

(No Model.)

4 Sheets—Sheet 1.

C. WHITAKER.

SEPARATOR MECHANISM FOR RING SPINNING FRAMES.

No. 498,340.

Patented May 30, 1893.

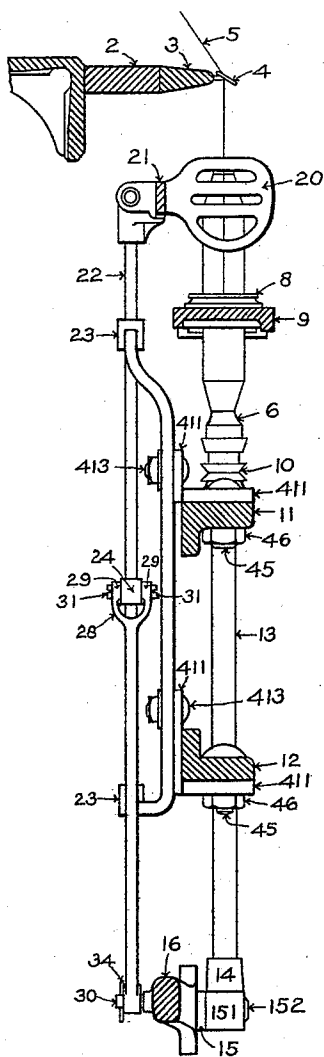


Fig. 2.

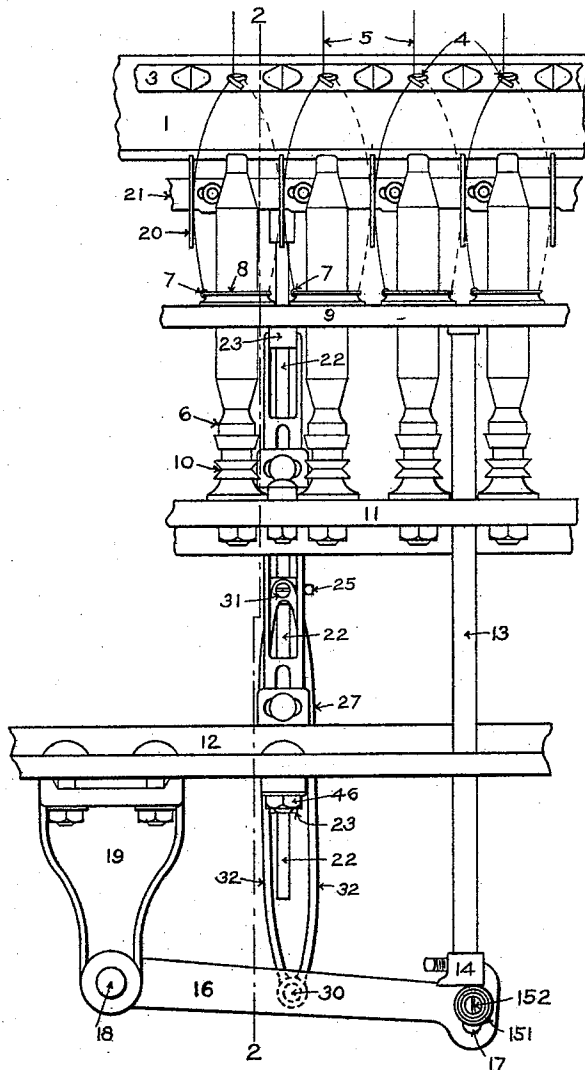


Fig. 1.

