(No Model.)

C. H. CHAPMAN.

BOLSTER FOR SPINNING SPINDLES.

No. 357,904. Patented Feb. 15, 1887.

Fig. 1

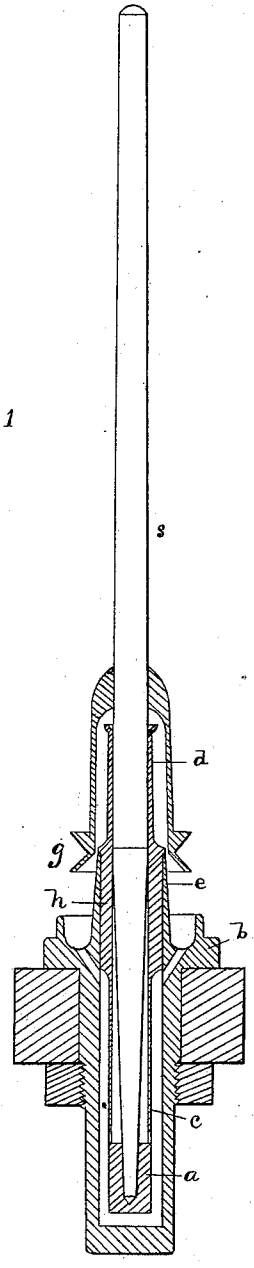
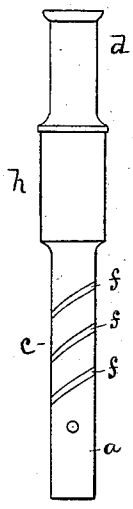


Fig. 2.



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UNITED STATES PATENT OFFICE.

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BOLSTER FOR SPINNING-SPINDLES.

SPECIFICATION forming part of Letters Patent No. 357,904, dated February 15, 1887.

Application filed May 27, 1886. Serial No. 203,415. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. CHAPMAN, residing at Groton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Bolsters for Spinning-Spindles; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings.

My invention relates to that class of spindles having a sleeve-whirl and having its bearings combined with a bolster case or support; and it has for its object to provide a construction and arrangement of the spindle and its bearings which shall enable the spindle to run steadily at high speed under all the conditions occurring in practical use, and at the same time retain the spindle in a permanent vertical position with relation to the ring. It is a well-known fact that spindles of this class cannot be operated satisfactorily if held in bearings that are entirely rigid and unyielding. To provide for the necessary adjustment various plans have been shown heretofore—as, for instance, certain forms have been constructed having step-bearings loosely fitted within a bolster-case and free to move laterally with the foot of the spindle without restraint and without limit until checked by contact with the interior of the bolster-case. This freedom of movement and the consequent contact operates in effect as a series of rapid blows against the foot of the spindle, inducing vibration and increasing the wear of the bearings. Other forms have been made with the bolsters and step-bearings integral and loosely fitted within a bolster-case throughout the entire length of such bearings. This form cannot be maintained in a permanent vertical position, and thereby causes great trouble with relation to the ring. I have found by experiment, however, that these defects can be overcome and the desired results obtained by supporting the step-bearing without lateral contact at or near the foot of the spindle, the bearing being provided with a fixed vertical support, either from above or below, which shall be so constructed as to be able to spring by reason of its own elasticity, and thereby permit the step-bearing to yield to the lateral pressure of the foot of the spindle when acted upon by the forms developed by the rotation of an unequally-distributed bobbin-load. I have also found that this result is rendered more complete and satisfactory by locating the bolster-bearing wholly above the bolster support or neck and constructing it in such a way that it also may be adapted to spring or yield by reason of its own elasticity, and thereby conform more freely to the movement of the step-bearing below.

Referring to the drawings, Figure 1 is a sectional elevation showing the spindle in elevation and the sleeve-whirl, bolster-rail, bolster-case, and bearings in section. Fig. 2 is an elevation showing a modification of the step-support.

