

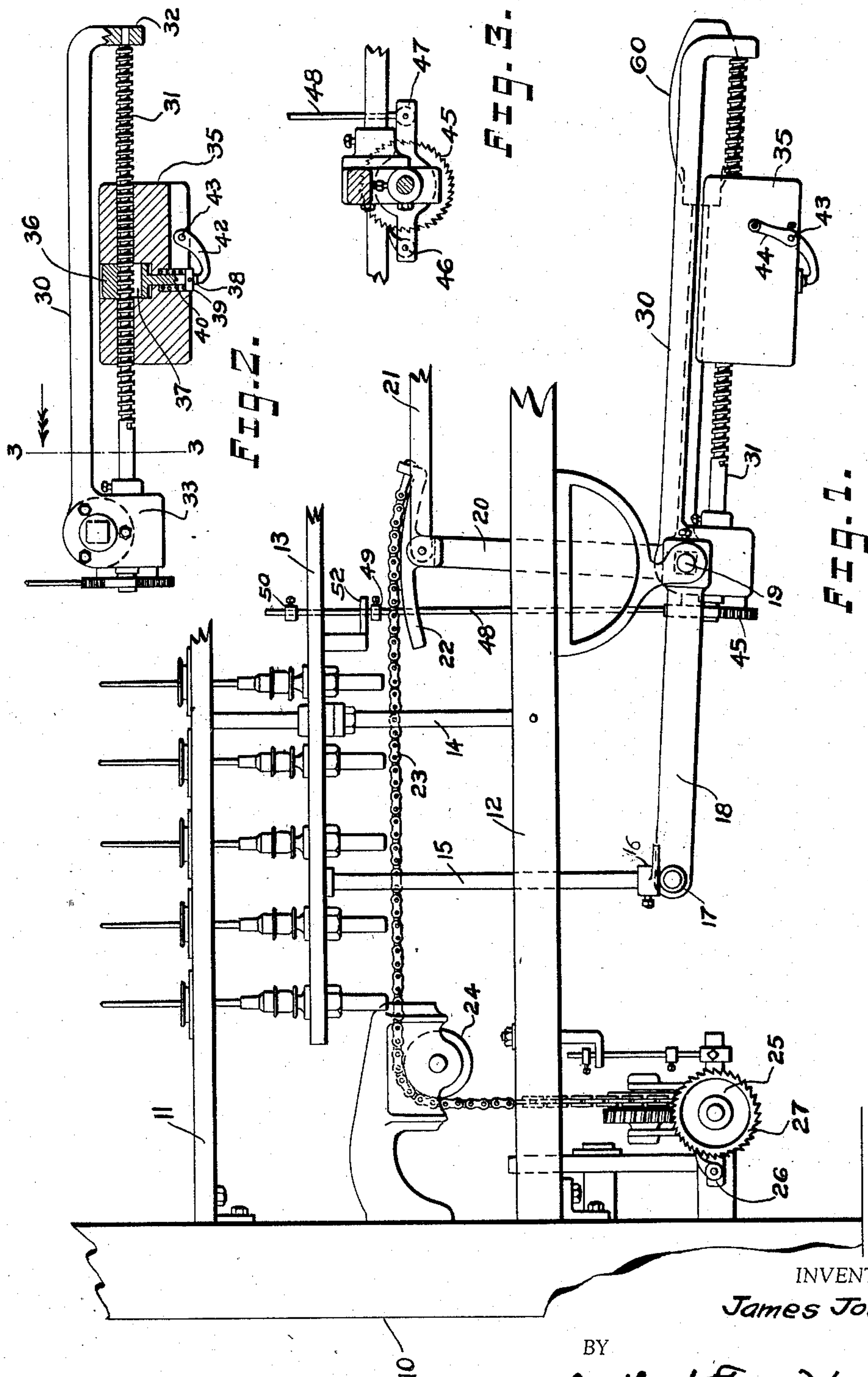
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COUNTERBALANCE MECHANISM FOR BUILDER LEVERS

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COUNTERBALANCE MECHANISM FOR BUILDER LEVERS

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This invention relates to the builder mechanism of a spinning or twisting machine and particularly to a mechanism for counterbalancing the varying weight of yarn on the bobbins in a machine of the type in which the spindles and bobbins, rather than the rings, are reciprocated vertically.

It is the object of my invention to provide means for automatically increasing the counterweight as the mass of yarn on the bobbins increases, together with means for conveniently releasing and resetting the counterweight when the bobbins are doffed.

My invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

A preferred form of the invention is shown in the drawings in which

Fig. 1 is a front elevation of parts of a spinning frame embodying my improvements;

Fig. 2 is a front elevation, partly in section, of the counterbalance mechanism, and

Fig. 3 is a sectional end view of the counterbalance mechanism, taken along the line 3—3 in Fig. 2.

Referring to the drawings, I have shown portions of a spinning frame 10 having a fixed ring rail 11 and a grit or frame member 12 extending lengthwise of the frame.

