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BOBBIN HOISTING MEANS OF STRANDING MACHINES

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3 Sheets-Sheet 1

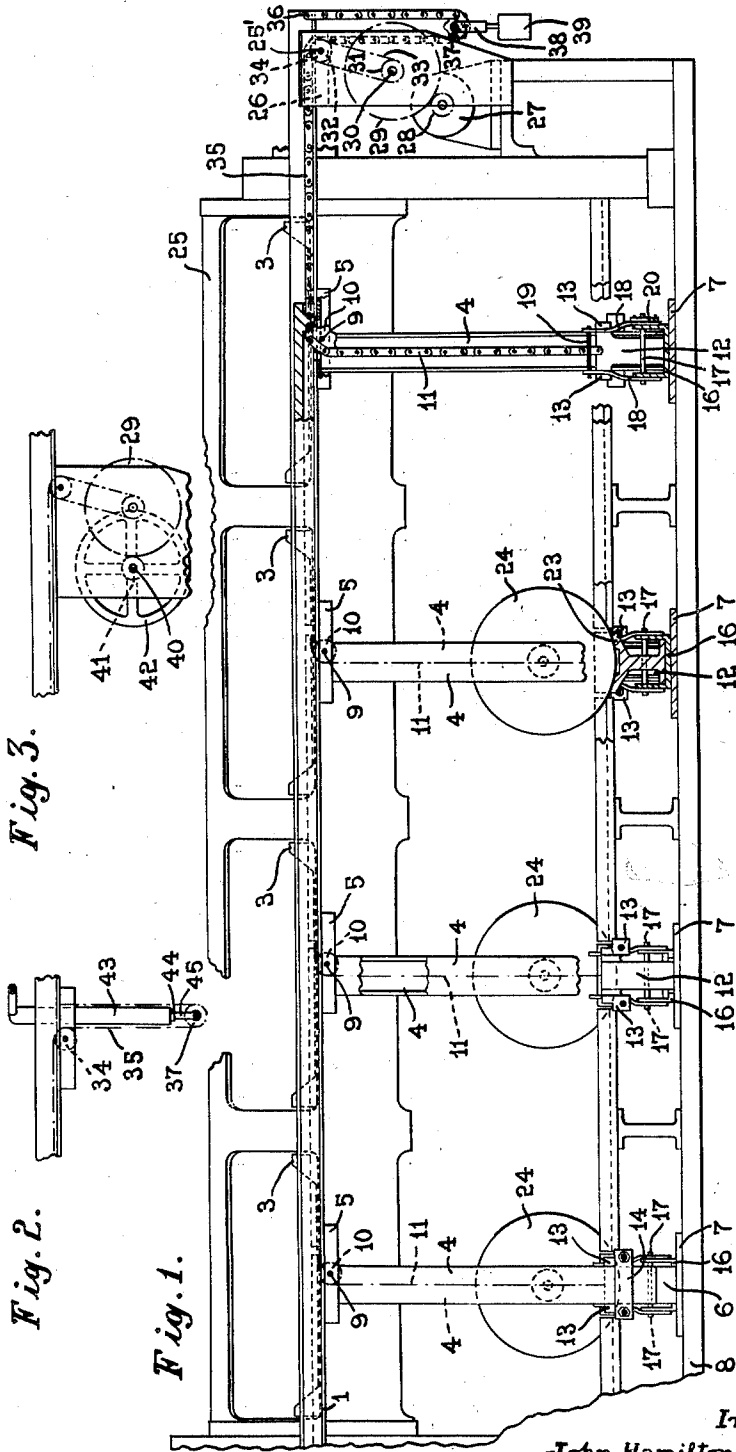


Fig. 2.

Fig. 3.

Fig. 1.