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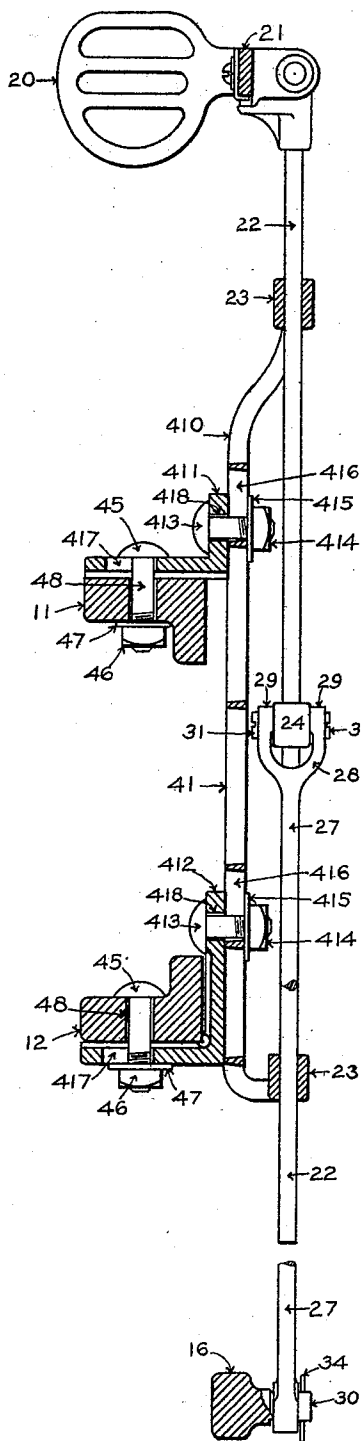


FIG. 6.

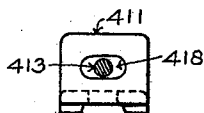


FIG. 13.

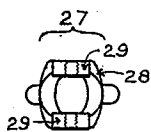


FIG. 4.

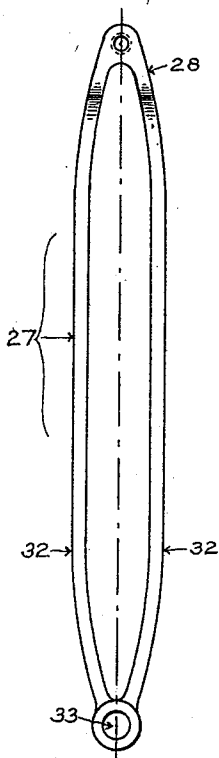


FIG. 3.

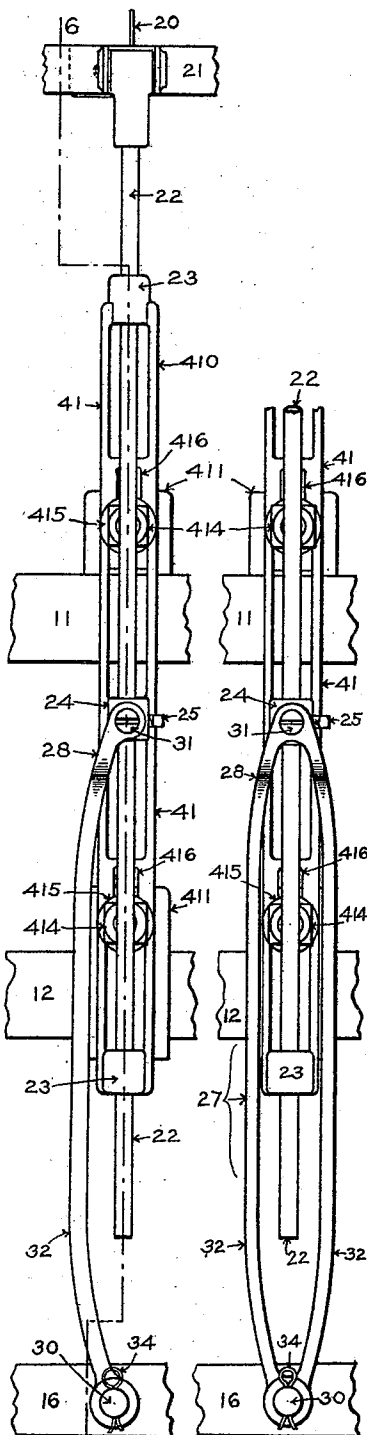


FIG. 7.

FIG. 5.

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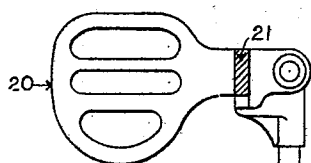
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C. WHITAKER.

