No. 684,119. Patented Oct. 8, 1901.

C. E. SMITH.

ROLL STIRRUP FOR DRAWING FRAMES.

(Application filed May 15, 1901.)

(No Model.) 2 Sheets—Sheet 1.

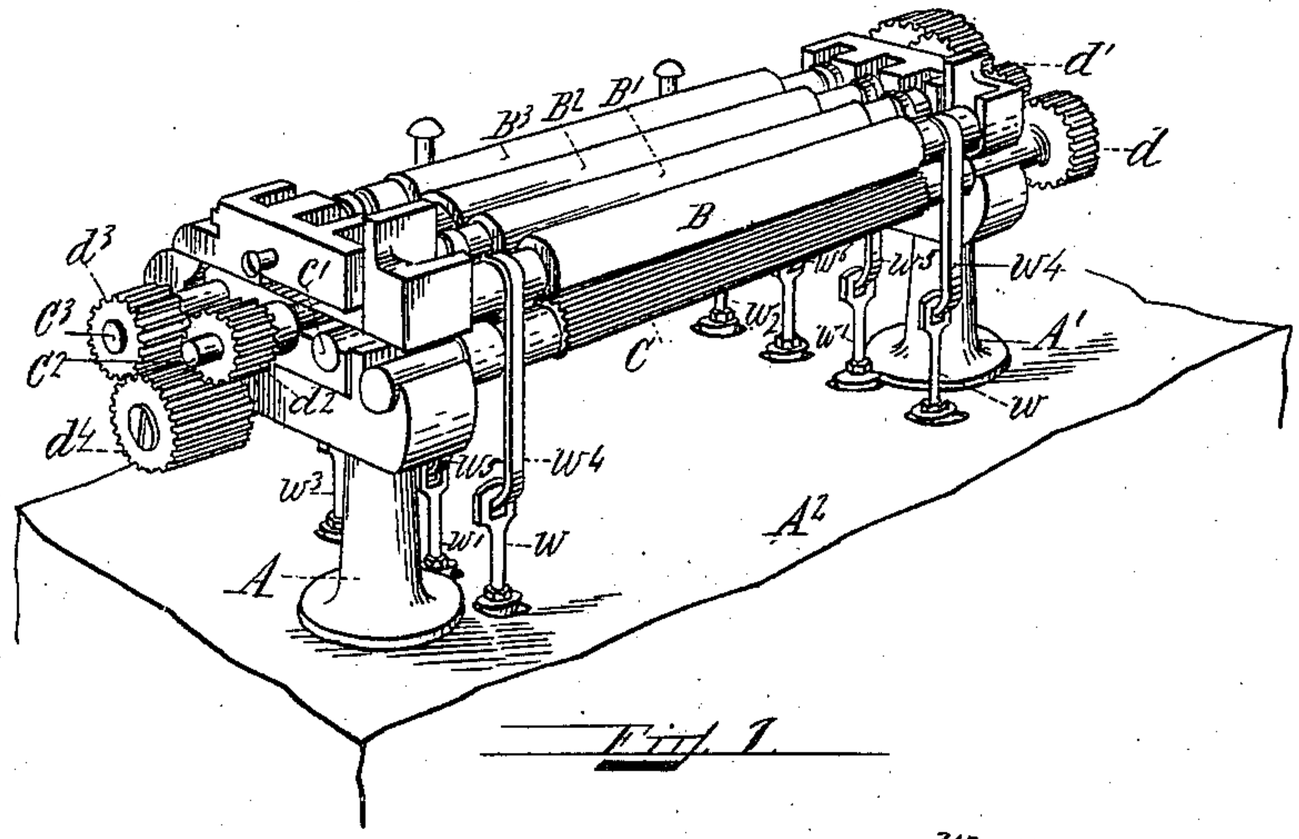


Fig. 1.

