(No Model.) 3 Sheets—Sheet 1.

J. H. WILSON.

DRAWING FRAME, &c.

No. 321,267. Patented June 30, 1885.

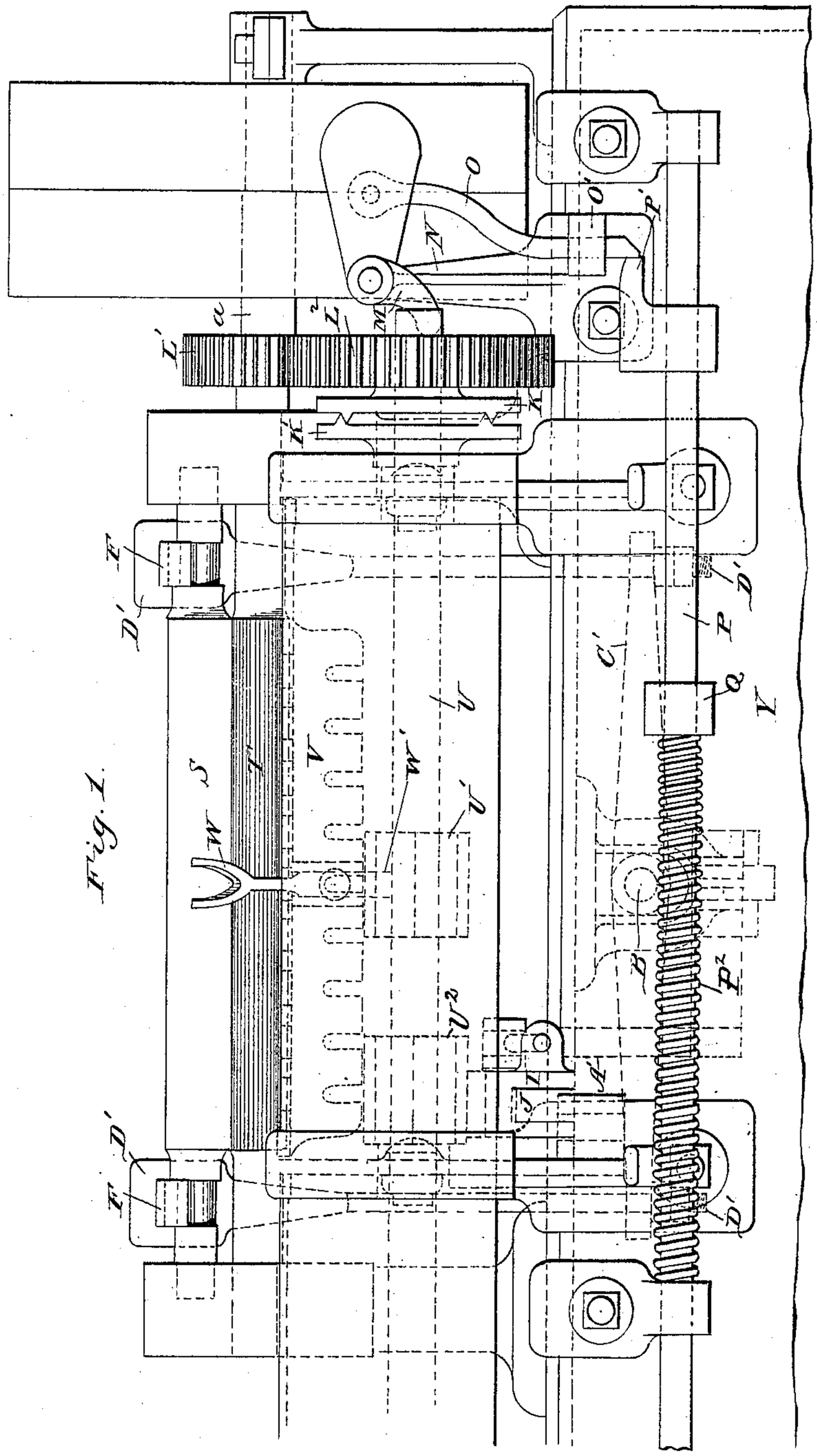

Fig. 1.