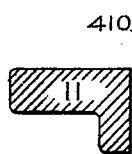
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22



410

25

10

41

40

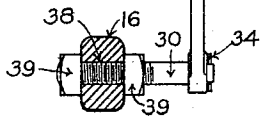
45

12

410

46

FIG. 9.



38

16

30

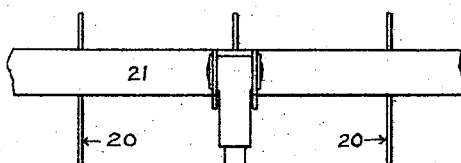
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WITNESSES.

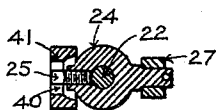
Mary Beverly  
Saml. C. Stephens.



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24

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27

FIG. 10.

22

23

11

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35

271

40

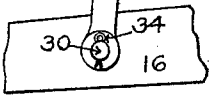
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23

46

46

FIG. 8.



30

34

16

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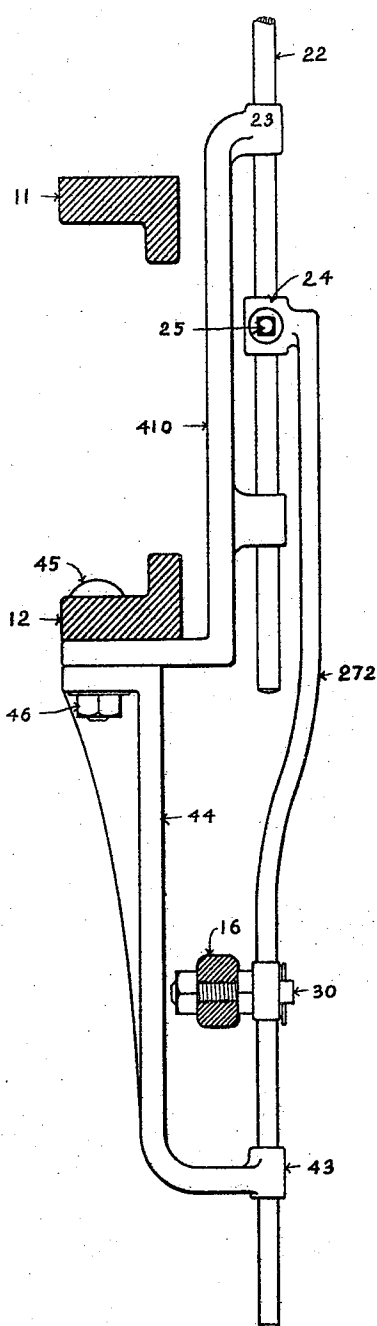


FIG. 12

WITNESSES.

*Mary Barry*  
*Saml. G. Stephens.*

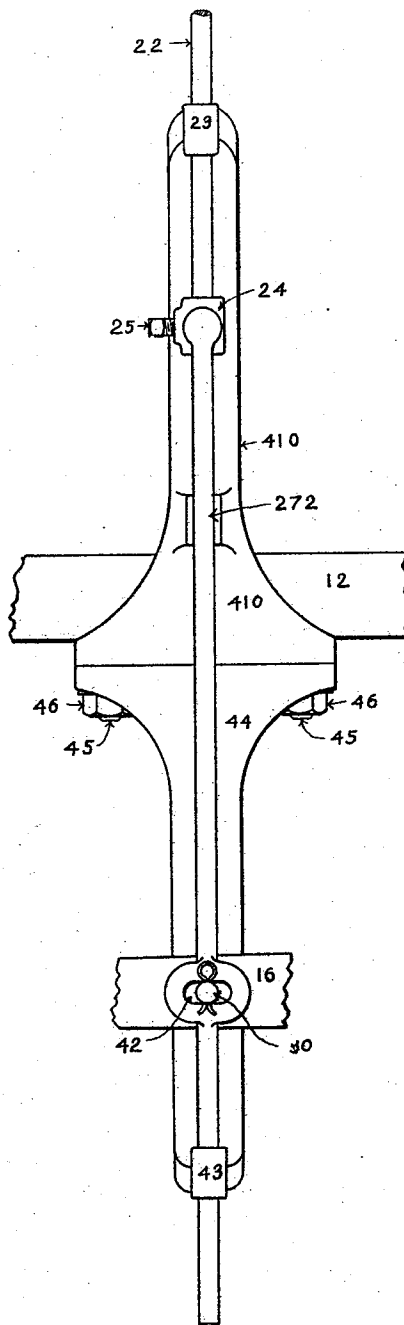


FIG. 11

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# UNITED STATES PATENT OFFICE.