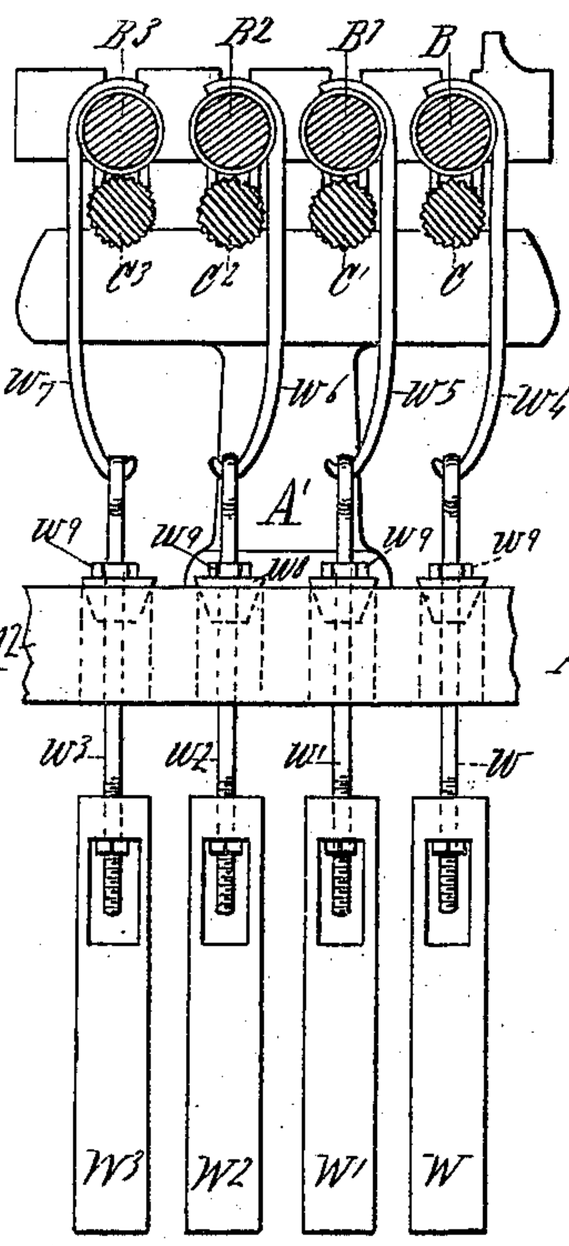
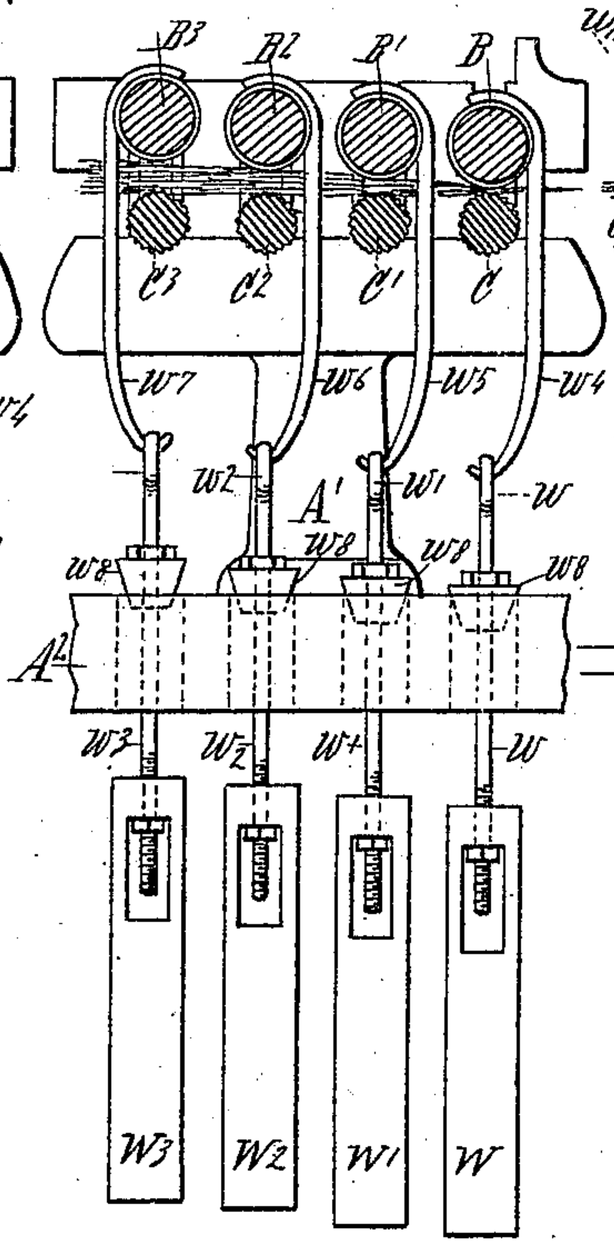


Fig. 2.



