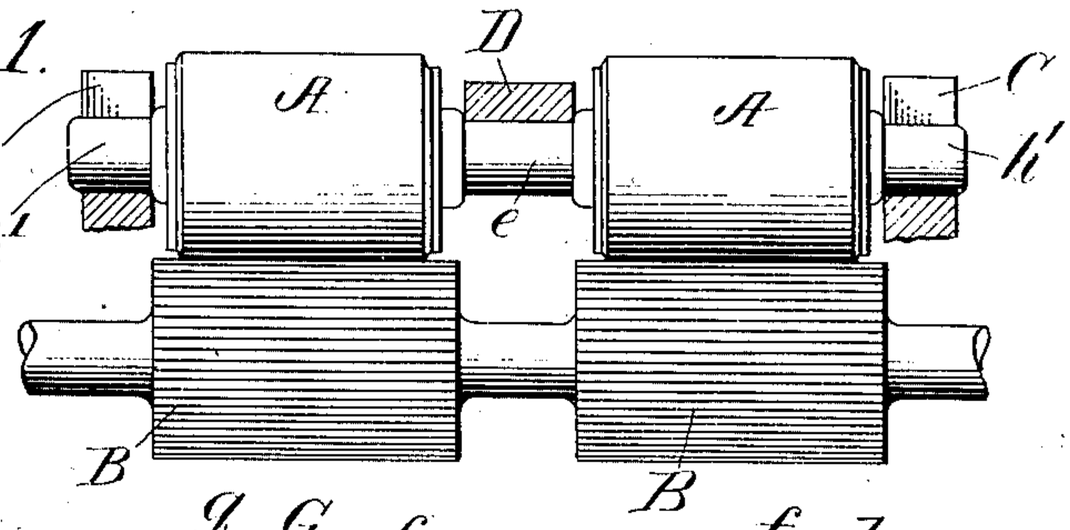
No. 840,010. PATENTED JAN. 1, 1907.

W. G. RAGSDALE.

TOP ROLL FOR SPINNING MACHINES.

APPLICATION FILED MAY 2, 1906.

Fig. 1.



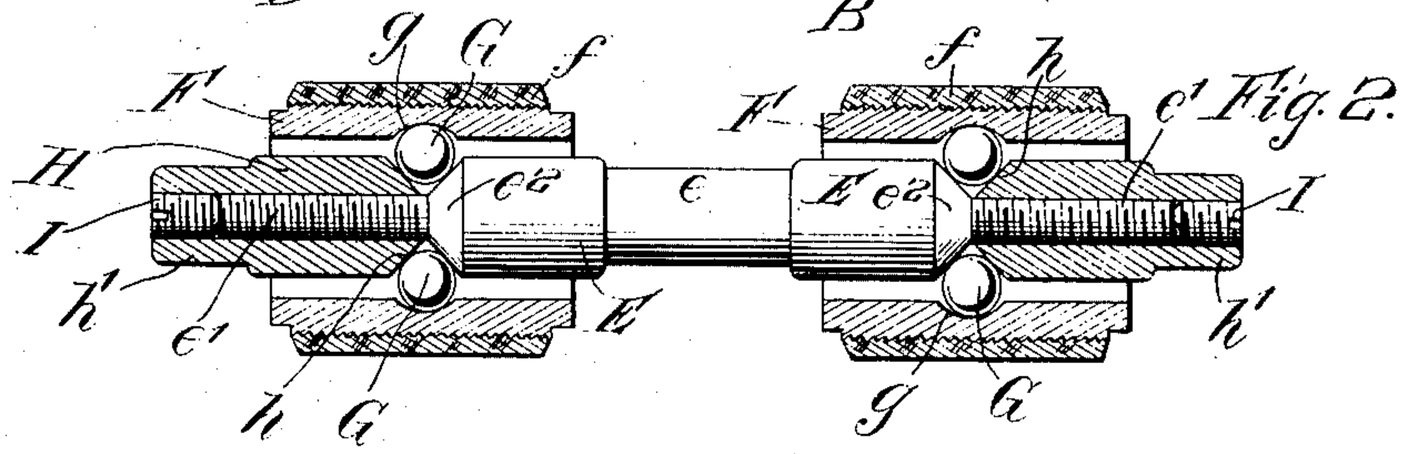


Fig. 3.

