

No. 755,450.

PATENTED MAR. 22, 1904.

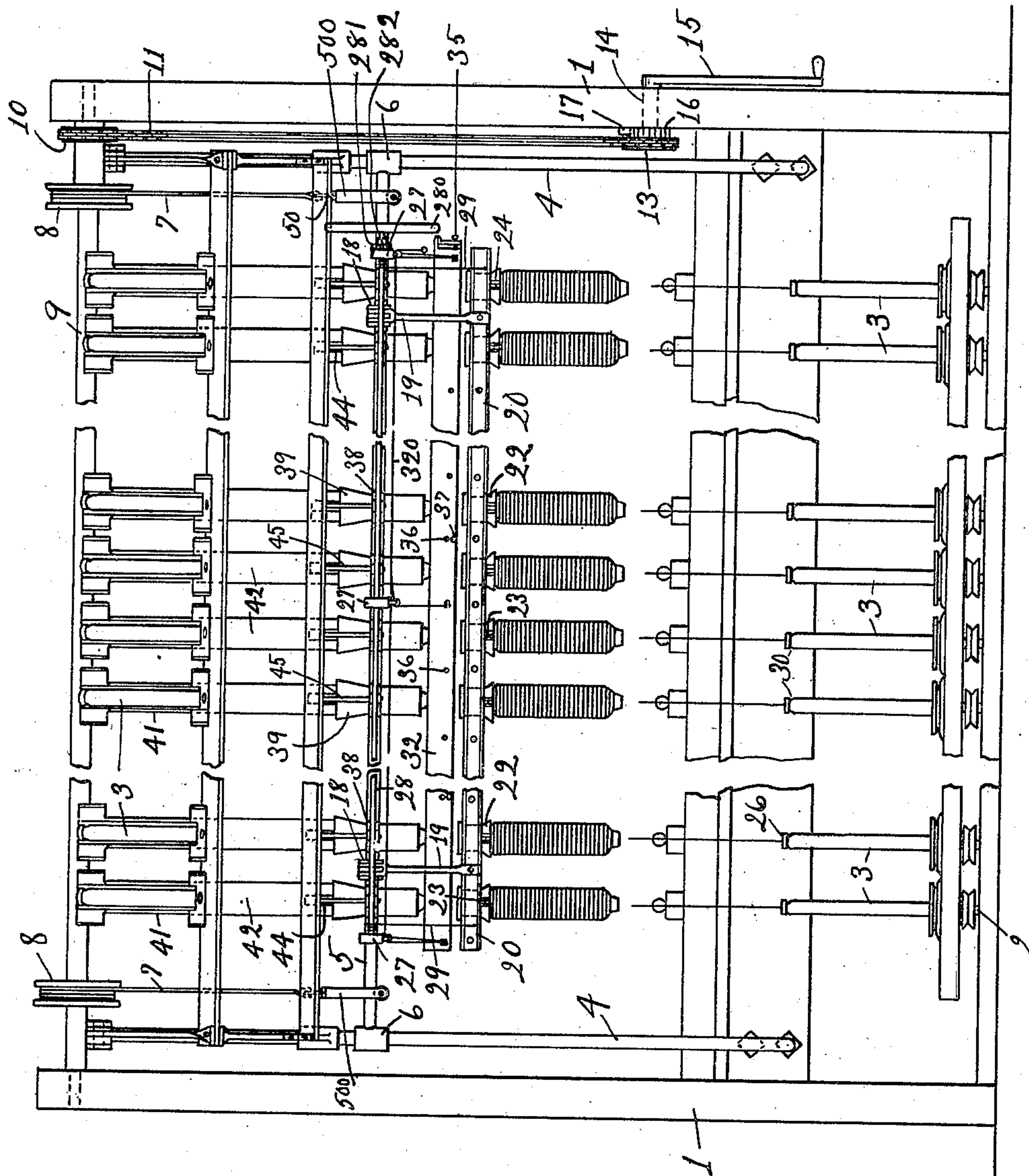
D. E. CAREY.

DOFFER FOR SPINNING AND TWISTING FRAMES.

APPLICATION FILED OCT. 8, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses:
H. B. Davis.
Maud M. Piper

Fig. 1.

Inventor:
Dennis E. Carey
By Noyes & Hermann
Attys

D. E. CAREY.
DOFFER FOR SPINNING AND TWISTING FRAMES.

APPLICATION FILED OCT. 8, 1903.

NO MODEL.

