

E. Blake.

Spindle Stop for Spinning Mach.
N^o 89,548. Patented May 4, 1869.

Fig. 1.

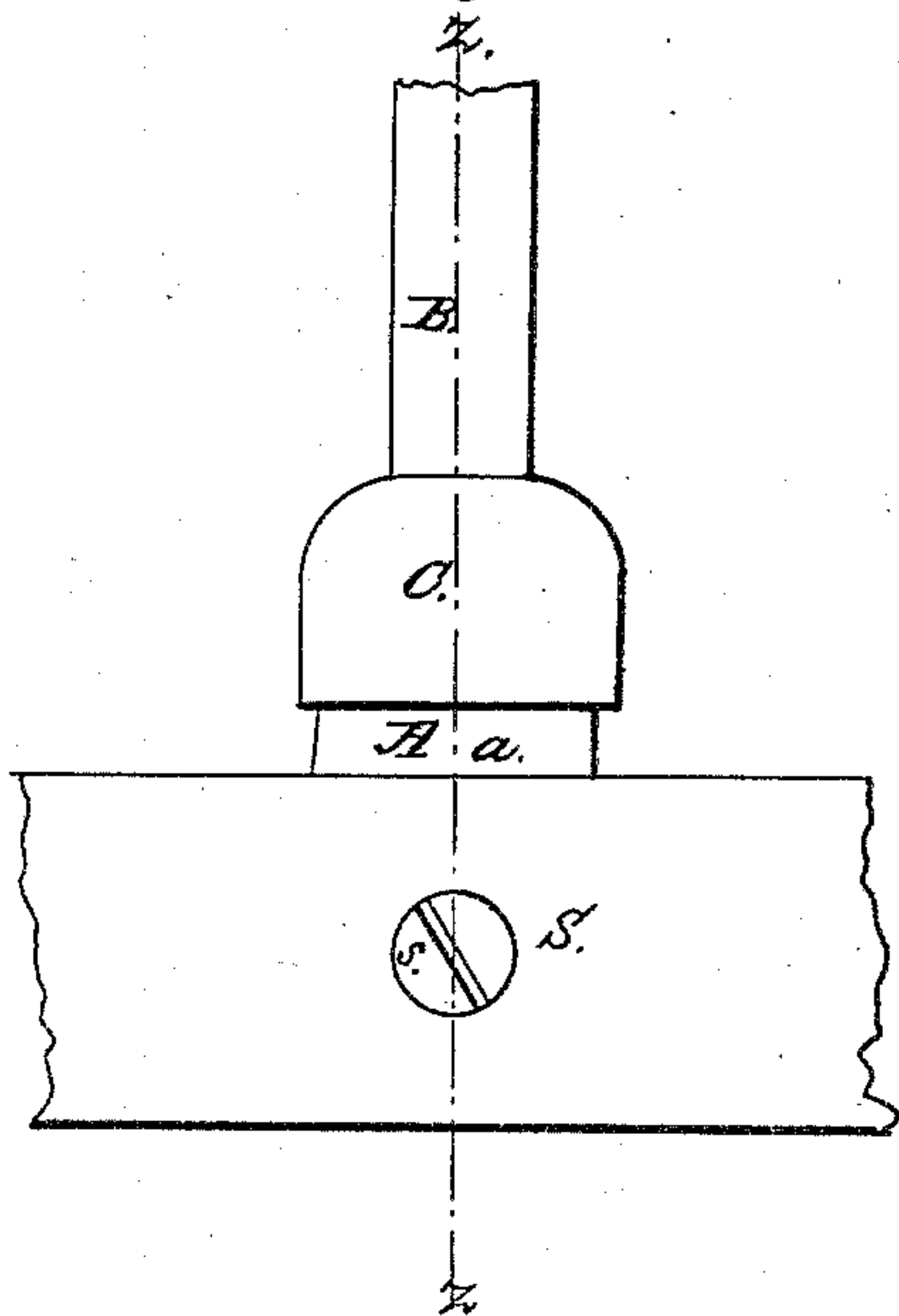


Fig. 2.

