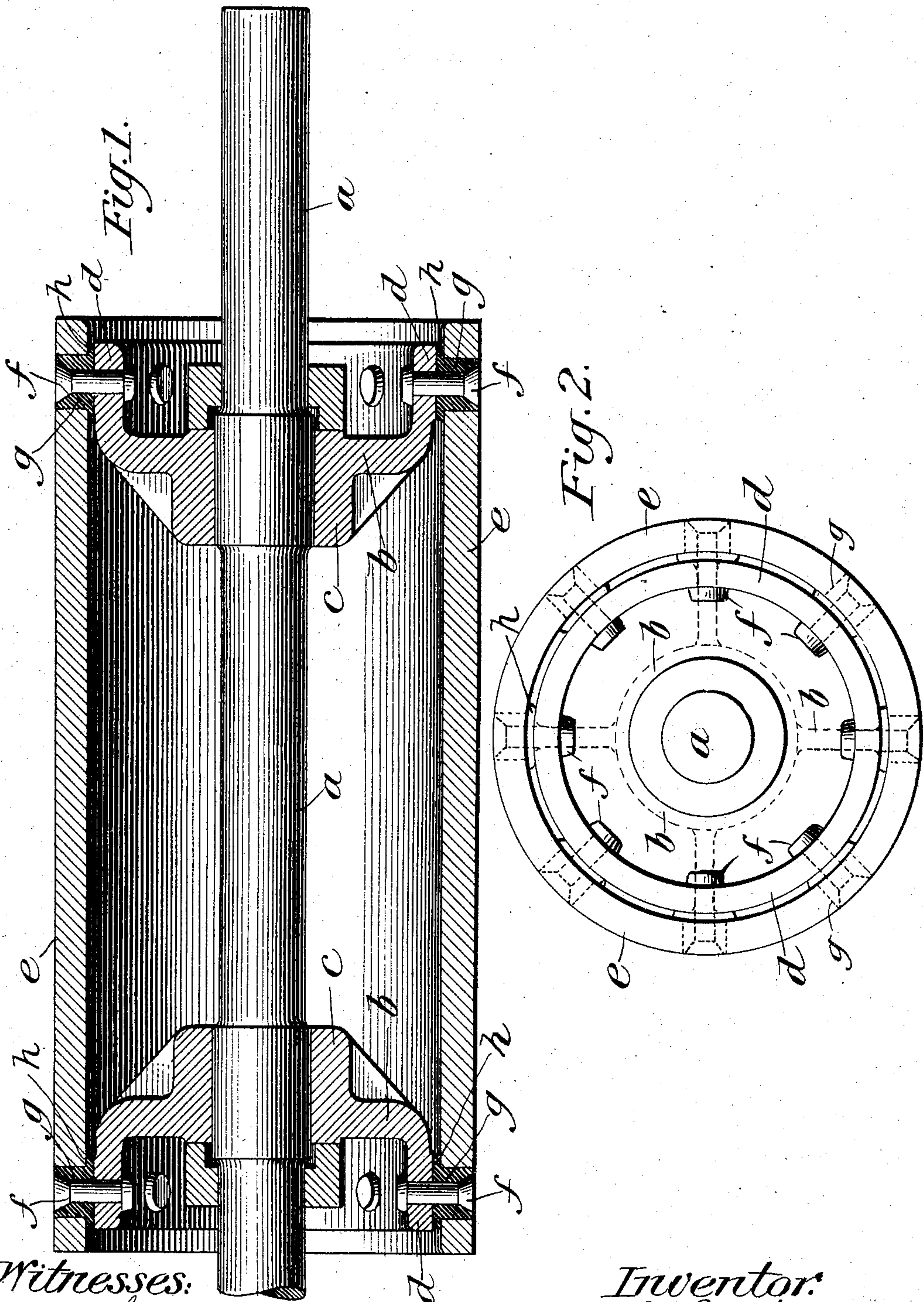


No. 790,210.

PATENTED MAY 16, 1905.

S. L. G. KNOX.  
ROLLER FOR DREDGE LADDERS.  
APPLICATION FILED AUG. 17, 1904.



Witnesses:  
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W. Beall Williams

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By his attys.  
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# UNITED STATES PATENT OFFICE.

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TO THE BUCYRUS COMPANY, OF SOUTH MILWAUKEE, WISCONSIN, A  
CORPORATION OF WISCONSIN.