3 SHEETS—SHEET 2.

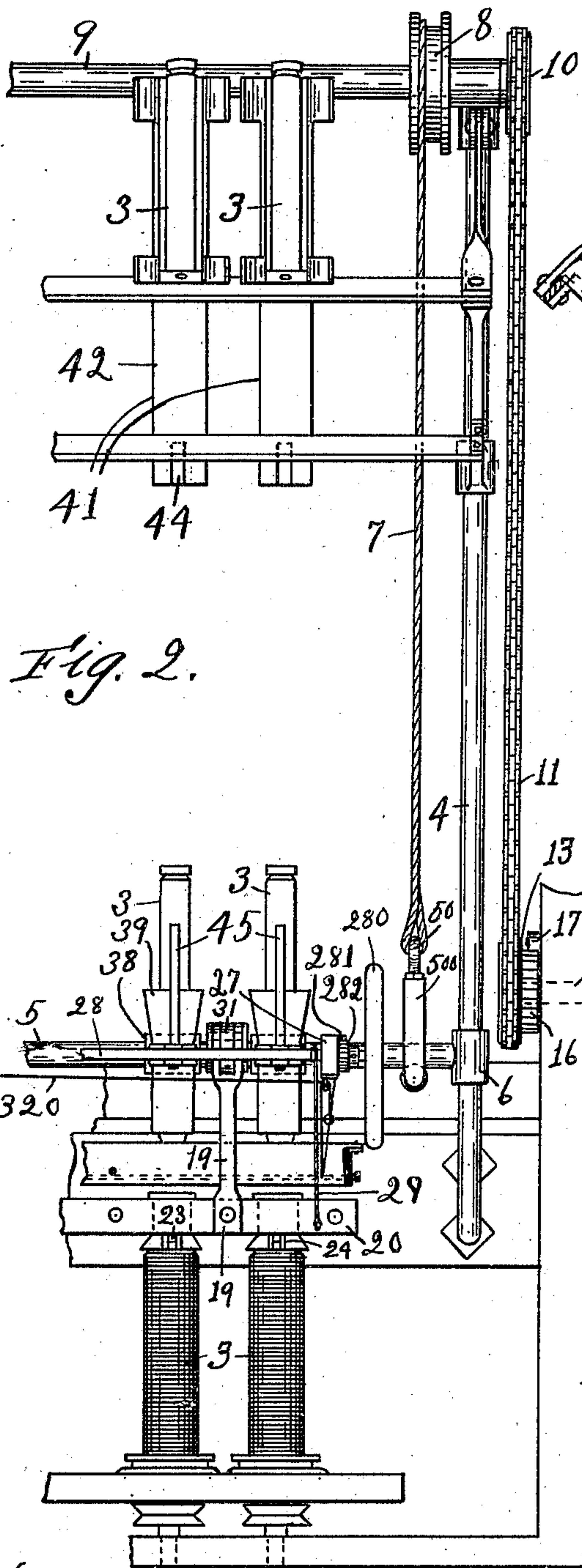


Fig. 2.