Witnesses:
H. C. Lowe
Walter Blandford

Inventor:
James H. Wilson
by Maullen Bailey
his attorney

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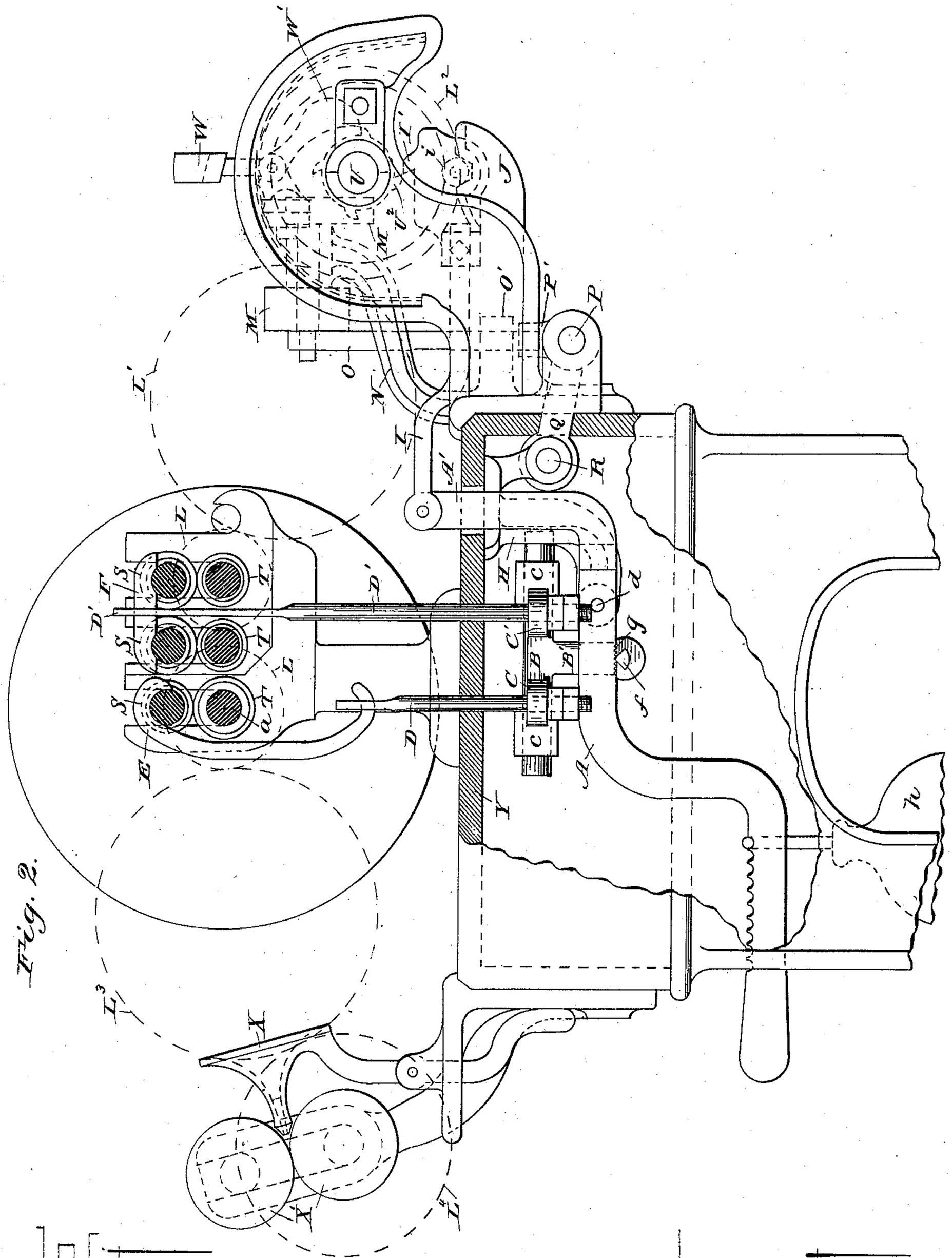

Fig. 2.

Witnesses:
H. P. Lowe
J. Walter Blandford

Inventor:
James H. Wilson
by Marcellus Bailey
his attorney

(No Model.) 3 Sheets—Sheet 3.

