

(No Model.)

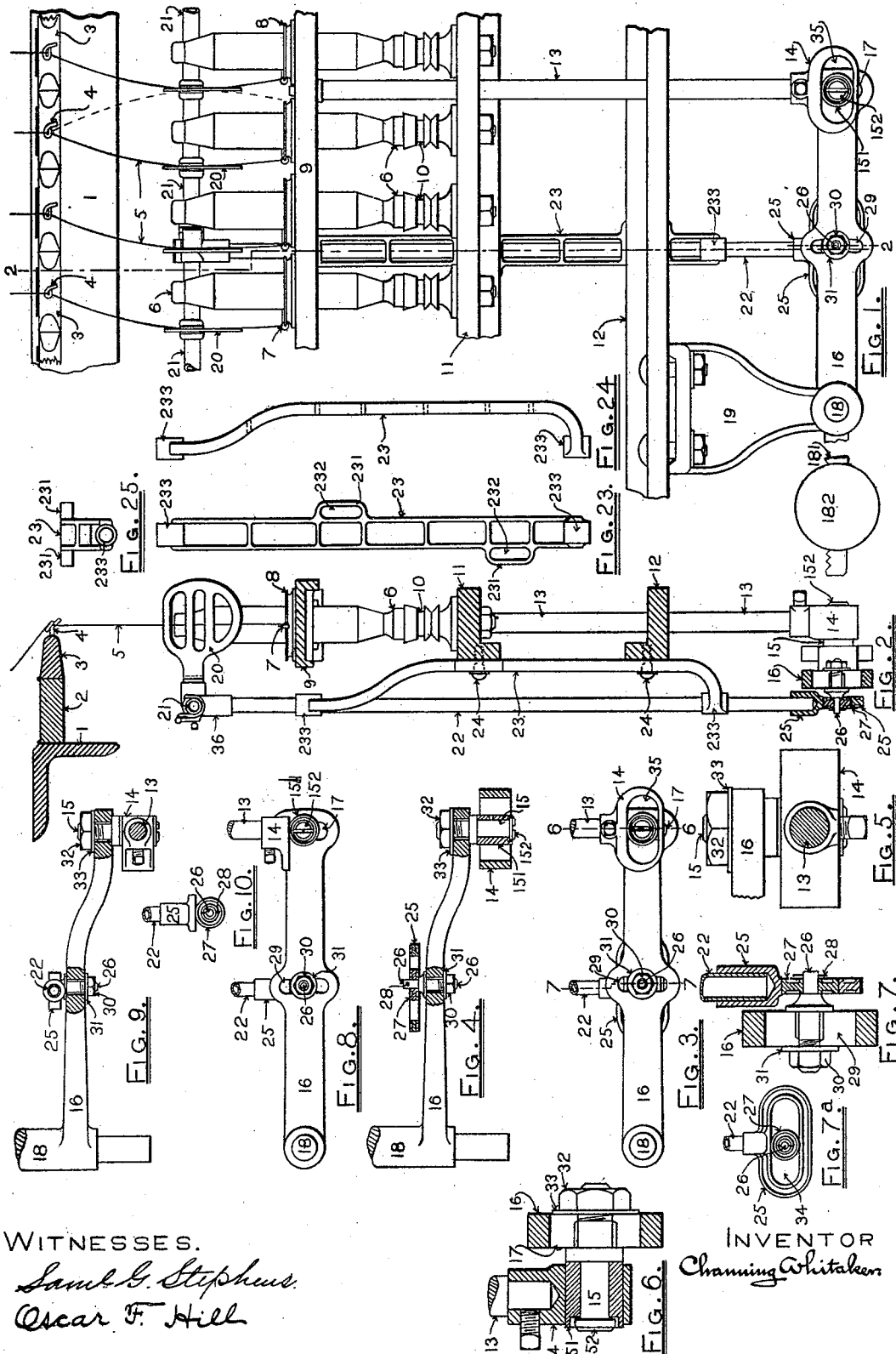
3 Sheets—Sheet 1.