In Fig. 1 it will be seen that the step-bearing *a* is suspended within the bolster-case *b* by means of the thin connecting-sleeve *c*, the upper end or connection of the sleeve being enlarged and closely fitted within the bolster-case *b*, and fixed therein so that it shall have no movement at that point. Below such fixed point the walls of this sleeve are made of such a thickness that they are elastic or flexible, and will spring sufficiently to permit the step-bearing to yield to the lateral pressure of the foot of the spindle *s*.

It is obvious that if the step-bearing were left entirely free to move laterally without restraint, as heretofore, it would strike from side to side and would lack the necessary lateral resistance to steady the spindle against gyration. With this construction, however, the elastic support *c* combines the very important and double function of permitting the step-bearing to yield to the foot of the spindle, whenever such yielding is necessary, to accommodate the spindle and its load, and at the same time the support offers a sufficient resistance to such movement to steady the spindle against gyration and limit the movement, so that no contact can be had with the interior of the bolster-case.

In order that the full benefit of this construction may be had the spindle *s* is tapered upward to a point above the plane of the bol-

ster-neck *e*, as shown, so that the entire bolster-bearing surface shall be located above the rigid lateral support of such neck, and the bolster-bearing *d* is thereby not only much less dead to the pressure of the spindle than if located within the rigid bolster-neck, but it is enabled to yield slightly by reason of its own elasticity, and thus conform to the movement of the step below. The extent of this movement, required to accommodate the spindle and its load, is much less at *d* than at *a*, as the center of motion will always be at a point within the plane of the band-groove *g*.

It is obvious that the extent or degree of flexibility to be allowed the parts *c* and *d* can easily be regulated in accordance with the bobbin-load to be carried by the spindle. I do not limit myself to any particular means of securing such flexibility, as I may secure that function either by forming the parts from thin metal, as shown in Fig. 1, or by grooving them spirally, as shown in Fig. 2, or by the use of a non-metallic and flexible material, such as wood or vulcanized fiber.

The bolster-bearing *d* is secured to the bolster-case by means of its lower end or extension, *h*, which is driven firmly into the neck *e;* or it may be screwed in, if preferred. By thus fixing the bolster to the case no looseness or play is allowed it, and as it cannot yield at the plane of the band-pull the spindle is maintained in a permanent vertical position with relation to the ring. It also operates to support the upper end of the bolster in a positive manner, so that no movement can be had there except from its own elasticity, and such elasticity co-operates with the step-bearing to steady the spindle against gyration. I do not limit myself to the application of the elastic step with such a bolster, as I may use such improved step-bearing in connection with a loose or rocking bolster-bearing, if preferred. I consider the fixed bolster-bearing as the most desirable, however.

It will be seen that the bearings *a* and *d*, Fig. 1, have no movement in common, but are entirely independent in operation, although formed for convenience from one piece.

I claim—

1. A spindle and its sleeve-whirl and a closed bolster-case or support therefor provided with a bolster-bearing for said spindle, and provided, also, with an independent step-bearing having an elastic extension or sleeve fixed at its upper end within the bolster-case and adapted to suspend the step-bearing within such case and at the same time permit the said step-bearing to yield laterally with the foot of the spindle, as set forth.

2. A spindle and its sleeve-whirl, a closed bolster-case therefor, and a bolster-bearing fixed to the said case and having its bearing-surface located wholly above the plane of such case, combined with an independent step-bearing suspended within the bolster-case by means of an elastic or flexible connecting-sleeve fixed at its upper end within the bolster-case and adapted to suspend the step-bearing in a flexible or elastic manner, as set forth.

3. A spindle and its sleeve-whirl and a closed bolster-case therefor provided with a compound bearing-tube for the said spindle, consisting of an upper part or section fixed to the bolster-case and adapted to afford a bolster-bearing, a lower part or section to receive the foot of the spindle and afford a step-bearing, and an intermediate elastic or flexible part or section adapted to suspend the said lower section within the bolster-case and at the same time permit such section to yield laterally with the foot of the spindle, as set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CHARLES H. CHAPMAN.

Witnesses:
J. R. GRAY.
WILLIAM BROWN.