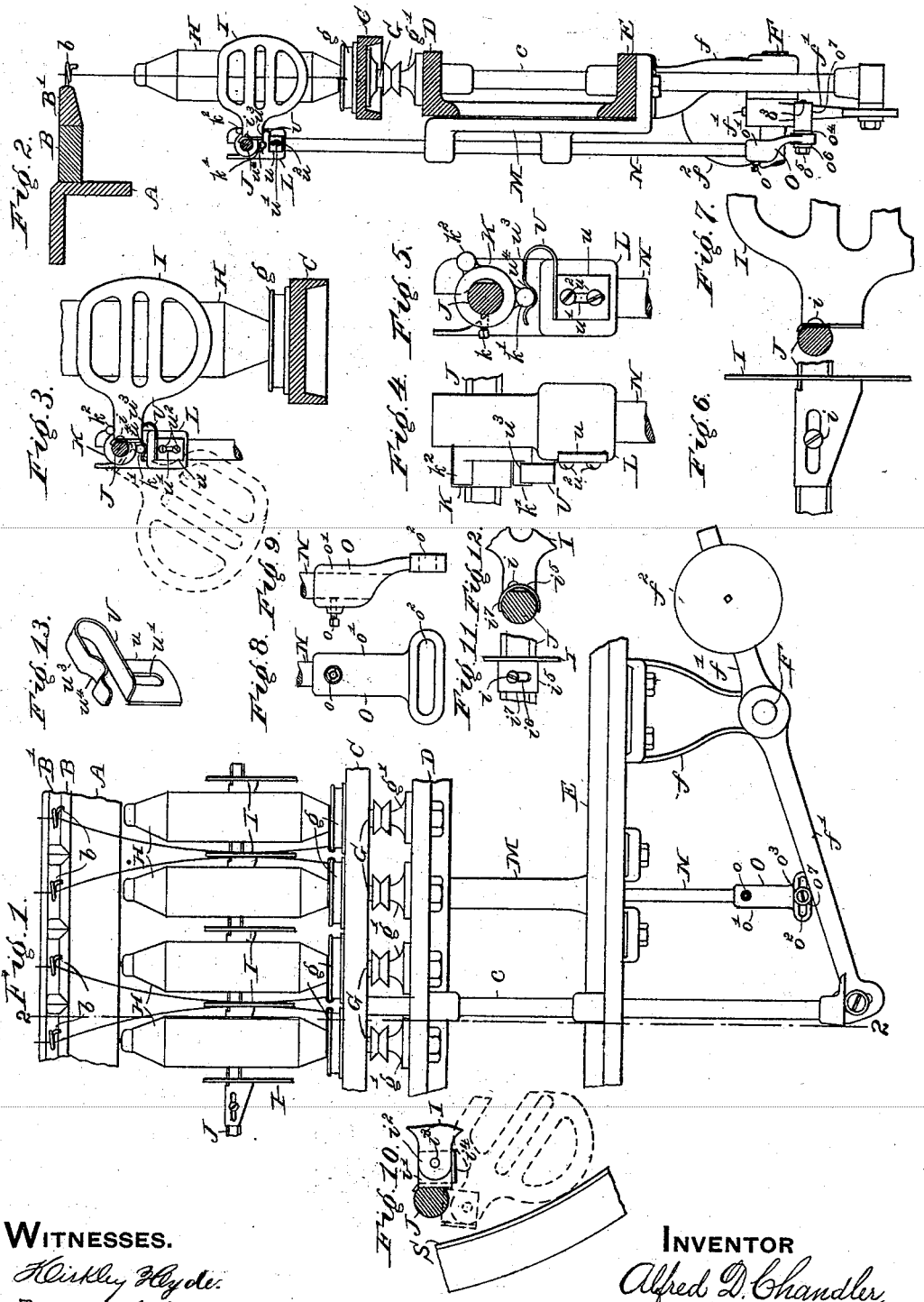
(No Model.)

A. D. CHANDLER.

YARN SEPARATOR.

No. 553,392. Patented Jan. 21, 1896.



