B. A. PETERSON.

DOFFER.

APPLICATION FILED JAN. 6, 1912.

1,121,535.

Patented Dec. 15, 1914.

4 SHEETS—SHEET 1.

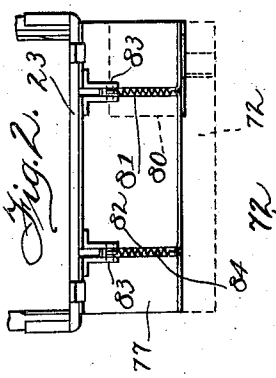


Fig. 2.

Fig. 1.

Witnesses:

J. C. Dewick.

George L. Chindahl

Inventor:

Burt A. Peterson

By Luther L. Miller

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4 SHEETS—SHEET 2.

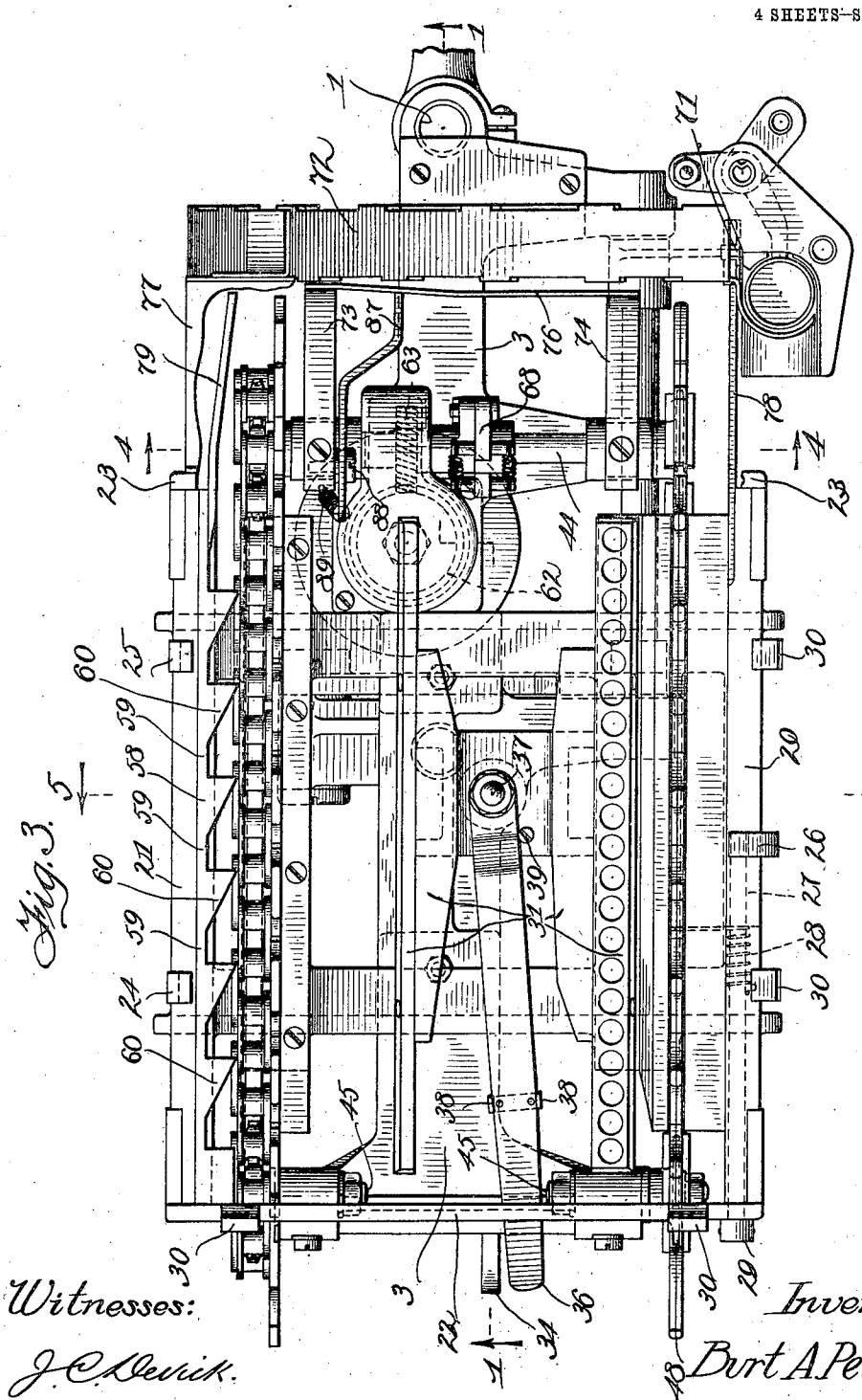


Fig. 3.