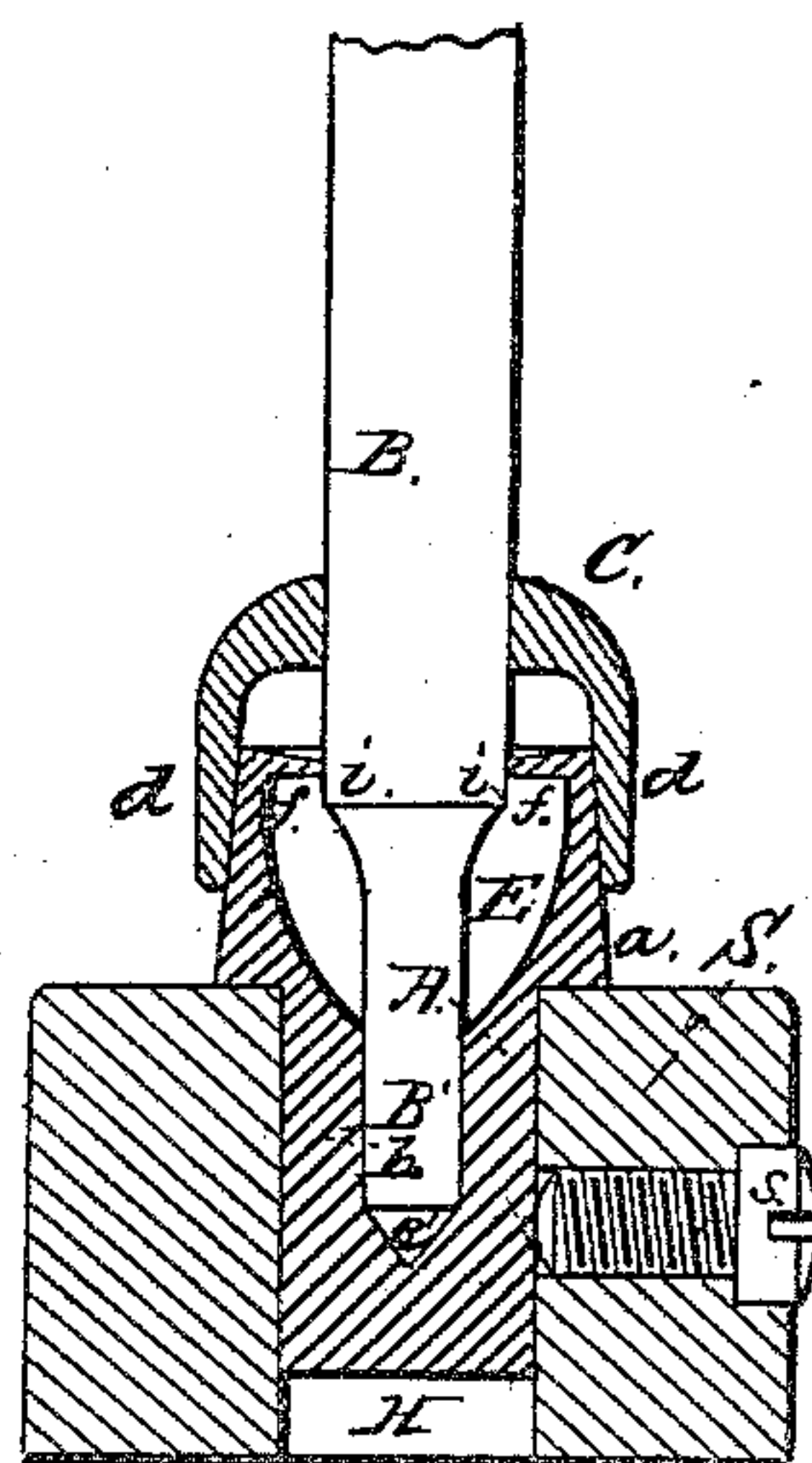


Fig. 3.