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## SEPARATOR MECHANISM FOR RING-SPINNING FRAMES.

SPECIFICATION forming part of Letters Patent No. 498,340, dated May 30, 1893.

Application filed February 10, 1893. Serial No. 461,733. (No model.)

*To all whom it may concern:*

Be it known that I, CHANNING WHITAKER, a citizen of the United States, residing at Tyngsborough, in the county of Middlesex and State of Massachusetts, have invented a certain new and useful Improvement in Separator Mechanisms for Ring-Spinning Frames, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention is an improvement in separator-mechanisms of the class in which the separators are applied to suitable supports that are carried by vertical rods, termed separator-rods, having communicated thereto a vertical reciprocating movement resembling that which is communicated to the lifting-rods which support the ring-rail with its rings.

The invention relates mainly to the means for imparting to the separator-rods and the parts which are supported thereby the vertical reciprocating movement aforesaid.

It relates also to the guides or stands by means of which the separator-rods are held and guided in proper vertical position.

The main object of the invention is to provide a simple, inexpensive, and convenient arrangement and construction of parts for communicating movement to the separator-rods positively in both directions, which shall include a convenient means of effecting the vertical shift or translation of the traverse of the separators that sometimes it is desired and necessary to make without altering the extent of such traverse, and which shall require or consume very little of the power that is used for the purpose of actuating the ring-frame to which it is applied.

Another object of the invention is to provide a stand of simple and strong construction which shall have capacity for enabling to be made all the adjustments ordinarily required to be made in practice.

Another object of the invention is to provide for supporting the separator-rail on the separator-rods in such manner as that when desired the separators may be turned from their working position between the spindles to a retracted or backward inoperative position, and at any time the separator-rail and

separators may be lifted from the supports and removed entirely from the ring frame.

The invention consists in certain novel combinations of parts and in certain novel features of construction, all as hereinafter fully described with reference to the accompanying drawings, and as is particularly pointed out and clearly defined in the claims at the close of this specification and forming a part hereof.

In the accompanying drawings, Figure 1 is a view in front elevation showing a portion of a ring-spinning frame with the preferred embodiment of my invention applied thereto. Fig. 2 is a view in vertical section on the line 2—2 of Fig. 1. Figs. 3 and 4 are views of the link or connecting-rod shown in Figs. 1 and 2, the former being a view in side elevation and the latter a view in plan. Fig. 5 is a view in rear elevation showing certain details. Fig. 6 is a view partly in section on line 6—6 of Fig. 7. Fig. 7 is a view in rear elevation showing a modification of devices represented in Figs. 1 to 5. Fig. 8 is a view in rear elevation showing another modification. Fig. 9 is a view thereof partly in vertical section. Fig. 10 is a view in horizontal section on the line 10—10 in Fig. 9. Fig. 11 is a view in rear elevation showing still another modification. Fig. 12 is a view thereof partly in vertical section. Fig. 13 is a view of one of the bracket portions of the adjustable stand.

In Figs. 1 and 2, 1 is the roller-beam, 2 the thread-board hinged thereto as usual, 3 the finger-boards hinged as usual to the thread-board, 4 the yarn-guides secured to the finger-boards, 5 the yarns passing from the yarn-guides 4 to the bobbins 6, through the travelers 7 on the rings 8 supported by the ring-rail 9, 10 the spindles on which the bobbins are mounted, 11 the spindle-rail, 12 the lower or guide-rail, 13 the lifting-rod for the ring-rail, 14 the shoe or foot at the lower end of the said rod, 16 the cross-shaft arm carrying the stud or pin 15, the latter either acting directly upon the said shoe or foot or being provided with the roller 151 which acts against the shoe or foot and fits upon the stud or pin 15.