Witnesses:

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4 SHEETS—SHEET 3.

Fig. 4.

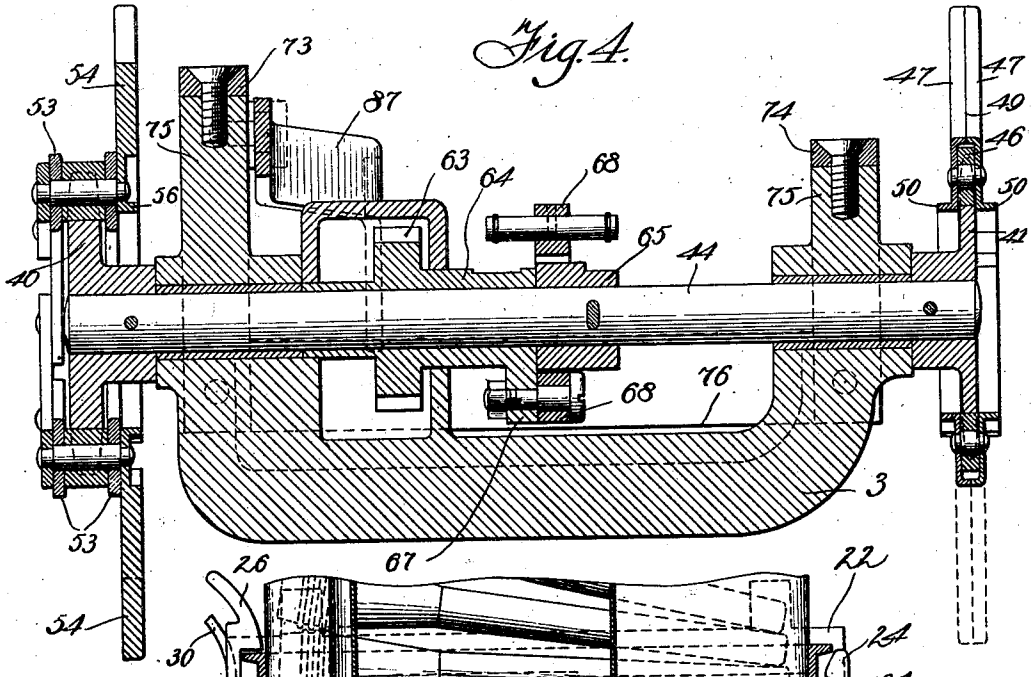


Fig. 5.

