD, INDIANA.

HOT-MILL ROLL.

No. 831,727.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JACOB LOOMIS, a citizen of the United States, residing at Elwood, in the county of Madison and State of Indiana, have invented certain new and useful Improvements in Hot-Mill Rolls, of which the following is a specification.

In the operation of hot-mill rolls a very considerable item of expense connected therewith is the unexpected and undeterminable breakage.

At the present the production of rolls for this purpose is accomplished in the following manner: A solid cylindrical casting of iron is made, the middle of the exterior being a chilled portion of the desired diameter and length for the rolling portion proper. This middle portion is flanked at each end by a journal portion cast approximately to the diameter desired, and each journal portion ends in a "wabbler" portion, also cast to the desired size and shape. The central portion is chilled on its periphery in casting. In order to place such a casting in condition to be used as a roll, the journal portions are turned true, and the chilled middle portion is carefully turned to the desired diameter and slightly cupped—i. e., the diameter at the exact middle is made slightly less than the diameter at the ends of the rolling portion—in order that when the roll becomes thoroughly heated the expansion may be such as to produce a middle rolling portion which is approximately parallel to the axis. In the production of such a roll the arrangement of molecules in the casting is such that very considerable internal stresses are set up because of the unequal cooling of the mass. As a consequence of this and also because of the cupping of the rolling portions a very considerable degree of skill is required in the operation of these rolls in order that they may be gradually heated and maintained at the desired temperature for the proper operation upon the hot sheet packs. Even with the greatest care and skill the proportion of breakage of rolls of this character is very large, and the moment of breaking or the point of rupture can never be definitely determined.

The object of my present invention is to produce a casting from which a hot roll may be produced in which there shall be no material internal stresses and in which the portions shall be such that the amount of ex-

pansion as the roll is heated by rolling hot plates will be substantially uniform throughout the length of the roll proper.

The accompanying drawings illustrate my invention.

Figure 1 is a vertical section of a casting made in accordance with my invention; and Fig. 2 is an elevation of a finished roll, the external appearance being substantially identical with the external appearance of a roll produced in the ordinary manner.

In the drawings, 10 indicates the middle portion of the casting, the periphery 11 being chilled by any desired means. Instead of forming the journal ends 12 of a size approximating the size to which they are to be turned I make said portions somewhat ellipsoidal, and instead of making the entire mass solid I core out an ellipsoidal core 13, the shape of this core being such as to produce a substantial uniformity of thickness of the metal throughout the length of the casting in order that the molten metal may cool substantially uniformly. At the chilled middle, however, I prefer to so proportion the parts that the middle dimension A shall be slightly less than the end dimensions B, so that when the roll is subjected to the heat of the packs of hot plates the expansion of the roll at the middle will be substantially the same as the expansion of the roll at the ends B, although the temperature at the middle A will be higher than the temperature at the ends, the difference in dimensions compensating for the difference in temperature.

When the casting has been produced as shown in Fig. 1, the portions 12 are turned down, as indicated by dotted lines in Fig. 1, to form the journal portions, and the chilled middle portion is turned substantially parallel with the axis.

In order to avoid sudden changes of temperature, the hollow core 13 may be plugged at its ends or filled with a non-conducting material, such as asbestos.

I claim as my invention—

1. A casting for hot-mill rolls consisting of a hollow body having a middle chilled portion flanked at each end with a journal portion each of which in turn terminates in a "wabbler" portion, the casting showing in longitudinal section substantial uniformity of thickness of shell from end to end through the middle chilled portion and the flanking journal portions.

2. A casting for hot-mill rolls consisting of
a hollow body having a middle chilled por-
tion flanked at each end with a journal por-
tion each of which in turn terminates in a
5 "wabbler" portion, the casting showing in
longitudinal section substantial uniformity
of thickness of shell from end to end through
the middle chilled portion and the flanking
journal portions, the middle sectional dimen-
10 sion A of the chilled portion being slightly

less than the end dimensions B of said chilled
portion.

In witness whereof I have hereunto set my
hand and seal, at Indianapolis, Indiana, this
6th day of April, A. D. 1905.

JACOB LOOMIS. [L. S.]

Witnesses:

ARTHUR M. HOOD,
JAMES A. WALSH.