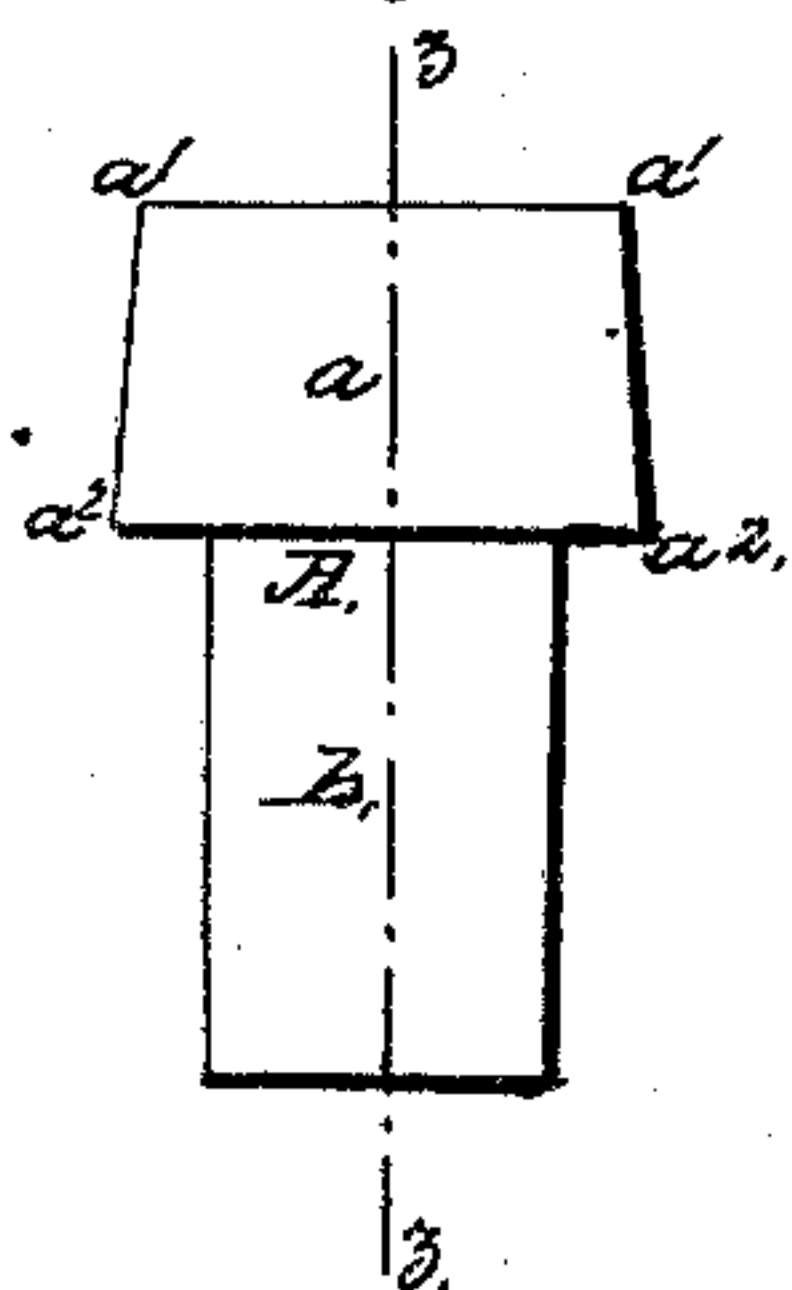


Fig. 5.

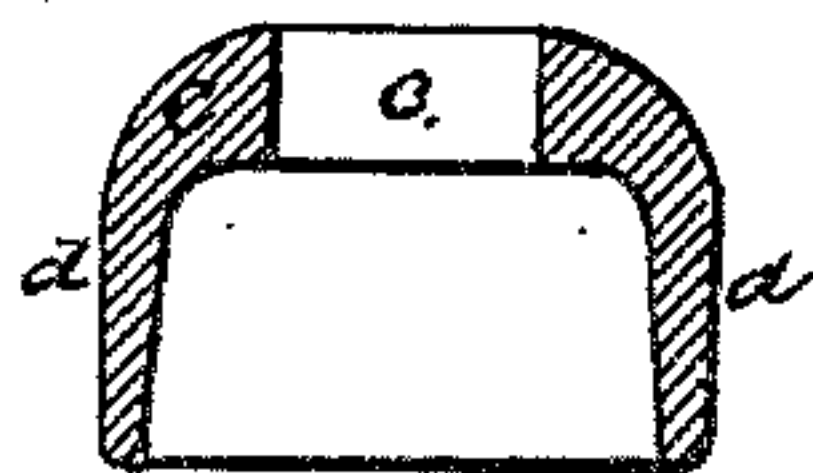
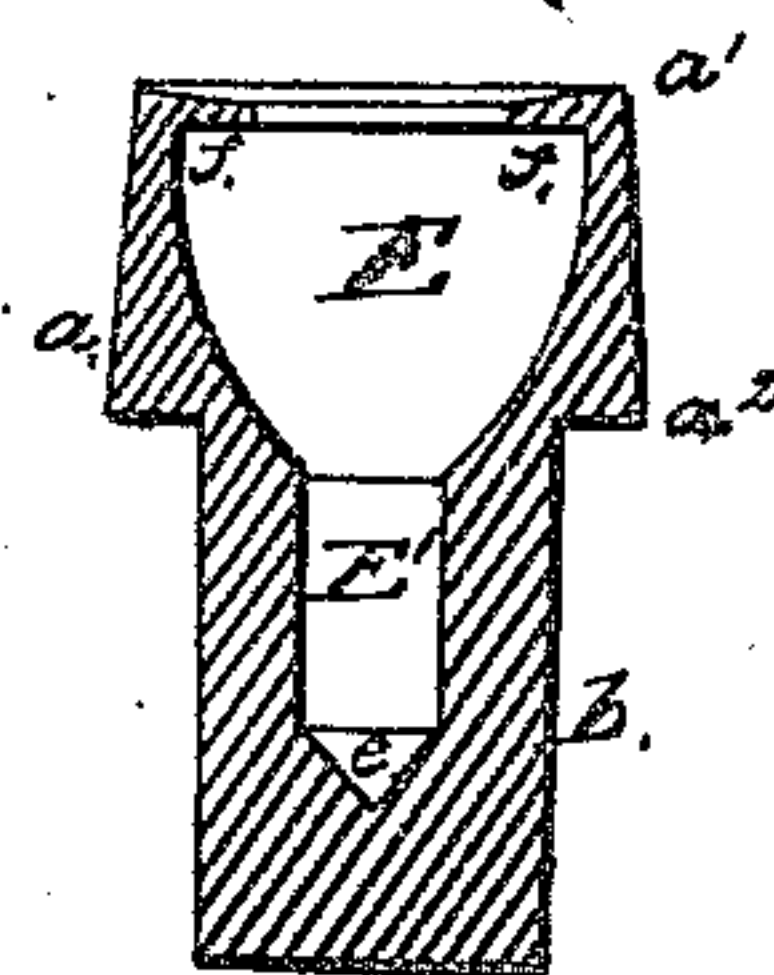