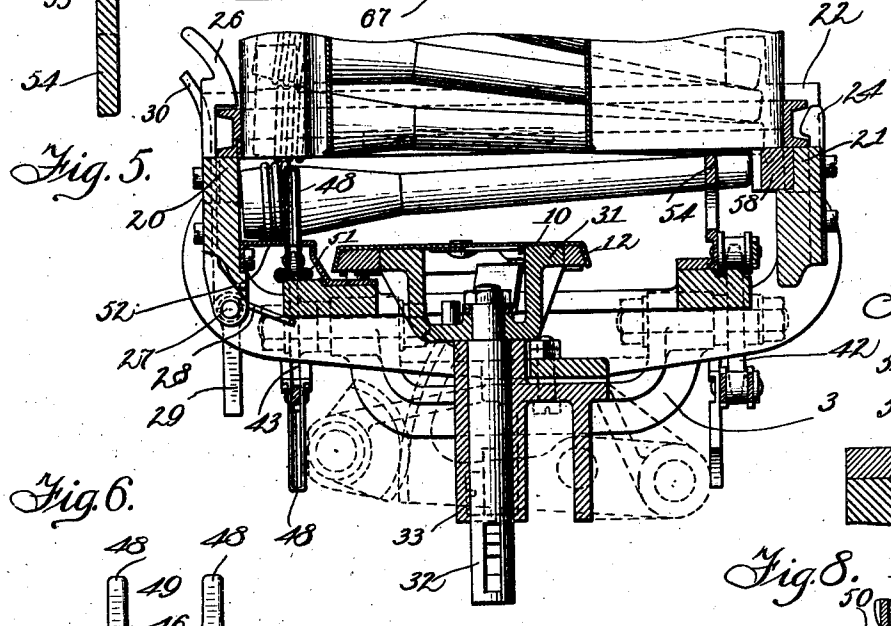


Fig. 7.

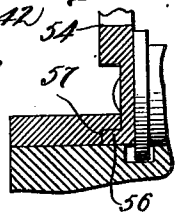


Fig. 6.

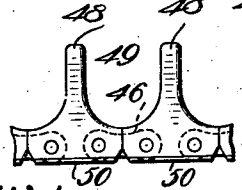


Fig. 8.

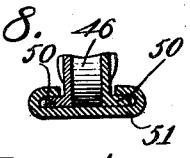
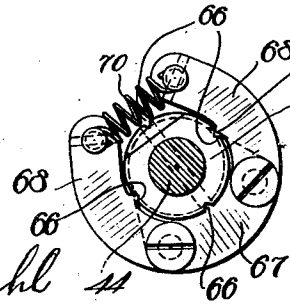


Fig. 9.



Witnesses:

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4 SHEETS—SHEET 4.

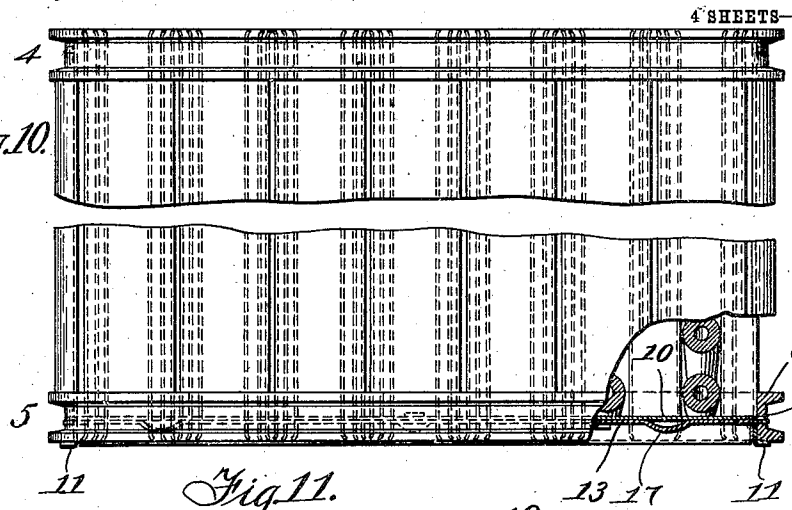


Fig. 10.

Fig. 11.

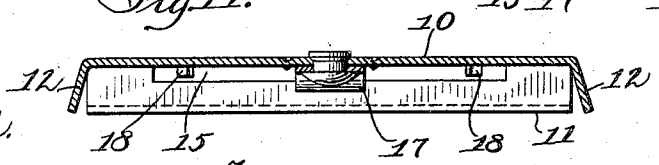


Fig. 12.