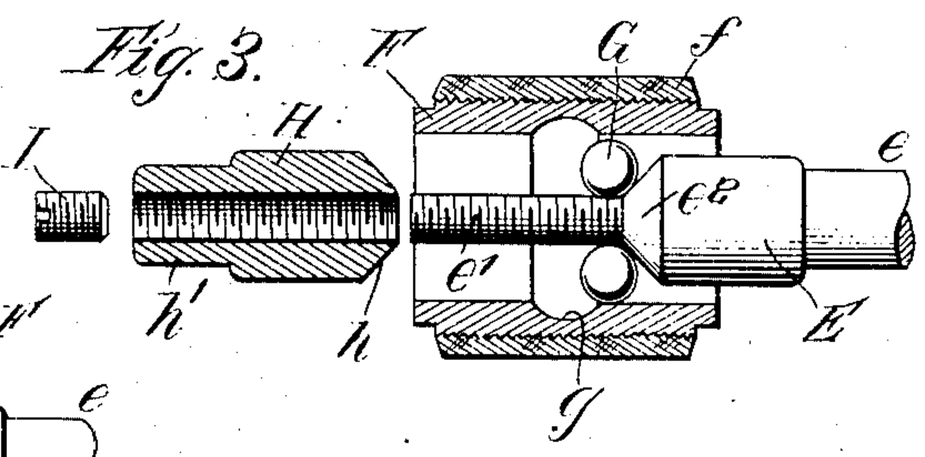


Fig. 4.

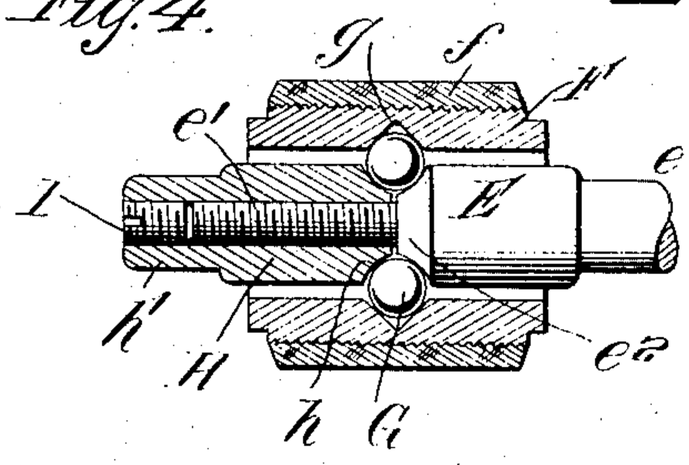


Fig. 5.

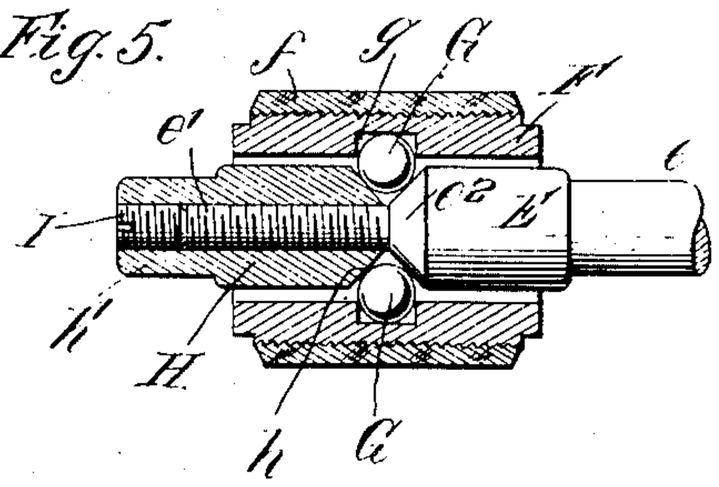
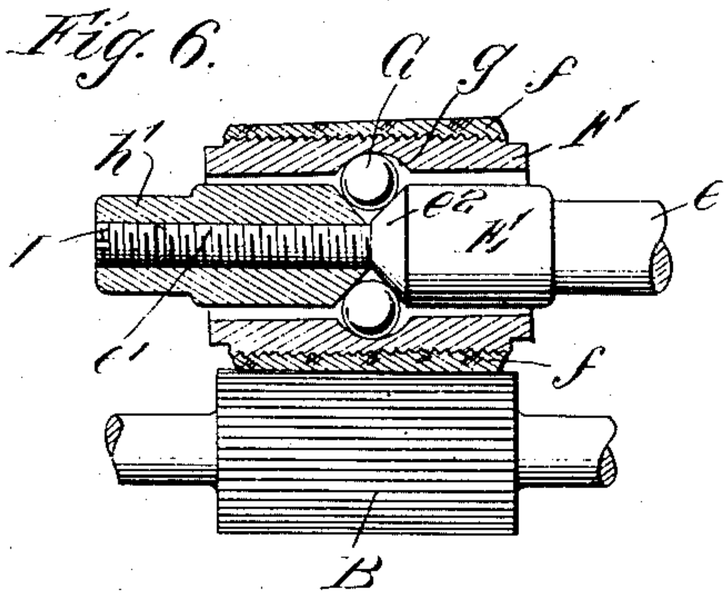