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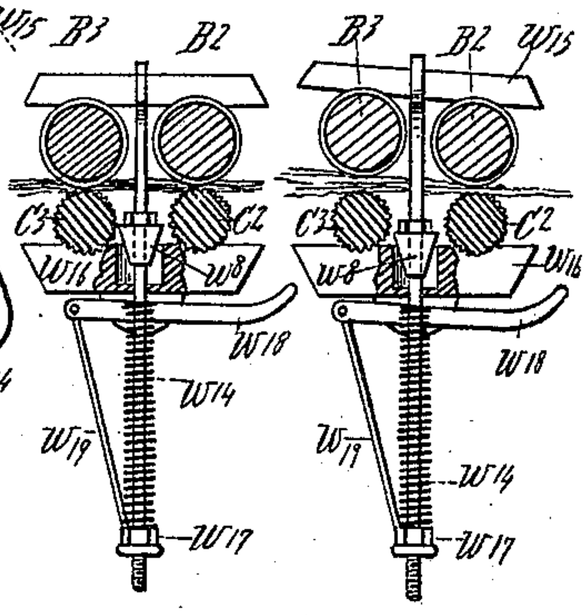

Fig. 16.

Fig. 15.

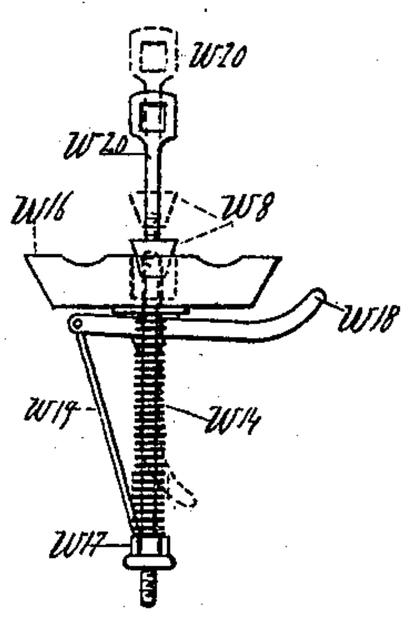

Fig. 14.

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ROLL STIRRUP FOR DRAWING FRAMES.

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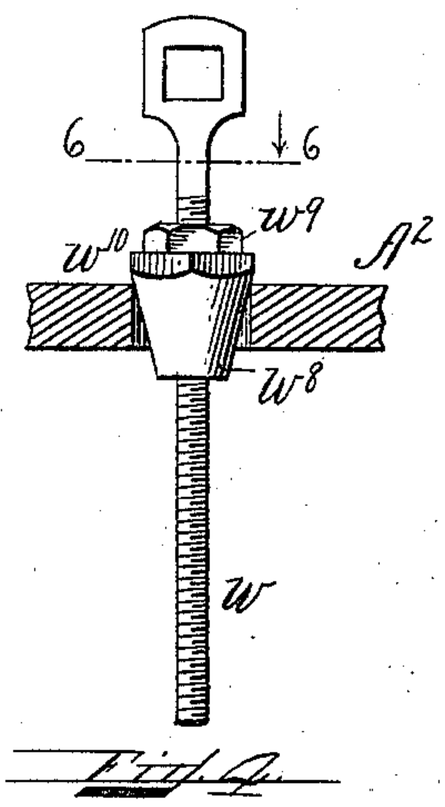
(No Model.) 2 Sheets—Sheet 2.



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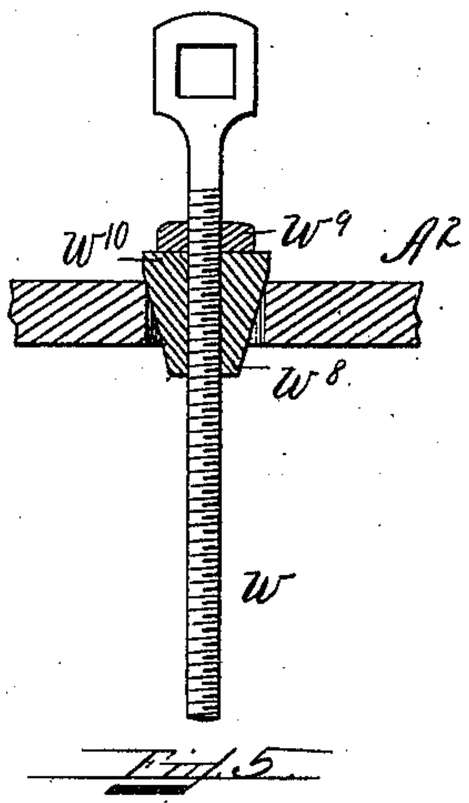