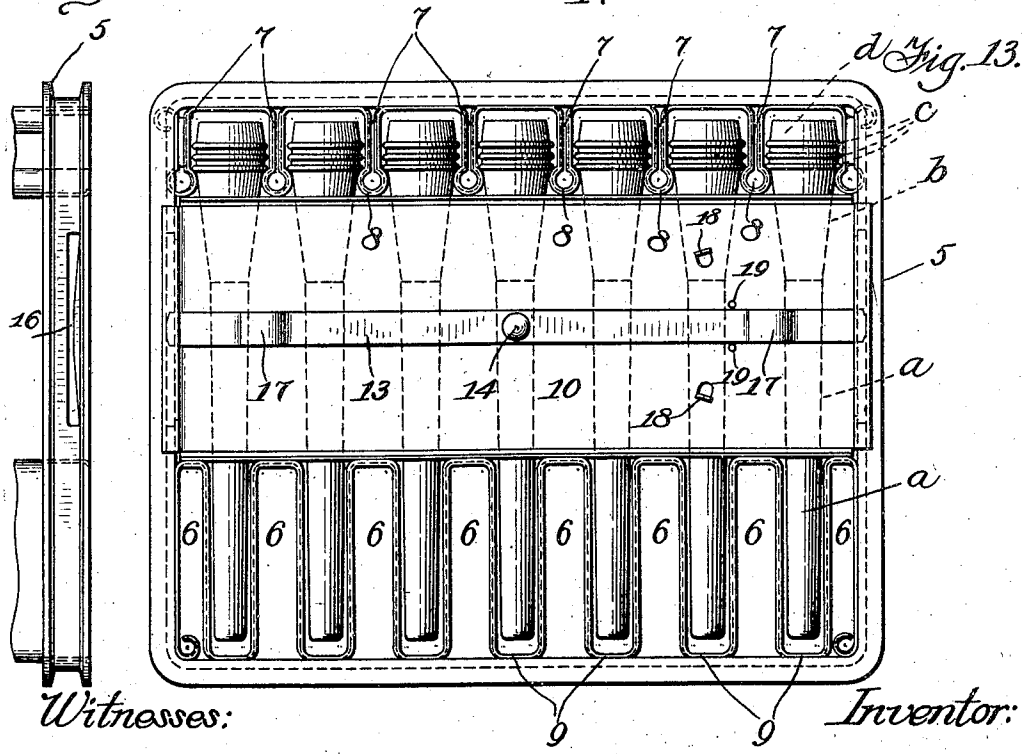


Fig. 13.

Witnesses:

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UNITED STATES PATENT OFFICE.

BURT A. PETERSON, OF ROCKFORD, ILLINOIS, ASSIGNOR TO HOWARD D. COLMAN, LUTHER L. MILLER, AND HARRY A. SEVERSON, OF ROCKFORD, ILLINOIS, CO-PARTNERS DOING BUSINESS AS BARBER-COLMAN COMPANY.

DOFFER.

1,121,535. Specification of Letters Patent. Patented Dec. 15, 1914.

Application filed January 6, 1912. Serial No. 669,762.

To all whom it may concern:

Be it known that I, BURT A. PETERSON, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have made certain new and useful Improvements in Doffers, of which the following is a specification.

This invention relates to portable or traveling machines for replacing the filled bobbins upon a spinning frame with empty bobbins, such, for example, as the doffer shown in Patent No. 983,858, issued February 7, 1911, upon an application filed by Howard D. Colman and Burt A. Peterson. The machine shown in said patent is particularly adapted for handling "warp bobbins", while the embodiment herein shown of the present invention is especially intended to operate upon "filling bobbins".

One of the objects of the present invention is to improve the construction of the magazine containing the empty bobbins.

Another object of the invention is to improve the means for feeding the bobbins from the magazine.

A further object is to provide improved means for controlling the passage of the empty bobbins from the feeding means to the device which next receives the empty bobbins.

In the accompanying drawings, Figure 1 is a vertical sectional view through the upper portion of a doffer embodying the features of my invention, the view being taken in the plane of dotted line 1 1 of Fig. 3. Fig. 2 is a top plan view, on a smaller scale, of some of the parts shown in Fig. 1. Fig. 3 is a top plan view, with the bobbin magazine and certain other parts omitted. Fig. 4 is a vertical sectional view taken in the plane of dotted line 4 4 of Fig. 3, but on an enlarged scale. Fig. 5 is a vertical section on dotted line 5 5 of Fig. 3. Fig. 6 is a fragmental elevation of the butt-conveying chain. Fig. 7 is a fragmental sectional view of a guide for the tip-conveying chain. Fig. 8 represents a guide for the butt-conveying chain. Fig. 9 illustrates a yielding connection between the conveyer and its driving mechanism. Fig. 10 is a fragmental side elevation of the bobbin magazine. Fig. 11 is a sectional view of a removable bottom for the magazine. Fig. 12 is a fragmental elevation of one end of the magazine. Fig. 13 is an under side view of the magazine.