C. WHITAKER.

SEPARATOR MECHANISM FOR RING SPINNING FRAMES.

No. 498,342.

Patented May 30, 1893.



(No Model.)

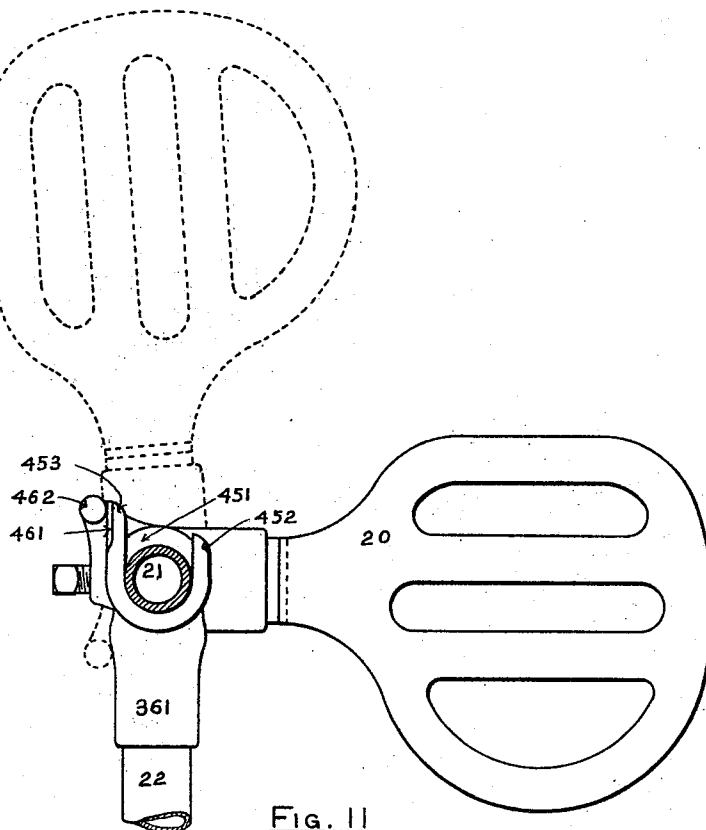
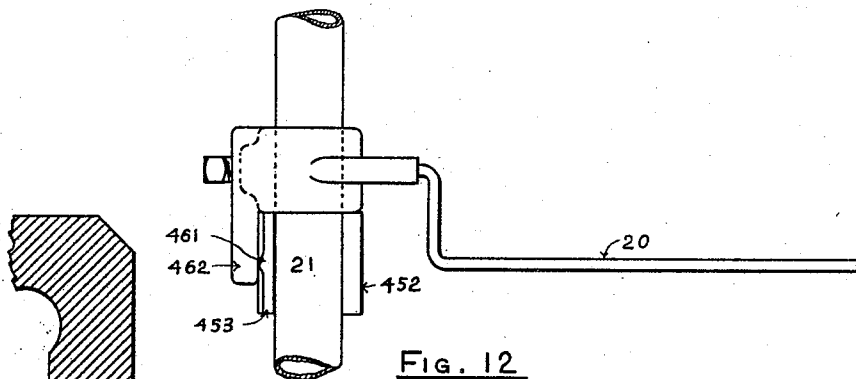
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WITNESSES.

Saml. G. Stephens.
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INVENTOR.

Channing Whitaker.

(No Model.)