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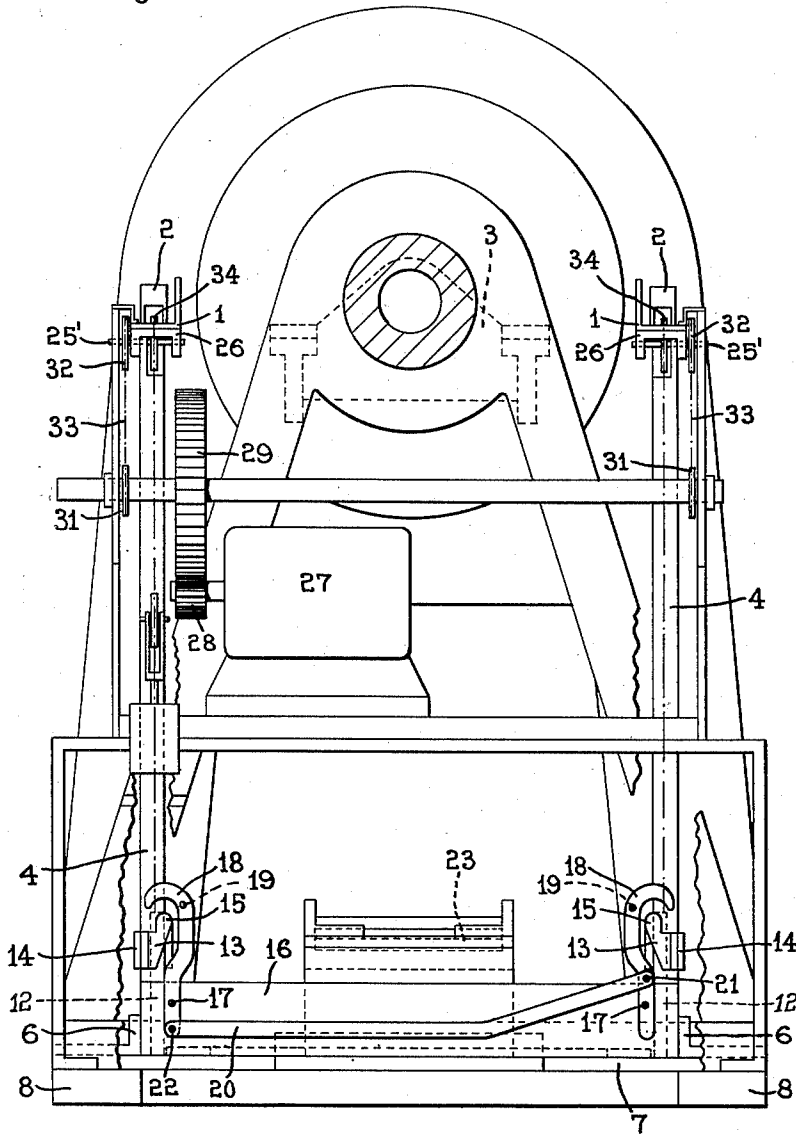
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Fig. 4.



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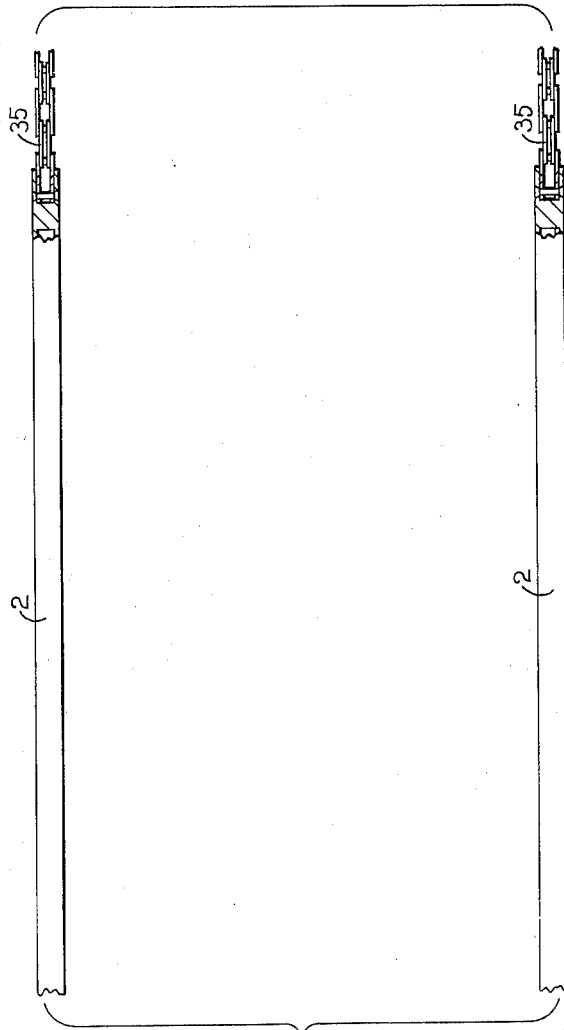


Fig. 5.