The supporting framework of the doffer may be of any suitable form. The drawings illustrate the upper portion only of said framework, said upper portion in this instance consisting of two vertical members 1 and 2, and a horizontal bracket 3 rigidly secured to said members.

As heretofore stated, the machine represented in the drawings is particularly intended to handle "filling bobbins", such, for example, as those shown in Fig. 13. Each of said bobbins comprises the cylindrical relatively-slender tip or body *a* and a butt comprising the upwardly-tapering portion *b*, a cylindrical portion provided with metallic rings or beads *c*, and the downwardly-tapering portion *d*.

The magazine containing the empty bobbins may be of any suitable form, as, for instance, that shown in Figs. 10 and 13. Said magazine comprises an upper and a lower rectangular frame 4 and 5, each preferably formed of an integral length of channel bar, the ends of the bar being preferably welded together so as to form a seamless frame. In order to adapt the magazine to contain a number of vertical tiers of bobbins I provide at opposite sides of the magazine a series of vertical partitions 6 and 7 extending from end to end of the magazine, each series of partitions consisting of folds formed in an integral piece of sheet-metal, the upper and lower edges of the sheet being suitably secured to the frames 4 and 5. In the present embodiment of the invention, the bobbins are intended to be arranged with the tips thereof extending in the same general direction. The partitions 6 and 7 are accordingly spaced apart at distances corresponding with the diameter of the tip and the butt, respectively, of a bobbin. In use the magazine stands in a vertical position as indicated in Fig. 5. By reason of the difference in the diameters of the tip and the butt of a bobbin the bobbins in a tier lie at various angles to the horizontal, the departure from the horizontal tending to increase as the tier increases in height. Such departure from a horizontal position tends to cause the bobbins to slide toward the low (or tip) side, with a conse-

quent departure of the butts from the vertical. In order to maintain the butts in a vertical line, I provide means to limit endwise movement of the bobbins in the magazine, which means may consist, as herein shown, of a bead 8 formed upon and extending longitudinally of each of the partitions 7, these beads being of greater thickness than the partition so as to overhang the butt-receiving spaces and restrict the open sides thereof sufficiently to prevent a butt from passing through such open sides. The beads 8 are also of advantage in connection with the loading of the magazine, the magazine being then in a horizontal or inclined position, and the beads 8 serving to prevent the bobbin tips from dragging on the walls 9. When the bobbins are being inserted into the magazine, the butts of the bobbins slide along the beads 8, the tips of the bobbins hanging out of contact with the walls 9. The partitions 6 are made of such height that the tips when hanging in a vertical position in the inclined magazine cannot leave the tip-receiving spaces.

The doffer comprises a bobbin-feeding means located below the magazine, and practically forming the bottom of the latter when in operation. In order that the magazine may be conveniently loaded before it is placed on the doffer, the magazine is provided with a removable bottom 10 adapted to be inserted upwardly into the space between opposite sides of the lower frame 5, said bottom having at each end an angular flange 11 which stops against the underside of the end frame 5, and thus limits the upward movement of the bottom. At the sides of the bottom are inclined flanges 12 arranged to fit between the inner ends of the partitions 6 and the beads 8, said flanges being inclined so as to assist in guiding the bottom into place. In the present embodiment, the bottom is removably secured in place by means of a latch 13 pivoted at 14 upon the lower side of the bottom, the ends of said latch being adapted to enter slots 15 in the end flanges of the bottom, and slots 16 in the lower frame 5. The end portions of the lower wall of each slot 16 are inclined upwardly toward the middle of the slot, as shown in Fig. 12, in order to exert a wedging effect upon the latch and thus draw the bottom firmly into position.

17 are projections upon the lower side of the latch to permit of conveniently engaging the latch to turn it into and out of operative position. The pivotal movement of the latch is limited by lugs 18 on the bottom.

19 are slight projections upon the under side of the bottom arranged one at each side of the operative position of the latch, to prevent accidental displacement of the latch when locked.

In order that the magazine may be conveniently reversed in case the lower end thereof becomes damaged, the slots 16 are duplicated in the opposite ends of the magazine so that either end of the magazine may be the lower end thereof.