3 Sheets—Sheet 3.

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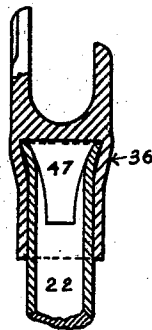


FIG. 15

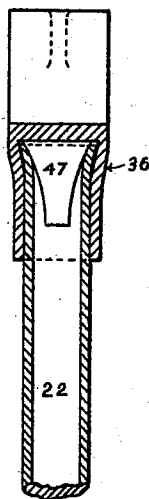


FIG. 13

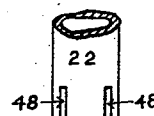


FIG. 16

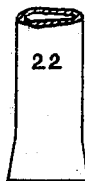


FIG. 21



FIG. 19

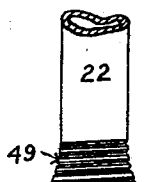


FIG. 20



FIG. 17

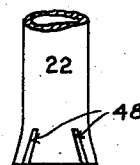


FIG. 18

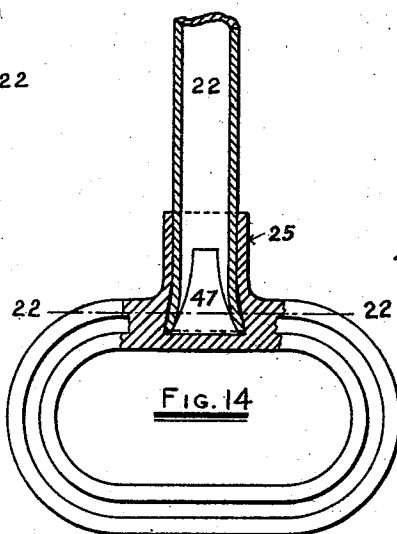


FIG. 14

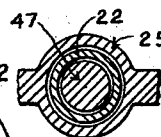


FIG. 22

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UNITED STATES PATENT OFFICE.

CHANNING WHITAKER, OF TYNGSBOROUGH, ASSIGNOR TO THE LOWELL
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SEPARATOR MECHANISM FOR RING-SPINNING FRAMES.

SPECIFICATION forming part of Letters Patent No. 498,342, dated May 30, 1893.

Application filed February 10, 1893. Serial No. 461,743. (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 certain new and useful Improvements in Separator Mechanisms for Ring-Spinning Frames, of which the following is a specification, reference being had therein to the accompanying drawings.

The present invention relates to the devices which are employed in ring-spinning frames for supporting and operating the separators which sometimes are interposed between the spindles of the said frames for the purpose of restricting the "ballooning" of the yarns being spun, and for preventing the said yarns from striking against one another in consequence of such ballooning.

The main object of the invention is to provide an improved arrangement and combination of supporting and operating devices of the simplest and most practical character, whereby not only shall the separators be moved vertically simultaneously with the ring-rail, and always in the same direction as the latter, but they shall be moved through a traverse of less extent than the ring-rail, so as to remain in proper position relatively to the various parts, the use of adjustable stops to determine the limit of the descent of the separators and of adjustable feet on the separator-rods to determine the highest point of the traverse of the separators thereby being rendered unnecessary; and wherein shall be embodied improved means for enabling the traverse of the separators quickly and conveniently to be shifted higher or lower as desired with relation to the thread-board, spindles and ring-rail, without any resulting variation in the extent of such traverse. The omission of the adjustable stops and adjustable feet secures a simplified and more reliable mechanism. Capacity for effecting a vertical shift or translation of the traverse of the separators is highly desirable in a separator-mechanism in order that the requirements of the different conditions under which one and the same spinning frame is used may be met properly, and also in order to enable the separator-mechanism to be fitted to the

different sizes of ring-spinning frames that are in use without it being necessary to keep on hand a stock of parts of various sizes or lengths. Prior separator-mechanisms of the same structural type as that to which the invention relates, as heretofore proposed to be built, usually have been devoid of capacity for the said vertical shift or translation. Where no provision for adjustment exists in the separator-operating devices, it becomes necessary for the maker thereof to provide different lengths of separator-rods, or a like supply of different sizes or lengths of some other part or parts, in order to enable the traverse of the separators in a given spinning-frame to be varied by an interchange of parts, and also in order to enable the separator-mechanism to be fitted to the different sizes of spinning-frames that are being built.

Another object of the invention is to provide a simple and practical construction of devices whereby to impart positive movement to the separators downward as well as upward, that is in both directions, while retaining capacity for adjustment of the character hereinbefore indicated.

