

WILLIAM E. COOPER.

Improvement in Devices for Boring Spherical Seats.

No. 126,522.

Patented May 7, 1872.

Fig. 1.

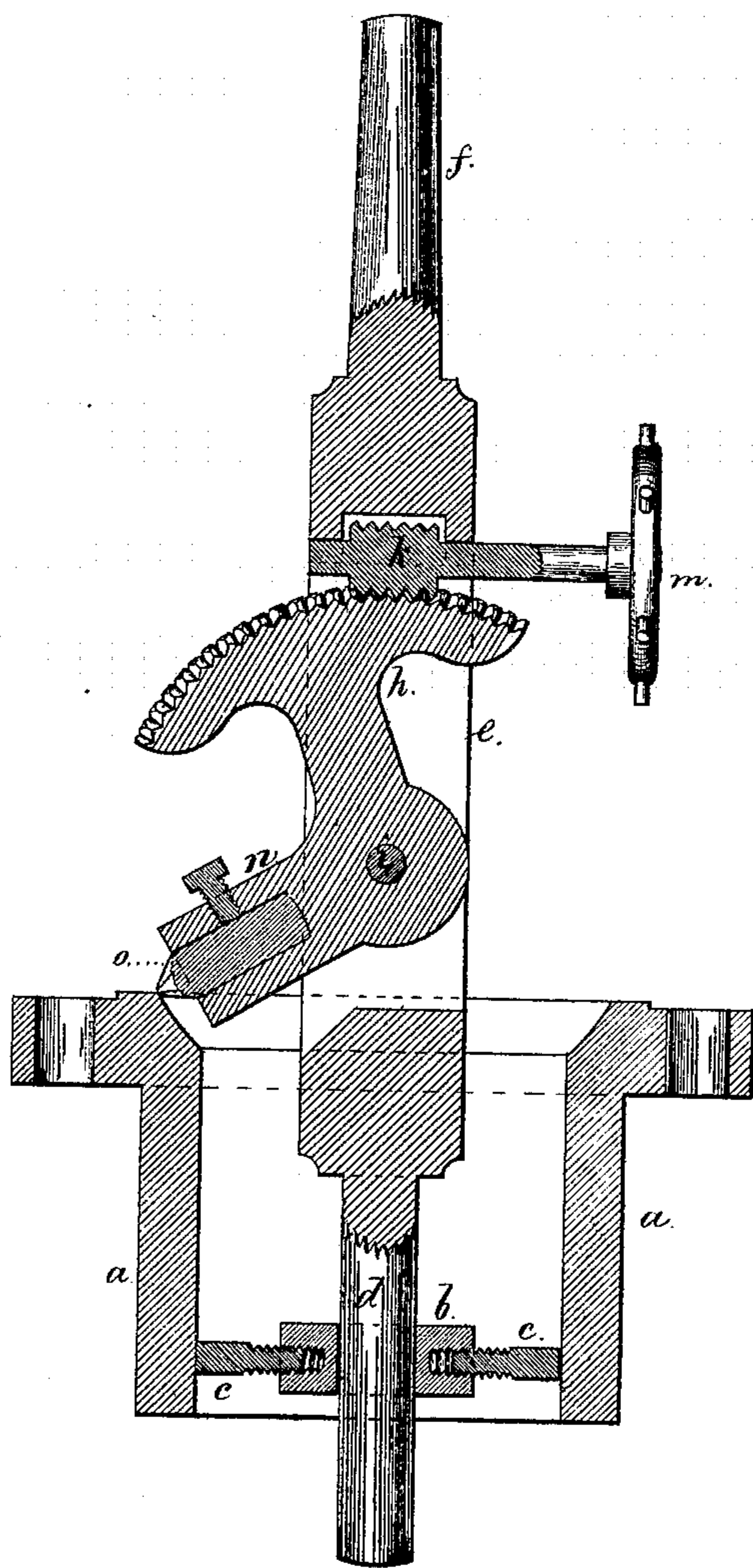
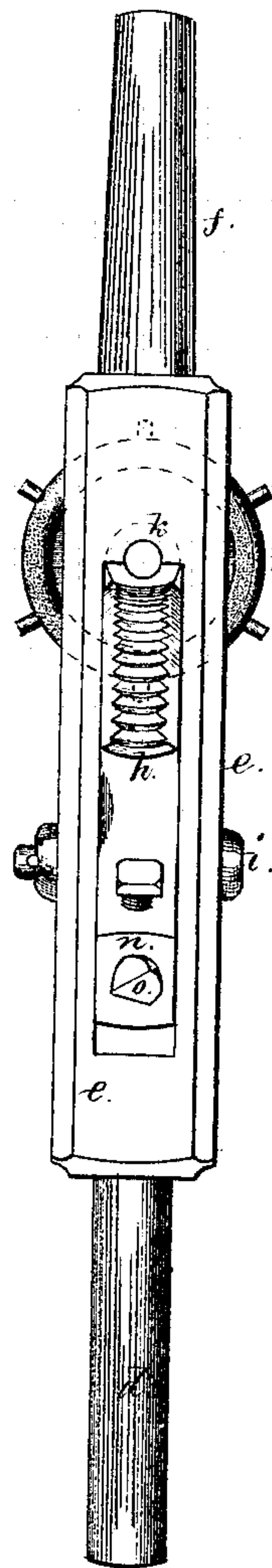


