

W. C. MACOMBER.
Spindles for Spinning Machines.

No. 232,522.

Patented Sept. 21, 1880.

Fig. 1.

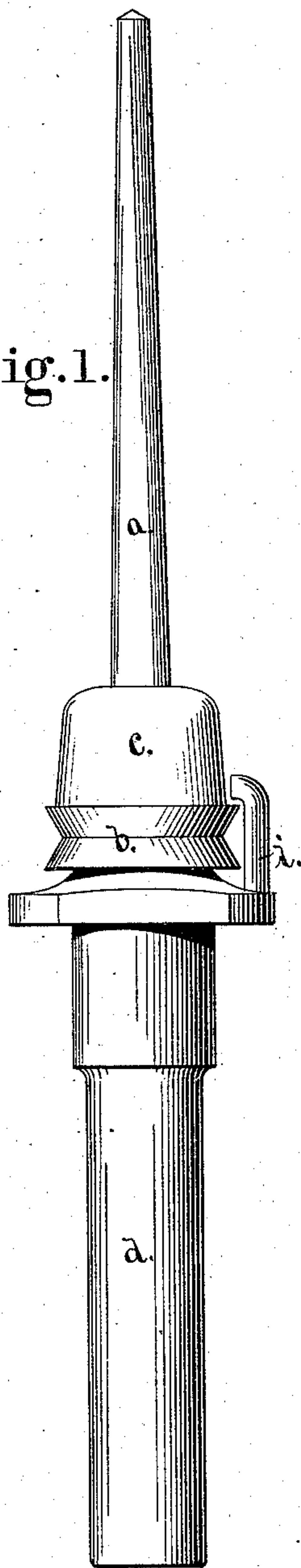
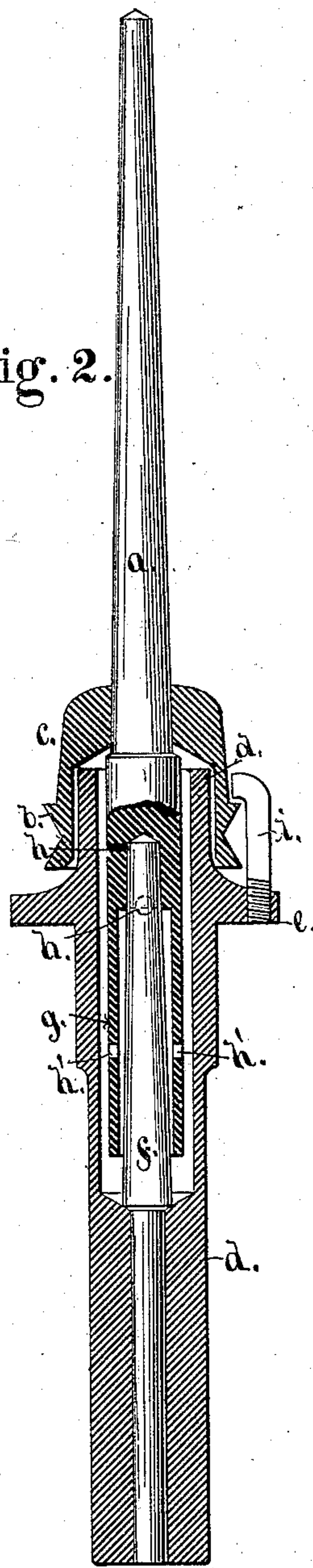


Fig. 2.



WITNESSES:

Joseph A. Miller Jr.
Wm. L. Cooper

INVENTOR:

William C. Macomber
by Joseph A. Miller Jr.

UNITED STATES PATENT OFFICE.

WILLIAM C. MACOMBER, OF BAL TIC, CONN., ASSIGNOR OF ONE-HALF OF
HIS RIGHT TO ADDISON S. HOPKINS, OF PASCOAG, R. I.

SPINDLE FOR SPINNING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 232,522, dated September 21, 1880.

Application filed December 31, 1879.

To all whom it may concern:

Be it known that I, WILLIAM C. MACOMBER, of Baltic, county of New London, and State of Connecticut, have invented a new and useful
5 Improvement in Spindles for Spinning-Machines; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

10 This invention has reference to improvements in spindles used for spinning and twisting machines on which a cop, tube, or bobbin is held by frictional contact and is driven with the spindle; and it consists in the peculiar
15 construction of the parts by which a live-spindle is supported on a dead-spindle extending upward through a tube forming part of and rotating with the live-spindle, and forming a step and bearing at a point practically on a
20 line with the center of the whirl, by means of which the live-spindle is driven.

It further consists in the combination, with the above, of the peculiar construction by which the bearing is lubricated, all of which
25 will be more fully set forth hereinafter.