Another object of the invention is to provide an improved means of supporting the separator-rail and holding it with the separators in an operative position, which means shall enable the journals or pivots of the separator-rail to be turned in bearings provided therefor so as that the separators either may be thrown forward into their lowered or working position or may be raised from between the spindles into their idle or inoperative position, and which shall enable the said rail and the separators connected therewith to be removed from the supports and the machine at any time and before the separators have been turned into their raised or idle position, as heretofore sometimes has been necessary, for the purpose of unlocking the rail.

The invention consists in certain features of improved construction and combination designed to secure the objects aforesaid, and first will be described with reference to the accompanying drawings, in which are represented the best embodiments thereof which so far have been devised, and then will be particularly pointed out and distinctly de-

fined in the claims at the close of this specification.

In the drawings, Figure 1 is a view in front elevation showing a portion of a ring-spinning frame and one embodiment of the invention applied thereto. Fig. 2 is a view in vertical section on the line 2—2 of Fig. 1. Fig. 3 is a view in side elevation of certain of the parts which are represented in Fig. 1. Fig. 4 is a view in plan of the parts which are represented in Fig. 3, but with certain portions thereof in section in order to show more clearly the construction. Fig. 5 is a view in enlarged plan of certain parts at the right in Fig. 3. Fig. 6 is a view in vertical section on the line 6—6 in Fig. 3. Fig. 7 is a view in vertical section on the line 7—7 in Fig. 3. Fig. 7^a is a view in side elevation of certain details of Figs. 1 to 4 and 7. Fig. 8 is a view in side elevation corresponding with Fig. 3 but showing a modification. Fig. 9 is a view in plan, partly in section, corresponding with Fig. 4, but showing the modification which is represented in Fig. 8. Fig. 10 is a view in side elevation of certain details of Figs. 8 and 9. Fig. 11 is a view mainly in side elevation but with the separator-rail and roller-beam in section, showing the means for supporting the separator-rail and for stopping it in each of the positions of the separators. Fig. 12 is a view in plan of the parts which are shown in Fig. 11. Figs. 13 to 22, inclusive, are views illustrating in detail the construction of the separator-rod, the said views showing various modifications. Fig. 23 is a view of the stand for the separator-rod in front elevation. Fig. 24 is a view thereof in side elevation. Fig. 25 is a view thereof in plan.

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 said shoe or foot and fits upon the stud or pin 15, it being held in place thereon by the thin-headed screw 152, the threaded part of which enters a threaded hole in the end of the stud or pin. 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, the cross-

shaft being in practice usually provided with an arm 181 on which is mounted adjustably a weight 182 for counterbalancing the parts which are operated by the arm 16.

At 20, in Figs. 1 and 2, the separators are shown.

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

At 21 is shown the separator-rail on which the separators are mounted, and at 22 one of the rods by which the said rail is supported, the said rail and rod by preference being tubular to secure lightness, and the separator-rod being held in upright position by guides 233 in a stand or bracket 23 which is secured to the rails 11 and 12 by screws 24, 24, passing through vertical slots 232 in the portions 231, 231, of the stand, the said portions being offset so that the separator-rod will not be in the way of the screw-driver when the screws are being turned. 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, is made as follows, reference being had to Figs. 3, 4 and 7 in particular. On the lower end of the rod 22 is affixed a foot or shoe 25 which is acted upon by either a stud or pin 26 carried by the arm 16, or a roller 27 which is mounted upon the said stud or pin and held in place thereon by means of a pin 28. The stud or pin 26 is mounted upon the arm 16 at a point between the cross-shaft 18 and the stud or pin 15, so that less movement shall be communicated to the separator-rod than to the lifting-rod, and at a distance from the axis of the cross-shaft which will secure the desired ratio between the extent of the up-and-down movement of the separators and that of the corresponding movement of the ring-rail.