At 17 is shown the cross-slot in the free end of the said cross-shaft arm 16 in which the said stud or pin is adjustably mounted, and

at 18 the cross-shaft on which the said arm is secured, the said cross-shaft turning in bearings in brackets 19 (only one of which brackets is shown) and being caused to rock by usual means for the purpose of moving the ring-rail up and down.

All of the foregoing parts may be of any usual or preferred construction.

At 20 the separators are shown, and at 21 the rail on which the separators are mounted.

At 22 is shown one of the separator-rods by the upper ends of which the separator-rail 21 is supported, the said rod being held in upright position by a guide or guides 23.

In making provision for actuating the rod 22 from the cross-shaft arm 16 simultaneously with the actuation of the ring-rail from the said arm, and in the same direction but through a traverse of less extent, and also positively in both directions, I contemplate employing various connections, differing among themselves in minor structural details, but all embodying the same general and characteristic elements or features and principles. The first of the essential elements or features is the collar 24, the said collar being slipped upon or applied to the separator-rod. The second of the said essential elements or features is an appropriate securing or adjusting device by means of which the collar 24 is secured in place at an intermediate point in the length of the separator-rod.

In the drawings I have shown the collar held in place by means of a clamping-screw 25, which is fitted to a threaded hole in the collar and takes bearing at its inner end against the shaft. The third of these essential elements or features is a connecting-rod, one instance of which is the connecting-rod 27 in Figs. 1, 2, 3, 4 and 5, interposed between the collar 24 and the cross-shaft arm 16, the upper end of the said connecting-rod being pivotally or otherwise suitably connected or engaged positively with the collar, and the lower end of the connecting-rod being connected likewise in a positive manner with the cross-shaft arm 16 as by a stud or pin 30 on the said arm at a point intermediate the axis on which the said arm turns and the point at which movement is communicated to the lifting-rod for the purpose of actuating the ring-rail.

The general considerations which lead to the employment of the foregoing features are the following: The said connections are such as to cause the separator-rail and separators to rise and fall simultaneously with the ring-rail and rings, but through a traverse of less extent, as is necessary in order that the separators may be maintained at all times in proper position relative to the parts adjacent to which they are in the spinning-frame, the connecting-rod swinging laterally in all arrangements in which it is connected pivotally with the collar, to enable its lower end to follow the curve of the arc in which the stud or pin 30 travels as the cross-shaft arm rises and falls.

By varying the point at which the collar 24 is fixed by the screw 25 to the separator-rod 22, the height of the separator-rail and separators in the spinning-frame may be varied as required, and, also, the traverse of the separators may be shifted or translated vertically without the extent of such traverse being changed.

It is found in practice, that cotton flyings continually collect upon the surface of the separator-rod, particularly when such surface is rough or oily. It results, when the bearings through which the separator-rod slides vertically have been too loosely fitted to the said rod in the first instance, and also when the said bearings have become too large through the wear incident to use, that the cotton flyings which collect upon the surface of the rod pass in between the rod and the said bearings, thereby clogging the opening between them, and this clogging, if not relieved by the attendant, goes on increasing until the resistance due to it becomes so great as to overcome the tendency of the parts to fall of their own weight after having been raised. Heretofore, it has been customary to nearly counterbalance the weight of these parts and to depend upon the unbalanced portion of such weight to carry them down after being lifted, and it has resulted in practice that the parts would not descend as intended when the bearings became clogged, but would remain for some time suspended, and then, perhaps as the result of a jar, go down suddenly with a jerk. If, at such times, through the too great flexibility of the separator-rail, some of the separators should strike against the ring-rail the regularity of the winding-on of the yarn would be disturbed. As a complete safeguard against the objectionable results of such clogging, I make the movements of the separator-rod positive in both directions, as above mentioned, so that if, in consequence of clogging, the separator-rod should stick sufficiently to prevent the separators from descending because of the weight of the parts, the machinery will draw them down.

