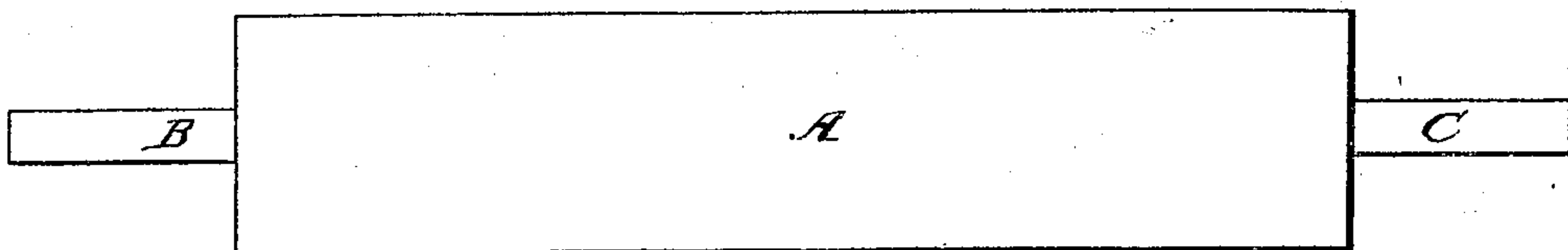


*Z. Washburn*

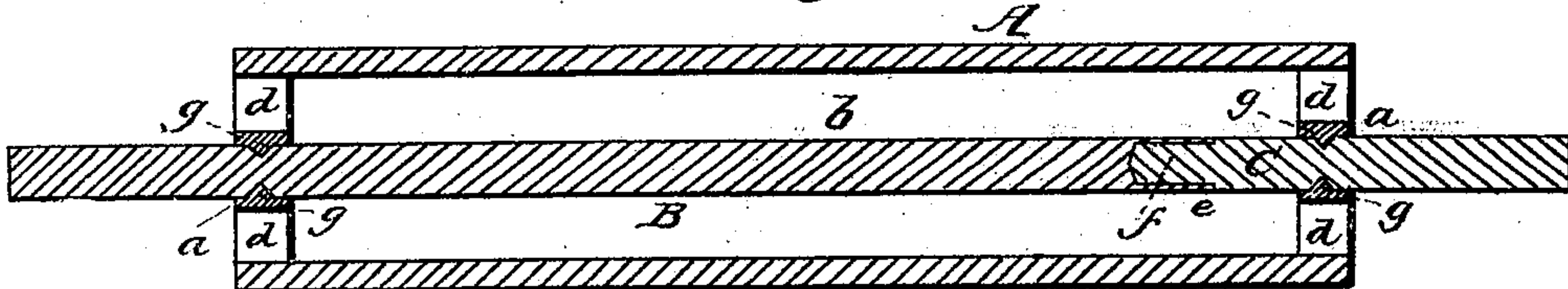
*Casting Metal Rollers.*

*N<sup>o</sup> 93,257.*

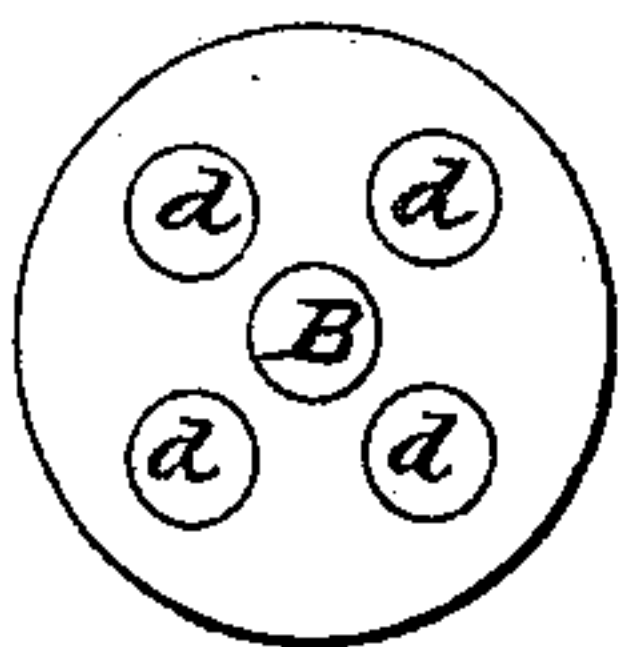
*Patented Aug. 3, 1869.*  
*Fig. 1.*



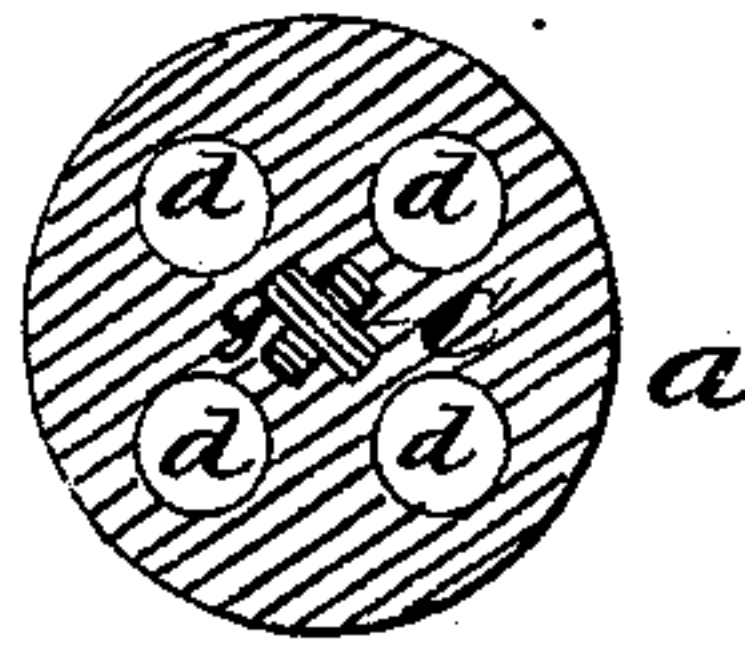
*Fig. 2.*



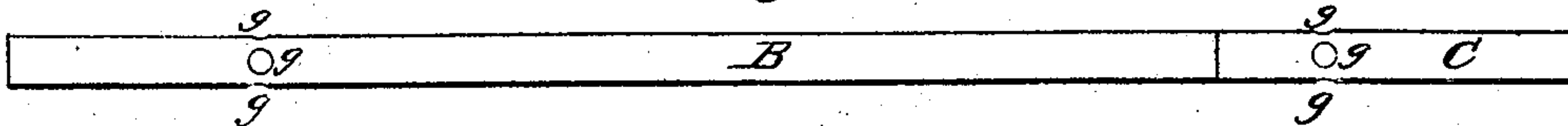
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



*Witnesses.*

*S. A. Piper.*  
*J. W. Snow.*

*Inventor.*

*Zadock Washburn.*

*by his attorney.*

*R. W. Eddy.*

# United States Patent Office.

ZADOCK WASHBURN, OF HOPEDALE, MASSACHUSETTS.

Letters Patent No. 93,257, dated August 3, 1869.

## IMPROVEMENT IN CASTING HOLLOW-METAL ROLLERS WITH SHAFTS.

The Schedule referred to in these Letters Patent and making part of the same.

To all persons to whom these presents may come:

Be it known that I, ZADOCK WASHBURN, of Hopedale, in the county of Worcester, and State of Massachusetts, have made a new and useful invention, having reference to the Manufacture of Hollow Cast-Metal Rollers with Shafts; and I do hereby declare the same to be fully described in the following specification, and represented in the accompanying drawings, of which—

Figure 1 denotes a side view;

Figure 2, a longitudinal section; and

Figure 3, an end view of a roller and its shaft, made in accordance with my invention.

Figure 4 is a transverse section, taken through one head of the roller, so as to show the cavities made in the shaft, for the purpose of holding it to the head, and preventing it from revolving therein.

Figure 5 is a top view of the shaft, showing such cavities.

The object I have had in view, in making my invention, has been to make a hollow cylinder, to be cast upon a shaft, without danger of breakage of the cylinder by the lengthwise contraction of it, which takes place during the process of the cooling of the cylinder, after it may have been cast upon the shaft.

For this purpose I form the shaft in two or more parts, and provide one of them with a socket, to receive a projection from the other, and I arrange such parts in line with one another, and in the axis of the mould, and so that both may support the core, for forming the chamber or hollow space of the cylinder.

In the drawings—

A denotes the hollow cylinder, having two heads, *a*, and a cylindrical chamber or space, *b*, extending from one to the other of such heads, and arranged concentrically with the outer curved surface of the cylinder.

The core of the mould for casting such a cylinder is to be cylindrical in form, and to be made on the two parts B C of the axle, or with them going through it lengthwise and concentrically with it.

