No. 628,523.

Patented July 11, 1899.

M. CAMPBELL.

SPINDLE.

(Application filed Oct. 12, 1898.)

(No Model.)

Fig. 1.

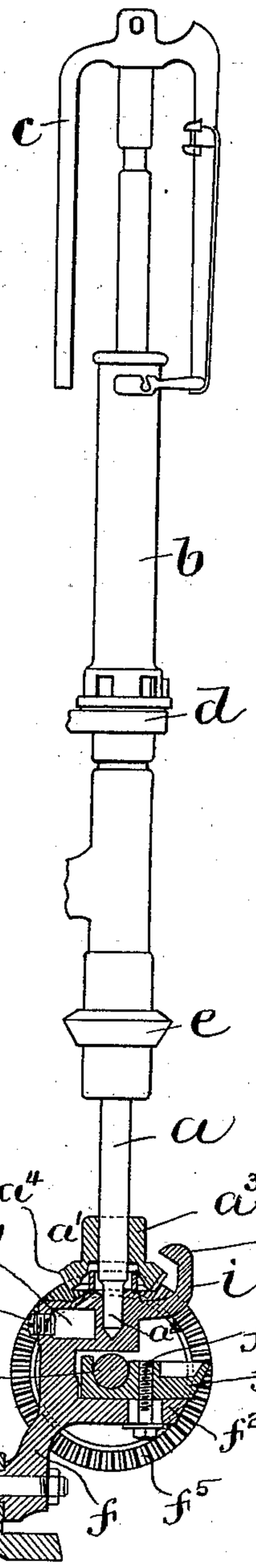

Fig. 2.

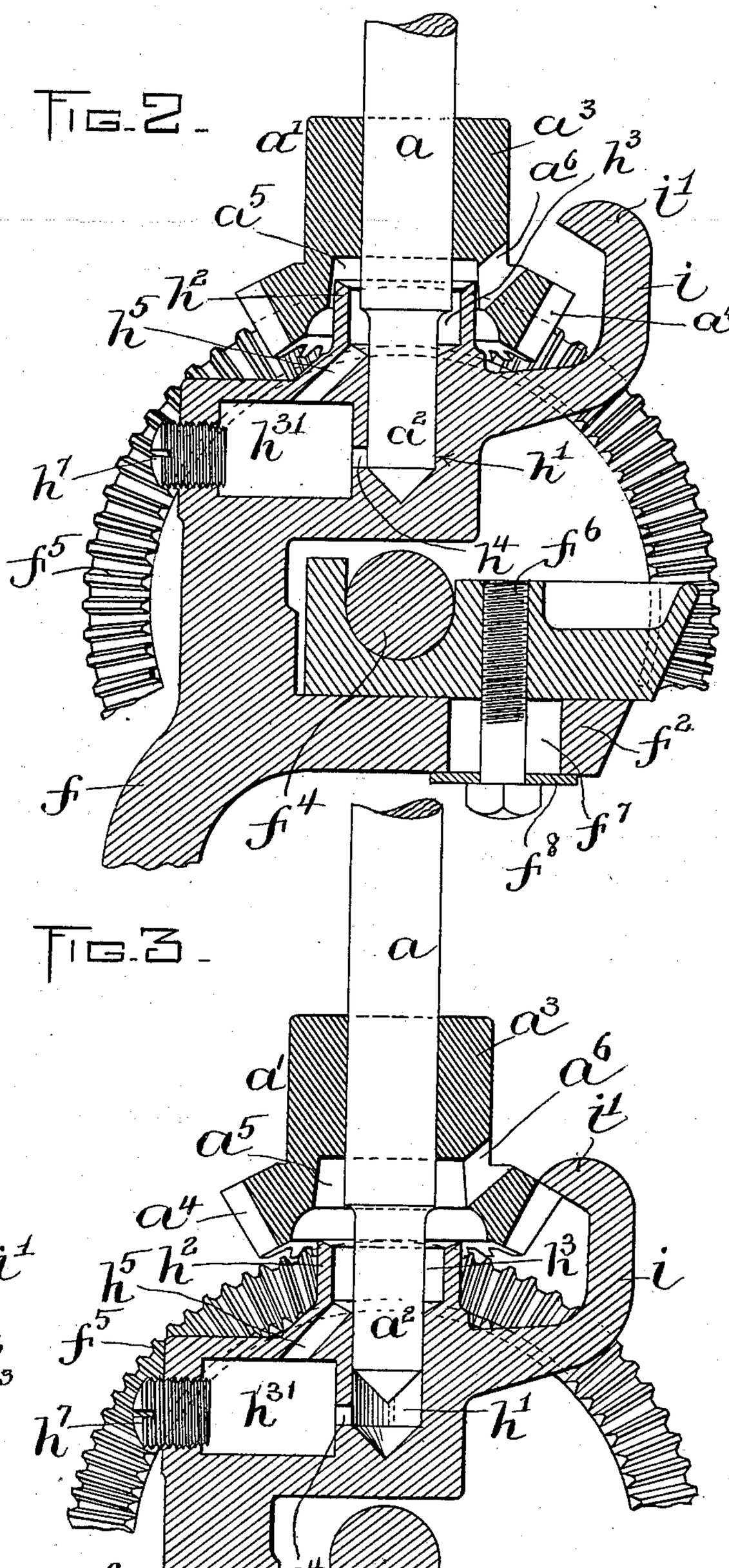

Fig. 3.

Witnesses:

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UNITED STATES PATENT OFFICE.

