

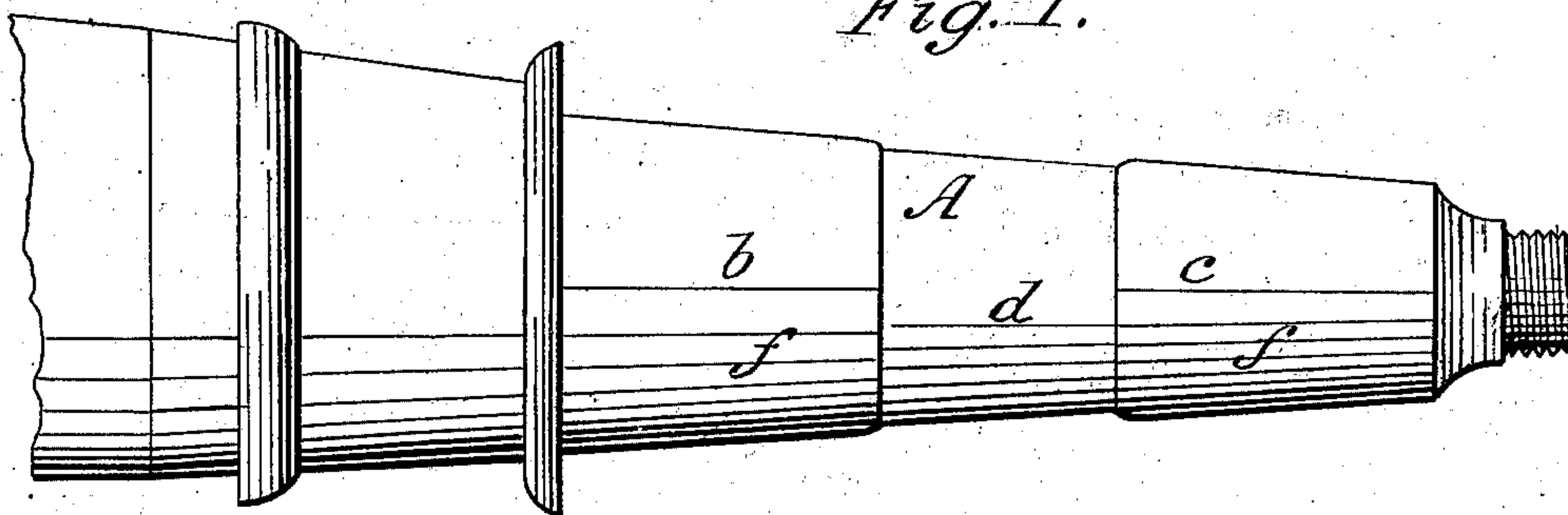
H. F. PHILLIPS.

Axle-Skein.

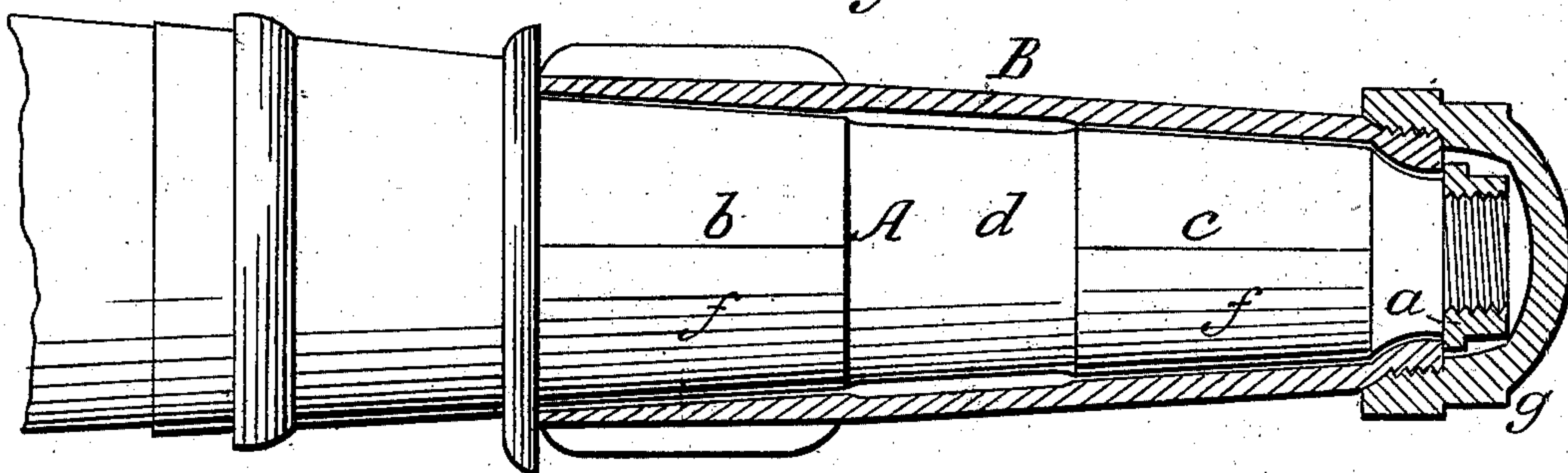
No. 39,617.

