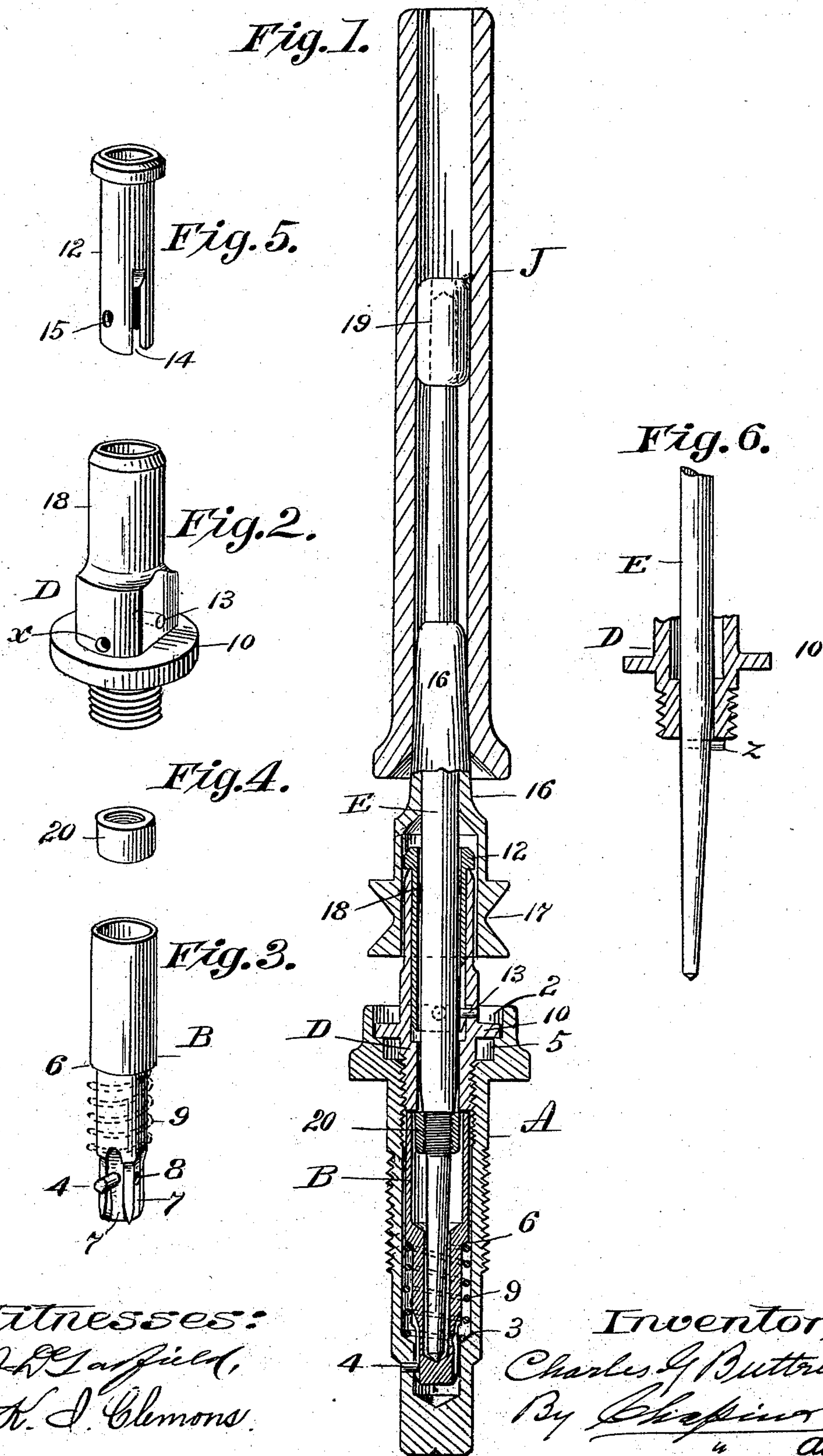


(No Model.)

C. G. BUTTRICK.
SPINNING MACHINE SPINDLE.

No. 505,507.

Patented Sept. 26, 1893.



Witnesses:
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UNITED STATES PATENT OFFICE.

CHARLES G. BUTTRICK, OF HOLYOKE, MASSACHUSETTS.

SPINNING-MACHINE SPINDLE.

SPECIFICATION forming part of Letters Patent No. 505,507, dated September 26, 1893.

Application filed September 15, 1892. Serial No. 445,958. (No model.)

To all whom it may concern:

Be it known that I, CHARLES G. BUTTRICK, a citizen of the United States, residing at Holyoke, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Spinning-Machine Spindles, of which the following is a specification.

This invention relates to spindles for spinning machines, the object being to provide an improved construction of spindle, bolster, step, and bolster case, all as hereinafter fully described, and more particularly pointed out in the claims.

