

T. BENTLEY.
ADJUSTABLE SPINDLE STEP.
APPLICATION FILED APR. 11, 1908.

988,924.

Patented Apr. 4, 1911.

2 SHEETS-SHEET 1.

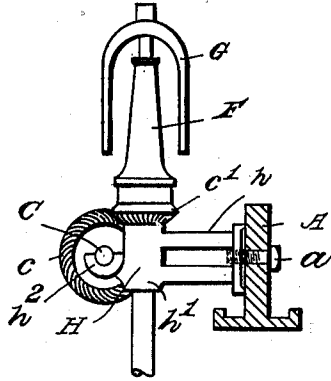


Fig. 1.

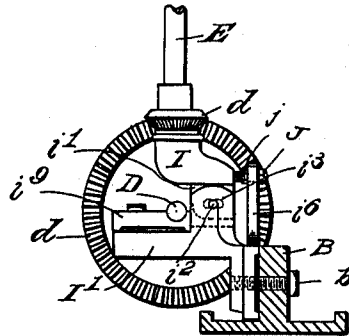


Fig. 2.

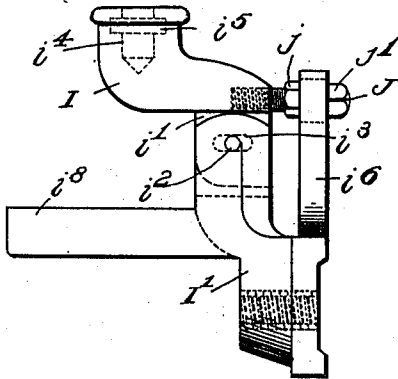


Fig. 3.

WITNESSES:

Ludger A. Nicol.
Grace Crowley.

INVENTOR.
Thomas Bentley,
BY Albert M. Moore,
His ATTORNEY.

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2 SHEETS—SHEET 2.

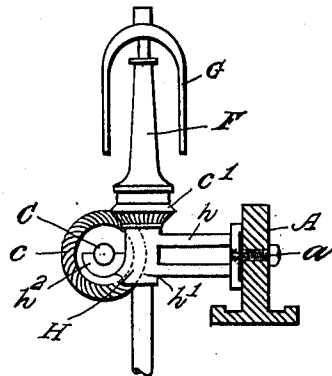


Fig. 4.

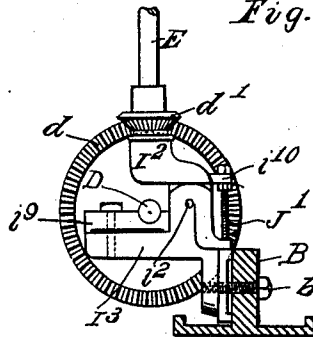


Fig. 5.

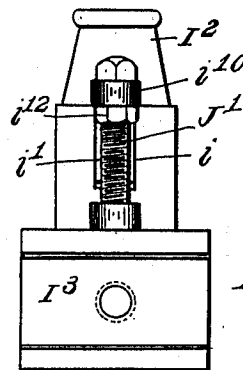


Fig. 6.

Witnesses:

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Inventor:
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UNITED STATES PATENT OFFICE.

THOMAS BENTLEY, OF DRACUT, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO
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ADJUSTABLE SPINDLE-STEP.

988,924.

Specification of Letters Patent.

Patented Apr. 4, 1911.

Application filed April 11, 1908. Serial No. 426,440.

To all whom it may concern:

Be it known that I, THOMAS BENTLEY, a citizen of the United States, residing at Dracut, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Adjustable Spindle-Steps, of which the following is a specification.

This invention relates to adjustable spindle-steps (especially for fly-frames) and comprises means which enable such a step to be rotated slightly in a plane at right angles to the rails of a fly-frame and to be moved through a limited distance toward and from said rails in the same plane.

The object of the invention is to lessen the amount of time and work heretofore spent in adjusting the step or lower bearing of the spindle to the step-rail in such a manner as to set the spindle in a vertical position. The step and step-rail have hereinbefore been fitted to each other for this purpose by filing and chipping with cold chisels, the operation requiring a great deal of time and the work of a skilled mechanic. In the case of the removal of too much stock by filing and chipping, it has heretofore been necessary to use shims or thin pieces of paper or metal or other material between the step and the step-rail to bring the spindle plumb. It sometimes happens that the step and step-rail are so far from properly fitting each other when the spindle is plumb that it is impracticable to fit the step and the step is thrown into the scrap heap.

When paper shims are used they frequently get oily and soften and become worthless, allowing the step to get out of place, and when metallic shims are used, they are likely to become loose through the jar of the machine in operation, so that the use of shims is unsafe in practice and requires frequent inspection and replumbing of the spindles.

By using the means hereinafter described it is practicably impossible for the spindles to get out of plumb after they are once properly set and the setting of the spindles does not require the work of a skilled machinist, but may be accomplished by an unskilled man who is reasonably careful, because the adjustment is made by means of screws and when made is secured by means of a nut which prevents the screw from turning.

The invention is applicable to all kinds of

fly-frames including slubbing frames, intermediate and fine frames and jacks.

