(No Model.)

M. CAMPBELL.

DIFFERENTIAL MOTION FOR DRIVING BOBBINS OF SPINNING FRAMES.

No. 553,667. Patented Jan. 28, 1896.

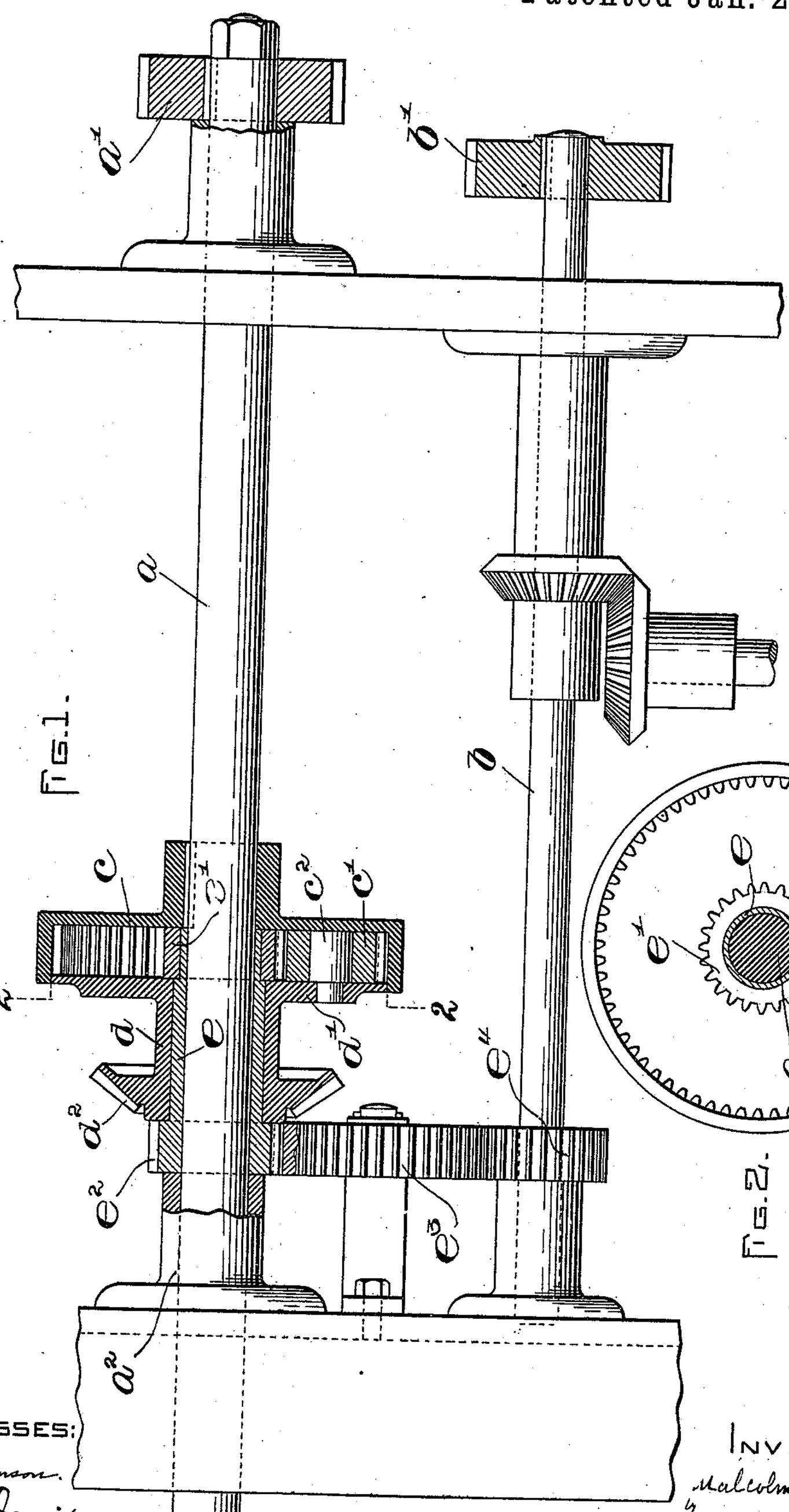

FIG. 1.

FIG. 2.

WITNESSES:
A. D. Harrison.
F. P. Davis.

INVENTOR:
Malcolm Campbell
by
Wright, Brown & Quinby
attys

UNITED STATES PATENT OFFICE.

MALCOLM CAMPBELL, OF WOONSOCKET, RHODE ISLAND.

DIFFERENTIAL MOTION FOR DRIVING BOBBINS OF SPINNING-FRAMES.