The doffer framework comprises a seat for the magazine, said seat comprising two parallel bars 20 and 21, the magazine being held against displacement by means of two stop flanges 22 and 23, two rigid hooks 24 and 25 and a hook 26 fixed upon a shaft 27 mounted in suitable bearings in the framework, the hook 26 being normally held in operative position by a torsion spring 28. An arm 29 on the shaft 27 provides means for releasing the hook 26.

30 are curved guides to assist in positioning the magazine on its seat.

Any suitable means may be employed to remove and replace the bottom 10 while the magazine is in position upon its seat, the means herein shown comprising a support 31 fixed to a spindle 32 which is slidable in a bearing 33 formed in the bracket 3. Said support is arranged to be raised into contact with the lower side of the bottom 10 by means of a hand lever 34 pivoted at 35.

The means for operating the latch 13 consists of a lever 36 pivoted at 37 on the support 31, said lever having thereon two lugs 38 adapted to lie at opposite sides of either of the two projections 17 on the latch 13.

39 is a stop to limit movement of the lever 36 in the direction to lock the bottom in place.

Assuming the lever 36 to be in the position represented in Fig. 3, if the lever 34 is operated to raise the support 31 into contact with the bottom 10, the lugs 38 will pass at either side of the adjacent projection 17. The support 31 being held up, the lever 36 is swung to one side, thereby turning the latch 13 so as to withdraw its ends from the slots 16. The support 31 may now be lowered, with the bottom 10 lying thereon. The flanges 12 fitting over the sides of the support 31 prevent lateral displacement of the bottom, while endwise displacement is prevented by the angular flanges on the ends of the bottom fitting over the ends of the support. As the bottom 10 is being thus lowered, the tiers of bobbins in the magazine settle until the lowermost bobbins rest upon a bobbin-feeding means. In the present embodiment the bobbin-feeding means consists of a conveyer comprising two endless chains carried by sprocket wheels 40, 41, 42 and 43. The wheels 40 and 41 are fixed upon a shaft 44 mounted in suitable bearings in the framework. Each of the wheels 42 and 43 is rotatably mounted upon a short shaft 45 (Figs. 1 and 3). The chain for conveying the bobbin butts is herein shown as consisting of links 46 (Fig. 4) pivotally connected to pairs of

sheet-metal stampings 47, said stampings being of such form as to constitute lugs 48 providing between them recesses 49 (Fig. 6) to receive the butts of the bobbins. Upon the outer side of each sheet-metal stamping is a flange 50 whereby the chain is provided upon each side with a series of such flanges. The upper run of the chain is held against lateral and vertical displacement by means of the flanges 50 passing through a guide 51 (Fig. 8) secured in the framework. At the outer side of the chain is a ledge 52 (Fig. 5) fixed in the framework, upon which ledge the bobbin butts slide as they are being moved by the chain. The chain for moving the bobbin tips may have lugs formed of sheet-metal stampings, as in the case of the butt chain. Herein I have shown the tip chain as comprising links 53 and lugs 54 (Fig. 4), the latter providing between them recesses 55 (Fig. 1) to receive the bobbin tips. Each of said lugs is provided with a guide rib 56 adapted to move in a guideway 57 (Fig. 7) provided in the supporting frame, whereby displacement of the upper run of said chain is prevented. When the bottom 10 is lowered, the conveyer chains are in such position that the tip-receiving recesses and butt-receiving recesses in said chains are respectively arranged directly below the tip-receiving spaces and butt-receiving spaces of the magazine, as indicated in Fig. 1. In the movement of the conveyer the tiers of bobbins are exhausted one after another, beginning at the side where the conveyer enters beneath the magazine, to wit, the left-hand side in Fig. 1.

It will be seen that the lugs 54 extend close to the magazine, and that the recesses 55 are just deep enough to contain the bobbin tips, whereby the loaded conveyer is given an approximately smooth upper surface, and jarring of the tiers of bobbins as the conveyer moves thereunder is minimized.