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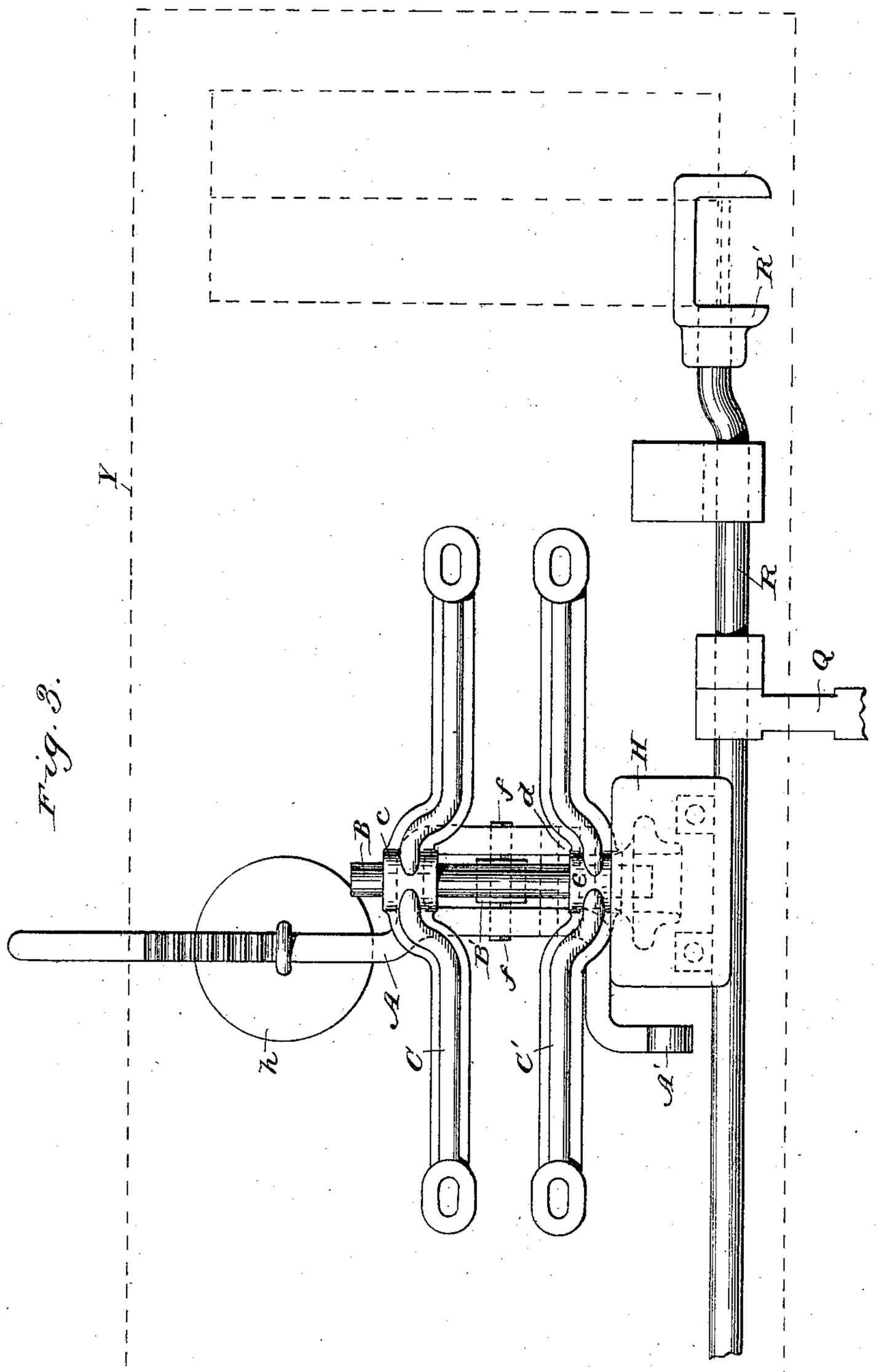

Fig. 3.

Witnesses:
N. S. Low
J. Stallo Blandford

Inventor:
James H. Wilson
by Munn & Co. Bailey
his attorneys

UNITED STATES PATENT OFFICE.

JAMES H. WILSON, OF LOWELL, MASSACHUSETTS.

DRAWING-FRAME, &c.

SPECIFICATION forming part of Letters Patent No. 321,267, dated June 30, 1885.

Application filed January 20, 1885. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. WILSON, of Lowell, in the State of Massachusetts, (assignor unto the Whitehead and Atherton Machine Company, of said Lowell,) have invented certain new and useful Improvements in Drawing, Roving, and Spinning Frames, of which the following is a specification.