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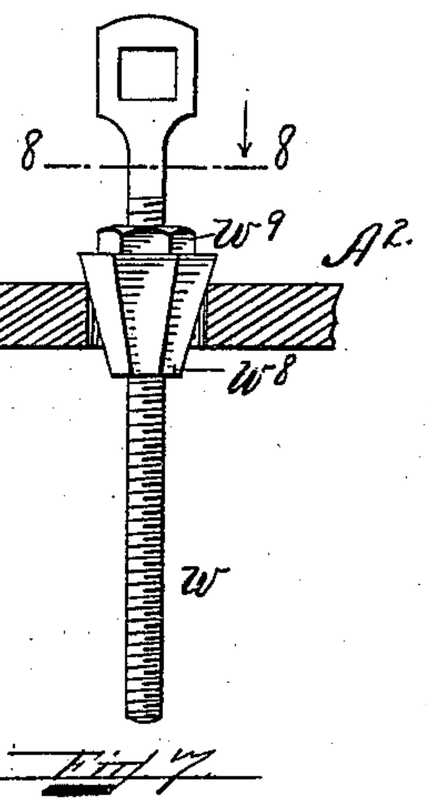

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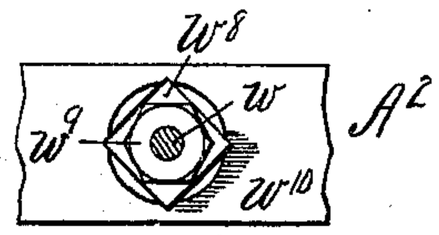
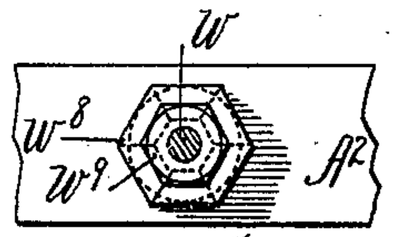


Fig. 6.



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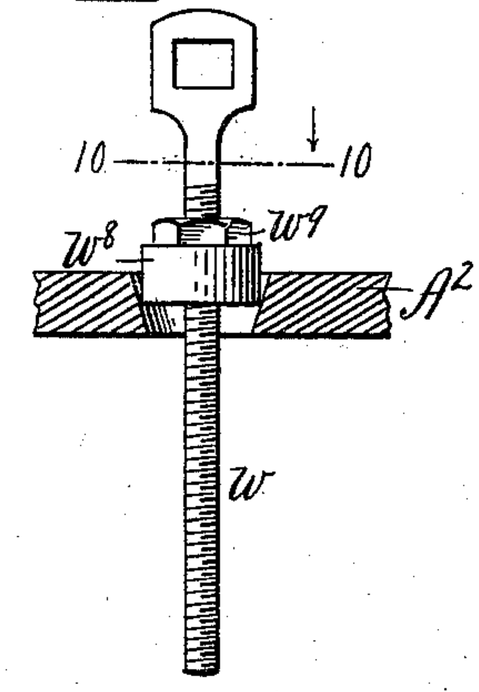

Fig. 9.

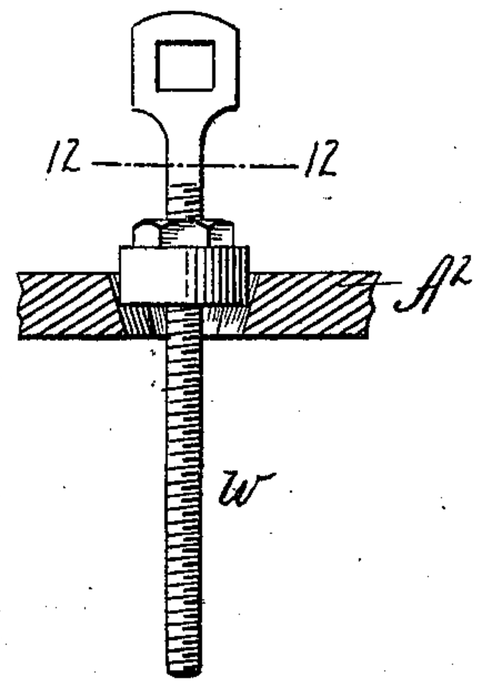

Fig. 11.