Figure 1 is a view, showing the exterior of my improved spindle, whirl, and oil-chamber. Fig. 2 is a partly sectional view of the same.

30 In the drawings, *a* is the blade of the live-spindle, on which the bobbin is held by frictional contact, and is driven with the spindle.

b is the whirl on which the driving-band rests, by means of which the spindle is driven. The whirl *b* forms the lower part of the cup *c*,
35 by which the whirl is secured to the spindle.

d is the oil-reservoir, provided with the projection *e*, which rests on the bolster-rail.

f is the dead-spindle, on the point of which the live-spindle revolves. A short bearing is
40 formed on the sides of the dead-spindle *f*, just below the point. The dead-spindle extends to a point practically on a line with the center of the whirl *b*, and may be made to extend slightly above this point. The dead-spindle is
45 firmly fixed in the lower end of the oil-reservoir, and the free portion, extending upward, is preferably made tapering.

g is a tubular sleeve, which revolves with the live-spindle and extends downward, sur-

rounding the dead-spindle. It is made to 50 nearly touch the dead-spindle at its lower point, so as to bear only near the point of the dead-spindle.

The holes *h h*, at or near the bearings on the dead-spindle, are made in the sleeve for the 55 purpose of drawing out the oil by centrifugal force, and thus allowing the oil to rise within the tube *g* to the bearing by the difference in atmospheric pressure thus created; and when it is desirable to bring the tube closer to the 60 dead-spindle near its base, then the holes *h' h'* may be made in the tube *g*, so that the oil can enter the interior space and flow to the bearing at the apex of the dead-spindle. A portion of the oil-reservoir extends upward 65 above the bearing, and is surrounded by the whirl, to prevent oil from flowing over the top edge of the oil-reservoir when the spindle is in operation.

The oil-chamber is larger than the spindle *a* 70 or tube *g*, and forms no bearing or bolster for the same, the only bearing being on the dead-spindle.

The oil drawn out by the centrifugal force from the hole or holes *h* runs down between the 75 tube *g* and the walls of the oil-reservoir, and as the tube provided with the holes *h h* at or near the bearing acts as a centrifugal pump, the oil is raised above its natural surface as long as the lower end of the tube *g* is submerged, 80 or, when the holes *h' h'* are used, as long as these are below the surface of the oil. The lubrication must therefore be perfect at all times, and as the oil-reservoir contains a large quantity of oil the spindle can be run a long 85 time without oiling.

By placing the step and bearing on the apex of the dead-spindle neither dirt, grit, or other impurities can reach the same, and the spindle will run with the least possible friction; and 90 by placing this step practically on a line with the center of the whirl, and therefore on a line with the driving-band, all binding and extra friction caused by the pull of the band is avoided; and if still greater steadiness is desired, 95 then the tube *g* may be made of such length and weight as to balance the weight of the spindle when laid on a knife-edge at the cen-

ter of the whirl, or it may be made so heavy as to balance the spindle and the bobbin when partly filled with yarn.

i is a turn-button for securing the spindle and holding the same while doffing the bobbin.

The construction of the spindle is so simple that it may be clearly understood from the drawings by any one versed in the art.

Heretofore in spindles the bolster has been supported in the case by a ball and socket and the whole surrounded by a sleeve-whirl, so that the center of the whirl shall be on a line horizontally with the center of the ball, whereby the strain of the band on the whirl in no way interferes with the axial adjustment of the spindle and bolster in the case. The step may be carried in such devices in the lower end of the bolster, or may be formed in the stationary bolster-case, in which last construction the step must be made larger than the spindle, in order to admit of the said spindle moving laterally therein.

Further, live-spindles have been connected with a bearing upon dead-spindles; but such live-spindles have had extensions that had auxiliary bearings in the oil-reservoir or elsewhere, whereas in my spindle the live-spindle

is wholly supported upon the end of the dead-spindle, and is entirely devoid and independent of auxiliary or supplemental bearings.

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

1. The live-spindle *a*, its cap *c*, and whirl *b*, the dead-spindle *f*, extending into the live-spindle to a point in practically horizontal line with the center of the whirl to form the sole bearing therefor, and the oil-reservoir, containing such dead-spindle, combined and arranged substantially as described.

2. A live-spindle provided with an oil tube or sleeve, a dead-spindle bearing said live-spindle at a point on a line with the horizontal center of its whirl, an oil-reservoir receiving wholly within itself the dead-spindle, oil-tube, and bearing, and a cap and whirl extending down over and covering the top of the oil-reservoir, all combined and arranged substantially as shown and described.

WM. C. MACOMBER.

Witnesses:

CHAS. D. WEAVER,
E. F. WEAVER.