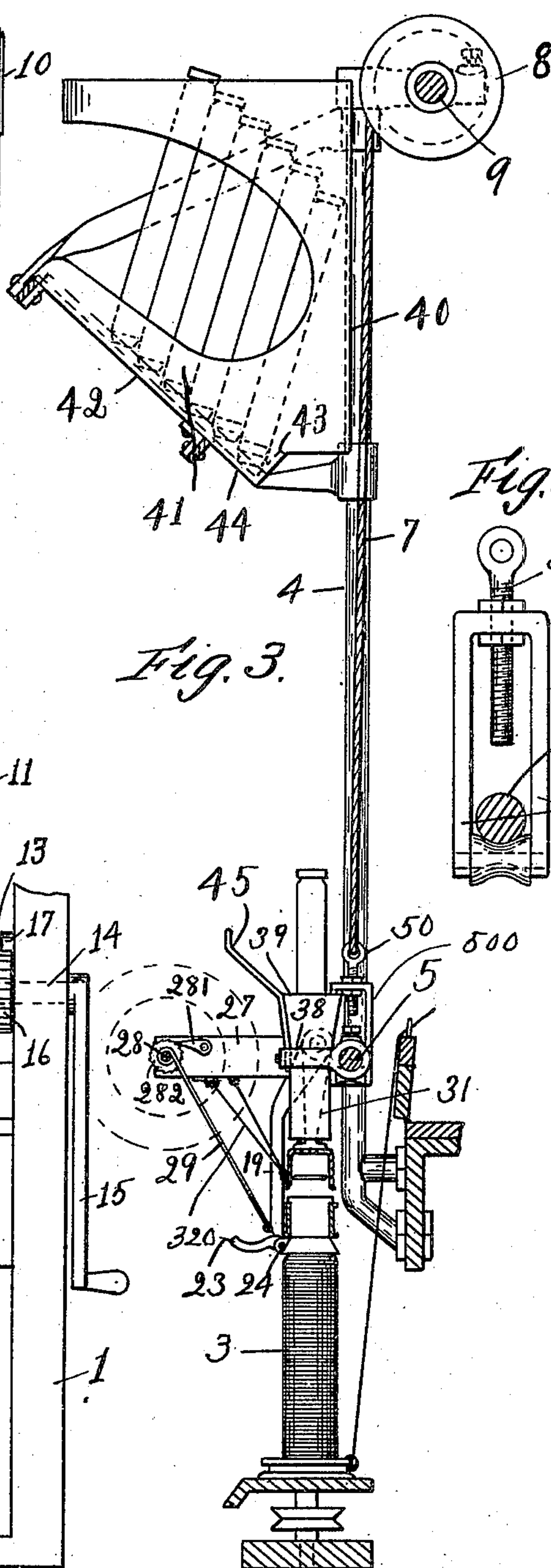
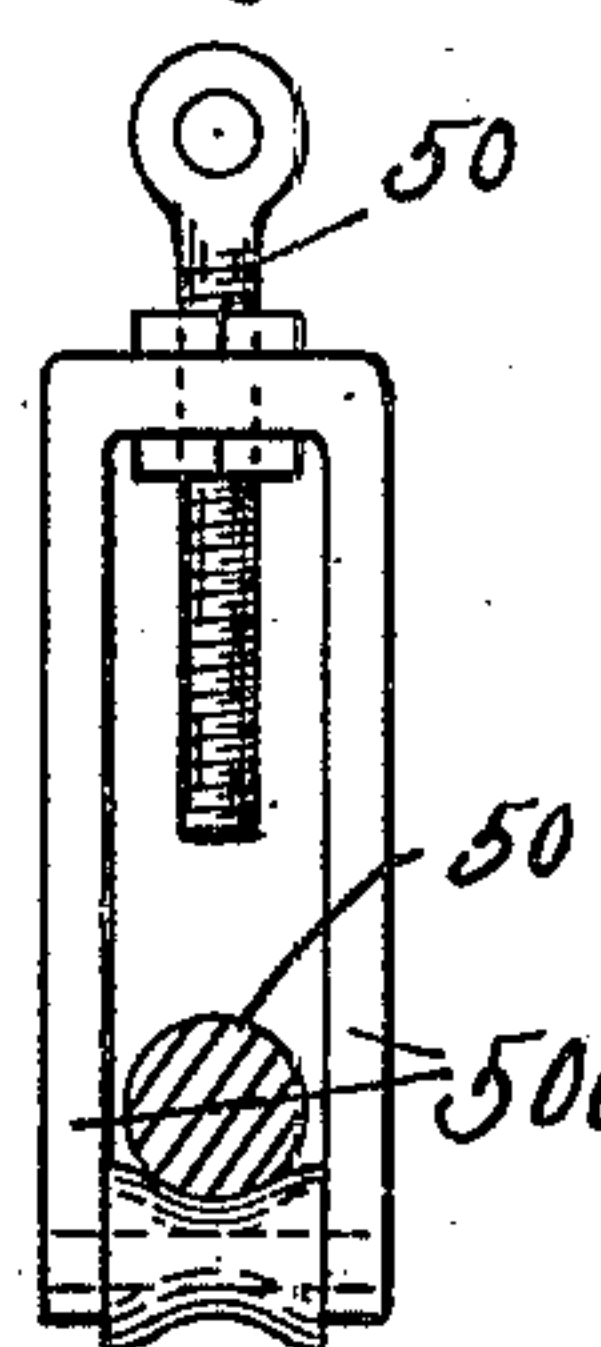


Fig. 3.

Fig. 14.