In the drawings forming part of this specification, Figure 1 is a sectional view of the spindle-step, bolster and step-tube, or case, and bobbin, a partly sectional view of the whirl and its hub, and a side elevation of the spindle, all illustrating a spindle and co-operating parts, embodying my improvements. Figs. 2, 3, and 5, are perspective views, respectively, of the bolster, the step, and the bolster-bushing. Fig. 4 is a perspective view of a spindle-collar, below described. Fig. 6 illustrates a modification, fully described below.

In the drawings A is the bolster-tube or case which receives the spindle-step and bolster. Said tube has a cup-shaped formation, 2, at its upper end, and thereat is screw-threaded internally to receive the bolster, as below described, and its lower end is fitted to receive the spindle-step, and a spring on the latter, and to this end said tube is provided with a concentric shoulder, 3, on its inner wall, a little above its lower end on which the lower end of said spring rests, and a pin, 4, is fixed in one side of said tube near said lower end which constitutes an inwardly extending projection on said inner wall with which the spindle-step engages to prevent the latter from turning. A shoulder, 5, around the inner wall of said cup having a diameter coinciding with that of the inner wall of said cup, 2, serves as a base against which the bolster is screwed, and the screw-thread, shown on the outside of the said tube, provides means for suitably securing the same to a supporting rail of a spinning machine. It will be seen that the said shoulder, 5, occupies a position at some distance, laterally, from the axis of the bolster, and above the base of said cup, that it affords a rigid sup-

port for the bolster and spindle; against the lateral deflection of the latter by the strain of the spindle-driving band on the whirl of the spindle.

The spindle-step, B, is of suitable tubular form to receive the lower end of the spindle, and the outer surface thereof is provided with a shoulder, 6, which serves as an abutment for the upper end of a spring, 9, and the lower end of the step has one or more grooves, 7, extending upward thereon, with either one of which the said pin or projection, 4, in the tube, A, may engage for the purpose above set forth. Said pin, 4, is shown in Fig. 3 separate from the tube, A. One or more holes, 8, are made through the wall of the step, B, to permit the escape of sediment therefrom, and to permit oil to circulate therethrough to or from the tube, A. The grooves, 7, in the step, B, permit the step to move up and down while held by the pin, 4, from turning. A coil spring, 9, (shown in dotted lines in Fig. 3) is placed on the step, B, between the shoulders, 6 and 3 on said step and on the tube, A, respectively, which serves to lift and hold the step constantly against the lower end of the spindle. Said spring also acts with sufficient lifting force to carry the spindle upward to a limited degree, and to hold the upper end of the step against the lower end of the bolster as shown.

The bolster, D, is of suitable tubular form to receive the spindle, and is provided with a flange, 10, which bears against the shoulder, 5, on the tube, A, and effectually excludes all dirt and dust from the latter, and the lower end of the bolster is threaded to screw into the upper end of said tube. The bolster, D, extends upwardly from the flange, 10, sufficiently far to provide an adequate support for the spindle and to enter within the whirl-sleeve on the spindle, as shown, and prevent dust from entering the bolster at its upper extremity. This last named part of the bolster is provided with a tubular bushing, 12, (Fig. 5) of brass or similar bearing-metal, having an annular collar thereon, as shown, engaging with the upper end of the bolster and suspending it in the latter, said bushing being removable for renewal when necessary. To that end a pin, 13, is fixed in the side of the bolster, one end of which projects slightly

beyond the face of the inner wall thereof to prevent the bushing from turning by contact with the spindle, said bushing, as shown, having one or more slots, 14, in its lower end in which said pin engages, and one or more oil holes, 15, which register with oil holes α in the adjoining walls of the bolster. The opposite sides of the bolster, near said flange, 10, are preferably flattened slightly to provide for applying a wrench thereto for screwing the bolster in and out, and suitable oil hole, or holes, are made through the side of the bolster, whereby the spindle and the step, and the parts within and above the tube, A, may be easily supplied with oil. After the bolster is screwed into the tube, A, as aforesaid, with its flange, 10, against shoulder, 5, that part of the cupped end of said tube which extends above said flange constitutes an oil receptacle in communication with the said oil hole or holes through the sides of the bolster, which receptacle retains any surplus oil, thereby preventing waste and tending to cleanliness.

The spindle, E, has fixed thereon the whirl-hub, 16, with which the whirl, 17, is integral, said hub carrying the whirl on its lower end which is chambered, as shown, to receive the upper end, 18, of the bolster, for the purpose above set forth. The spindle, above said whirl-hub, is made about one-half the usual length, and the upper end of the spindle is fitted to receive the spindle-head, 19, which is preferably of cylindrical form. Said head, 19, is so fitted to the tapered end of the spindle that it is easily removed and replaced by the hand, and is properly retained while the spindle is running, and when the bobbin is doffed, by reason of the corresponding taper-forms of spindle and of the hole in the head. The said spindle-head is made preferably of iron or similar metal, but if found desirable it may be made of hard wood, hard rubber, or aluminium thereby sensibly diminishing the weight thereof, and the tendency to vibration when the spindle shall be run at very high speed.