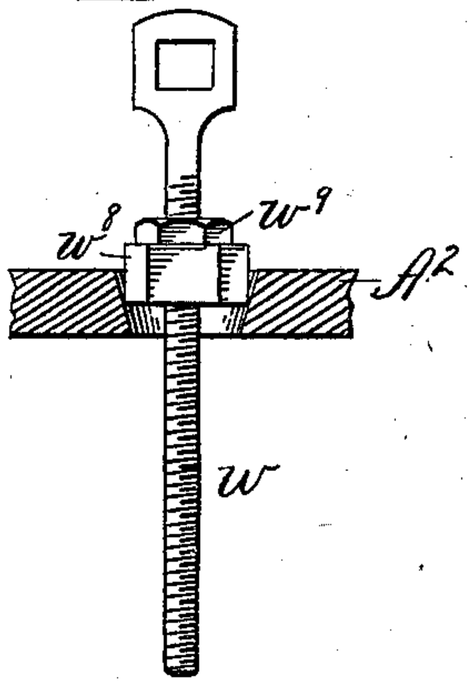

Fig. 13.

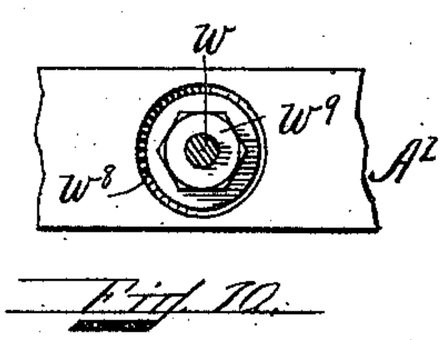

Fig. 10.

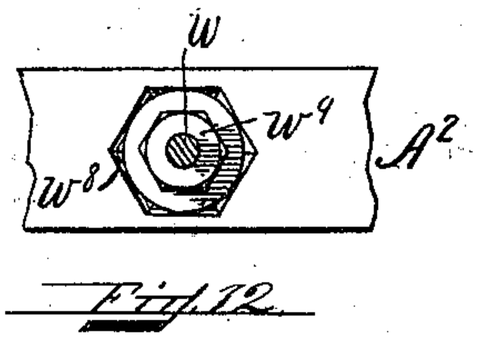

Fig. 12.

Witnesses:
E. A. Allen
W. E. Coveney

Inventor:
Cyrus E. Smith
by his attorney
Beach & Richardson

UNITED STATES PATENT OFFICE.

CYRUS E. SMITH, OF FALL RIVER, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO EDWARD SHOVE, OF SAME PLACE.

ROLL-STIRRUP FOR DRAWING-FRAMES.

SPECIFICATION forming part of Letters Patent No. 684,119, dated October 8, 1901.

Application filed May 15, 1901. Serial No. 60,254. (No model.)

To all whom it may concern:

Be it known that I, CYRUS EDWARD SMITH, a citizen of the United States, residing at Fall River, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Roll-Stirrups for Drawing-Frames, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a perspective view of my invention. Fig. 2 is a transverse section thereof. Fig. 3 is a transverse section showing how the top rolls become automatically heavily weighted by the passage of lumpy sliver between the top and bottom rolls. Fig. 4 is an enlarged detail of improved stirrup. Fig. 5 is a section thereof. Fig. 6 is a plan view of said stirrup on line 6 6 of Fig. 4. Figs. 7, 8, 9, 10, 11, 12, 13, and 14 show modifications of said stirrup. Figs. 15 and 16 show both the application of modification shown in Fig. 14 to top and bottom rolls of a drawing-frame and the operation of said combination.

