

J. J. HENRY.  
Mill-Spindles.

No. 149,475.

Patented April 7, 1874.

Fig. 1.

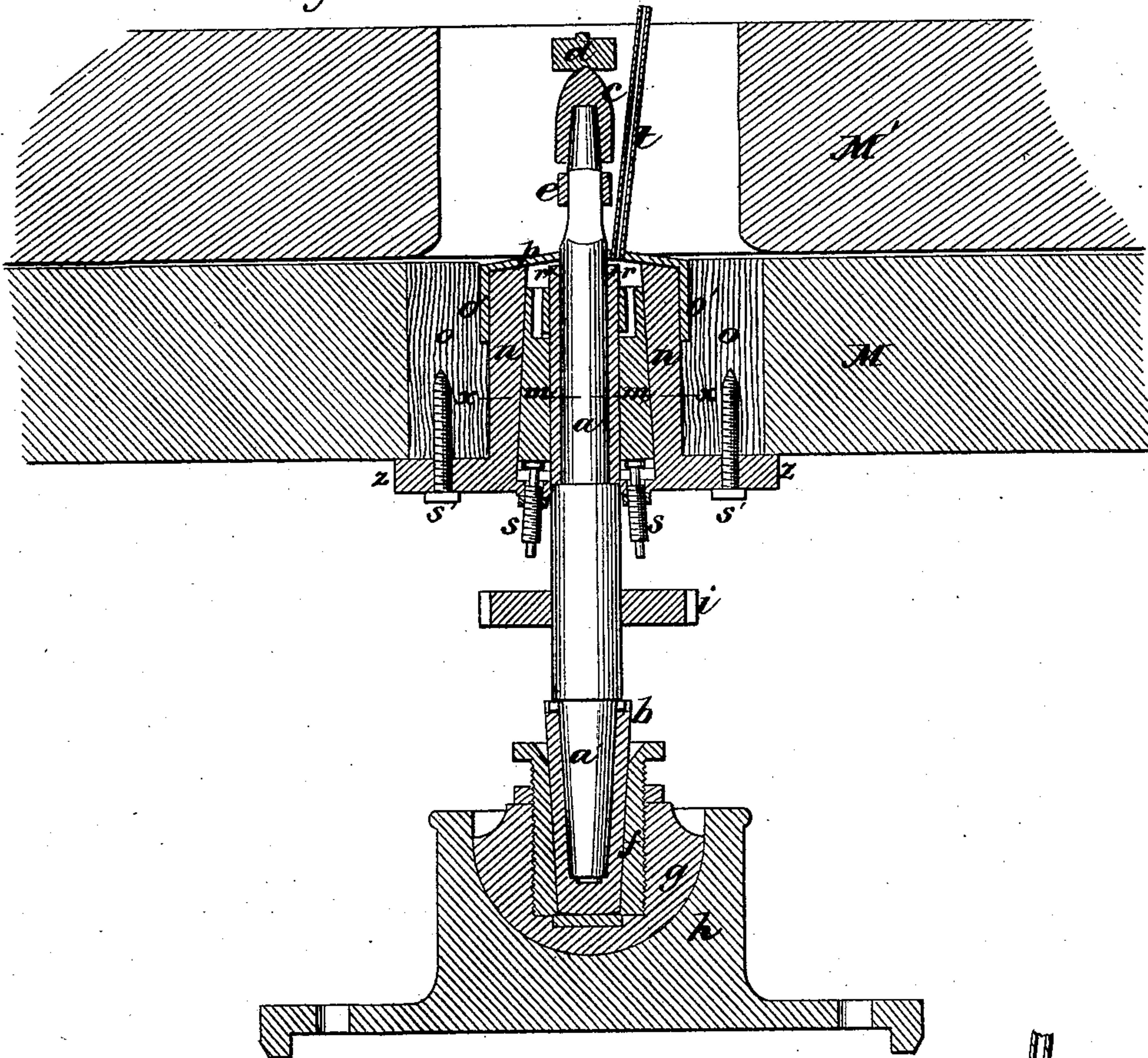


Fig. 2.