Just below the part of the spindle inclosed by the bolster, D, is a collar, 20, (see Fig. 4,) which is made preferably of brass, and is screwed onto the spindle. This collar is of such diameter that it enters the upper end of the step, B, when the several parts occupy their working positions, and its upper end abuts against the lower end of the bolster, D, and prevents the spindle from being accidentally withdrawn from the bolster and step during the operation of doffing, or when the spindle-head is taken off, or at other times. Said collar, 20, also obviates the employment of the "turn button" or hook heretofore fixed on the rail or step-tube, and extending above and to a position to engage with the upper side of the whirl, in order if the bobbin be given an unintentional upward movement, to retain it in place. The said spindle-retaining hook is inconvenient because of the tend-

ency of yarn-ends to become caught thereon, and it hinders easy access to the spindle-parts when cleaning them. If preferred, the said collar, 20, which is screwed onto the spindle, may be replaced by a pin, z , placed transversely in the spindle, (as shown in Fig. 6,) and arranged, as is said collar, to have such an engagement with the lower end of the bolster, by one or both projecting ends thereof, as will prevent the said lifting movement of the spindle. Either of said last described devices is efficient for locking the spindle in the case while the bolster is in the latter.

The bobbin, J, has its lower end bored to a slight taper conforming to that of the whirl-hub, 16, but above said tapered portion the bore is of uniform diameter. Thus the bobbin has such frictional engagement with the whirl-hub as to cause it to be rotated uniformly with the spindle. That portion of the bobbin above the whirl-hub is supported in line with the spindle by the engagement of the spindle-head, 19, with the inner walls of the bobbin.

The above described construction of the tapering whirl-hub, the bobbin, J, frictionally supported on said hub, with its lower end at some distance above the whirl, 17, and its uppermost portion supported by the short spindle, E, having the removable head, 19, thereon, is one which provides many practical advantages in running and in manipulation of the devices, among which are the following:

The clear space between the lower end of the bobbin and the enlarged part of the whirl-hub permits the bobbin to always come to such a frictional bearing on said hub as will invariably cause the bobbin to rotate coincidentally with the spindle, and thus insure a perfectly twisted yarn.

In doffing, the short spindle facilitates the easy removal of the bobbin.

The support of the bobbin by the spindle-head near a central point between its ends, provides such support where the yarn-load on the bobbin is greatest, and tends to prevent vibratory movements under high speeds.

In doffing it often occurs that the end of yarn leading from the spinning-ring is caught around the whirl-hub, and through carelessness of the operator more or less yarn-waste is so allowed to collect on the tapered part of said hub, that the bobbin cannot be brought to a proper bearing-connection with the hub, and said faulty connection results in uncertain rotation of the spindle and consequently slack-twisted and spoiled yarn. The remedy for this trouble is the removal of the waste yarn from the whirl-hub. To effect this the bobbin is first taken off. Then, if the spindle-head be fixed thereon, the said waste must be cut or broken in order to remove it. But with the spindle-head removable and the spindle secured in the bolster against upward movement, as herein shown and described, said waste can, by removing the spindle-head,

be drawn upward off from the spindle, thus saving much time as compared with breaking or cutting it off.

What I claim as my invention is—

5 1. The step case having a cup at its upper and an annular shoulder on its inner wall above the base of said cup, combined with the bolster engaging said case by a screw thread below the base of said cup, and hav-
10 ing a flange engaging the said shoulder in the casing, together with the spindle and operative connections, all combined substantially as described.

15 2. The spindle, the step, the whirl-hub fixed to the spindle and having a chamber therein, the step casing having the cup at its upper end on whose wall is a shoulder, 5, located above the base of said cup, the bolster screwing into said case and having a flange, 10,
20 bearing on said shoulder, and extending upwardly into said chamber combined and operating substantially as set forth.

25 3. The spindle, the step, the whirl-hub fixed to the spindle and having a chamber therein, the step case having the cup at its upper end on whose inner wall is a shoulder, 5, located above the base of said cup, the bolster extending upwardly into said chamber and screwing into said case and having a flange, 10,
30 bearing on said shoulder, and having a pin, 13, through its side, and the removable bolster-bushing, 12, having an annular collar thereon at its upper end engaging with the upper ex-

tremity of the bolster, and one or more longitudinal slots in its lower end and having a
35 slot engaging with said pin, combined and operating substantially as set forth.

4. The step case and the bolster having screw threaded engagement therewith, the spindle having a removable collar thereon
40 below the bolster, and the spring supported step in the step case bearing the spindle toward the bolster, all combined substantially as described.

5. The step casing, the steps therein of tubu-
45 lar form to receive the spindle and having a passage, 8, through its wall, the spring supporting the step and the projection from the casing to prevent the rotation thereof, the spindle having a collar within the step and
50 the bolster with which said collar engages, all combined substantially as described.

6. The step case with the bolster having screw-threaded engagement therewith the spindle having a removable collar below said
55 bolster, and the tubular step in said step case inclosing said spindle and collar, said step having a lubricating passage, and a spring surrounding said step above the lubricating passage and bearing upward on the step, all
60 substantially as described.

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Witnesses:

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