Witnesses:
H. B. Davis.
Maud M. Piper

Inventor:
Dennis B. Carey
by Noyes & Combs
Attys

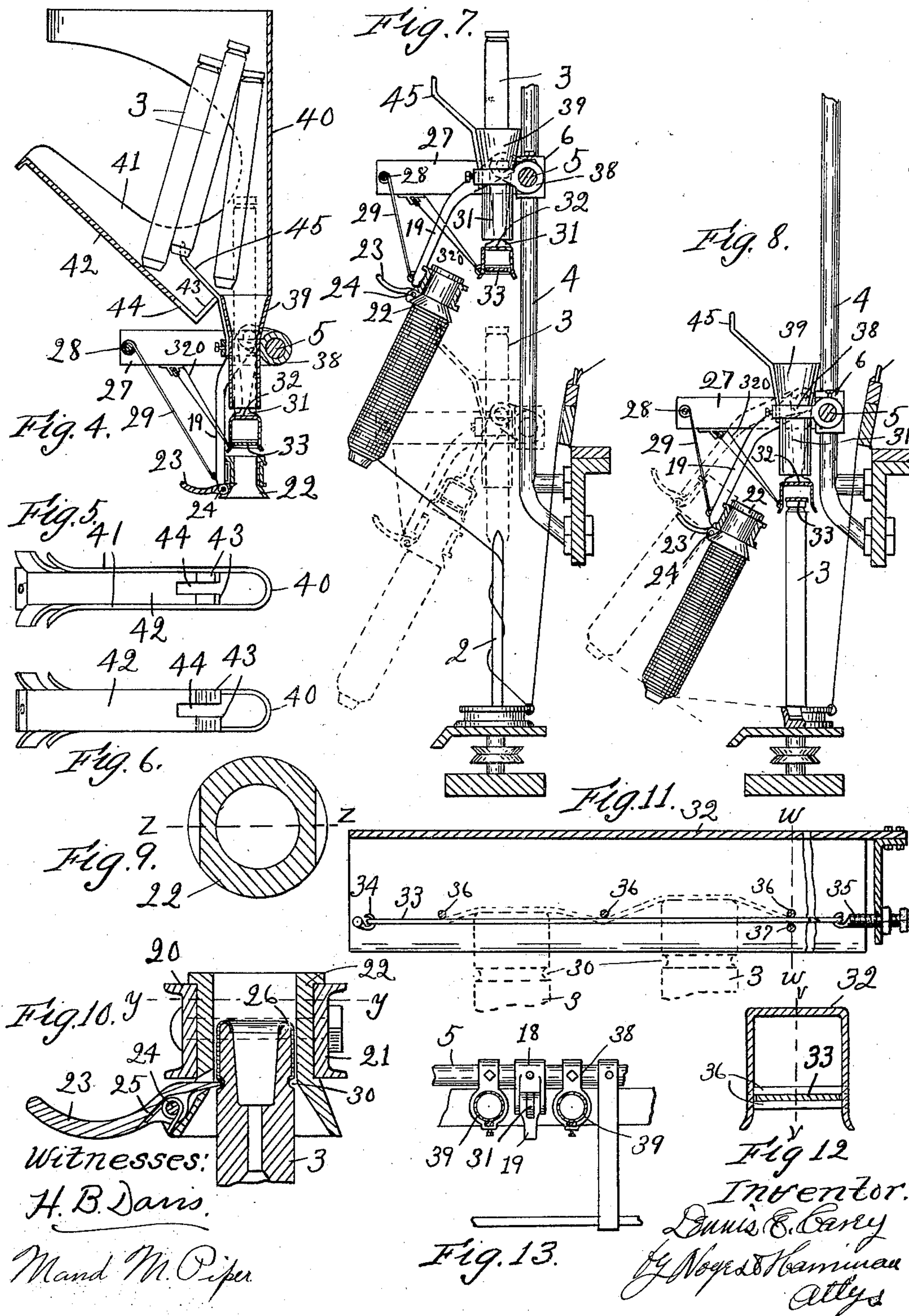
D. E. CAREY.

DOFFER FOR SPINNING AND TWISTING FRAMES.

APPLICATION FILED OCT. 8, 1903.

NO MODEL.

3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

DENNIS E. CAREY, OF SOUTH LAWRENCE, MASSACHUSETTS.

DOFFER FOR SPINNING AND TWISTING FRAMES.

SPECIFICATION forming part of Letters Patent No. 755,450, dated March 22, 1904.

Application filed October 8, 1903. Serial No. 176,296. (No model.)

To all whom it may concern:

Be it known that I, DENNIS E. CAREY, of South Lawrence, county of Essex, State of Massachusetts, have invented an Improvement in Doffers for Spinning and Twisting Frames, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

10 This invention relates to a mechanism for simultaneously doffing the bobbins on a spinning-frame and simultaneously placing empty bobbins on the spindles after the wound bobbins have been doffed.

15 My invention consists of a vertically-movable carrier provided with means for automatically connecting the same with the upper ends of the bobbins while in position on the spindles and means for moving said carrier so that the bobbins will be doffed, said carrier being further provided with a series of bobbin-holders adapted to conduct empty bobbins onto the spindles after the filled bobbins have been doffed, and means for firmly forcing the 25 bobbins down upon the spindles after they have been placed thereon.

My invention further consists in providing a series of magazines containing a supply of empty bobbins adapted to supply a single bobbin automatically to each bobbin-holder after each doffing operation has been finished.