SPECIFICATION forming part of Letters Patent No. 553,667, dated January 28, 1896.

Application filed July 2, 1894. Serial No. 516,323. (No model.)

To all whom it may concern:

Be it known that I, MALCOLM CAMPBELL, of Woonsocket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Differential Motions for Driving Bobbins of Spinning-Frames, of which the following is a specification.

This invention relates to differential motions such as are employed in spinning machinery, including slubbing and roving frames, for the purpose of driving the bobbin at a speed which varies in accordance with its changing diameter—that is, decreasing the speed of the bobbin in exact ratio to the increase in its circumferential surface produced by the winding on of the roving or sliver.

The prime object of the present invention is to provide much more simple means for bringing about the desired result than heretofore found necessary.

An embodiment of the invention is illustrated in the accompanying drawings, which form part of this specification.

Figure 1 shows a sufficient portion of the mechanism of a roving-frame to illustrate the application of my invention, some of the parts appearing in elevation and others in section. Fig. 2 shows a section on line 2 2 of Fig. 1.

It has not been deemed necessary to give an illustration and description of a complete roving-frame, and therefore sufficient illustration only is given to identify the parts of the frame with which the invention is directly concerned.

The letter a designates the main driving-shaft, which is journaled in boxes a^2 on portions of the supporting framework, and b designates the cone-driven shaft, the said shafts being equipped with pinions a' and b' for connection with the top and bottom cone-pulleys in any of the well-known ways.

On the shaft a is affixed an internal gear c, and a pinion c' intermeshing with said gear is mounted on a stud c^2 fastened in the flange d' of a sleeve d, which loosely surrounds the shaft. The flange d' fits in the periphery of the internal gear, so as to protect the same from dirt and dust, but it has no rotative engagement with said internal gear, the latter being made smooth where the flange occupies it. The sleeve d carries affixed to it or formed with it a bevel-gear d^2, which is designed to connect through any of the well-known means with the bobbins. A sleeve e fits loose between the sleeve d and the shaft a, and carries on one end a gear e' in mesh with the pinion c', and on the opposite end a gear e^2 meshing with an intermediate gear e^3, which in turn meshes with a gear e^4 affixed on the shaft b.

It will now be seen that any rotation of the sleeve d derived from the shaft a must depend for its speed on the relative movement of the gears c and e'. The speed of the gear c is constant, being directly connected with the driving-shaft, and the speed of the gear e' is variable, being driven through the medium of the cone-pulleys. At the commencement of the winding of a set of bobbins the gear e' is driven at its maximum speed; but with each shifting of the strap on the cone-pulleys the speed of said gear e' is decreased, and correspondingly that of the sleeve d, so that with the completion of each build of rovings the speed of the bobbins decreases commensurately with the increase in circumferential surface of the bobbins.

The extreme simplicity of the construction over its predecessors will be immediately recognized by those skilled in the art.

In assembling the parts the sleeve e carrying the gear e^2 is placed on the shaft and carried against the box a^2, the sleeve d is slipped over the sleeve e and carried against the gear e^2, the gear e' is affixed to the sleeve e and confines the sleeve d thereon, and the internal gear c is brought up against the end of the sleeve e and the gear e' and keyed to the shaft. It is to be noted that the keying of the internal gear to the shaft locks all the parts in place against endwise movement.

I am aware that a differential gearing of the form shown is not broadly new with me, and I do not therefore make claim to the same.

What I claim as my invention is—

1. In a spinning-frame, the combination of the driving-shaft, an internal gear affixed thereto, a loose sleeve adapted for connection with the bobbins and having a flange fitting within the periphery of the said internal

gear, a pinion carried by said flange and meshing with the internal gear, a loose inner sleeve carrying a gear in mesh with said pinion, the cone-driven shaft, and gearing connecting the latter with said inner sleeve.

2. In a spinning frame in combination, the driving shaft, a sleeve loosely mounted thereon and fitted up to one of the bearings of the shaft, a gear fast upon each end of said sleeve, the cone driven shaft, gearing connecting the latter with one of the gears of the said sleeve, a second sleeve fitted loosely on the first named sleeve, and confined by the gears on the inner sleeve and adapted for connection with the bobbin, an internal gear fixed to the shaft, and a pinion carried by a flange on the outer sleeve, and meshing with the internal gear and the other of said gears on the inner sleeve, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses, this 29th day of June, A. D. 1894.

MALCOLM CAMPBELL.

Witnesses:

HORACE BROWN,

FRANK PARKER DAVIS.