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YARN-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 553,392, dated January 21, 1896.

Application filed May 9, 1893. Serial No. 473,542. (No model.)

To all whom it may concern:

Be it known that I, ALFRED D. CHANDLER, a citizen of the United States, residing at Chelmsford, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Yarn-Separators for Spinning-Frames, of which the following is a specification.

My invention relates to yarn-separators for spinning-frames; and it consists in the devices and combinations hereinafter described and claimed, and especially in so constructing and organizing the separators that they may be placed in such a position as not to interfere with the operation of doffing. Since the introduction of higher speeds for spindles greater efficiency in separators is found necessary, and to meet this demand the trade has supplied what is technically known as a "wide" blade. These blades have greater width from top to bottom and are usually made to project below their line of support to a greater extent than above it. The use of these wide blades has made necessary considerable new invention in order to adapt them to existing conditions, and such is the object of my invention, in which I believe this result is first obtained in a satisfactory manner. In my prior patents, No. 476,731 and No. 496,186, I showed an invention in separators which obviated some of the defects of prior structures, as the separators were actuated by separator-rods which relieved the ring-rail of the weight of the separator. My former patents, however, did not achieve all that was desired, because the separators therein shown, if made with wide blades, would interfere with the operation of doffing.

By my present construction and arrangement of the separators and their supporting devices, I am enabled for the first time to use separators of any width desired without interfering in any way with complete ease in doffing the spindles or with the construction of other parts of the frame, and by using separators of increased width it is made possible to use a longer traverse of the bobbins and a larger diameter of the same than has heretofore been customary.

In the accompanying drawings, Figure 1 is a front elevation of such parts of a ring-spinning frame as are necessary for the understanding of my invention and my invention applied thereto; Fig. 2, a vertical section on the line 2 2 in Fig. 1; Fig. 3, a vertical section of the ring-rail, the separator-bar, showing in side elevation a spinning-ring, part of a cop of yarn, a separator-rod, its socket, a separator shown by full lines in its operative position and by dotted lines in the position it occupies in doffing, and the collar having projections, and the spring which holds said separator in either of its positions; Fig. 4, a rear elevation of the upper part of the separator-rod, a part of the separator-bar, the collar having projections, and the spring which engages said projections to hold the separator in or out of operative position; Fig. 5, a side elevation of the parts shown in Fig. 4, the collar with projections in Figs. 4 and 5 being in position to hold the separator between the spindles; Fig. 6, a front elevation of a part of the separator-bar and a separator secured thereto; Fig. 7, a vertical cross-section of the separator-bar and a side elevation of the shank and adjacent parts of a separator secured to said bar; Fig. 8, a rear elevation of the lower part of a separator-rod, the adjustable foot, and the set-screw by which said foot is held and adjusted on said separator-rod; Fig. 9, a side elevation of the parts shown in Fig. 8; Fig. 10, a side elevation of a part of one of the supports of a ring-spinning frame, a vertical section of the separator-bar, and a side elevation of a modified form of the separator secured to said bar, the separator-blade being represented as pivoted to its shank, a part of the separator being shown in full lines in its operative position and in dotted lines in the position it occupies in the operation of doffing, when its complete backward movement is prevented by the position of the support; Fig. 11, a front elevation of part of the separator and part of the separator-bar, and Fig. 12 a side elevation of these parts, these figures showing another means of accomplishing the object of the device shown in Fig. 10—that is, to allow certain of the separators to be stopped by the supports of the spinning-frame without interfering with the complete backward movement of the other separators; Fig. 13, an isometric perspective view of the retaining-spring.