Drawing-frames as usually made have a number of pairs of rolls, each pair consisting of a top roll and a bottom roll in rolling contact, said top roll being above and free to move in grooves to and away from the lower roll, whose bearings are fixed in standards on a roller-beam. The top roll is held in said rolling contact with the lower roll by a heavy weight hung from the top roll, and thus receives its motion from the lower or power roll. The principal purpose of a weighted roll is to reduce the too thick and lumpy sliver whenever the latter shall appear; but such roll acts at all times whether or not the sliver is too thick. Hence there are intervals when the pressure exerted by the weighted roll is objectionable. For example, during those intervals the top rolls offer great resistance to turning, and there is a consequent loss of power. As the top rolls are usually of leather and the lower fluted and of steel, the leather covers of the former are needlessly soon cut to pieces and have to be replaced with new covers, and as the heavily-weighted top rolls are turned by frictional contact with the lower or power rolls the sliver is drawn out more on its under side than on the top by reason of the weighted top rolls tending to stop, move slower than the bottom rolls, and retard the top of the sliver, to the injury of the sliver.

Now the purpose of my invention is to overcome these objections by providing means whereby the pressure between the top and bottom rolls of railway-head drawing-frames, slubbers, roving-frames, and other spinning-machines may when required be either increased or decreased automatically, thereby substituting for the action of the usual heavy weights imposed on said top rolls all the time the action of weights or springs, which are permitted to act on said rolls only when required at different times.

In the drawings illustrating the principle of my invention and the best mode now known to me of applying that principle, A A′ are the standards, secured to the roller-beam A^2; B B′ B^2 B^3, the top rolls; C C′ C^2 C^3, the bottom or power rolls, and W W′ W^2 W^3 the weights, suspended from the top rolls by the stirrups w w' w^2 w^3 and double-ended hooks w^4 w^5 w^6 w^7. The top and bottom rolls are mounted in the usual manner in pairs B C, B′ C′, B^2 C^2, B^3 C^3 in bearings in standards A A′, and while the lower rolls are fluted and are of steel said top rolls may be either covered with leather or fluted and of steel, like the lower rolls. The top and bottom rolls of each of said pairs are in rolling contact; but the top rolls' bearings allow the top rolls to be raised vertically away from and out of contact with their respective bottom or power rolls, as by sliver passing between said top and bottom rolls. Said top rolls derive their movement from the intervening slivers in rolling contact with the bottom power-rolls, which in turn derive their movement through gears d d' d^2 d^3, the two former, d d', meshing with a gear on the opposite end of standard A′ and similar to d^4, with which mesh d^2 d^3.

Over each top roll B B′ B^2 B^3 is hung a pair of double-ended hooks w^4 w^5 w^6 w^7, and hooked to the lower ends of these hooks are stirrups w w' w^2 w^3, that pass down through holes in the roller-beam A^2 and are secured to their respective weights W W′ W^2 W^3. Each stirrup, as w, (see Figs. 1 and 4,) is threaded for a portion of its length, and on said portion or shank is threaded and screwed a conical piece

of iron w^8, above which is a check-nut w^9. Each stirrup-hole in the roller-beam A^2 is cylindrical and has a smaller diameter than that of the conical piece w^8, and thus forms for the cone a seat whose line of contact with the cone is a circle lying between the base and the apex of the cone and having its diameter less than that of the base of the cone, the contact-faces of said cone and said seat lying in different planes. To enable the operator easily to adjust the cone on its shank, the base of the cone stands above the top of the roller-beam A^2, as appears in Figs. 4 and 5, and has its edges cut away, as at w^{10}, so that the cone can be grasped and turned by the fingers of the operator. It will be obvious (see Figs. 2 and 3) that each weight has two possible points of support—namely, one on the top roll, as B^3, and the other on the roller-beam A^2—either one or the other, according to the position assumed by the upper hook and the cone relatively to each other. If they are nearer together than said points of support, then the top roll becomes heavily weighted; if not, the heavy weight is borne on the roller-beam and the top roll by reason of its own weight simply rests on the bottom roll. Now in practical operation each cone is so adjusted on the shank of its stirrup (see Fig. 2) as to allow the sliver to pass between the rolls and yet to raise the top roll enough to allow the weight just to begin to act, and thus keep the rolls together and in contact. If, perchance, the sliver is too thick or contains lumpy matter, as shown in Fig. 3, then said lumps raise up the top rolls, their hooks, and stirrups, and consequently the cones, from their seats, and the top rolls become heavily weighted and, with their respective bottom rolls, do their required work. The lumps having disappeared and the sliver having resumed its usual thickness, the top rolls drop into their normal positions and the weights draw the cones down into their seats and the upper rolls are relieved of their heavy weights by their cones, now firmly seated in the roller-beam.