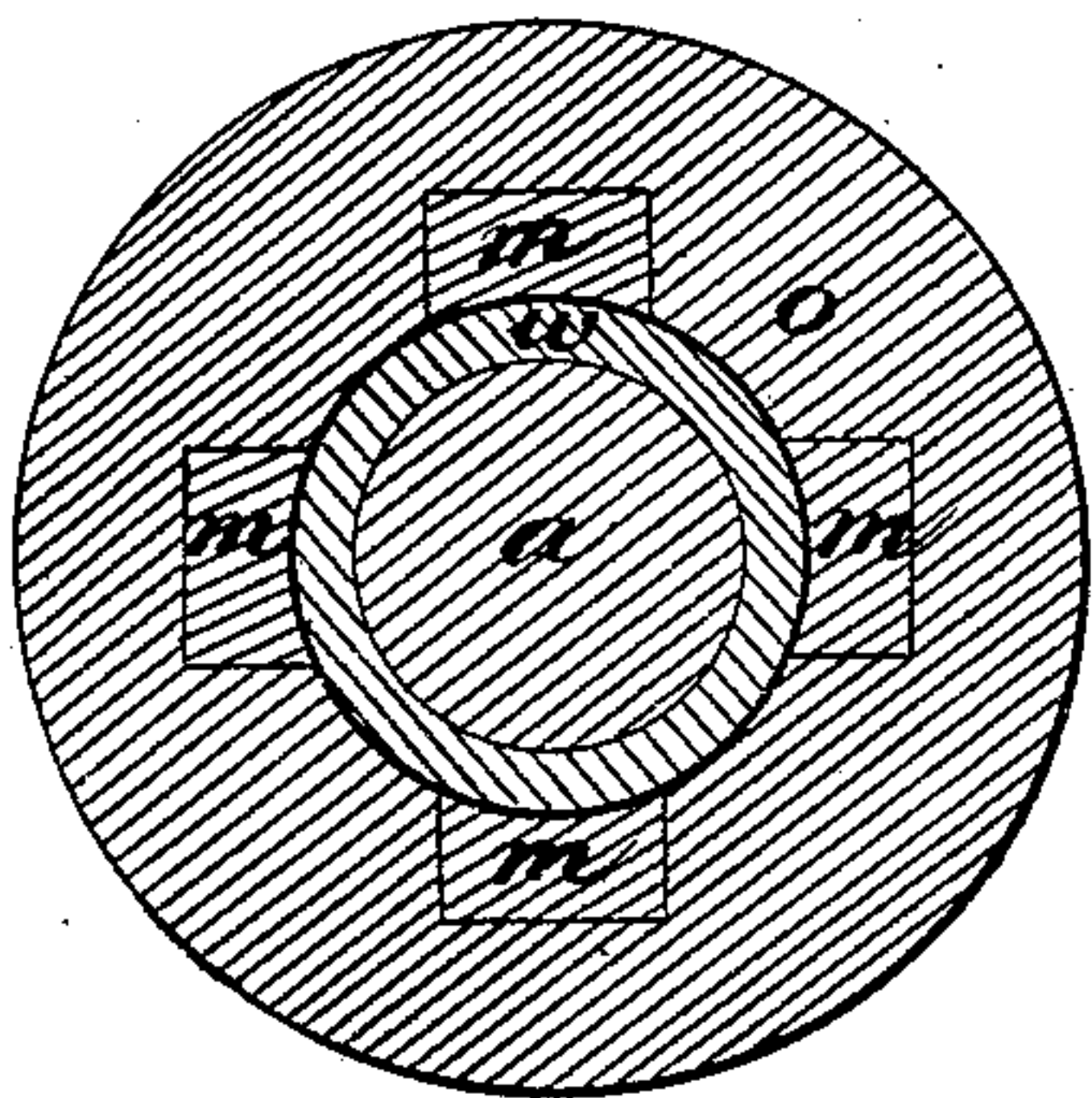
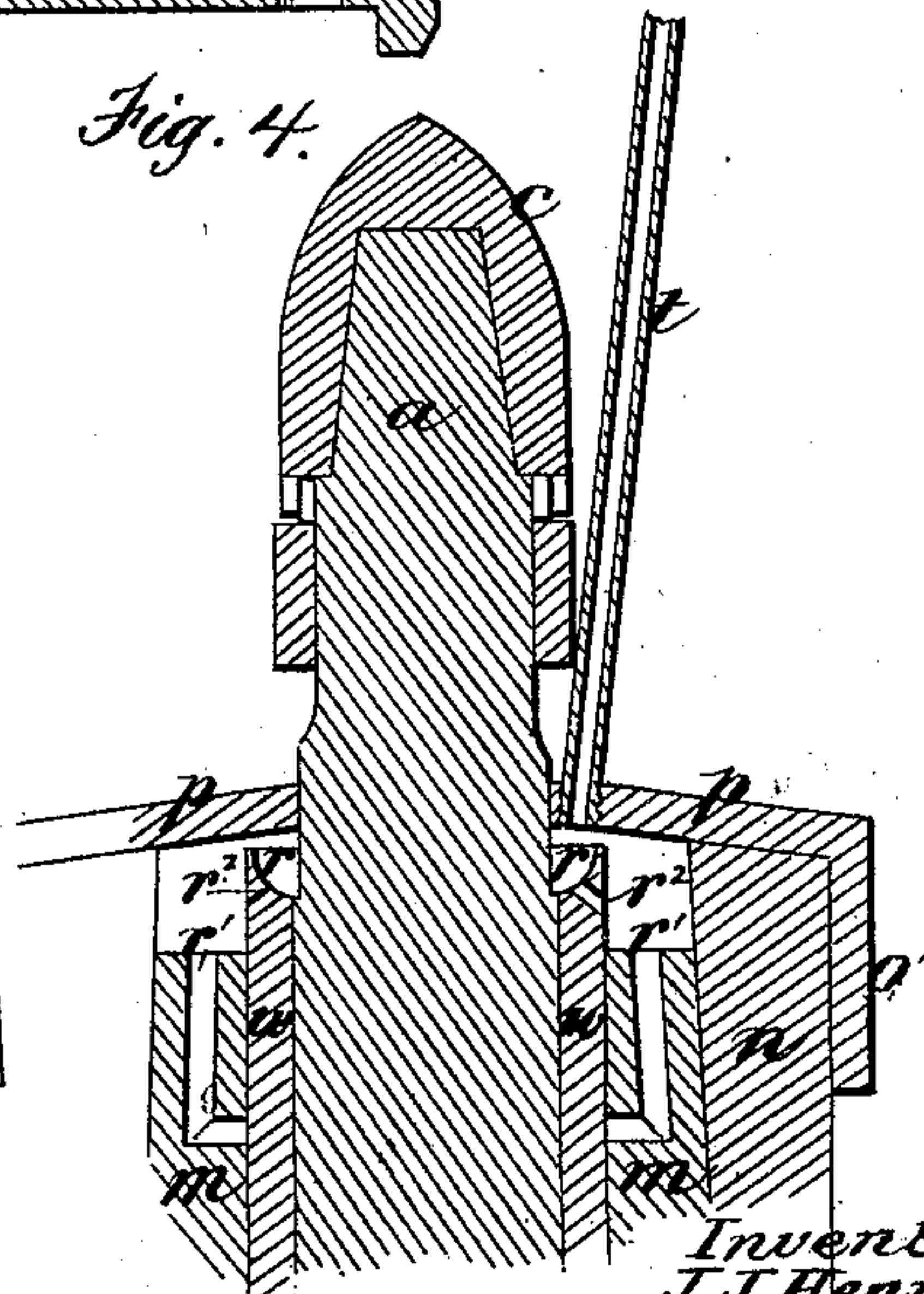