The weight of the bobbins resting upon a given bobbin sometimes causes that bobbin to tilt so that its tip does not lie against the next lower bobbin. If the lowermost bobbin in a tier should be so tilted, a bobbin moved under such tilted bobbin by the conveyer might be free to tilt upwardly. Such tilting might result if the weight of the superposed bobbins were applied at such a point on the bobbin butt that the bobbin would rock on the ring *c* nearest the base of the bobbin. To prevent such displacement of a bobbin carried by the conveyer, I provide means for shifting the bobbin longitudinally toward the left (Fig. 5), which means comprises a bar 58 fixed in position to underlie the tip spaces of the magazine, said bar having recesses therein, the wall 59 (Fig. 3) of each of which recesses is substantially alined with the wall 9 of a tip space in the magazine. The wall 60 of each recess is inclined so that as the conveyer progresses the tip of the bobbin will be carried into contact with said inclined surface and the bobbin thereby cammed or forced longitudinally into the position shown in Fig. 5. The weight of the tiers under which the bobbin must pass prior to discharge will then be exerted at such a point on the bobbin as to hold the bobbin in its proper position on the conveyer. Obviously no cam surface 60 need be provided for the tier of bobbins last to be fed.

To prevent breakage or excessive shock in case a bobbin should bind between the magazine and the conveyer, I provide suitable means such as a yielding connection between the conveyer and its driving means. In the present embodiment, the conveyer is driven from a vertical shaft 61 which is connected to the conveyer shaft 44 by means to be now described.

Upon the upper end of the vertical shaft 61 is fixed a spiral gear wheel 62 (Fig. 3) meshing with a similar gear wheel 63 which is rigid with a sleeve 64 (Fig. 4), said sleeve being rotatably mounted upon the shaft 44. Adjacent to one end of the sleeve 64 is a collar 65 pinned or otherwise rigidly connected to the shaft 44. In the periphery of said collar are four equidistant V-shape notches 66 (Fig. 9). The sleeve 64 has formed thereon a lug 67 upon which are pivoted two arms 68, each provided with a wedge-shaped tooth 69, said teeth being located diametrically opposite each other with respect to the collar 65, and being adapted to enter the notches 66. Two springs 70 normally hold the arms 68 together so as to retain the teeth 69 in the notches 66. The distance between two adjacent notches 66 is equal to the distance between the centers of two adjacent bobbin spaces in the magazine. If a bobbin should bind between the magazine and the conveyer the teeth 69 will be forced out of the notches 66 with which they were engaged, whereby the movement of the conveyer is suspended without interfering with the operation of the remainder of the mechanisms of the doffer. The momentary resistance experienced by the operator in turning the driving crank of the doffer as the teeth 69 leave the notches 66 indicates to the operator that a bobbin has failed to pass properly into the conveyer. However, when the wedge-shaped teeth 69 snap into the next pair of notches 66 said teeth cam the collar 65 in a reverse direction to a slight extent, and this reverse movement is often sufficient to release the bobbin and permit it to descend properly into the conveyer. When the bobbin-feeding mechanism misses a step as just described, one of the spindles on the spinning frame is left unsupplied with a bobbin, a bobbin being manually placed on said spindle after the doffer has passed.

The bobbins occupy a horizontal position in the magazine and a vertical position upon the spinning frame. The bobbins are discharged from the magazine in a horizontal position and are conducted in the present embodiment to an erector 71 (Fig. 1) which places the bobbins in an upright position. The erector oscillates within a casing 72 which prevents displacement of the bobbins and which is connected to the discharge end of the bobbin-conveyer by suitable guide means. The conveyer deposits each bobbin upon two inclined guides 73 and 74 which lie between the vertical planes of the conveyer chain and the upper ends of which are secured to bosses 75 (Fig. 4) on the bracket 3. The lower ends of the guides 73 and 74 are connected by a plate or bar 76. Above the guides 73 and 74 is a cover plate 77. At opposite sides of the conveyer are guides or guard fingers 78 79 which prevent endwise displacement of the bobbin. The passageway formed by the guides 73 74 78 79 and the plate 77 is made to conform, generally, at its outlet end, in cross-sectional dimension to the shape of the bobbin by securing a guide 80 to the under side of said plate. This guide prevents vertical play of the tip of the bobbin.