Fig. 4.



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EZEKIEL BLAKE, OF CHICOPEE FALLS, MASSACHUSETTS.

Letters Patent No. 89,548, dated May 4, 1869.

IMPROVEMENT IN SPINDLE-STEP FOR SPINNING-MACHINES.

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

To all whom it may concern:

Be it known that I, EZEKIEL BLAKE, of Chicopee Falls, in the county of Hampden, and Commonwealth of Massachusetts, have invented a new and improved Spindle-Step; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, and to the letters and figures of reference marked thereon, in which—

Figure 1 is an elevation of said spindle-step, having the foot of a spindle set therein, and the whole shown as set in the rail of an ordinary spinning-frame;

Figure 2 is a vertical sectional view, the plane of transverse section being indicated by the line Z Z in fig. 1;

Figure 3 is an elevation of the cap, which forms the step itself, the cover being removed, and the whole being taken out of the rail, in which it rests when in use;

Figure 4 is a vertical axial section through the line z z, fig. 3; and

Figure 5 is a vertical axial section through the cap, which rests upon the upper part of the step, and closely encircles the spindle.

All the aforesaid drawings are full size, and represent the step, rail, and spindle, of the size actually employed in manufacturing-operations.

My invention is designed to be employed upon ring-spinning frames, and may also be employed in mule-spinning.

The high rate of speed at which cotton-spindles are driven—from three to five thousand revolutions per minute—makes it absolutely necessary that the foot of the vertical spindle, and the socket or step in which it turns as a bearing, should be constantly and thoroughly lubricated; and the great friction developed in a dry step, under the high speed, very speedily wears the step so as to render it useless.

The steps in common use, for the most part, require oiling daily, or at intervals of a very few days, and at the expense of much oil and labor, and of the frequent stoppage of the spinning-machinery, while my invention is designed to be run for several months with a single oiling, such oiling being readily and expeditiously performed.

It has also been estimated that the waste of oil by frequent oilings, and by loss from oil thrown out of the step, amounts to about five-sixths of the whole amount of oil applied, leaving but a single sixth to be utilized in overcoming the friction of the step and spindle, nearly all of which waste is prevented by the operation of my invention, an important gain, not only in an economical point of view, but in point of cleanliness, and also in lessening the liability to fires from oil-soaked floors.

A cap is also added to the spindle-step, not to prevent the escape of oil, which is otherwise provided for, but to keep the cotton-waste, dust, and other foreign matter from getting into the step.

This cap, and the upper part of the step, I so shape,

relatively to one another, that the former always fits tightly upon the latter, and always drops into the right position upon the step.

The cap, therefore, is not supported upon the spindle and revolved with it, as in many covered spindle-steps, but the stem of the spindle passes down through a cylindrical opening in the top of the cap, which opening is made just large enough to allow the spindle-stem to turn within it.

The construction of my invention is as follows:

S represents a portion of the rail of a spinning-frame, in which is the usual cylindrical opening, H, to receive a spindle-step, there being many of these steps arranged in a line along the rail, and held in place by set-screws s.

In the ordinary spindle-steps, without a collar at the upper end, such set-screws are necessary to prevent the step from dropping through the rail, but are not absolutely necessary with steps such as shown in the drawings.