For an understanding of my invention reference is made to the accompanying drawings, in which—

35 Figure 1 is a front elevation of a spinning-frame provided with my invention. Fig. 2 is a front elevation of one end thereof. Fig. 3 is an end view thereof with the end support removed. Fig. 4 is a cross-sectional view of one of the bobbin-magazines. Figs. 5 and 6 are top and bottom plan views thereof. Figs. 7 and 8 are detail views representing different positions of the parts while the doffing operation is taking place. Figs. 9 and 10 are detail views of one of the doffers, Fig. 9 being a transverse section on the line *yy* of Fig. 10 and Fig. 10 being a central longitudinal section on the line *zz* of Fig. 9. Figs. 11 and 12 are detail views of the means for pressing 50 the bobbins down on the spindles, Fig. 11 be-

ing a longitudinal section on the line *vv* of Fig. 12 and Fig. 12 a transverse section on the line *ww* of Fig. 11. Fig. 13 is a plan view of a portion of the carrier. Fig. 14 is a detail view of the yoke for supporting the carrier.

In the drawings, 1 indicates the end supports of a spinning-frame having a series of spindles 2, which are driven in the usual manner, the thread being fed to the bobbins 3 on said spindles, as indicated in Fig. 3 and in the manner well known in this class of machines. Vertical guide rods or standards 4 are secured to each end support 1 and at such intermediate points as may be necessary, as shown in 65 Figs. 1, 2, and 3, and a carrier-bar 5, having sleeves 6, which slide on said guide-rods 4, extends the entire length of the machine and is adapted to be moved up and down in a horizontal position. A horizontal shaft 9 extends 70 the length of the machine and is journaled in fixed bearings secured to the frame, it being arranged at a suitable distance above the line of bobbins, said shaft being provided with a series of drums 8, having cables 7 secured 75 thereto at one end and at their opposite ends a screw-eye 50, which is threaded in a yoke 500, (see Fig. 14,) in which said carrier 5 is supported, whereby said carrier may be raised and lowered on rotation of said shaft. 80 A sprocket 10 is secured to the outer end of said shaft 9, and a chain 11 passes over said sprocket and over a sprocket 13, which is secured to the inner end of a horizontal shaft 14, said shaft 14 being journaled in the frame 85 of the machine. The outer end of said shaft 14 is provided with a crank 15, and the inner end thereof, next to the sprocket 13, is provided with a ratchet-wheel 15, with which a pawl 17, mounted on the frame, is adapted to 90 engage.

The carrier-rod 5 has a series of brackets 18 rigidly secured thereto, and an arm 19 is pivoted to each bracket between forwardly-extending ears thereon. Said arms 19 are 95 of angular form and are rigidly secured at their lower ends to the front side of a horizontal bar 20, and a series of doffers 22 are clamped between said bar and a bar 21 at intervals corresponding to the distance be- 100

tween each spindle. Each of said doffers 22 preferably comprise a hollow or tubular casing or shell, which is open and flaring or bell-shaped at its lower end, the upper end of each
 5 doffer being formed with a cylindrical bore of slightly greater diameter than that of an ordinary bobbin at its top and said upper portion being flattened at its front and rear sides, as shown in Fig. 9, to provide faces
 10 against which the bars 20 and 21 may be clamped, flanges or shoulders being formed at each side of said faces which engage the edges of said bars.

A latch 23 is pivoted on a pivot 24 in the
 15 front side of each doffer, the inner ends of said latches passing through the walls of said doffers and projecting a short distance into the bore thereof at approximately the meeting point of the cylindrical and flaring por-
 20 tions thereof.

A spring 25, which encircles the pivot 24, acts to throw the inner end of said latch downwardly against the under side of the slot through which said latch passes. The bob-
 25 bins 3 are preferably chambered in their upper ends, as shown in Fig. 10, and provided with annular grooves 30 within a short distance of said upper ends. A ferrule 26 is preferably placed upon the upper end of each bob-
 30 bin, the lower end of the ferrule being bent into said groove 30 and terminating at the middle thereof and the upper end of the ferrule being bent inwardly into the recess in the upper end of the bobbin. This construction of bobbin and
 35 latch is such that when the end of the bobbin is passed into the bore of the doffer a suitable distance the inner end of the latch will enter the groove 30, and thus firmly connect the doffer and bobbin, said ferrule 26 protecting
 40 the tip of the bobbin and preventing the latch from chipping or wearing away the wood adjacent the annular groove. A series of bracket-arms 27 are rigidly secured at suitable intervals to the carrier 5 and extend
 45 forward horizontally therefrom, and a lifting-rod 28, having a hand-wheel 280 at its end, is journaled in the outer ends of bracket-arms 27. Cables 29 are secured at one end to said rod 28 at suitable intervals, so that they may
 50 be wound thereon, and at their opposite ends to the front doffer-bar 20. A pawl 281 is pivoted on one of the brackets 27, and a ratchet-wheel 282 is secured on the rod 28. An arm 31 is also pivoted to the bracket 18 upon the
 55 same pivot as that of the arm 19, said arm preferably being pivoted between ears formed on the upper end of the arm 19, the latter being of such form that the arms 31 may hang vertically in the rear of the arms 19. A bob-
 60 bin-depressor comprising a casing 32 is secured to the lower ends of the arms 31, said casing being preferably made in the form of an inverted trough with side walls which flare outward at their lower edges. A presser strap
 65 or band 33, preferably of leather which is