Fig. 2.



Witnesses

Chas H Smith

Geo. A. Walker

Inventor

William E. Cooper,

Lemuel W. Serrell
att'y.

UNITED STATES PATENT OFFICE.

WILLIAM E. COOPER, OF HORNELLSVILLE, NEW YORK.

IMPROVEMENT IN DEVICES FOR BORING SPHERICAL SEATS.

Specification forming part of Letters Patent No. 126,522, dated May 7, 1872.

To all whom it may concern:

Be it known that I, WILLIAM E. COOPER, of Hornellsville, in the county of Steuben and State of New York, have invented an Improvement in Means for Boring Spherical Seats; and the following is declared to be a correct description thereof.

Metal pipes have been made with a ring between one length and the next, said ring having a convex or zone-shaped exterior entering a spherical seat at the end of the pipe, so that one pipe may stand at an angle to the next and still the joint be tight. Valves of engines, pumps, &c., have also been made as a zone or segment of a sphere, resting within a similar-shaped seat. In finishing these spherical seats it has been usual to employ a burr or reamer of the shape required for the seat; this, however, requires great force to operate it, the cutting-edges become notched and injured, and the grooves filled with the chips or cuttings, and the seat is imperfect. The object of my invention is to provide a means for boring out a spherical seat with absolute accuracy to fit a spherical segment of any desired size. I accomplish this by mounting a radius-tool in a stock that is within the boring-bar and is swung by a worm-pinion and sector in a meridian line, and hence turns or bores out the seat in the most perfect and accurate manner to fit a ring or valve whose surface is convex, and forms a spherical segment of corresponding shape and radius.

In the drawing, Figure 1 is a vertical section of the apparatus, and Fig. 2 is an elevation at right angles to Fig. 1.

The pipe *a* is shown in position for the boring-tool to act in making the concave seat at the end. Within the pipe *a* is the centering-head *b*, that is adjusted in position and firmly held by the screws *c c*. The mandrel *d* fits into this head, and can be freely revolved therein, or moved endwise to bring the boring instrument into the proper position relatively to the

seat to be bored. The stock *e* and mandrel are connected or formed together, and the tapering end *f* of the stock is secured in a lathe or vertical drill, so that the apparatus may be revolved; and I remark that this apparatus can be operated by hand-power when mounted in a suitable frame, and moved by a ratchet drill-stock or otherwise. The stock *e* is slotted longitudinally to receive the sector *h* that is attached by the bolt *i*, and has notches or teeth upon its edge, into which the worm-pinion *k* works. The shaft of this pinion *k* has on it a crank-arm or wheel, *m*, and when this apparatus is operated in a lathe or drilling-machine the edges of the wheel *m* should have pins projecting to come in contact with a fixed stop and turn the pinion automatically. The tool-holding stock *n* projects from the sector *h*, and in this the tool *o* is clamped. This tool becomes the radius of the globular segmental seat that is to be turned, and it is swung in a meridian line by the worm-pinion *k* and sector *h* as the cutting progresses gradually. In this manner, as the apparatus is revolved, the globular segmental seat will be bored out with great accuracy, the radius corresponding to that of the spherical segment forming the valve or ring, and by positioning the apparatus with the bolt *i* at a greater or less distance from the plane of the seat to be turned so the said seat will be more or less dishing.

I claim as my invention—

The mandrel *d*, and longitudinally-slotted stock *e*, within which is the sector *h*, and actuating-pinion *k*, in combination with the tool-stock *n*, projecting from the sector *h*, the parts being sustained and revolved, substantially as and for the purposes set forth.

Signed by me this 2d day of January, 1872.
WM. E. COOPER.

Witnesses:

MILES W. HAWLEY,
CELIA A. HAWLEY.