The step itself, A, is composed of a straight cylindrical portion, b, of the usual diameter of ordinary steps, and an enlarged portion, a, the outside of which is slightly tapering or conical, so as to make a close fit with the cap, which shuts down over it.

The enlargement of the upper part of A forms a rim, a' a'', which serves to support the step in the rail, but serves a more important purpose in affording room within the step for a capacious oil-chamber, above the top of the rail, and extending up the spindle higher than the whole step generally rises, thus affording a much longer socket than usual beneath the oil-chamber for the foot of the spindle.

The space which the enlarged portion a occupies above the rail is not useful for any other purpose, and is not occupied at all when the ordinary steps are used with their tops rising just out of the rail.

A thin rim, f f, projecting inward, encircles the spindle, so as to close the top of the cup when the spindle is in place, and prevents the oil from spurting upward when the spindle is dropped into its seat after doffing.

The upper side of the rim is made slightly concave or dishing, so that any oil which may follow up on the spindle when in motion, will be guided back into the oil-chamber when the spindle is still.

The angular bottom, e, of the socket is of the ordinary form, and at the usual depth below the top of the rail.

Above this is the straight cylindrical portion, E', of the socket, which opens into the roomy oil-chamber E, the shape of which is plainly shown in figs. 2 and 4.

It will be observed that by carrying up the step above the rail, so as to bring the whole oil-chamber above the top of the rail, the straight passage E' can be much elongated, thus affording a much longer bearing, and keeping the spindle more accurately in its proper vertical position.

The spindle is of the ordinary form, having the conical foot e' fitting the angular seat e, the straight cylindrical portion B' nearly filling the part E' of the socket,

and a swell at the upper part of the oil-chamber, ending in the full-sized spindle-stem B, above the swell.

It is desirable that the upper edge *i i* of the swelled part shall fall a little below the rim *f f*, so that the oil will be deflected from the annular space between the rim *f f* and the spindle B.

The inner sides of the cap C are made slightly flaring, so as to correspond with the taper of the sides *a'* *a''* of the step; and a circular opening, *c*, is made in the top of C, which is closely fitted by the stem B of the spindle.

If the conical form of the outside of the enlarged part *a* of the step, and the inner side of the cap C, have the same axis as the step A, then the cap will always settle down evenly upon *a*, and the opening *c*, in the top of the cap will be in correct position to receive the vertical spindle B, without binding or crowding it, and make nearly an air-tight joint about the top of A.

The step A and the cap C may be made of brass, iron, or other metal, which will withstand the wear of the foot of the spindle.

The operation of my invention is as follows:

The step being set in its socket in the rail, and the spindle standing within it, the cap C is lifted off from the step, and the spindle raised a fraction of an inch, say one-fourth, so as to bring the smaller part, B', of the spindle above the rim *f f*. There will then be space to insert the nose of an oil-can between the spindle B' and the rim *f f*, and fill or nearly fill the empty space in E E' and *e* with oil. The spindle can then be dropped back into its seat, and the cap C replaced upon A. A slight pressure will make the flaring cap fit very tightly upon A, while the rounded form of the outside of C allows no waste or threads to catch and wind up around the cap.

At the very high speed at which such spindles revolve, as before specified, the centrifugal force repels

the oil from the spindle, and piles it up against the sides of the oil-chamber E, the rim *f f* preventing it from running upward out of the chamber. When the spindle is stopped, the oil will run back about the spindle, penetrating down into the foot *e* and straight part E' of the step.

By comparative tests, it is estimated that the supply of oil which can be carried in the oil-chamber E, will keep the spindle thoroughly lubricated for several months, from eight to twelve, and that grit and dirt will be so effectually excluded by the described arrangement of the cap C, that the step and spindle-foot will last much longer than when used in the ordinary open steps.

I do not claim as patentable the construction of an oil-chamber in a spindle-step, irrespective of its position, and of the particular conformation of the step itself, which will allow me to locate the oil-chamber above the rail, as described, and also allow a greatly-increased capacity of the chamber, inasmuch as such chambers of limited capacity, and made without any enlargement of the step, and below the top of the rail, are in common use. Nor do I broadly claim as new the employment of a cap with a spindle-step; but I limit my claims of invention to the following-described matters and things, which I claim as new, and desire to secure by Letters Patent, viz:

The spindle-step A, having the portion *a* elongated and enlarged, and having the seat *e*, oil-chamber E, and rim *f* formed therein, in combination with the cap C, having the central opening *c*, and the inner sides thereof conical in section to fit the tapering sides *a'* *a''* of the step, all constructed and arranged substantially as set forth.

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Witnesses:

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