My improvements in drawing, roving, and spinning frames consist, first, in an improved organization of the mechanism for weighting the drawing-rolls, and, secondly, in combining with the roll-weighting mechanism of machines of the kind referred to a stop-motion mechanism which will act to arrest motion of the machine in event of particles of the sliver catching and gathering or rolling up on the rolls with which the said weighting mechanism is in operative connection. The weighting of drawing-rolls is ordinarily accomplished by what is known as "lever-weighting," the mechanism for this purpose consisting of saddles which bear upon the top rollers, and are connected by stirrups to hanger-bars, which are pressed upon by a pivoted adjustably-weighted lever. It is frequently desirable in changing from one grade of work to another to adjust the "top-roller weighting" so as to bear more heavily on the front than on the back rolls, or vice versa, as the case may be, at the will of the operator. This adjustment, broadly considered, is old in the art; but so far as I am informed it has heretofore been effected by making the stirrups adjustable upon their saddles, the usual way having been to make a series of notches on the double saddle or saddles for the back top rolls, and to adjust the stirrup or stirrups to such notches as are calculated to produce the desired variation in the pressure. Under this arrangement, however, the stirrup or stirrups (which are located between the two pairs of back rolls) have necessarily a very restricted range of adjustment on account of the small space between the two pairs of rolls, and the adjustment, when obtained, is very likely to be disturbed or changed by the operative in cleaning up the machine or in removing roller-laps, at which time the weights are generally taken off the machine. To remedy these serious drawbacks, I remove the point of adjustment so that it shall be between the weight-lever and the part of the top-roller weighting mechanism upon which it bears. By this arrangement I obtain a much greater range of adjustment, and I also bring the point of adjustment below the table of the machine and in a position where the adjustment, when once made, is not likely to be disturbed unless intentionally. During the drawing operation it not unfrequently happens that particles of the sliver catch upon the drawing-rolls and immediately gather and roll up on the same, instead of passing through. This accumulated fiber not only impairs the action of the machine, but if allowed to remain for any length of time hardens and becomes so compacted and bound upon the rolls that it can be removed only with considerable effort. To prevent this trouble, it is very desirable to stop the machine in the early stage of the difficulty; and to this end I combine with the top-roller weighting mechanism a stop-motion mechanism, connected therewith and operated thereby in such manner that the movement of the weighting mechanism due to the accumulation of fiber on the drawing-rolls and the lifting of the top rolls consequent thereon shall actuate the stop-motion mechanism to arrest the movement of the machine. This combination not only can be employed to stop the machine when the rolls "lap up," but can also be utilized, as will hereinafter be pointed out, to stop the machine when the sliver fails to pass between the drawing-rolls, if so fine an adjustment should be desired. In the latter event it would supplement the usual back-stop motion arrangement employed in machines of this class.

In the accompanying drawings I have represented so much of a drawing-frame as needed for the purpose of illustrating my invention.

Figure 1 is a rear elevation of a portion of the machine. Fig. 2 is an elevation of the right-hand end of the machine with the drawing-rolls in section and the table and frame of the machine partly broken away and in section, so as to disclose more fully the roll-weighting mechanism. Fig. 3 is a plan of the weight-lever, the hanger-bars, the adjustable cross-piece connecting said hangers, and the sliding shipper rod and fork for shifting the belt from fast to loose pulley, and vice versa.

In this figure the said pulleys and the table are outlined in dotted lines.

The shipper-rod is omitted from Fig. 1 with a view to avoiding complication and obscurity in the illustration.

The machine in the drawings shows a stand of three pairs of drawing-rolls. These rolls are weighted at their ends; but the invention obviously is applicable to machines having top rolls weighted at the middle only.

Y is the frame and table of the machine, supporting the working parts.

The drawing-rolls are supported and driven in the usual way from the main or driving shaft *a* through the intermediary of gearing L.

T are the lower fluted power-driven rolls, and S are the top rolls, which co-operate with them.

X′ are the two calender-rolls, the lower one of which is driven from the gear of the front fluted roller, T, through the intermediary of spur-wheels L^3 L^4.

X is the ordinary front or condensing trumpet.

W is the back stop-motion trumpet and stand. V is the back shell to hold the same.