The recesses in the conveyer which receive the bobbin butts and tips are sufficiently deep so that the lugs 48 and 54 cam or force the bobbins down the inclined guides 73 and 74. To control the bobbins while they are being thus moved through the passageway between the magazine and the erector, I provide suitable means such as two dogs 81 82 (Fig. 2) pivoted at 83 in position to bear upon the opposite end portions of the bobbin, said dogs being pressed downward by springs 84. Downward movement of the dogs is limited by the contact of the portion 85 of each dog with a stop pin 86. A finger 87 is pivoted at 88 and is yieldingly pressed against the under side of the bobbin by a coiled spring 89, upward movement of the finger 87 being limited by contact of the projection 90 on said finger with the bar 76. It will be seen that the bobbins are moved under control down the inclined passageway extending to the erector casing, the bobbins being discharged onto the erector 71. After the bobbin has passed the finger 87, the broad free end of said finger swings up and closes the passage behind the bobbin, so that the latter cannot become displaced.

I claim as my invention:

1. In a doffer, in combination, a vertically-arranged bobbin magazine, an endless conveyer below said magazine and forming a bottom therefor, means for driving said conveyer, and a yielding connection between the conveyer and its driving means to prevent damage in case a bobbin should bind between the magazine and the conveyer.

2. A bobbin magazine comprising two opposite walls suitably secured together, each of said walls being of sheet-metal and each having partition-forming folds therein, the folds upon one wall being spaced apart at distances corresponding to the diameter of a bobbin butt and the folds upon the opposite wall being spaced apart at distances corresponding to the diameter of a bobbin tip, the folds forming butt partitions comprising longitudinally extending beads overhanging adjacent butt spaces to limit endwise movement of bobbins placed in the magazine.

3. A bobbin magazine consisting of two metallic end frames, sheet metal sides rigidly secured to said end frames, each of said end frames having slots therein, a bottom insertible into either end of the magazine, and locking means on the bottom adapted for coöperation with the slots in either end frame.

4. In combination, a bobbin magazine having at each end a rectangular supporting element, a bottom insertible through either of said elements, and bottom-locking means carried by said bottom, each end of the magazine being adapted to receive said bottom-locking means.

5. A bobbin magazine having a plurality of spaces therein extending from top to bottom of the magazine to contain tiers of bobbins, the opposite ends of the magazine being similarly constructed, a bottom adapted for insertion into either end of the magazine, and locking means on the bottom adapted to engage either end of the magazine.

6. In a doffer, a bobbin magazine, a bobbin-feeding means located below said magazine and operating transversely of the respective bobbins, and means to shift bobbins endwise as they are being moved by the bobbin-feeding means.

7. In a doffer, a bobbin magazine having an open lower end, an endless bobbin conveyer operating beneath the magazine and forming a bottom therefor, and means to shift bobbins endwise as they are being moved by said conveyer.

8. In a doffer, means for moving a bobbin transversely of its length, and means cooperating with said moving means to cause endwise adjustment of the position of the bobbin on said moving means.

9. In a doffer, an endless conveyer for laterally moving bobbins, and a wedge-shape member located at one side of said conveyer in position to be contacted by a bobbin being conveyed, to cause endwise movement of the bobbin.

10. In a doffer, an endless conveyer for laterally moving bobins, a magazine directly

above said conveyer, the bobbins in said magazine resting upon the conveyer, and cam means at one side of the conveyer adapted to be contacted by the tip ends of the bobbins on said conveyer for longitudinally shifting the bobbins on the conveyer toward the opposite side of the conveyer.

11. In a doffer, a magazine adapted to contain a plurality of tiers of bobbins and having an open lower end, an endless conveyer beneath said magazine and forming the bottom thereof, and a bar located at one side of the conveyer, and having recesses which are vertically alined with the respective tiers of bobbins, one wall of each recess being inclined and adapted to be contacted by the tip end of a bobbin to cause endwise adjustment of the bobbin transversely of the conveyer and toward the side of the conveyer opposite said bar.

12. A magazine for empty "filling" bobbins, comprising a rectangular body, partitions in said body for segregating rows of empty bobbins, a relatively narrow closure insertible into the end of the magazine body adjacent to the butt-partitioning means in position to underlie the rows of bobbins near the butts of the latter, and means for securing the closure to the body.

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

BURT A. PETERSON.

Witnesses:
W. R. HEYM,
LOUISE A. CULVER.