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# UNITED STATES PATENT OFFICE

2,509,828

## BOBBIN HOISTING MEANS OF STRANDING MACHINES

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7 Claims. (Cl. 242—58)

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This invention relates to the bobbin hoisting means of stranding machines and has for its object to provide a novel construction which enables any individual bobbin to be hoisted separately or any greater number of the bobbins to be hoisted simultaneously at will from one hoisting point on the machine.

A bobbin hoisting means of a stranding machine in accordance with my invention has a slidable, stiff member extending along each side of the machine and having attached to it at suitably spaced distances flexible hoisting members each attached to a linearly guided member adapted at will to be connected to and disconnected from a platform for the bobbin.

The slidable stiff members are adapted to be displaced simultaneously along the sides of the machine by manual and/or power operable means.

Each flexible hoisting member may consist of a pivotal link chain one end of which is connected to the slidable stiff member and the other end to the linearly guided member.

Each linearly guided member may comprise a slide which is slidable on a linear guide and adapted to be engaged by and disengaged by hooks provided on a linearly guided cross-member carrying or comprising the platform.

The hooks of each cross-member may be interconnected so as to be simultaneously operable by a single operation.

The linear guides on which the slides slide may also serve to guide linearly the cross-member, which may be arranged readily removable and replaceable.

The means of displacement of the slidable stiff members may comprise shafts having sprocket wheels engaged by chains connected to adjacent ends of the slidable stiff members, the shafts being adapted to be rotated by a handle and/or by a motor through suitable gearing or by an arrangement comprising a hydraulic or compressed air cylinder and piston or ram.

In the accompanying drawings:

Figure 1 is a fragmentary side elevation, partly in section and with portion broken away, of a bobbin hoisting means of a stranding machine.

Figure 2 is a fragmentary side elevation illustrating a modification of a detail.

Figure 3 is a fragmentary side elevation illustrating another modification of a detail.

Figure 4 is an end view in section of the said bobbin hoisting means, and is drawn to a larger scale.

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Figure 5 is a detached, fragmentary plan view illustrating a detail.

Referring to the drawings, in the construction shown in Figures 1 and 4, I support on the horizontal rail 1 already existing on each side of the stranding machine, or on a horizontal rail of angle section secured to each side of the machine for the particular purpose, a slidable member, shown as a stiff bar 2 of inverted channel section, so that it is free to slide longitudinally on the said rail. In vertical register with the centre of each bobbin cradle 3, of which four are shown for the purpose of illustration I provide at each side of the machine linear guide member, shown as a vertical upright 4 of channel section with its channel facing inwards. The upper end of the upright 4 is secured to the underside of the said rail by an upper bracket 5 of inverted channel section and the lower end of the upright 4 is secured by a lower bracket 6 of angle section to a cross-strip 7 secured at its ends to lower rails 8 fixed to the foundation and parallel with the horizontal rails 1. Each upper bracket 5 forms a double bearing for an offset short shaft 9 on which an idle sprocket wheel 10 is secured, a part of one flange of the upright 4 being cut away to accommodate a part of the sprocket wheel 10 and the bracket 5 and horizontal rail having registering apertures through which the sprocket wheel 10 projects into the channel of the bar 2. The sprocket wheels 10 serve to position the bars 2 laterally without preventing longitudinal sliding thereof.

A flexible hoisting member, shown as a pivotal link, draft chain 11, runs on each idle sprocket wheel 10. The upper end of the chain 11 is secured in the channel of the respective bar 2 and the chain extends downwards along the channel of the respective upright 4, the idle sprocket wheel 10 serving to change the direction of travel of the chain 11 from the vertical to the horizontal and vice versa.

The sprocket wheels 10 and chains 11 serve to position the bars 2 laterally without preventing longitudinally sliding thereof.

The lower end of each chain 11 is secured to the upper end of a linearly guided member, shown as a slide 12 which slides on to the respective upright 4 and comprises a casting which runs in the channel of the upright 4 and has lugs 13 extending over the edges of the flanges of the upright 4 and across the sides thereof, and a plate 14 extending across the outer side of the web of the upright 4 and secured to the lugs 13. Each lug 13 has an upwardly pointing nose 15, Figure

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4 the purpose of which will hereinafter become apparent.