A spindle rail 13 is mounted on guide rods 14 and is vertically reciprocated by lifter rods 15 extending down through bearings in the grit and provided with feet 16 engaged by rolls 17 on the ends of lifter levers 18. The levers 18 are mounted on cross shafts 19 having upwardly extending arms 20 connected by tie rods or bars 21.

The lever arm 20 on the end cross shaft 19 is provided with a segment 22, to which is attached a chain 23 passing over a guide pulley 24 and secured to the usual builder mechanism 25.

This mechanism includes a worm and worm wheel actuated by a pawl 26 and ratchet 27 and in itself forms no part of my present invention, which relates to improved means for counterbalancing the increasing weight of

yarn on the bobbins as the bobbins are gradually filled.

For this purpose, I secure a counterbalance arm 30 on one or more of the cross shafts 19 and I mount a threaded rod 31 in bearings 32 and 33 at the opposite ends of the arm 30.

A counterweight 35 is supported by the threaded rod 31 and is slidable thereon. The counterweight 35 is recessed in its middle portion to receive a member 36 having an opening 37 therethrough, the upper portion of which is internally threaded to fit the threaded rod 31. The lower portion of the opening 37 is cut away, so that when the member 36 is raised, the internal threads clear the rod 31, and the weight 35 may be moved freely longitudinally thereof.

The threaded member 36 has a depending stud portion 38 and is provided with a collar 39 and spring 40, both housed in a recess in the weight 35. The spring acts against the collar to draw the member 36 yieldingly downward into operative engagement with the screw threads of the rod 31.

An arm 42 is mounted on a cross rod 43 pivoted in the weight 35 and is provided with a handle 44 at its outer end. The arm 42 engages the stud 38 and the member 36 may be thus raised by means of the handle 44, when it is desired to free the weight for longitudinal adjustment thereof on the shaft 31.

A ratchet wheel 45 is fixed to the front end of the threaded rod 31 and is engaged by a pawl 46 on a rocking lever 47, connected to an actuating rod 48 having collars 49 and 50 adjustably secured thereon. The rod 48 extends through an opening in a bracket 52 secured to the ring rail 13.

As the spindle rail moves up and down, the collars 49 and 50 are alternately engaged by the bracket 52, and the pawl 46 is oscillated to feed the ratchet 45 at any desired rate of speed, thus gradually moving the weight 35 toward the outer end of the arm 30 and increasing the counterbalancing effect thereof.

When the bobbins are filled and doffed, the weight 35 is readily returned to its initial position by releasing the member 36 manually

and sliding the weight freely along the rod 31.

Additional counterweights 60 may be placed on the cross shafts 19 to counterbalance the constant weight of the spindle rails 13 and the spindle and bobbins supported thereby, the weight 35 being used mainly to counterbalance the varying amount of yarn on the bobbins.

I have thus provided an extremely simple construction by which the spindle rails will be automatically counterweighted during the gradual filling of the bobbins and by which the increase in counterweight may be regulated in accordance with the size of yarn being spun or twisted.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:—

1. In a spinning or twisting frame, a counterbalance mechanism comprising a lever arm, a threaded rod rotatably mounted therein, means to intermittently rotate said rod, a counterweight slidable on said rod, a member movably mounted in said weight and threaded in one portion to engage said rod when in operative position and recessed to clear said rod when in inoperative position, and means to move said member to operative position.

2. In a spinning or twisting frame, a counterbalance mechanism comprising a lever arm, a threaded rod rotatably mounted therein, means to intermittently rotate said rod, a counterweight slidable on said rod, a member movably mounted in said weight and threaded in one portion to engage said rod when in operative position and recessed to clear said rod when in inoperative position, and yielding means to move said member to operative position.

3. In a spinning or twisting frame, a counterbalance mechanism comprising a lever arm, a threaded rod rotatably mounted therein, means to intermittently rotate said rod, a counterweight slidable on said rod, a member movably mounted in said weight and threaded in one portion to engage said rod when in operative position and recessed to clear said rod when in inoperative position, yielding means to move said member to operative position, and manually operated means to move said member to inoperative position.

4. In a spinning or twisting frame, a counterbalance mechanism comprising a lever arm, a threaded rod rotatably mounted therein, means to intermittently rotate said rod, a counterweight slidable on said rod, and means on said weight effective to detachably engage the screw threads on said rod, whereby said weight may be moved by said rod axially thereof.

5. In a spinning or twisting frame, a counterbalance mechanism comprising a lever arm, a threaded rod rotatably mounted therein, means to intermittently rotate said rod, a counterweight slidable on said rod, and means on said weight yieldingly actuated to detachably engage the screw threads on said rod, whereby said weight may be moved by said rod axially thereof.

6. In a spinning or twisting frame, a counterbalance mechanism comprising a lever arm, a threaded rod rotatably mounted therein, means to intermittently rotate said rod, a counterweight slidable on said rod, means on said weight yieldingly actuated to detachably engage the screw threads on said rod, whereby said weight may be moved by said rod axially thereof, and manual means for disengaging said detachable means from said rod.

In testimony whereof I have hereunto affixed my signature.

JAMES JOLLY.