Fig. 3.



Fig. 4.



Witnesses.  
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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN MILL-SPINDLES.

Specification forming part of Letters Patent No. 149,475, dated April 7, 1874; application filed February 21, 1874.

*To all whom it may concern:*

Be it known that I, JOHN JOSEPH HENRY, of Baltimore, in the county of Baltimore and State of Maryland, have invented certain new and useful Improvements in Mill-Spindles; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings forming part of this specification, in which—

Figure 1 is a vertical section of my invention. Fig. 2 is a horizontal section through the line *x x*, Fig. 1. Fig. 3 is a perspective view of one of the wedge-shaped bearing-blocks removed; and Fig. 4 is an enlarged vertical section, showing the removable cock-head and the lubricating devices.

Similar letters of reference in the accompanying drawings denote the same parts.

My invention relates to improvements in mill-spindles, which may be applied to other vertical shafts; and consists, first, in the employment of a removable socketed toe, fitting over the lower end of the spindle, and having its bearing in a screw-threaded socket attached to a hemisphere, the latter having its bearing in a similarly-formed socket, as described in Letters Patent No. 137,443, granted to me April 1, 1873. The object of making the toe removable is to replace it, when worn, by another toe. My invention further consists in the employment of a removable cock-head, on which the balance-rynd rests, which can readily be detached when worn, and replaced by another cock-head. My invention also consists in the employment of sliding wedge-shaped bearing-blocks, having their inner surfaces concave to embrace the spindle, and fitting in correspondingly-formed grooves in a collar surrounding the spindle, and covered by a cap having an inclined upper surface, to prevent the ingress of dirt and grain, the wedge-shaped bearing-blocks being adjustable vertically by set-screws or their equivalents, to prevent lateral play of the spindle, and compensate for the wear of the latter. My invention further consists in the employment of certain devices for lubricating the mill-spindle, as hereinafter more fully set forth.