Besides such, there should be one or more smaller cores arranged in the mould, and properly supported, so as to form either or each of the heads of the cylinder, with one or more holes, *d*, going through it, such holes being to enable a person to remove from the cylinder, after it may have been cast, the material constituting the core or cores.

The major part, B, of the shaft is made with a socket, *e*, extending into one end of it, and to receive a tenon, *f*, projected from the next adjacent end of the minor part C.

Furthermore, in each of the parts B C, where the cylinder-head is to be cast upon it, there is to be one or more cavities, *g*, or instead thereof, there may be one or more projections or nipples, extending from the shaft.

The mould is to be formed with cavities, to receive and support those parts of the shaft which are to extend beyond the heads of the cylinder.

When the shaft is so made, it will be seen that the cylinder, after having been cast upon it, and upon the core previously placed or moulded on the shaft, will be able to contract lengthwise, while cooling, without danger of either of its heads being broken or forced off the body of the cylinder by the shaft, for the part of the shaft attached to one head of the cylinder will be free to slide or move endwise, without interruption from the other part, and consequently the cylinder, while cooling, will be free to contract.

I make no claim to a hollow cylinder with a single shaft extending through it from end to end, and beyond the ends of such cylinder; nor do I claim a hollow cylinder as made with journals, to project from its opposite ends only.

What I claim as my invention, and as an improvement in casting a shaft and hollow cylinder or roller together, and the latter upon a core, is—

The employment of the shaft in the two parts B C, socketed and tenoned, and arranged in the core and mould as described, the whole being as and for the purpose specified.

Also, the shaft as made in two or more parts, socketed and tenoned together as described, and provided with cavities, for the metal of the heads to flow into, when cast upon the shaft, as described.

Also, the new or improved manufacture of metallic roller, as made with its shaft constructed in two or more parts, socketed and tenoned, and arranged as described, and with the metal of the heads cast into cavities of the shaft, or upon projections from such shaft, the whole being as explained.

ZADOCK WASHBURN.

Witnesses:

F. J. DUTCHER,

E. D. BANCROFT.