more or less flexible and elastic, is secured at one end to a hook 34, fixed at one end of the casing 32 and at the other end to a hook 35, which is adjustably mounted in the opposite
 70 end of said casing. A series of transversely-extending rods 36 are secured to the side walls of said casing 32 adjacent the upper side of said strap 33, one of said rods being provided approximately midway between each spindle
 75 2, and a series of supporting-rods 37 are preferably secured in a similar manner at suitable intervals below the strap, so as to prevent undue sagging of the same. The arms 31 and casing 32 are so arranged that when the doffers
 80 are swung down to the position which they normally assume the upper ends of said doffers will be supported close to the lower edges of the side walls of said casing and directly beneath the same.

A cable 320 is supported upon pulleys 85 mounted on the under side of brackets 27 and extends the entire length of the casing 32. Branch cables are connected to the main cable, and these branches and one end of the main
 90 cable pass about sheaves on the casing and are secured to the brackets 27, so that when the opposite end of the cable is pulled the casing will be swung outward.

A series of brackets 38 are secured to the carrier 5 directly above each doffer 22 or spindle 2, said brackets being provided with vertically-extending apertures, in each of which
 95 a tubular bobbin-holder 39 is mounted and securely clamped to the bracket by a set-screw or any suitable means. Said bobbin-holders 39 are preferably cylindrical in form and flaring at their upper ends, their internal diameters being slightly greater than the external diameter of an empty bobbin. The lower
 100 ends of said holders 39 terminate closely adjacent the upper side of the casing 32 when the latter is in its normal position, as shown in Fig. 4.

A series of bobbin-magazines 40 are rigidly supported in any suitable manner upon the
 110 frame, one of said magazines being arranged over each bobbin-holder 39. Each of these magazines is provided with guiding sides 41 at the top and bottom thereof which flare at their front ends, sufficient space being pro-
 115 vided between the top and bottom portions of said sides to permit a bobbin resting against the rear side of the magazine to be reached with the hand, so that the bobbins may be readily placed in and removed therefrom.

The bottom 42 of each magazine extends obliquely downward from the front to the rear side thereof, and its lower end terminates in an upturned lip 43 at such a distance from the
 120 rear side of the magazine that a bobbin may readily pass between said lip and said side. A narrow slot 44 is formed in the middle of said lip and in the adjacent portion of said bottom, said slot being of less width than the
 125 diameter of a bobbin and of sufficient width

to permit the passage therethrough of a finger 45, which is secured to the front side of each bobbin-holder 39 and extends upwardly and forwardly therefrom in an oblique direction, its extreme end portion preferably extending vertically.

When the bobbins are thrown into the magazine, they will slide down the inclined bottom, and the first bobbin will be caught at its lower end by the lip 43, and its upper end will tip forward and rest against the rear side of the magazine, the other bobbins which may be thrown therein lying against the first bobbin, as shown in Fig. 3. The openings in the bottoms of the magazines between the lips 43 and the rear sides thereof are directly above or in line with the passage through the bobbin-holders 39, so that when the carrier 5 is raised the ends of said tubular holders will come into register with the openings in the bottoms of the magazines.

As the carrier is raised, so that the upper ends of the holders engage the bottoms of the magazines, the fingers 45 will pass through the slots 43 of the magazines, and their upturned ends will enter the bore of the bobbins which lie next to or against the bobbins which are resting against the lips 43 and will lift them up over said lips, as indicated in Fig. 4, so that they will slide down the inclined sides of said fingers and fall into and through the tubular bobbin-holders until their lower ends rest on the upper side of casing 32, as shown in dotted lines in Fig. 4. When the carrier is lowered, the bobbins which were engaged by the upturned ends of the fingers 45 will be permitted to move to the position of the bobbins previously discharged into the holders.