A bobbin carrying member, shown as a movable platform support 16 of channel section extends between the two uprights 4 provided for each bobbin cradle 3. The support 16 has its web cut out at its ends so that it embraces the flanges of the uprights 4 and is therefore guided in the longitudinal direction of the machine by the uprights 4 and is therefore constrained, when raised or lowered, to rise or fall vertically in exact register with the axes of the bearings provided on the cradle 3 for the bobbin shaft.

The support 16 can be placed in position and removed readily without fastening or unfastening any part.

To establish connection between the support 16 and the slides 12 on the respective two uprights 4, a horizontal pivot pin 17 is mounted in the flanges of the support 16 at each end thereof and a hook 18 is mounted on the pin 17 at the outer side of each flange of the support 16 so as to be oscillatable. Each two hooks 18 on the same pin are tied together by rigid ties 19 so that they oscillate together. A bent pivoted connecting rod extends externally along one side of the support 16 and has one end connected at 21 to one of the coupled pair of hooks 18 above the pivot pin 17 thereof and the other end connected at 22 to one of the other coupled pair of hooks 18 below the pivot pin 17 of the said other pair, whereby, when one pair of hooks is moved in one direction the rod 20 causes the other pair automatically to be moved simultaneously in the reverse direction. The hooks 18 are adapted to be engaged from below by the hereinbefore mentioned lugs 13 when in an outer position and to be clear of the lugs 13 when in the inner position.

Each support 16 has mounted on it a bobbin platform 23 the base of which lies in the channel of the support 16 and the supporting surfaces of which are sufficiently elevated above the support 16 to enable the bobbin 24 resting on the said surfaces to be raised into position in the cradle 3 from below without the fouling of the support 16 with the rotary member 25 of the stranding machine.

In operation, when the two bars 2 are displaced simultaneously in the requisite direction they pull the upper ends of all the chains 11 simultaneously in the same horizontal direction and the lower ends of the chains 11 are all simultaneously caused to rise to the same extent in the channels of the uprights 4 and therefore all the slides 12 are caused simultaneously to slide to the same extent upwards on the uprights 4. If the hooks 18 of all the supports 16 are in the inner position and therefore not engaged by the lugs 13 on the slides 12 by means of the noses 15, the supports 16 and therefore the platforms 23 and bobbins 24 thereon remain unraised. If however the hooks 18 of any one of the supports 16 are moved by hand into the outer position whilst as shown in Figure 4 the slides 12 are in the lowermost position, the raising of the slides 12 causes the noses 15 of the lugs 14 of the slides 12 associated with that particular support 16 to engage the hooks 18 and thereupon lift only that particular support 16 and thereby lift the platform 23 and bobbin 24 associated with the said support. When however the hooks 18 of some or all of the supports 16 are moved into the outer position whilst the slides 12 are in the lowermost position, the said supports 16 will be lifted simultaneously when the bars 2 are displaced in the correct direction.

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Therefore by the correct setting of the hooks 18 a bobbin can be hoisted into position in any single one of the cradles 3, or bobbins can be simultaneously hoisted into any selection of the cradles 3, or bobbins can be hoisted simultaneously into position in all of the cradles 3. Unloading of empty bobbins can likewise be effected singly or simultaneously in any series or all together, the lowering of the support 16 or supports 16 after the corresponding platform or platforms 23 have been raised to support it, being effected by allowing the two bars 2 simultaneously to slide back into the initial position under the weight of the chains 11, slides 12, and any platform or platforms 23 support or supports 16 and empty bobbin or bobbins thereon.

To actuate the bars 2 simultaneously in the hoisting direction, there may be shafts 25' mounted in brackets 26 at or near one end of the machine and adapted to be rotated by an electric motor 27 through gear wheels 28, 29, a countershaft 30, sprocket wheels 31 and 32, and an endless driving chain 33. Each shaft 25' has a sprocket wheel 34 fixed to it and meshing with two pivotal link chains 35 one end of each of which is connected to the correct end of one of the bars 2. The other end of each chain 35 is anchored at 36 to the corresponding rail 1 so that it forms a loop which carries a jockey sprocket wheel 37 which is weighted by means of a rotatable stirrup 38 carrying a weight 39. A releasable locking pawl and ratchet (not shown) associated with the shaft 30 or other suitable locking means are provided to prevent unwanted rotation of the shaft in the lowering direction. Suitable starting and reversing means and automatic stop means which are already well-known in connection with electric motors are provided to control the motor and prevent overrunning of the shafts 25.