## ROLLER FOR DREDGE-LADDERS.

SPECIFICATION forming part of Letters Patent No. 790,210, dated May 16, 1905.

Application filed August 17, 1904. Serial No. 221,079.

*To all whom it may concern:*

Be it known that I, SAMUEL L. GRISWOLD KNOX, a citizen of the United States, residing in Milwaukee, county of Milwaukee, State of Wisconsin, have invented certain new and useful Improvements in Rollers for Dredge-Ladders; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to the construction of built-up rollers for elevator-dredges and similar machines where the conditions require the rollers to be made out of metal that is so hard that machining for the fastenings is impossible or unusually difficult.

As here shown, the invention is applied to the idler roller of an elevator-dredge; but rollers for other machines may be made in the same way.

In the accompanying drawings, Figure 1 is a longitudinal section of a roller embodying the invention, and Fig. 2 is an end view of the same.

The invention relates only to composite or built-up rollers that are constructed in parts and put together to form the complete article.

In the drawings, *a* denotes the roller-shaft, *b b* a pair of disks mounted thereon by hubs *c c*, so as to rotate with the shaft or revolve thereon as may be preferred. The disks have crown-flanges *d d* at their outer edges and carry and support the cylindrical shell *e* of the roller. The shell is secured to the disks by rivets *f f*, passing through the shell and the flanges of the disks, as clearly shown in the drawings. The roller-shell is necessarily made of very hard material in order to withstand the abrading action of the sand and gritty matter. Manganese steel is preferably employed; but any other metal may be used that is sufficiently hard for the purpose.

It is necessary that the outer surface of the roller should be perfectly plain and smooth, and in order to avoid all projections and crev-

ices on the periphery it is essential that the rivet-holes should be countersunk and accurately machined and that the heads of the rivets should lie flush with the roller's periphery. It is, however, impossible or extremely difficult to perform the machining operations necessary to secure this fit with ordinary tools; and the invention consists in forming large holes in the shell where the rivets are to be located and in casting plugs *g g* of softer metal in these holes, then boring, counter-sinking, and otherwise machining the rivet-holes in these softer plugs. Any metal may be used for the plugs that is sufficiently softer than that of the shell to permit the tools to work in it. I prefer to form the plugs of mild steel, but do not desire to be restricted to any particular material. They may be inserted in the mold in the same manner as cores and the hard metal cast around them so as to shrink on and hold them in place, or they may be cast into the hard metal. I do not, however, desire to be restricted to any particular manner of putting the plugs in place or to any particular material out of which they are to be made, and when I speak of the plugs as being "cast" in the roller-shell I desire to be understood as also meaning that they may be secured there in any way.

The disks *b b* are preferably made of the same material as the shell, but as it is unnecessary to machine the rivet-holes in the flanges *d d* it is not required that plugs be employed at this point, though I would have it understood that they may be used wherever desired.

As clearly illustrated in Fig. 1, the plugs are preferably formed with heads *h* on the inner periphery of the roller. The flanges *d* of the disks *b* bear directly on these heads and not on the inner surface of the roller, as heretofore, and the object in forming the heads in this way is to avoid all machine-work on the hard surface of the roller and to provide a bearing of softer material for the disks. In this way all machining, whether of the roller

or the disks, is avoided, for the inner surfaces of the heads of the plugs are easily bored without striking the harder metal.

Having thus described my invention, what

5 I claim is—

1. A shell for the rollers of elevator-dredges and the like, said shell being made of metal too hard to be machined, and provided with plugs of softer metal at points where machin-  
10 ing is required.

2. A built-up roller for elevator-dredges and the like, comprising a hard-metal shell with plugs of softer metal cast therein at points where machining is required.

15 3. A built-up roller for elevator-dredges and the like, comprising a shaft, disks mount-

ed on said shaft, a hard-metal shell carried by the disks, plugs of softer metal cast in the shell, and rivets passing through the plugs and securing the shell to the disks. 20

4. A built-up roller for elevator-dredges and the like, comprising a shaft, a hard-metal shell, plugs of softer metal cast in the shell with heads projecting beyond the inner sur-  
25 face, and disks mounted on the shaft and bearing against the heads of the plugs.

In testimony whereof I affix my signature in presence of two witnesses.

SAMUEL L. GRISWOLD KNOX.

Witnesses:

HARRY B. HAYDEN,  
P. C. BODE.