In the drawings, as shown, the movement of the separator-rod and separators is intended to be a little more than one-half as great as that of the lifting-rod and ring-rail. For the purpose of independently shifting vertically the traverse of the separators without varying such traverse in extent, provision is made for shifting the stud or pin 26 upon the arm 16 in a direction which is cross-wise of the arm 16 and preferably in a curve which is concentric with the axis of the cross-shaft. Thus, as shown in Figs. 1, 3, 4, 7 and 8, the arm 16 is formed with a transverse curved or arc-shaped slot 29 which preferably is concentric with the axis of the cross-shaft 18, and in which slot the stud or pin 26 is fitted, the threaded end of such stud or pin receiving thereon, on the side of the arm opposite to that on which the roller 27 is located, a nut 30 and washer 31 whereby the stud or pin is secured at the desired position of adjustment transversely of the arm in the said slot. For the purpose of effecting a similar shift of the traverse of the ring-rail, the stud or pin 15, by means of which the lifting-rod and ring-rail are actuated, has on the threaded end

thereof, on the side of the arm 16 which is opposite to that on which the roller 151 is mounted, a nut 32 and washer 33 whereby it is secured in the desired position of adjustment transversely of the arm 16 in the slot 17, which also is curved or arc-shaped and concentric with the axis of the cross-shaft, all as is shown clearly in Figs. 1, 4, 5, 6 and 8. The two studs or pins 15 and 26, it will be seen, are independently adjustable in the slots 17 and 29, thereby enabling the traverse of the ring-rail to be adjusted or shifted vertically as required without such adjustment affecting the traverse of the separators, or necessarily requiring a compensating adjustment of the devices for moving the separators up and down, and also enabling the traverse of the separators to be independently adjusted or shifted at any time relatively to the traverse of the ring-rail.

From the fact that the slots 17 and 29 are arc-shaped and concentric with the axis of the cross-shaft 18 it results that the relative movements of the lifting-rod and separator-rod will not vary from the intended relative movement, however the studs may be adjusted within the two slots. It is preferred that both of the said slots be concentric, in order that this may be the case, inasmuch as if they were straight slots at right angles to the length of the cross-shaft arm, or if one of them were straight and the other concentric, the ratio of the movement of the separator-rod to that of the lifting-rod would vary from the desired ratio according as the studs were adjusted to different positions in the slots.

It is found in practice that, when the guides 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 guides have become too large through the wear incident to use, the cotton flyings which collect upon the oily surface of the rod pass in between the rod and the said guides, 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 guides 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 time, 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 the movements of the separator-rod may be made positive in both directions so that if,

as the result of the 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. Figs. 1, 2, 3, 4, 7 and 7^a show an improved means of communicating movement from the arm 16 to the separator-rod positively in both directions without interfering at all with the capacity for effecting a vertical shift or translation of the traverse of the separators. In these figures the foot or shoe 25 is formed with a horizontal slot 34 into which projects the free end of the stud or pin 26 and its roller 27. This couples or connects together the arm 16 and the separator-rod in a manner to cause movement to be transmitted from the former to the latter positively in both directions, while it leaves the stud or pin 26 free to be adjusted as may be required in the slot 29. The foot or shoe 14 carried by the lifting-rod 13, if desired, also may be formed with a slot, 35, as indicated in Figs. 1, 3, 4, 5 and 6, for the reception of the free end of the stud 15 or the roller 151 mounted thereon. If it is not sought to cause the separators to move downward positively, then the separator-rod 22 may be fitted with a foot or shoe having simply a plain under surface to rest upon the stud or pin 26 or its roller 27, as shown in Figs. 8, 9, and 10. In Figs. 8 and 9 the lifting-rod 13, also, is shown fitted with a similar shoe or foot.