Patented Aug. 18, 1863.

*Fig. 1.*



*Fig. 2.*



*Witnesses.*

*R. F. Osgood.*

*W. A. Loder.*

*Inventor.*

*H. F. Phillips.*

*by J. Fraser & Co. attys.*



# UNITED STATES PATENT OFFICE.

HENRY F. PHILLIPS, OF AUBURN, ASSIGNOR TO DOWNS & CO., OF SENECA FALLS, NEW YORK.

## IMPROVEMENT IN AXLE-SKEINS.

Specification forming part of Letters Patent No. 39,617, dated August 18, 1863.

*To all whom it may concern:*

Be it known that I, H. F. PHILLIPS, of Auburn, in the county of Cayuga and State of New York, have invented a new and useful Improvement in Axle-Skeins; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

Figure 1 is a view of the skein removed from its box; Fig. 2, a view of the same resting in its box, the latter being shown in section.

Like letters of reference indicate corresponding parts in both figures.

My improvement has reference to those known as "thimble-skein" and "pipe-boxes"; and my invention consists in chill-hardening a portion of the lower bearing-surface resting in the box, thereby reducing the friction and rendering the same capable of longer resisting the wear and economizing the labor, and consequently the cost, of manufacturing.

The skein A is of ordinary form, and rests in a box, B, being secured by the nut *a*, as usual, on its end, to inclose and protect which another nut, *g*, screws on the extremity of the box itself, as clearly represented in Fig. 2.

To secure a plain support, as well as to make the skein as light and as cheap as possible, I cast it hollow nearly or quite its whole length, and within it, secured by any suitable means—as by bolts—is situated the end of the axle. I prefer to harden a portion only of the length of the skein within the box, as the bearing-surface, (represented at *b c*,) the intermediate space, *d*, being of smaller diameter, in order to not bear in the box, and also to receive and retain any excess of the lubricating material inserted within. The lower half, *f f*, (more or less, as may be necessary,) of the bearing portions *b c*, or all that surface that positively comes in contact with the box and is subject to friction, is hardened by the ordinary process of chill-casting, the corresponding portions of the mold being made of iron in order to obtain this effect, as usually practiced in making chilled castings. The result is that the two bearing portions of the journal are hardened on their wearing-surfaces equal to steel of the highest temper, and running in a

box of soft iron very slight friction is produced, the difference in hardness between the two surfaces corresponding to that of an ordinary wrought-iron journal in a box of Babbitt metal. Consequently the wheel runs with great ease and requires less lubrication. The chilled portions receive a perfectly smooth or "glazed" surface from the mold, and do not require turning or finishing in the lathe, thus effecting a material saving in the cost of manufacture, while the hardening of the metal extends so deep that no amount of wear will ever remove it, which gives it great superiority over case-hardening, by which process only a thin scale of steel is produced on the surface, which soon wears through, or if, by accident, the journal becomes heated from friction, is at once destroyed by oxidation. By this arrangement and process I am enabled to use a hollow, cast-iron skein, instead of the solid, case-hardened wrought-iron or steel one, saving thereby much expense in material, manufacture, and time, and producing a strong and perfect device. The chilled parts, by their extreme hardness and depth, are as enduring as steel, and much more so than case-hardened iron, whose surface is very thin, and therefore quickly worn out. By chilling but the under side, or only half-way round, I harden only that portion which bears and receives wear, while all the upper portion remains unchilled, and therefore preserves all its toughness and strength. The strength of the skein, especially when hollow, might be seriously affected if it were chilled entirely around; and, in addition to this, if chilled entirely around, the expansion and contraction of the metal, caused by heating and suddenly cooling, is liable to produce fractures; but by chilling only half the circumference I avoid this difficulty. The new article of manufacture thus produced is in convenient form for transportation, and, being made of different sizes, is applicable to wheels of all kinds, and it is, therefore, in convenient form for the trade. On account of transportation, the outer nut, *g*, for holding the parts compactly, is of great convenience.

I am aware that it is common to make carriage-axles of steel with hardened journals, and to case-harden the surfaces of wrought-

iron ones; but in these the hardening process extends over the whole surface, both where it is and where it is not required—in the case of tempered steel rendering it more liable to break from the general hardness, and of case-hardening, being deficient in durability from its superficial depth; but I am not aware that axle-skeins or journals have before been made by chill-casting those portions only which are subject to wear, to produce at once a journal combining great durability, strength, and cheapness. Therefore

What I claim as my invention, and desire

to secure by Letters Patent, as a new article of manufacture, is—

The hollow cast-iron skein or journal A, provided with the chilled bearing-surfaces *ff*, extending part way around the same, substantially as herein set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

H. F. PHILLIPS.

Witnesses:

HORACE T. COOK,

FRED. M. TERRILL.