While the machine is operating the carrier 5 will be lifted to its uppermost position, as shown in Figs. 1 and 4, and an empty bobbin will be disengaged from the magazine and be supported on the casing 32 in each holder 39. When the bobbins which are on the spindles have been filled, the ring-rail which guides the thread upon the bobbin is moved down to its lowest extent, as indicated in Figs. 2 and 3, and the machine is stopped. The pawl 17 is then lifted, so that the carrier 5 may be permitted to slide down the guide-rods 4 until the doffers 22 pass over the upper ends of the bobbins, the flaring lower ends of said doffers guiding the bobbins into the tubular portions thereof. When the doffers have been moved down to such an extent that the latches 23 are opposite the grooves 30 in the bobbins, the latches will enter said grooves and connect the bobbins to the doffers, the parts assuming the position shown in Fig. 10. Then the carrier 5 is lifted, drawing the filled bobbins from the spindles. The carrier 5 is lifted to such a point that the lower ends of the filled bobbins are above the upper ends of the spindles, and then the hand-wheel 280 upon the

rod 28 will be rotated, winding the cables 29 thereon and swinging the doffers and filled bobbins outwardly to the full-line position shown in Fig. 7, in which position they are held by the pawl and ratchet 281 282. The carrier is then lowered so that the lower edges of the casing 32 are close to the upper ends of the spindles 2. The cord 320 is then pulled, swinging the casing 32 forward from beneath the ends of the bobbin-holders, and as the empty bobbins in the latter will no longer be supported and as the holders are directly over the spindles the bobbins will fall and slide down upon the spindles, as shown in Fig. 7.

In order that the bobbins may be secured to the spindles firmly enough to prevent them from flying off when the spindles are being rotated, it is necessary that they be pressed down upon the spindles with some force. To accomplish this result, the cord 320 is released, permitting the casing 32 to swing back to its normal position, and then the carrier is lowered until the presser-strap 33 in the casing is carried into engagement with the upper ends of the bobbins, pressing them down to their correct positions, the flaring side walls of the casing guiding the ends of the bobbins against the strap.

While all of the bobbins which are used on a certain spinning-frame are usually of approximately uniform length, yet on account of swelling and shrinkage of the wood and other causes the diameters of the bores often vary to such an extent that one bobbin must be forced down on a spindle considerably farther than another in order that it may be firmly connected thereto. For this reason if a rigid or unyielding bobbin-engaging face were provided on the casing 32 only the bobbins having bores of the least diameter would be properly pressed down, while the others would still be loose upon the spindles. By providing the loosely-supported presser-strap 33 and by holding said strap down by rods 36 between each bobbin the strap may slide longitudinally over said rods and automatically adjust itself according to the distance which each bobbin must be forced down in order that it may be firmly secured to the spindle. In other words, each portion of the strap which actually engages a bobbin will yield to an extent corresponding to the bore of the particular bobbin against which a particular portion thereof is pressed, as illustrated in Fig. 11, with the result that each bobbin will be firmly pressed down in place on the spindles. The filled bobbins are then swung outwardly, breaking the threads, the carrier is raised to the position in Fig. 1, and the machine is started. The filled bobbins may then be removed by simply depressing the latch 23 of each doffer, a box preferably being held beneath them, so that the bobbins will drop therein.

As the carrier is raised to its uppermost position the bobbin-holders will be refilled in the manner previously described, and then the apparatus will be ready for the next doffing operation.

While the bobbin-depressor performs the twofold function of a bobbin-support and a means for pressing the bobbins down on the spindles, it will be apparent that to combine these two functions in one device is more of a convenience than a necessity.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with a spinning-frame, a vertically-moving carrier, a series of bobbin-holders mounted thereon, means for automatically supplying empty bobbins thereto, a series of doffers connected together and arranged to engage the upper ends of the bobbins while on the spindles, means for moving said doffers vertically to lift the filled bobbins from the spindles and means for moving the bobbin-holders to deliver the empty bobbins thereto, substantially as described.

2. In combination with a spinning-frame, a series of tubular bobbin-holders open at both ends, means for discharging empty bobbins into the upper ends thereof, independent supporting means for engaging the lower ends of the bobbins while in the holders, means for holding said bobbin-holders in register with the spindles and for moving said supporting means transversely of the holder to permit the bobbins to drop onto the spindles, substantially as described.

3. In combination with a spinning-frame, a series of tubular bobbin-holders arranged in a straight line and open at their lower ends, a bobbin-supporting means extending below the lower end of each holder, and in line with the line of said holders, means for holding the said bobbin-holders in register with the spindles, and means for moving said supporting means to one side of the line of the holders to permit the bobbins to drop onto the spindles, substantially as described.

4. In combination with a spinning-frame, a vertically-movable carrier, a series of bobbin-holders mounted thereon, and open at their lower ends, a bobbin-support extending below the lower ends of each holder and pivotally connected to said carrier, said support being arranged to swing to one side of said holders to permit the bobbins to fall onto the spindles when said holders are moved into the register therewith, substantially as described.

5. In combination with a spinning-frame, a series of magazines, a series of bobbin-holders, means for simultaneously discharging a single bobbin from each magazine into each holder, means for supporting the bobbins in the holders, means for simultaneously moving said holders so that the bobbins are carried into register with the spindles, and means

for simultaneously releasing the bobbins in the holders to permit the bobbins to drop upon the spindles, substantially as described.