In the accompanying drawings, on two sheets, Figure 1 is a vertical transverse section of the bolster-rail and step-rail, an end elevation of the bobbin-shaft and the spindle-shaft, and a side elevation of a spindle, flier, bobbin and bolster and a step provided with my improvement; Fig. 2, is an enlarged side elevation and Fig. 3, an enlarged rear elevation of the improved step shown in Fig. 1, detached; Fig. 4, a view similar to Fig. 1, showing a modification of the step; Fig. 5, a side elevation and Fig. 6, a rear elevation of the step shown in Fig. 4, in both cases enlarged and detached.

The bolster-rail A, step-rail B, bobbin-shaft C, bobbin-shaft gear *c*, bobbin-gear *c*¹, spindle-shaft D, spindle-shaft gear *d*, spindle-gear *d*¹, bobbin F and flier G are or may be all of the usual construction. The bolster H is also of the usual form and comprises a bracket *h* and a sleeve *h*¹ or bolster proper, to receive and fit the spindle E and may also comprise a hook *h*² or half-journal box to support the bobbin-shaft C, such hooked bolsters being used at intervals on the frame with a greater number of bolsters without hooks. The bolsters are supported on the bolster-rail A, to which they are very carefully fitted in such a manner as to hold the axes of the sleeves *h*¹ in a vertical position in the same vertical plane and to hold the half journal-boxes *h*² where such occur, in the same horizontal plane, said bolsters being secured to the bolster-rail by bolts *a* which pass horizontally through said rail into the bracket of the bolster.

The step hereinafter described is formed in two parts I I¹, the lower part I¹ being a bracket secured to the step-rail B by a bolt *b* substantially in the same manner as the bolster is secured to the bolster-rail and this bracket I¹ is provided with a groove *i* shown in Fig. 3 which receives the narrowed lower end *i*¹ or tongue of the upper part I of the step, the upper and lower parts I I¹ of the step being jointed to each other by a pin *i*² which passes horizontally through the groove *i* and the tongue *i*¹, so that the upper part of the step may be rocked upon the lower part. The pin *i*² passes through a horizontal slot *i*³ in the tongue *i*¹, thus enabling the part I not only to be rocked on the part I¹, but to be moved on said last-

named part toward and from the step-rail. The step part I is provided with the usual vertical opening shown by dotted lines in Fig. 2 at i^4 to receive the lower end of the spindle and may also be provided in the usual manner with a recess or enlargement i^5 , also shown in dotted lines to serve as a lubricating chamber. The part I turning and sliding upon the part I^1 enables the part of the step which receives the spindle to be adjusted to fit the spindle after the latter has been set in its proper position in the bolster. The part I^1 is provided with an upwardly extending arm i^6 integral therewith which has a vertical slot i^7 through which a screw J is driven forward into the part I of the step, the slot i^7 permitting the rocking movement of the part I on the part I^1 . When the parts I I^1 are properly adjusted they are prevented from movement by a nut j which being turned up clamps the arm i^6 between said nut and the head j^1 of said screw. The lower part of some of the steps are provided with brackets or projections i^8 on which are supported slides i^9 which are held and adjusted in the usual manner and serve as half bearings for the spindle-shaft D.

In the modification shown in Figs. 4, 5 and 6, the screw J^1 , which serves a similar purpose as the screw J above described, is arranged vertically and passes down through a vertical slot i^{11} in a horizontal arm i^{10} which is integral with the upper part I^2 of the step. A nut i^{12} on the screw J^1 screws against the arm i^{10} to prevent turning of the parts I^2 I^3 of the step on each other after proper adjustment. In Figs. 4, 5 and 6 no provision is made for sliding the upper part I^2 on the lower part I^3 of the step. In other respects the modified step is like the first above described, similar parts being indicated by like letters of reference. In either case, the bolster is first adjusted in the usual manner to plumb the spindle, the parts of the step being loose in the meantime and free to accommodate themselves to the position of the spindle. The parts of the step being in proper position to suit the adjustable spindle, are then secured in place by the screw and nut. A nut may be substituted for the head of the screw J J^1

but a screw provided with a head is preferred to avoid the projection of the screw at the back of the step-rail, such projection catching lint and interfering with the cleaning of the frame.

With this invention the upper part of the step may be adjusted with reference to the spindle without disturbing the position of the spindle-shaft which is supported entirely upon the lower part of said step.

I claim as my invention:—

1. The combination of a spindle-step formed in two parts, one of which is adapted to be secured to a step-rail, the other of said parts being pivoted to the part so secured, one of said parts having an arm rigidly secured thereto and provided with a slot, a screw passing through said slot and engaging a threaded hole with which the other of said parts is provided, and a nut turning on said screw to grasp said arm between said nut and the head of said screw.

2. The combination of a spindle-step formed in two parts, one of which is adapted to be secured to a step-rail and is provided with an arm having a vertical slot, the other part of said step being pivoted to said first-named part and provided with a threaded hole, a screw passing through said slot and engaging said hole and a nut turning on said screw to grasp said arm between said nut and the head of said screw.

3. The combination of a spindle-step formed in two parts, one of which is adapted to be secured to a step-rail and is provided with an arm having a vertical slot and with a groove, the other part of said step being provided with a suitable tongue to fit said groove, said tongue having a horizontal slot, a pin passing through said groove and the slot of said tongue to enable said step-parts to be rocked and to be moved horizontally with reference to each other, and means for preventing said step-parts from moving on each other.

In witness whereof, I have affixed my signature in presence of two witnesses.

THOMAS BENTLEY.

Witnesses:

ALBERT M. MOORE,
GRACE CROWLEY.