MALCOLM CAMPBELL, OF BOSTON, MASSACHUSETTS.

SPINDLE.

SPECIFICATION forming part of Letters Patent No. 628,523, dated July 11, 1899.

Application filed October 12, 1898. Serial No. 693,277. (No model.)

To all whom it may concern:

Be it known that I, MALCOLM CAMPBELL, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Spindles, of which the following is a specification.

This invention has relation to spinning machinery, and more particularly to spindles, having for its object to provide certain improvements in the same, whereby they may be run with a smaller expenditure of power than heretofore and may be thrown out of operation automatically in case they become enwrapped with lint or waste, to thereby prevent a conflagration.

The invention therefore consists of certain features of construction and relative arrangement of parts, all as fully illustrated upon the drawings now to be described in detail, and finally pointed out in the claims hereunto appended, whereby I am enabled to obtain the desired results hereinbefore referred to, as well as to increase the general efficiency of machines in which spindles are employed.

Reference is to be had to the accompanying drawings, and to the letters marked thereon, forming a part of this specification, the same letters designating the same parts or features, as the case may be, wherever they occur.

Of the drawings, Figure 1 represents a spindle and its step equipped with my invention. Figs. 2 and 3 represent enlarged sections through the lower portion of the spindle and the step.

Referring to the drawings, a indicates the spindle, b the bobbin, c the flier, d the bolster-rail, and e the bobbin-gear, all of which are of the ordinary construction. The bracket f is attached to the step-rail g in the ordinary way by a bolt f', and it is provided with the support f^2, on which rests the adjustable bearing f^3 for the shaft f^4, which imparts motion to the spindle a through the medium of the driving gear-wheel f^5 and the spindle-gear a'. The bearing f^3 is secured to the support f^2 by a set-screw f^6, passed through a slot f^7 therein and having its head bearing against a washer f^8.

The rear portion of the bracket forms a step h for the lower reduced end a^2 of the spindle, being provided with a socket h' to receive it. The step is further provided with an upwardly-projecting annular flange h^2, forming an annular chamber h^3 around the lower end of the spindle. There is also formed in said step an enlarged oil-reservoir h^{31}, which communicates by a duct h^4 with the lower portion of the socket h' and by an inclined duct h^5 with the chamber h^3. There is a clean-out aperture h^6, leading into the reservoir h^{31}, which is normally closed by a screw h^7. The spindle-gear a' is rigidly secured to the spindle, and it has a hub a^3 and the bevel-toothed portion a^4. It is provided in its hub with an annular chamber a^5, considerably greater in diameter than the spindle a and adequate to receive the flange h^2 on the step, as shown in Fig. 2, so as to form a cap for the chamber h^3.

Projecting out from the step is an arm i, which extends upwardly and then terminates in a hook i', lying over the spindle-gear. This arm is of such length as to permit of the spindle being raised to the position shown in Fig. 3, where it is out of engagement with the gear f^5.

By the construction thus described I am enabled to obtain numerous important results. In the first place I secure a proper lubrication of the spindle by means of the oil which is stored in the reservoir, but which passes up from the socket, while the spindle is rotating, into the chamber, and from thence to the reservoir h^{31}, and returns to the bottom of the socket h' to traverse again the same path. In this way I obtain a constant circulation of the lubricant, and by reason of the large volume which I am enabled to use it does not become gummed or sticky and permits the rotation of the spindle with the least possible expenditure of power. When the oil reaches the annular chamber h^3, it is prevented from leaving it by the spindle-gear a', which forms a cap, as hereinbefore described, said cap likewise preventing lint and foreign material from entering said oil-chamber. When the supply of lubricant becomes diminished, the spindle-gear a' is raised and oil is introduced into the annular chamber h^3 through an aperture a^6, extending through the hub of the said gear, said aperture being practically closed, however, by the flange h^2 when the spindle and its gear are returned to normal position.

It frequently occurs that lint and waste material become wrapped about the spindle, so that when the bolster is raised and lowered it becomes heated by its frictional engagement therewith and sometimes causes a conflagration. I arrange, therefore, for the spindle to have a limited movement relatively to its step, whereby the upward movement of the bolster in case the spindle be wrapped about with lint or waste will lift the spindle, and consequently move the spindle-gear out of engagement with the gear-wheel f^5, so that the spindle will immediately stop and the attendant become apprised of the condition of affairs.

Having thus explained the nature of the invention and described a way of constructing and using the same, though without attempting to set forth all of the forms in which it may be made or all of the modes of its use, I declare that what I claim is—

1. A step for a spindle having a socket enlarged at its upper portion to form an annular chamber surrounding the spindle, an oil-reservoir below the plane of said chamber, and ducts connecting said reservoir with said socket and said chamber in combination with a gear on the spindle having an aperture to permit of the introduction of oil into said chamber.

2. A step for a spindle having a socket enlarged at its upper portion to form an annular chamber surrounding the spindle, an oil-reservoir below the plane of said chamber, and ducts connecting said reservoir with said socket and said chamber, in combination with a gear on the spindle having a portion to close said chamber, said gear being movable up from said chamber and having an aperture to permit of the introduction of oil into said chamber.

3. The combination of a driving-gear, a spindle having a gear intermeshing with the first-mentioned gear, and a step having a stop to limit the upward movement of the spindle-gear, said stop being normally arranged at a distance from said gear, whereby it will allow said spindle-gear to be moved automatically out of engagement with the driving-gear, for the purpose described.

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

MALCOLM CAMPBELL.

Witnesses:
C. F. BROWN,
A. D. HARRISON.