U is the spider or stop-motion shaft, provided with a spider or series of projecting teeth, U′, to be engaged by the tail W′ of the pivoted back stop-motion trumpet when the sliver breaks. The stop-motion shaft is driven from the pinion L on the back fluted roller through an intermediate, I′, which gears on the one hand with pinion L, and on the other hand with a spur-wheel, L^2. The latter is loose, and can slide on the stop-motion shaft U, and carries a clutch-disk, K, opposite which is a like disk, K′, fixed on the stop-motion shaft. The two disks are provided on their interior opposite faces with V-points or wedge-shaped projections, (seen in Fig. 1,) which interlock when the two disks are pressed together, as is normally the case. They are thus held together by the weighted lever M, pivoted to the stand N, and arranged so that its toe shall bear against the hub of gear L^2, and thus press it and the disk K up to the other disk, K′.

To the outer weighted end of the lever M is jointed the latch-rod O, moving in a guide, O′, and normally occupying the position indicated in Fig. 1, where its lower end is in the path of a projection, P′, on the back spring-controlled rod, P, which is supported and arranged to slide in proper bearings on the back of the machine, and is fastened to the sliding shipper-rod R by the connecting bar or arm Q. A spiral spring, P^2, surrounding the sliding rod P, and confined between one of the stationary bearings of the said rod on the one hand and the bar or arm Q on the other hand, tends to force the sliding rod P, and consequently the shipper-rod R, to move from right to left and to thus bring it to a position where the fork R′ on the latter rod will hold the driving-bolt on the loose pulley. Normally the latch-rod O is in the path of the projecting stop P′ on the rod P, and thus holds the rod against the stress of its spring in a position in which the shipper-fork R′ will hold the driving-belt on the fast pulley. When, however, the stop-motion shaft is restrained from moving by any cause—as, for instance, by the engagement with its spider U′ of the tail of the back trumpet, W—the disks K K′, owing to the shape of the projections on their inner faces, will be forced apart and disengaged. The hub of the gear L^2 will consequently force back the toe of the lever M and lift the weighted end of the latter, thus drawing up the latch-rod O out of the path of the projection P′ and releasing the sliding rod P, which will at once be thrown by its spring into a position to shift the belt from the fast to the loose pulley, thus stopping the machine.

The parts thus far described are of the type usually found in machines of the class to which my improvements relate, and in their organization and mode of operation do not embrace essential novelty, although a description of them is essential to a proper understanding of my improvements.

I have not deemed it necessary for the most part to more than merely outline in dotted lines the motion-transmitting gearing.

I come now to those parts of the machine in which my improvements are found.

E and F are the top-roll saddles, the former being single saddles for the front top roll and the latter being double saddles for the middle and back top rolls. There are, as indicated in Fig. 1, two saddles of each kind, taking their bearings at the ends of the rolls. From the saddles extend the stirrups D D′, which connect at their lower ends with the hanger-bars C C′. The lower ends of the stirrups, which are screw-threaded, pass through slots in the ends of the hanger-bars, (shown in Fig. 3,) and are held in place by nuts which are screwed upon them below the hanger-bars. These hanger-bars are virtually a part or a continuation of the stirrups, their purpose being to afford means for securing a center bearing on which the weight-lever can rest. This center bearing, which I term the "bearing-arm," is the part which I make adjustable with reference to the weight-lever for the purpose of varying the distribution of the pressure upon the top rolls. The bearing-arm in this instance consists of a sliding rod, B, mounted and adapted to slide in bearings *c* in the hanger-bars.

A is the weight-lever, pivoted at *d* to the weight-lever stand or bracket H, which is fast to the under side of the table of the machine. From the rod B hangs a vertical arm, B′, and from each side of the lower end of the arm B′ extends laterally a knife-edge projection, *f*, forming a bearing for the weight-lever. The weight-lever is forked or slotted, as seen in Fig. 3, to form an opening for the passage of arm B′, which extends down through it, and

the projections *f* extend on each side below the lever, so that the latter can rest and take its bearing on them. The bearing-surface of the lever is notched, as indicated at *g*. Fig. 2. Lever A is of course adjustably weighted, the adjustable weight being shown at *h*. By moving the sliding rod B back or forward in its bearings the knife edge projections *f* can be caused to take into any one of the series of notches *g*, and in this way the bearing can readily be shifted so as to cause the weight-lever to exercise greater pressure on the front or on the back rolls, as desired. Set-screws in the hanger-bars or other suitable means may be provided for securing the bearing-arm in its adjusted position; but such devices are not indispensable and are not shown in the drawings.