It has been proposed heretofore to make the movements of the separators positive in both directions in separator-mechanisms of the same structural type as that which is represented in the accompanying drawings, but in all known instances of this kind the construction adopted has been of such character as to prevent adjustment such as is required in order independently to shift or translate vertically the traverse of the separators. My present invention has as a special object to enable this adjustment to be made.

The best form of connecting-rod and best arrangement of parts which I yet have devised seems to be that which is shown in Figs. 1 to 5, the connecting-rod being shown separately in side elevation in Fig. 3 and in plan in Fig. 4, and being represented as applied to the separator-mechanism in Figs. 1, 2 and 5. In this form of connecting-rod the upper end,

28, of the connecting-rod is forked or split, the arms 29—29, of the fork, receiving between them the collar 24, and the said arms being made to occupy positions at the front and rear sides respectively of the collar. Screws 31, 31, are passed through the said arms and into the collar, to connect the connecting-rod and collar, and also to serve as pivots on which the connecting-rod can turn as it swings with the cross-shaft arm. The connecting-rod is symmetrical on each side of the axial line indicated in Fig. 3, and is of open construction, with the two sides 32—32, thereof, bowed apart and separated to the extent which is necessary in order to provide against contact of the said sides with the parts which are located between them. The lower end of the connecting-rod is formed with a hole, 33, therethrough to receive the stud or pin, 30, projecting from the cross-shaft arm, 16, the said end being held in place upon the said stud or pin, 30, by means of a split pin, 34, passed through a hole in the free end of stud 30 outside of the connecting-rod. The lower end of the separator-rod extends down between the two arms, 29—29, of the forked upper end of the connecting-rod, and also between the two sides 32—32 of the said connecting-rod, while the said sides are located at opposite sides of the lower guide, 23, for the separator-rod. The construction is such as to enable the lower end of the connecting-rod to be pivoted to the cross-shaft arm at a point on the latter which is so located that the horizontal component of the movement of the pivotal stud or pin 30, as it swings in a circular arc, shall be bisected by the center line of the separator-rod. I consider this the best arrangement. It results in maintaining, at all times, in the movement of the cross-shaft arm, the point at which force is transmitted from the cross-shaft arm to the separator-rod as nearly as possible in line with the separator-rod, and reduces to a minimum the side pressure and friction of the separator-rod in its guides. Also, the line of the force transmitted to the separator-rod from the cross-shaft arm is located in the same vertical plane as the center line of the separator-rod, from which it results that there is no tendency to twist or rotate the separator-rod in its guides, and it is made unnecessary to employ special devices to prevent such twisting or rotation. Further, in the case of the connecting-rod shown in Figs. 1 to 5 the force transmitted by means of the connecting-rod is transmitted in a line passing through the axis of symmetry of the connecting-rod. This form of connecting-rod may be made very light because of the rigidity and strength secured by its structure.

A modified form of connecting-rod capable of securing similar results, but requiring to be made of somewhat heavier build in order to give it the necessary rigidity and strength is represented in Figs. 6 and 7. The difference existing between this form and that

which has been described is simply that in this form the connecting-rod is not made bilateral and symmetrical, when viewed in the position represented in Fig. 7, but is unilateral and unsymmetrical. Both forms are symmetrical when viewed in the position represented in Figs. 2 and 6. That part of the form of connecting-rod shown in Fig. 7, which is intermediate the ends thereof, is bowed sufficiently to provide against contact with the lower end of the separator-rod and the lower guide, 23.