The roller-beam A, thread-board B, finger-

boards B′, yarn-guides *b*, the ring-rail C, lifting-rod *c*, spindle-rail D, guide-rail E, cross-shaft F, turning in brackets *f*, secured to the guide-rail E, cross-shaft arm *f′*, weight f^2, spindles G, rings *g*, spindle-bearing *g′*, and bobbins H are all of the usual construction and operation and substantially as shown in two United States Patents to me respectively numbered and dated 476,731, June 7, 1892, and 496,186, April 25, 1893. The separator-rod N and socket-piece L are substantially as shown in said last-named patent, and the separator-rod N is guided in a stand M, which is represented as of the form shown in the patent first above-named, and secured to the guide-rail E, as therein shown and described. The separator-bar J instead of being a flat bar or strip, as shown in said patents, is a round bar which turns directly in the socket-piece and dispenses with the hinge-brackets shown in said patent, one side of the separator-bar herein described being flat to receive the bent shank of the separator I, said shank being secured by a screw *i* to said separator-bar.

The separator-bar is prevented from endwise movement in the socket-pieces L by collars K, which surround said separator-bar between the ends of said bar and said socket-pieces, and are held from turning on said bar by set-screws *k*. Each collar K is provided with two lateral projections *k′* k^2, arranged at equal distances from the center of said collar and at about one hundrd and twenty degrees from each other, more or less, one of said projections *k′* being immediately below the center of the collar when the separators are in operative positions, so that when the separator-bar and the collar K are turned to bring the other projection k^2 below the center of said collar K the separator will be swung downward and backward into the position indicated by dotted lines in Fig. 3, leaving a clear space between the adjacent bobbins to enable the bobbins to be doffed without the hand striking the separators. The separators are held in their operative positions, as shown by full lines in Fig. 3, or in position for doffing, as shown by the dotted lines in said figure by a sheet-metal spring U of the form shown in Fig. 13, said spring having a vertical shank *u*, provided with a slot *u′*, by means of which it is secured to the side of the socket-piece L by means of one or more screws u^2, as shown in Fig. 5, the upper horizontal part u^3 of said spring U having a notch, depression or bend u^4 to receive either of the projections *k′* k^2 and to retain the separator-bar and separators in position. The spring U is in shape similar to a letter **U** turned on its side, the shank *u* being attached to the lower side of the **U** and formed in one piece therewith. Said separator-bar and separators may easily be turned from one position to the other by the hand applied to the separators secured to the separator-bar, as above described.

The construction and arrangement of the separator-bar, separators and connected parts, above described, enable the separators to be turned out from between the spindles in spinning-frames in which the horizontal distance from the ring-rail to the roller-beam is too small to allow of the separators being turned upward sufficiently to be out of the way in the operation of doffing, especially where a very wide separator-blade is used. The slot *u′* in the shank *u* of the spring U allows the spring to be adjusted vertically to vary the pressure of said spring against the projections *k′* k^2, as may be necessary.

Where the separators herein described are applied to frames not constructed with special reference thereto, some one of the separators is likely to strike a support S of the frame, and in order that all the separators may not thereby be prevented from being turned into the position for doffing the separators in front of said supports must be movable with reference to the separator-bar. This end may be accomplished by forming the shank of the separator in two overlapping parts *i′* i^2, as shown in Fig. 10, the part *i′* of said shank being secured to the separator-bar by the means above described, and the part i^2 of said shank being pivoted at i^3 to the part *i′*, so that when the separators are turned down the separator-blade in striking the support S and being stopped thereby will turn on the pivot i^3 and allow the separator-bar with other separators to be turned into the position shown by dotted lines in Fig. 3. The part *i′* of the separator-shank is provided with a laterally-projecting flange or ledge i^4, which supports the part i^2 of said shank when the separator-bar is turned into operative position.

In Figs. 11 and 12 the separator-shank is all in one piece, but the bent attaching portion of the shank i^5 is a longitudinal section of a horizontal cylinder i^7 which fits the curved surface of the separator-bar and is secured to said bar, as above described, by a screw *i*, but the slot i^6, through which said screw passes into the separator-bar, is large enough and long enough to allow the separators, when stopped by the support S, to turn on said bar, or rather to allow said bar to turn without turning said separator and said slot i^6 is so arranged that when the separator-bar is turned back into operative position the screw *i* is turned into and against the upper end of said slot i^6 and supports the separator in its operative position.

