(No Model.)

W. T. CARROLL.

SPINDLE BEARING.

No. 544,805. Patented Aug. 20, 1895.

Fig: 1.

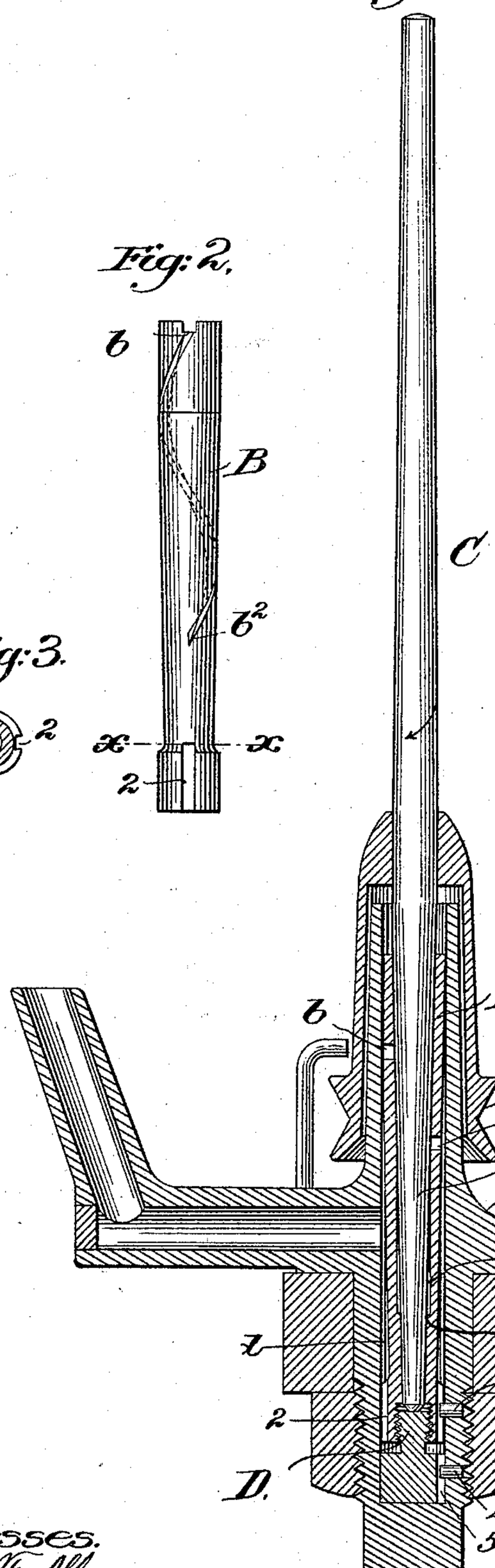


Fig: 2.

Fig: 3.

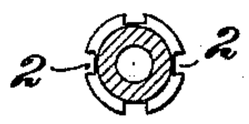


Fig: 4.

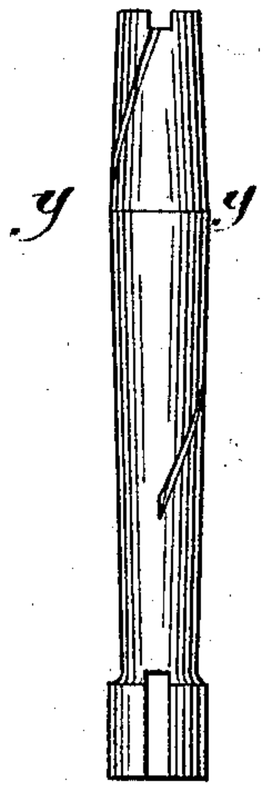
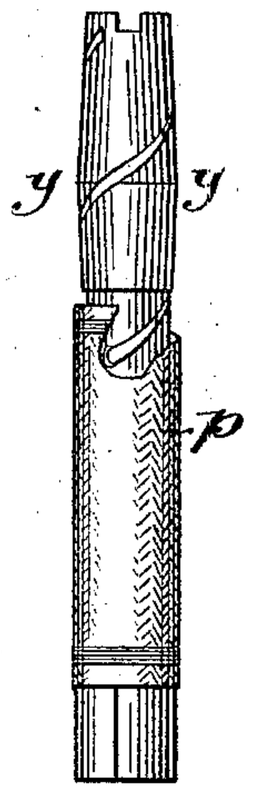


Fig: 5.



Witnesses.
Edward F. Allen
John C. Edmunds.

Inventor:
William T. Carroll
by Crosby & Gregory. Attys.

UNITED STATES PATENT OFFICE.

WILLIAM T. CARROLL, OF WORCESTER, MASSACHUSETTS.

SPINDLE-BEARING.

SPECIFICATION forming part of Letters Patent No. 544,805, dated August 20, 1895.

Application filed December 5, 1894. Serial No. 530,879. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM T. CARROLL, of Worcester, county of Worcester, State of Massachusetts, have invented an Improvement in Spindle Bearings or Supports, of which the following description, in connection with the accompanying drawings, is a specification, like letters and numerals on the drawings representing like parts.