In the modification that is represented in Figs. 8, 9 and 10, the collar, 24, is provided with a rearwardly projecting pin, 35, on to which is fitted the upper end of the connecting-rod here designated by the numeral 271, the said end of the connecting-rod having a hole through which the pin, 35, passes, and the connecting-rod being held in place upon the pin, 35, by a split pin, 36, which is passed through a hole in the end of the latter. The connecting-rod at its lower end is formed with a hole therethrough to receive the stud or pin 30 projecting from the cross-shaft arm, 16, the said lower end being held in place upon the said stud or pin by means of a split pin, 34, passing through a hole in the free end of the stud or pin outside of the connecting-rod. In these figures I have shown the stud or pin formed separately from the cross-shaft arm and with a screw-threaded portion which is passed through a hole, 38, made transversely in the cross-shaft arm, 16. The said hole may be either plain, or screw-threaded as shown. On the stud or pin are placed nuts, 39, 39, fitting against the opposite sides of the cross-shaft arm and serving to hold the stud or pin fixedly in place. In this modification, in consequence of the connection of the upper end of the connecting-rod with the collar on the separator-rod being offset with relation to the axis of the separator-rod, there is a tendency to cause the separator-rod to twist or rotate in its guides or bearings at certain times during the working of the parts. I deem it advisable to make provision for counteracting this tendency, and, therefore I may employ in connection with the features already described as pertaining to this modification a directing guide which shall hold the separator-rod against being turned or rotated on its axis, while, at the same time, it shall leave the said separator-rod free to be moved up and down as required. A simple form of directing-guide is that shown in Figs. 8, 9 and 10. In these figures, the projecting-head or end of the screw, 25, by which the collar, 24, is clamped in place upon the separator-rod, passes into a vertical slot, 40, which is provided in the upright portion or web, 41, of the stand 410 carrying the guides 23—23, for the separator-rod.

In all of the foregoing modifications, I have embodied a connecting-rod which is pivotally joined at its upper end to a collar on the separator-rod, and is similarly joined at its lower

end to the cross-shaft arm. This mode of construction and connection provides for actuating the separator-rods with a minimum of resistance due to friction resulting from the movements of the connecting devices relatively to and upon one another.

In Figs. 11 and 12, I have shown a further modification bearing in certain particulars of form a slight resemblance to that which is presented in Figs. 8 and 9, but resembling those which are presented in Figs. 1 to 7 in having the line of the force transmitted to the separator-rod lying in the same vertical plane with the center line of the separator-rod. The construction shown in Figs. 11 and 12 differs from that shown in Figs. 8 and 9 mainly in having the motion transmitted to the separator-rod from the cross-shaft arm by means of a pin on the latter which plays in a slotted cross-head forming a part of the connecting-rod, instead of having the lower end of the said connecting-rod pivoted to the said stud or pin. In Figs. 11 and 12, the connecting-rod is designated 272, and the slot in the said connecting-rod in which plays the stud or pin on the cross-shaft arm 16 is marked 42. The upper end of the connecting-rod is joined to the collar at a point which is offset from the separator-rod, as in the case of the construction represented in Figs. 8 and 9. Inasmuch as in this modification it is unnecessary for the connecting-rod to swing or vibrate laterally as the cross-shaft arm moves up and down, the connecting-rod and collar may be formed integrally, as shown, or otherwise fixedly connected together so as to form either actually or practically one piece.

To hold the connecting-rod from vibrating or moving laterally, I apply thereto a guide, 43, which is fitted to the said rod at some point where it will not interfere with the moving parts. In Figs. 11 and 12, I have shown the said guide as receiving the prolonged lower end of the rod below the slotted portion, and as forming a part of a stand, which is held by bolts 45, 45, and the nuts 46, 46, to the lower rail 12. The said bolts and nuts may be, as shown, those which secure the stand 410 to the said rail 12. In this construction, inasmuch as the force by which the separator-rod is moved up and down is applied always in a line which is parallel with the axis of the separator-rod and sometimes is identical therewith, there is no tendency to rotate the separator-rod in its bearings, and hence the directing guide of Figs. 8, 9 and 10, is omitted.

More or less work, in the shape of fitting and adjusting, ordinarily has to be performed in applying and adapting separator mechanisms to ring-frames. To economize labor, trouble, and expenditure of time in this direction, I have devised an adjustable stand for the separator-rod which is so constructed as to admit of being changed and shifted in a manner to meet all of the requirements or-