The means of supporting the separator-rail upon the separator-rod is shown in Figs. 11 and 12. In these figures the socket 361 affixed to the upper end of the separator-rod has an open bearing 451 for the reception of the journal of the separator-rail, and a rest 461 receiving the impact of a stop 462 carried by one of the separators or otherwise mounted to move in unison with the separators and separator-rail, the said rest 461 serving to arrest the rotation of the separator-rail, and the separators carried thereby, when the separators have been lowered into their working position between the spindles, and also serving as a fulcrum against which the stop 462 takes a bearing to enable the gravity of the parts in front of the stop to impel the rail-journal to its seat and hold it there; and the construction of the parts is such as to enable the separator-rail and separators to be removed directly from the bearing-supports and from the machine, at any time, before the separators have been turned out of their operative position, without its being necessary to provide for the disengagement of the rail from its bearings by

first turning the separators into their raised or idle position. The walls 452 and 453 in front and in rear of the bearing 451 are both vertical, being of sufficient height to insure the retention of the separator-rail, the rest 461 being on the rear side of the rear wall 453, and the arrangement of the rest 461 and stop 462 is such as to permit the front wall 452 to be made very low. In fact such front wall is necessary only for the purpose of holding the separator-rail from dropping forward out of the open bearing when the separators have been raised and the pressure of stop 462 against the rest 461 has been lessened or relieved. The part of rest 461 with which the stop 462 contacts, and against which the said stop bears when the separators are in their lowered position is parallel with the walls of the bearing, and there is no obstruction to prevent the separator-rail from being lifted directly from its support before the separators have been turned from their operative position. When the stop 462 is formed on a separator, it is formed on that separator which is next adjacent to the socket 361. The said stop 462 projects to the rear of the rest 461. When the separators are turned into their lowered and operative or working position, the stop 462 strikes against the rest 461 as soon as that position has been reached. The stop 462 then acts as a pivot, and the weight of the parts to the front thereof bears the separator-rail down into its seat in the bearing 451. When the separators are thrown from between the spindles into their raised or idle position they may, if desired, rest against the roller-beam 1, as indicated in Fig. 11. Or, the stop 462 may be allowed to strike against the lower portion of the socket 361 and thus arrest the movement of the separators when they have reached their idle position, as shown in dotted lines in Fig. 11. As will be observed, the acting surface or portion of the rest 461 is formed as a narrow projecting part of the socket, it being located at mid-width of the socket and of semi-cylindrical outline where the stop 462 touches it. When the separators are in their usual operative position the stop 462 presses against the narrow projection, while at the same time the separator-rail presses against the interior of the bearing of the separator-rail support. From this it results that if the separator-rail socket should, from any accidental cause, become slightly turned on its axis, the pressure of the stop 462 upon the narrow projection, and the pressure of the separator-rail against the interior of the bearing, will restore the socket-bearing to parallelism with the separator-rail. Preferably, the face of the stop 462 which bears against the rest is made of a cylindrical curve, such curve forming part of a cylinder of small diameter parallel to the axis of the separator-rail.

The mode in which the socket 36 and foot or shoe 25 are represented as being connected

with the opposite ends of the separator-rod in Figs. 13 to 22 secures the said parts immovably and reliably to the said rod. In Figs. 13, 14, 15, and 22, 47 is a casting resembling in shape the frustum of a cone. The diameter of its large end is small enough to permit it to be slipped through the smallest part of the hole formed in the socket 36 or foot or shoe 25 for the reception of the end of the separator-rod 22. The diameter of its small end is small enough to enable such end to enter the approaching end of the tubular rod 22 without difficulty, after the piece 47 has been introduced, large end first, into the hole in the socket or foot or shoe, and while the end of rod 22 is being pushed into such hole. If the separator-rod 22 is made of sufficiently soft metal, as, for instance, the soft so-called steel which is used frequently by boiler makers, the rod 22 can be forced down upon the frustum and expanded thereby at the end until its exterior strikes against the interior of the enlarged part of the hole in the socket or foot or shoe, forcing the shell of the rod hard against the said interior and immovably retaining the end of the rod in the socket, or foot or shoe.

Figs. 13 and 15 show the socket applied and secured in the described manner to the upper end of the separator-rod, Fig. 14 the foot or shoe similarly applied and secured, and Fig. 22 shows a section on the line 22-22 of Fig. 14.