The arrangement described is applicable to rolls weighted at both ends. When, however, the top rolls are weighted in the middle only, the hanger-bars can be dispensed with, and the bearing arm or piece can be connected directly to the stirrups. Other modifications can be made. What is essential is that that part of the roll-weighting mechanism termed by me the "bearing-arm," upon which the weight-lever bears or rests, should be adjustable with reference to said lever substantially in the manner hereinbefore indicated.

Having described my improved roll-weighting arrangement, I now proceed to a description of the other portion of my improvements, which, as before stated, consists in combining with the roll-weighting mechanism stop-motion mechanism in such manner that the movement of the roll-weighting mechanism consequent upon the formation of a lap on the drawing-rolls will actuate the stop-motion mechanism to stop the machine. The preferred way of effecting this result is represented in the drawings. I find it most convenient and best on the whole to use the weight-lever A as the instrumentality for actuating the stop-motion. For this purpose the weight-lever is continued back of its fulcrum, and this continuation, A′, in a curved or bent form (see Figs. 2 and 3) extends up through the table of the machine, and at its top is jointed to a piece, I, which I term a "roll-lap stop-motion piece." This piece rests and is adapted to slide back and forth on a bearing, J. It takes its bearing on J through the intermediary of lateral roller-studs *i*, with which it is provided, these roller-studs resting normally in ⟨ or double inclined recessed bearings in piece J.

Upon the top of piece I is a projection or stop, I′, and upon the stop-motion shaft U at a point above this stop, is a spider, U^2, similar to U′, already described. Normally the roller-studs of piece I rest at the bottom of the ⟨ recesses in bearing-piece J, and in this position stop I just clears the spider U^2, as seen in Fig. 2. The formation of a lap on the drawing-rolls will, however, at once lift the weighted end of lever A, thus moving back its extension A′, and consequently causing the piece I to slide to the rear. The latter, however, in thus moving will travel up the inclined face of the bearing on which it rests, and consequently will be lifted so as to bring its stop I′ into the path of the spider U^2 on the stop-motion shaft, arresting the movement of the latter and stopping the machine. By the ⟨ or double-inclined formation of the bearing-recesses, the motion of the weight-lever in either direction from its normal position may be availed of to raise the stop-motion piece into position to stop the machine. In this way the device may, as hereinbefore suggested, be utilized to stop the machine when the sliver fails to pass between the rolls, as well as when it rolls up and accumulates on the rolls.

I remark that in lieu of the ordinary stop-motion device hitherto used in connection with the vibratory arm or lever that carries the front or condensing trumpet, X, I can employ a mechanism similar to that described in connection with the weight-lever A, said vibratory lever being connected to said stop-motion mechanism by means of suitable mechanical devices, which will readily suggest themselves to the skilled mechanic. In this event the bearing for the stop-motion slide need have but one incline; and the same is true also with respect to the roll-lap stop-motion in case the movement of the weight-lever in one direction only from its normal position is to be availed of.

Having described my improvements and the best way known to me of carrying the same into effect, I state, in conclusion, that I do not restrict myself to the details of construction and arrangement of the several parts hereinbefore described, because the same manifestly can be varied in many particulars without essentially changing the nature of the invention; but

What I claim as new and of my own invention is—

1. The combination, with the weight-lever and the drawing-rolls, of the mechanism through the intermediary of which the pressure of said lever is caused to be exerted upon said rolls provided with a weight-lever bearing which is adjustable toward and away from the axis of oscillation of said lever, substantially as and for the purposes hereinbefore set forth.

2. The drawing-rolls, the saddles, their stirrups, and hanger-bar, in combination with the weight-lever and the sliding bearing-arm carried by said hanger-bars and adjustable with reference to said lever, substantially as and for the purposes hereinbefore set forth.

3. The combination, with the stop-motion mechanism, of the vibratory weight-lever forming part of the roll-weighting mechanism and connected to and adapted to operate the stop-motion mechanism, substantially as and for the purposes hereinbefore set forth.

4. The vibratory weight lever, in combination with the stop-motion shaft, the spider thereon, the sliding roller-lap stop-motion piece connected to said weight-lever, and the inclined bearing for said piece, substantially as and for the purposes hereinbefore set forth.

5. The stop-motion shaft and spider thereon, in combination with the sliding stop-motion piece and the inclined recessed bearing for the same, substantially as and for the purposes set forth.

In testimony whereof I have hereunto set my hand this 9th day of January, 1885.

JAS. H. WILSON.

Witnesses:
EDWARD E. RIPLEY,
A. T. ATHERTON.