dinarily encountered in practice, and to enable a separator mechanism to be quickly applied in exactly the desired and proper position and relations. In Figs. 5, 6, 7 and 13, I have shown the details of the said adjustable stand. In the remaining figures of the drawings I have shown only an ordinary and simple form of stand, in order to avoid confusion and to secure simplicity in the said other figures. In Figs. 5, 6, and 7, (see more particularly Fig. 6) the stand is shown composed of the main portion, 41, which is provided with the guides 23—23 for the separator-rod and with the two separate brackets 411, 412. Two of such brackets are provided, in order to secure steadiness, but one alone may be employed. The said brackets 411, 412, are formed substantially L shaped, and through a horizontal slot 418 in the vertical part of each is passed the stem of a headed bolt, 413, which also passes through a vertical slot, 416, in the main portion, 41, the said bolt receiving on its threaded end a washer, 415, and a nut, 414, for securing the bracket and the main portion together. The horizontal part of each bracket 411 and 412 has formed therein a slot 417 extending lengthwise of the said horizontal part, that is, at a right angle to the direction of the slot 418, and through this slot is passed the stem of the headed bolt, 45, the said bolt receiving on its threaded end the washer, 47, and the nut, 46, by which each bracket is secured to its supporting rail 11 or 12. The slots 416, 417, and 418, permit of the guides 23, 23, being given a range of adjustment universally in all directions to the extent of the limits imposed by the lengths of the said slots.

I do not herein lay claim broadly to a link pivotally connected at its one end to the separator-rod and at its other end to the cross-shaft arm, nor to actuating mechanism for a separator-rod embodying such a link and also adjusting means whereby the position of the separator-rail and separators may be shifted vertically, for these are claimed in my application for Letters Patent for improvements in separator-mechanisms for ring-spinning frames filed February 10, 1893, Serial No. 461,732.

I claim as my invention—

1. The combination with the separators, the separator-rail, the separator-rod, and the cross-shaft arm, of the connecting-rod connecting at its lower end with the cross-shaft arm, a collar on the separator-rod with which the upper end of the connecting-rod engages, and means for securing the collar adjustably on the separator-rod, substantially as set forth, whereby the separator-rod and the parts carried thereby are sustained vertically and moved up and down positively by the cross-shaft arm, and whereby the traverse of the separator-rail and separators may be shifted vertically by sliding the separator-rod through the collar, substantially as described.

2. The combination with the ring-rail, the

lifting-rod, and the cross-shaft arm actuating the said rod, the separators, the separator-rail, and the separator-rod, of the connecting-rod connecting at its lower end with the cross-shaft arm at a point intermediate the axis on which the latter turns and the point at which movement is transmitted to the lifting-rod, a collar on the separator-rod with which the upper end of the connecting-rod engages, and means for securing the collar adjustably on the separator-rod, all substantially as set forth, whereby the separator-rod and the parts carried thereby are sustained vertically and moved up and down positively by the cross-shaft arm, but through a traverse of less extent than that of the ring-rail, and whereby the traverse of the separator-rail and the separators may be shifted vertically by sliding the separator-rod through the collar, substantially as described.

3. The combination with the separators, the separator-rail, and the separator-rod, of the cross-shaft arm, the connecting-rod pivotally connected at its lower end with the cross-shaft arm and bowed to avoid contact with the lower end of the separator-rod and adjacent parts as it is operated, the collar on the separator-rod with which the upper end of the connecting-rod engages, and means for securing the collar adjustably on the separator-rod, all substantially as set forth.

4. The combination with the separators,

the separator-rail, the separator-rod, and the cross-shaft arm, of the connecting-rod pivotally connected at its lower end with the cross-shaft arm, bowed to avoid contact with the lower end of the separator-rod and adjacent parts in its movement, and having a forked upper end, the collar on the separator-rod to the opposite sides of which the arms of the forked upper end of the connecting-rod are pivoted, and means for securing the collar adjustably on the separator-rod, all substantially as set forth.

5. The combination with the separator-rod, means for moving the same vertically, and a supporting-rail or other fixed part of a machine-framing, of the vertically-slotted main stand-portion provided with a guide or guides for the separator-rod, and an L shaped bracket having slots therein at right-angles to each other, a securing bolt passed through one of said slots and the vertical slot of the main stand-portion, and a securing bolt passed through the other of said slots and the rail, whereby universal adjustment of the guide or guides is provided for, substantially as described.

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

CHANNING WHITAKER.

Witnesses:

MARY CAVERLY,  
SAML. G. STEPHENS.