The appearance of the end of the separator-rod when expanded is represented separately in Fig. 21. The socket 36 and foot or shoe 25 with their contained conical expanders may be slipped upon the opposite ends of the separator-rod and secured in position on their respective ends of the rod at one operation. The economy of time which is thus secured renders this a matter of some importance. If the metal of the separator-rod is too hard to expand readily under the conditions that have just been described, then the ends of the said rods may be split for a short distance as shown at 48 in Figs. 16, 17, and 18.

Fig. 16 represents in elevation one end of the rod with the splits therein, Fig. 17 an end elevation thereof, and Fig. 18 the appearance of the split end after having been expanded. Or an ordinary tapering steam-pipe or gas-pipe thread may be cut upon the ends of the separator-rod, which also will enable the said ends to be more easily expanded and jammed tightly against the interior of the socket, or foot or shoe, for the shape of the tapering threads is such that the outer part of the V of the threads will flatten against the interior of the socket, or foot or shoe, and cause the latter to be fastened immovably to the separator-rod by the exercise of less force. The appearance of the threaded end of the rod after having been expanded against the interior of the socket, or foot or shoe, is represented in Fig. 20.

I do not claim broadly herein the combination with the separator-rail, and a stop mov-

ing in unison therewith of a support provided with an open bearing for the rail-journal, and also with a rest without obstruction to interfere with the stop while the rail is being removed, for this is not of my invention. Nor do I claim broadly the like combination embracing a narrow rest, or a separator provided with a stop, for I have laid claim to combinations like unto the above and embracing these features in my application for Letters Patent filed February 10, 1893, Serial No. 461,731.

I claim as my invention—

1. The combination with the ring-rail, the lifting-rod, the arm 16, means for operating the lifting-rod from the said arm 16, the separators, the separator-rail, and the separator-rod, of an actuating stud or pin applied to the said arm at a point intermediate the axis on which the arm turns and the point at which power is transmitted from the arm to the lifting-rod, and adjustable transversely of the arm, means whereby the stud or pin is held in adjusted position on the arm, and operative connections through which the said stud or pin transmits movement to the separator-rod and parts carried thereby, substantially as described.

2. The combination with the ring-rail, the lifting-rod, the arm 16, means for operating the lifting-rod from the said arm 16, the separators, the separator-rail, and the separator-rod having a foot or shoe at the lower end thereof, of a stud or pin applied to the arm at a point intermediate the axis on which the same turns and the point at which power is transmitted to the lifting-rod, and adjustable transversely of said arm, and means whereby the said stud or pin is held in adjusted position on the arm, substantially as described.

3. The combination with the ring-rail, the lifting-rod, the arm 16, means for operating

the lifting-rod from the said arm 16, the separators, the separator-rail, and the separator-rod having the slotted foot or shoe at the lower end thereof, of the stud or pin applied to the arm 16 at a point intermediate the axis on which the same turns and the point at which power is transmitted to the lifting-rod, adjustable transversely of the said arm, and projecting into the slot in the foot or shoe of the separator-rod, and means whereby the said stud or pin is held in adjusted position on the arm, substantially as described.

4. The combination with the ring-rail, the lifting-rod, its foot or shoe, the separators, the separator-rail, the separator-rod and its foot or shoe, of the arm 16 having the slots 17 and 29 formed therein transversely at different distances from the axis on which it turns, the pins or studs 15 and 26 mounted in said slots, and means for independently securing each stud or pin in the desired position of adjustment in its appropriate slot, substantially as described.

5. The combination with a separator-rail, and the separator provided with a stop, of the support constructed to permit the separator-rail to be unobstructedly removed therefrom before the separators have been turned out of their operative position, it having the open bearing from which the rail-journal may be removed directly, and also the narrow projecting rest at the rear side thereof without obstruction to interfere with the stop while the rail is being removed, substantially as described.

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

CHANNING WHITAKER.

Witnesses:

MARY CAVERLY,
SAML. G. STEPHENS.