In addition to or in lieu of the electric motor, there may be a journalled operating shaft 40, Figure 3, having a gear wheel 41 in mesh with the gear wheel 29, the shaft 40 also having a hand wheel 42 or handle, rotation of which in the requisite direction causes the bars 2 to be pulled longitudinally in the hoisting direction.

Furthermore in lieu of an electric motor, there may be a hydraulic or compressed air cylinder 43 fixed to each rail 1, Figure 2, for operating a hydraulic or compressed air piston or ram 44 which slides in the cylinder and is connected by a stirrup 45 to the jockey pulley 37 of each chain 35. When the pistons or rams 44 are projected hydraulically, the chains 35 are pulled in such a way as simultaneously to pull the bars along longitudinally in the requisite direction. Alternatively the rams may be fixed and the cylinders connected to the jockey pulleys.

Any other suitable means may be employed to operate the bars.

The vertical uprights 4 support or assist in supporting the horizontal rails 1 against the load created by the bobbins and other rising and falling parts. Instead of channel section uprights 4, they may be tubular to contain the chains 11 and slides and have vertical slots through which the slides are connected to the hooks 18.

Ropes or flexible cables may be employed instead of chains, and grooved jockey pulleys and a winding gear be provided accordingly.

I claim:

1. A bobbin hoisting mechanism of a stranding machine comprising a slidable member extending along each side of the machine, flexible

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hoisting members attached to the slidable members at spaced distances along their lengths, guided bobbin carrying members, linearly guided members attached to the flexible hoisting members, and means on the bobbin carrying members for separately disconnecting the said bobbin carrying members from and separately connecting the said bobbin carrying members to the said linearly guided members at will.

2. A bobbin hoisting mechanism of a stranding machine, comprising a slidable member extending along each side of the machine, flexible hoisting members attached to the slidable members at spaced distances along their lengths, guided bobbin carrying members, linearly guided members attached to the hoisting members, disengageable means for connecting the bobbin carrying members to the linearly guided members, and means for sliding the slidable members simultaneously at will.

3. A bobbin hoisting mechanism of a stranding machine, comprising slidable members at the sides of the machine, pivotal link chains connected at one end to the said members at spaced distances along their lengths, linearly guided members provided at the other end of the said chains, bobbin carrying members, and means for connecting the bobbin carrying members to and disconnecting them from the linearly guided members at will.

4. A bobbin hoisting mechanism of a stranding machine, comprising slidable members extending along the sides of the machine, flexible hoisting members connected at spaced distances apart along the slidable members, linearly guided members attached to the hoisting members, linearly guided bobbin carrying members, and displaceable hooks on the bobbin carrying members for individual connection of the bobbin carrying members to and disconnection of the bobbin carrying members from the linearly guided members at will.

5. A bobbin hoisting mechanism of a stranding machine, comprising slidable members extending along the sides of the machine, flexible hoisting members connected at spaced distances apart to the slidable members, a plurality of linearly guided members attached to the hoisting members, a bobbin carrying member associated with each two

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linearly guided members, two displaceable engaging devices provided on each carrying member for connection of each bobbin carrying member to the two linearly guided members with which it is associated, and a rod connecting the two displaceable engaging devices together for causing displacement of either of the two displaceable engaging devices on displacement of the other and causing thereby the connection or disconnection of the bobbin carrying member to the two linearly guided members by a single operation.

6. A bobbin hoisting mechanism of a stranding machine, comprising longitudinally slidable members extending along the sides of the machine, flexible hoisting members connected to the slidable members at spaced distances apart, linear guide members at the sides of the machine, slides attached to the flexible hoisting members and guided by the guide members, movable bobbin carrying members arranged crosswise of the machine and guided by the said guide members, and disconnectable means for connection of the bobbin carrying members and disconnection of the same from the slides at will.

7. A bobbin hoisting mechanism of a stranding machine, comprising longitudinally slidable, stiff members mounted at the sides of the machine, pivotal link chains connected by one end to the said members at spaced distances apart, a slide provided on the other end of each chain, bobbin carrying members arranged crosswise of the machine, means for optional connection of any of the bobbin carrying members to a corresponding pair of the slides, draft chains connected to the slidable stiff members, shafts mounted on the machine, sprocket wheels mounted on the shafts and engaged by the draft chains, and means for rotating the shafts simultaneously at will.

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