In the accompanying drawings, *a* represents a mill-spindle, the lower end *a'* of which is in-

serted in the socket of a removable toe, *b*, which is stepped in a socket, *f*, having its outer surface screw-threaded, to engage with a female screw in the hemisphere *g*; the latter having its bearing in a hemispherical recess in the block *h*, which supports the spindle, as described in Letters Patent No. 137,443, granted to me, and dated April 1, 1873. The removable toe *b* is attached to the lower end of the spindle by means of lugs on the spindle, which engage in notches or recesses in the upper end of the toe, or by any other similar means, by which it can be readily removed and replaced.

By this construction, it will be seen that, when the toe is worn, it can readily be removed and replaced by another toe.

*M M'* are the millstones, the upper stone, *M'*, being movable, and the lower one, *M*, stationary. *c* is a cock-head, provided with a socket in its lower end, which fits over the upper end of the spindle, and is attached thereto by lugs on the spindle, which engage with recesses in the lower end of the cock-head, or other equivalent means. *d*, Fig. 1, is a cross-section of a part of the balance-rynd, the arms not being shown in the drawing; and *e* is a similar section of a part of the driver, its arms not being shown in the drawing. The ends of the arms of the driver and the ends of the bail are made to enter recesses in the upper movable stone *M'*, in the usual manner.

It will be perceived by rendering the cock-head *c* removable it may be detached readily when worn, and a new one substituted for the worn one.

The eye of the stationary millstone is bushed or filled with wood, as seen at *o*, in which is inserted the collar *n*, surrounding the spindle, and provided with horizontal arms *z z*, provided with holes, in which are inserted screws *s<sup>1</sup> s<sup>1</sup>*, which are screwed into the wood *o*, thereby securely attaching the collar *n* to the eye of the lower stationary millstone *M*. *m m* are wedge-shaped bearing-blocks, made concave on their inner surfaces to embrace the spindle, which they surround. The bearing-blocks *m m* fit in correspondingly-formed wedge-shaped recesses in the collar *n*, and are vertically adjustable in the recesses by means of screws *s s*, the heads of which bear against the lower ends of the bearing-blocks, fit into openings *s<sup>2</sup>*,



(see Fig. 3,) and pass through female screws made in perforations in the lower end of the collar *n*. The screws *s s* are situated obliquely to the spindle, or in line of direction of the wedge-shaped bearing blocks *m*, and their lower ends are made without a screw-thread, so that a wrench may be applied to turn them when it is desired to adjust them.

By this construction, arrangement, and adjustment of the bearing-blocks, it will be seen that compensation may be made for any wear of the spindle around the collar, thus enabling the operator to prevent any lateral displacement of the spindle.

*p* is a cap, the upper surface of which is inclined, to prevent the ingress of grain or dirt into the eye of the lower stone, and which, from its inclined position, serves to guide the grain toward the space between the millstones. The side faces *o'* of the cap *p* are cylindrical in form, surround the collar *n*, and are inserted in the wood *o* in the eye of the stationary stone *M*. *W* is a sleeve surrounding the spindle, securely attached thereto, and revolving with the spindle. The upper end of the sleeve *W* is provided with a recess, *r*, for oil, (see Fig. 4,) which is introduced therein through the tube *t*, passing up through the eye of the movable stone *M'*. *r<sup>2</sup> r<sup>2</sup>* are oil-passages, any desired number being employed, through which the oil passes into the oil-passages *r<sup>1</sup> r<sup>1</sup>*, bent right-angularly at their lower ends, by means of which construction oil for lubricating

the spindle is introduced between the collar and the sleeve *W* attached to the spindle. *i* is a pinion, to which the motive power is applied to rotate the spindle, and with it the stone *M'*, attached thereto.

I claim as my invention—

1. The removable socketed toe *b*, fitting over the lower end of the spindle, and secured thereto by a detachable fastening, substantially as described, and for the purpose set forth.

2. The removable socketed cock-head *c*, fitting over the upper end of the spindle, and secured thereto by a detachable fastening, substantially as described, and for the purpose set forth.

3. The collar *n*, provided with wedge-shaped recesses for the reception of the wedge-shaped adjustable bearing-blocks *m m*, in combination with the cap *p o'*, having an inclined upper surface, substantially as described, and for the purpose set forth.

4. The cap *p o'*, having an oil-tube, *t*, attached to its upper inclined face, in combination with the oil-recess *r* and the oil-passages *r<sup>2</sup> r<sup>1</sup>*, the whole arranged, constructed, and operating substantially as described, and for the purpose set forth.

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Witnesses:

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