The abundance of dust and cotton that accumulates on cotton machinery is well known, and it is this rapid accumulation which renders the use of an adjustable nut whose flat face rests on the top of the roller-beam practically valueless, the reason being that as the stirrup vibrates up and down under the influence of the varying cotton-sliver the dust and cotton soon collect to such an extent between the faces of said nut and beam that the accumulation has to be constantly cleared away to maintain the delicate adjustment of the nut to a few thousandths of an inch. Now this objection is obviated by the above-described conical nut and seat, which are only one of the many embodiments of one of the essential features of my invention, said essential feature consisting in providing means whereby the number of points of contact between the supported and supporting faces of the nut and its seat are reduced and the contact-faces of said nut and seat are in different planes. For example, the nut may be a pyramid of any number of sides, having a circular seat, as shown in Figs. 7 and 8, and having its line of contact with said seat between the base and apex of said pyramid, said seat having a diameter less than that of the pyramid, or a cylindrical nut having a conical seat, as shown in Figs. 9 and 10, or a cylindrical nut in a pyramidal seat, as shown in Figs. 11 and 12, or a polygonal nut of any number of sides in a conical seat, as shown in Fig. 13. In brief, seats and nuts having faces which lie in different planes enable the dust and cotton to accumulate, if at all, between the seat and nut only along their point of contact and then only to fall of their own weight away from said point when the nut is lifted off its seat.

Fig. 14 shows a modification in which a spring is substituted for a weight. In this form the stirrup (see Figs. 15 and 16) is shown supported on a saddle w^{15}, which rides upon the top of two top rolls B^2 B^3. The shank of said stirrup is threaded and provided with a cone w^8 in the usual manner above described and passes through a bottom saddle w^{16}, having a seat therein for said cone. There is a spiral spring w^{14} on the shank of said stirrup, and it is secured thereon between said bottom saddle w^{16} and a nut w^{17}, threaded on said shank. Pivoted to said lower saddle is a lever w^{18}, which actuates one end of a rod w^{19}, whose other end is secured beneath the under side of said nut. The purpose of this lever being to allow the adjustment of the stirrup and saddles to the rolls when the lever w^{18} is in the position shown in dotted lines in Fig. 14, the head w^{20} is pushed through the lower saddle w^{16} farther than normally, and by bringing the latter in contact with the lower rolls the upper saddle w^{15} can be easily pushed through the head and over the top rolls, and by releasing the lever the saddles, rolls, and stirrup assume their proper positions, as shown in Fig. 15, and the cone is properly adjusted in its seat for clear sliver. When, as shown in Fig. 16, lumpy sliver passes under the top roll, the cone is raised out of its seat w^8, the spring is compressed, thereby compressing both the top and bottom rolls, and consequently the sliver, into the proper form and condition.

What I claim is—

1. The top and bottom rolls of a drawing-frame; stirrups mounted on said top rolls; blocks on said stirrups; seats for said blocks, said seats being in fixed position relatively to said top rolls, and the contact-faces of said blocks and said seats lying in different planes; and means secured to said stirrups to exert pressure on said top rolls; whereby opposite vertical movements of any top roll throw said pressure exerted on said roll through said stirrup, into and out of action when desired.

2. The top and bottom rolls of a drawing-frame; stirrups mounted on said top rolls;

blocks threaded on the shanks of said stirrups; seats for said blocks; said seats being in fixed positions relatively to said top rolls, and the contact-faces of said blocks and said seats lying in different planes; and means secured to said stirrups to exert pressure on said top rolls; whereby opposite vertical movements of any top roll throw said pressure exerted on said roll through said stirrup, into and out of action, when desired.

3. The top and bottom rolls of a drawing-frame; stirrups mounted on said top rolls; blocks threaded on the shanks of said stirrups; seats for said blocks; said seats being in fixed positions relatively to said rolls, and the contact-faces of said blocks and said seats lying in different planes; weights secured to their respective stirrups; whereby opposite vertical movements of any top roll throw its respective weight into and out of action, when desired.

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

CYRUS E. SMITH.

Witnesses:
ANNE R. HADFIELD,
JOHN H. HADFIELD.