Spindles for spinning and other purposes as ordinarily constructed waste large quantities of oil, the oil for the most part being thrown off as a fine spray, and in the case of sleeve-whirl spindles the spray reaches the air from the lower end of the whirl. The tendency of the oil to rise in the bolster and between it and the spindle and to escape at any point or crevice is greatly enhanced in that class of spindle now so extensively in use having tapering pintles and bolsters, the oil readily following the upwardly-inclined pintle. In my experiments to overcome the rising of the oil in and its waste from the bolster, I have devised a structure wherein the oil has set up in it, by the motion of the spindle, a downward current next the surface of the pintle of the spindle, and this I have accomplished by providing the bolster or loose bearing with a spiral slot extended from its outer to its inner side or cut through the bolster, the slot being directed from the upper toward the lower end of the bolster and in the direction of rotation of the spindle, there being left or made about the lower end of the spindle or between the slotted bolster and the surrounding bolster-case a chamber in which may circulate the current of oil, which is established by the rotation of the spindle. Preferably the bolster will be reduced externally in diameter for part of its length in the production of this oil-circulating chamber.

Figure 1 in elevation shows a spindle mounted in one of my improved bolsters. Fig. 2 is a side elevation of the bolster detached. Fig. 3 is a section in the line x, and Figs. 4 and 5 are modifications of my invention.

In the drawings, A represents the usual spindle-rail having suitably secured therein by a nut A′ or otherwise a supporting-case A^2, which is adapted to receive my improved bolster B.

The spindle C shown is of well-known construction, it having a sleeve-whirl C′ and a tapering pintle C^2.

The bolster B is composed of a metallic shell which is slotted from at or near its upper end, as at b, downwardly and spirally toward the lower end thereof, the slot terminating at b^2, the said slot being inclined about the bolster in the direction of rotation of the spindle and being cut from the outer to the inner side of the bolster. The lower end of the bolster has suitable notches, as 2, which are adapted to be entered by a pin or projection, as 3, to restrain the rotation of the bolster in the supporting-case, and the bolster is shown as provided at its lower end with a step D or end bearing for the spindle, the said step being united to the bolster by a screw, the step itself being represented as restrained from rotation by a pin 4 in a slot 5. This sort of a step-and-bolster connection enables the bolster to be adjusted vertically in usual ways.

In the production of the bolster a portion of the same at its exterior is removed by turning or otherwise to leave a space d between the bolster and the interior of the supporting-case for the circulation of oil, and this space may be made by reducing the bolster, either from its upper end, as in Fig. 2, or from a point, as the line y y, Figs. 4 and 5, downwardly; and, if desired, the bolster may be surrounded at its reduced portion by means of a packing, as p, represented in Fig. 5. The bolster-bearing is held loosely in or with relation to the outside support.

In the production of the bolster I prefer to drill a tubular hole in the same by means of a straight drill, and thereafter the upper end of the hole so made is reamed out for a part of its length by a tapering reamer, thus leaving a space, as e, within the bearing and between it and the surface of the pintle of the spindle when the latter is in position, the said space adding to the oil-space and tending to aid in the continuance of the downward circulation. The point end of the tapering reamer may be small enough to deepen the hole left after the action of the straight drill, and thereby prepare a space for the extremity of the pintle. The space e is located just above the shoulder d^{10}, (see Fig. 1,) which serves as the top of the lower lateral bearing for the

pintle. The spindle mounted in a bolster of this kind may be rotated rapidly, and owing to the slot being extended about the bolster in the direction of rotation of the spindle the oil between the pintle of the spindle and the interior of the bolster is given a downward direction, it rising between the non-rotating surfaces of the exterior of the bolster and the interior of the support.

I do not desire to limit this invention to the exact construction of the loose bolster or to the exact shape or length of the spiral slot therein, so long as it is extended downwardly about the loose bolster in the direction of rotation of the spindle, nor to the exact number of slots used.

The bolster is of rigid metal, capable of withstanding the strain of the spindle and holding it in proper position for rapid rotation.

In the drawings, Figs. 1 and 2, the upper end of the bolster contacts substantially with the interior of the bolster-case, and so does the lower end, but the oil-chamber *d* is formed between the upper and lower ends of the bolster.

In the modifications, Figs. 4 and 5, the point *y y* forms a stop or head to fit and substantially fill the bolster, and these two stops are considered of very material advantage in the use of the bolster, because they leave between them a comparatively large oil-space with which the open sides of the spiral slots communicate to thus keep up a free and easy circulation of oil.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A spindle support, combined with a bolster held loosely therein with its upper end below the top of the support, and having a spiral slot cut through the same, the slot extending from its upper toward its lower end and in the direction of rotation of the spindle, substantially as described.

2. A bolster case, a spindle having a pintle, and a step, combined with a lateral bolster interposed loosely between the said bolster case and the pintle of the spindle, the upper end of said bolster being below the top of the bolster case, the said bolster being provided with an open-sided spiral slot extending from its upper toward its lower end in the direction of rotation of the spindle, and having its external diameter reduced for a part of its length to thus constitute an oil chamber between the exterior of the bolster and the interior of the case when the bolster is within the case, the bolster having at its interior near its lower end an oil chamber *e*, the said slot affording the oil a free circulation through the walls of the bolster from one to the other of said oil chambers, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM T. CARROLL.

Witnesses:
HARRY B. OTIS,
CHARLES P. FRAIL.