The device shown in Fig. 10 is preferred to that shown in Figs. 11 and 12, where the former can be used, the latter being intended to be used in cases where, owing to the nearness of the ring-rail to the front of the roller-beam, the shank of the separator, if the middle of the separator-blade is properly arranged between the adjacent spindles, would be too short to be conveniently jointed.

Of course, in building new frames, if sufficient attention is paid to the placing of the spindles and the arrangement of the sup-

ports S, all the separators may be rigidly secured to their separator-bar.

A vertical motion is communicated to the separator-rods N by the cross-shaft arm f', the lower end of said separator-rod being provided with a foot O, adjustable on the lower end of said rod by means of a set-screw o, said foot being provided with a sleeve o' to receive said rod and said screw passing radially into said sleeve against said rod. The lower end of the foot O is provided with a transverse horizontal slot o^2 which receives a stud o^3, having a shoulder o^4 arranged against the front of said foot, said stud passing through said slot and being secured therein by a nut o^5 which turns on the rear end of said stud against a washer o^6, in a well-known manner, so that by loosening the nut o^5 said stud o^3 may be adjusted in the slot o^2 nearer to or farther from the cross-shaft F. An anti-friction-roll o^7 turns on the stud o^3 in front of the foot O and rests upon the cross-shaft arm f', so that when said cross-shaft arm is raised the separator-rod and the parts supported thereby are raised, and when said cross-shaft arm falls said separator-rod and supported parts fall by their own gravity, the strain of the separating devices upon said cross-shaft arm being the same at all times.

By adjusting the foot O on the separator-rod N the extreme points of the traverse of the separators will be changed, but the length of said traverse will not be affected thereby.

By moving the stud o^3 in the slot o^2 nearer to or farther from the cross-shaft F, the length of traverse of the separators will be diminished or increased.

The stopping of a single separator by a support S will not prevent the two bobbins next adjacent from being doffed, the one at the right of said separator by the right hand and the other by the left hand.

I claim as my invention—

1. The combination of the separator-bar, separators secured thereto, suitable bearings in which said separators may be turned to bring said separators into operative position or into position for doffing, a collar secured on said bar and having projections, and a spring secured to one of said bearings and having a bend or depression to receive either of said projections and thereby to hold said separators in either of said positions, as and for the purpose specified.

2. The combination of the frame and its supports, the separator-bar, separators rigidly secured to said bar in front of the space between said supports, suitable bearings in which said bar may be turned, and other separators carried by said bar in front of said supports and adapted to yield in an upward direction only in striking said supports, to allow said first-named separators to be turned downward into said space, as and for the purpose specified.

3. The combination of the frame and its supports, the separator-bar, separators rigidly secured to said bar in front of the space between said supports, suitable bearings in which said bar may be turned, and other separators arranged in front of said supports and having shanks formed in two parts, jointed to each other, one part of each shank being rigidly secured to said separator-bar, to allow said last-named separators to yield in an upward direction only in striking said supports and to allow said first-named separators to be turned into said space between said supports, as and for the purpose specified.

4. The combination of the spindles, the ring-rail, the vertical separator-rod, the separator-bar operated by said rod, separators secured to said bar, the cross-shaft having an arm, a foot secured to the lower end of said separator-rod and having a transverse slot, and a stud secured in said slot and raised by said cross-shaft arm, and adjustable in said slot toward and from said cross-shaft, to vary the length of traverse of said separator-rod, as and for the purpose specified.

5. The combination of the spindles, the ring-rail, the vertical separator-rod, the separator-bar operated by said rod, separators secured to said bar, the cross-shaft having an arm, a foot secured to the lower end of said separator-rod and having a transverse slot, a stud adjustably secured in said slot and an anti-friction roll carried by said stud and resting on said cross-shaft arm, said stud being adjustable in said slot toward and from said cross-shaft, to vary the length of traverse of said separator-rod, as and for the purpose specified.

In witness whereof I have signed this specification, in the presence of two attesting witnesses, this 8th day of May, A. D. 1893.

ALFRED D. CHANDLER.

Witnesses:
ALBERT M. MOORE,
JOSEPH W. PIPER.