Fig. 6.



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UNITED STATES PATENT OFFICE.

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TOP ROLL FOR SPINNING-MACHINES.

No. 840,010. Specification of Letters Patent. Patented Jan. 1, 1907.

Application filed May 2, 1906. Serial No. 314,822.

To all whom it may concern:

Be it known that I, WILLIAM G. RAGSDALE, a citizen of the United States, residing in Jamestown, in the county of Guilford and State of North Carolina, have invented certain new and useful Improvements in Top Rolls for Spinning-Machines, of which the following is a specification.

My invention relates to certain improvements in what are called "top rolls" employed in spinning frames, mules, speeders, drawing-frames, and other like machinery; and the object of my invention is to provide a top roll which will not require the use of a lubricating-oil, but will run freely with a minimum amount of friction, will adjust itself to irregularities in the formation of the roll, and may be easily assembled, taken apart, or adjusted.

When oil is used to lubricate the rolls, there is danger of the leather or rubber covering usually employed becoming injured by the creeping of oil from the bearings to the surface of the roll, and it also sometimes happens that the cotton or yarn passing between the rolls is made to adhere thereto by the escaped oil. By employing ball or roller bearings the use of oil can be dispensed with and yet friction can be reduced to a minimum, so as to allow the roll to run with perfect freedom and without injury. In applying ball-bearings to top rolls it is desirable that the construction of the bearing shall be as simple as possible consistent with efficiency, that proper adjustments shall be provided for, and that the parts may be easily assembled or taken apart. It is also desirable that the rolls shall be capable of adjusting themselves to compensate for any irregularities in their coverings in order that the top rolls may grip their companion fluted rolls throughout the entire length of the top-roll coverings. All of these advantages are present in my improved ball-bearing top roll, which is illustrated in the accompanying drawings, in which—

Figure 1 shows a front elevation of a pair of fluted rolls and their companion top rolls with my improvements applied. Fig. 2 shows a longitudinal central section through a pair of my improved top rolls. Fig. 3 shows in section some of the parts of the top roll detached from the other parts. Fig. 4 shows a longitudinal section of one modification, while Fig. 5 is a similar view of another modification. Fig. 6 shows how a top roll having a covering of uneven thickness will adjust itself relatively to a fluted roll, so that the covering may grip the fluted roll from end to end.

In Fig. 1 I have shown a pair of top rolls A arranged parallel with a pair of fluted rolls B in the usual way. The frame in which the top rolls are supported is indicated at C, and the usual saddle is indicated at D. The arbor E is formed with a central portion *e* to receive the saddle, and it has at each end a screw-threaded spindle *e'* of reduced diameter, connected with the central portion of the arbor by a tapered shoulder e^2. The shells F may be covered with rubber, leather, or other suitable material *f*, as usual. Preferably the shells are formed with fine threads, as shown, and the covering is screwed on in such manner as to fit closely and tightly without any liability of slipping endwise or turning on the shell. Each shell is formed on its inner side midway between its ends with an annular groove *g* to receive balls or rollers G, which bear on the tapered shoulders e^2 and are held in contact therewith by sleeve-nuts H, the inner ends *h* of which are tapered correspondingly with the tapered shoulders. I may form the groove *g* with curved walls, as shown in Fig. 2, with flat, inclined, or V-shaped walls, as illustrated in Fig. 4, or I may make the groove rectangular in cross-section, as indicated in Fig. 5. The shoulders e^2 and the tapered ends *h* may have flat inclined surfaces, as shown in Fig. 2, or they may be curved, as illustrated in Fig. 4.

The nuts H screw onto the spindles *e'*, and the balls are contained in the channels formed by the grooves *g* and the spaces between the ends *h* of the nuts and the shoulders e^2. The nuts are somewhat longer than the spindles, providing journals *h'*, and when screwed home leave spaces to receive tightening-screws I. When inserted, these screws bear firmly against the ends of the spindles and lock the nuts and spindles securely together. When the parts are assembled, as indicated in Fig. 2, the shells are free to revolve about the arbor and spindles with a minimum amount of friction. The nuts may be adjusted to any desired extent and firmly locked to prevent the balls being dislodged, while permitting them to have perfect freedom of movement.

The construction shown provides for a slight rocking movement which compen-

sates for any irregularity in the thickness of the covering *f*. Sometimes this covering is not exactly even, and so the top roll will not always bear evenly on the fluted roll; but by providing the rocking movement referred to these irregularities are compensated for. I have illustrated this feature of my invention in Fig. 6, where it will be observed that the covering *f* is made of different thickness. The drawings exaggerate somewhat this irregularity merely for clearness of illustration; but where any such irregularity occurs in the thickness of the covering the roll will rock sufficiently to allow its covering to bear against the fluted or channeled roll from end to end.

The drawings show the spaces between the nuts, arbor, and shells somewhat greater than in practice. This also is done in order to more clearly illustrate the construction. Ordinarily the bore of the shells is such as to provide very little space between the inner walls of the shells and the arbor and nuts, but sufficient to allow a very slight rocking movement to compensate for the irregularities in the covering before referred to.

Fig. 3 shows some of the parts separated, and by inspection of this figure it will be seen how easily the parts may be assembled or taken apart. In assembling the shell is first passed onto the spindle, balls are dropped in, as indicated, the spindle and arbor then being held vertically, and then the nut H is screwed home and the tightening-screw I applied. When the proper adjustment is made, the balls will be located as illustrated in Fig. 2. When thus assembled, the shells will be able to freely revolve and will have a slight rocking movement. The shells are of extremely simple construction and may be of any diameter. The construction shown provides a very simple way of holding the shells in place, preventing endwise movement thereof, and yet provides an antifriction-bearing, giving perfect freedom of movement.

I claim as my invention—

1. A top roll, comprising an arbor having a threaded spindle at one end and formed with a tapered shoulder at the inner end of the spindle, a nut screwing onto the spindle and having a tapered inner end, a shell formed with an annular groove on its inner side intermediate its ends and balls interposed directly between the shoulder and the tapered end of the nut and entering the groove of the shell.

2. A top roll, comprising an arbor having a spindle of reduced diameter on one end, a tapered shoulder between the spindle and the central portion of the arbor, a nut having a tapered inner end arranged on the spindle, balls interposed directly between the end of the nut and the shoulder of the arbor, and a roller-shell having an annular groove arranged midway between its ends and receiving the balls and which fits the arbor and nut loosely so as to provide a slight rocking movement on the balls.

3. A top roll, comprising an arbor having a threaded spindle at one end, and formed with a tapered shoulder at the inner end of the spindle, a nut screwing onto the spindle and having a tapered inner end, a locking-screw entering the nut and engaging the outer end of the spindle, a shell formed with an annular groove intermediate its ends and balls in the groove interposed directly between the shoulder and the tapered end of the nut.

4. A top roll, comprising an arbor having a central portion formed to receive a saddle and having threaded spindles at opposite ends, a tapered shoulder at the inner end of each spindle, a nut screwing onto each spindle and having a tapered inner end, a screw locking each spindle to its nut, and a shell at each end of the arbor formed with an annular groove intermediate its ends and balls in the groove interposed directly between the shoulders and the tapered ends of the nuts.

5. A top roll comprising a shell having an annular groove midway between its ends on the inside, an arbor or support for the shell having a groove coinciding with the groove in the shell and balls arranged in the groove of the arbor and the shell for preventing endwise movement of the shell and allowing a slight rocking movement thereof while permitting the shell to revolve about the arbor with a minimum amount of friction.

6. A top roll, comprising an arbor formed with threaded spindles at opposite ends, and with shoulders at the inner ends of the spindles, nuts screwing onto the spindles and having tapered inner ends and outer ends formed to provide journals for the roll, roller-shells formed with ball-receiving grooves intermediate their ends, and balls in the grooves interposed directly between the inner ends of the nuts and the tapered shoulders.

In testimony whereof I have hereunto subscribed my name.

WILLIAM G. RAGSDALE.

Witnesses:
J. S. SPENCER,
MAMIE GARDNER.