6. In combination with a spinning-frame, a series of magazines, a series of bobbin-holders, means for simultaneously discharging a single bobbin into each holder, a series of doffers, means for causing said doffers to lift the filled bobbins simultaneously from the spindles and means for simultaneously discharging the empty bobbins in the holders upon the spindles after the filled bobbins have been lifted therefrom, substantially as described.

7. A doffer for spinning-frames comprising a hollow casing open at its lower end and adapted to pass over the tip of a bobbin, automatic engaging means therein for connecting the bobbin and casing when they are brought into engagement, and means for moving said casing vertically, substantially as described.

8. A doffer for spinning-frames comprising a hollow casing, open and flaring or bell shaped at its lower end and adapted to pass over the tip of a bobbin, automatic engaging means therein for connecting the bobbin and casing when they are brought into engagement, and means for moving said casing vertically, substantially as described.

9. In combination with a spinning-frame, a vertically-moving doffer having a vertically-arranged cavity in its under side cylindrical at its upper end and flaring at its lower end, and a bobbin-engaging device borne by said doffer adapted to connect the bobbin with the doffer when the bobbin enters said cavity, substantially as described.

10. In combination with a spinning-frame, a bobbin provided with an annular groove near its upper end, a vertically-movable doffer comprising a hollow casing open at its lower end, and a latch extending into said cup adapted to automatically enter the groove of the bobbin when the bobbin is within the cup, substantially as described.

11. In combination with a spinning-frame, a bobbin having an annular groove adjacent its tip, a doffer having a cavity, cylindrical at its upper end and adapted to fit on said tip, a latch having one end normally held within said cavity in position to enter said groove and movable to one side thereof, and means for moving said doffer vertically, substantially as described.

12. In combination with a spinning-frame, a vertically-movable carrier, a series of bobbin-holders mounted thereon, and open at their lower ends, a bobbin-supporting means extending below the lower ends of each holder, means, pivotally connected to said carrier and suspended below said supporting means, for lifting the bobbins from the spindles, and means permitting movement of said supporting means to one side of said holders to permit the bobbins therein to fall onto the spindles, substantially as described.

13. In combination with a spinning-frame, a carrier, a bobbin-holder mounted thereon, a bobbin-magazine arranged above said holder having an inclined bottom and with an opening at the lower end of said inclination through which a bobbin may pass, a stop adjacent said opening preventing the bobbins from sliding therethrough, means for moving said holder into register with said opening and for lifting the bobbin held by said stop over the stop to discharge the same into the holder, substantially as described.

14. In combination with a spinning-frame, a carrier, a bobbin-holder mounted thereon, a bobbin-magazine arranged above said holder having an obliquely-disposed bottom, and an opening therein at its lower end, a stop adjacent said opening to prevent the bobbins from sliding through said opening, said bottom having a slot in its lower end, a finger on said holder adapted to pass through said slot and to lift the bobbin held by said stop above the stop to discharge the bobbin into said holder, and means for sustaining the bobbin in the holder, substantially as described.

15. In combination with a spinning-frame, a vertically-movable carrier, an open-ended bobbin-holder mounted thereon, a bobbin-magazine arranged in and having its bottom inclined downwardly toward the path of movement of said holder and terminating at one side thereof, the lower end portion of said bottom being provided with a narrow slot, a stop at the lower end of and at one side of said slot, and an obliquely-disposed finger connected to said holder and movable therewith through said slot and above said stop, substantially as described.

16. In combination with a spinning-frame, a vertically-movable carrier, an open-ended bobbin-holder mounted thereon, a bobbin-magazine arranged in and having its bottom inclined downwardly toward the path of movement of said holder, and terminating at one side thereof, the lower end portion of said bottom being provided with a narrow slot, a stop at the lower end of and at one side of said slot, an obliquely-disposed finger connected to said holder and movable therewith through said slot and above said stop, said finger being of such length that it will extend beyond the base of the bobbin resting against said stop and will enter the bore of the next bobbin, substantially as described.

17. In combination with the spinning-frame having a series of spindles, means for simultaneously supplying a bobbin to each of said spindles, and means, independent of said bobbin-supplying means, for pressing the bobbins down on the spindles after they have been placed thereon by said supplying means, substantially as described.

18. In combination with a spinning-frame having a series of spindles, a series of bobbin-

containing holders, means for causing the bobbins to fall from said holders onto said spindles, and means for thereafter pressing the bobbins down on said spindles, substantially as described.

19. In combination with a spinning-frame having a series of spindles, of a depressor arranged to engage the upper ends of said bobbins after they have been placed on the spindles, and to force them down on said spindles simultaneously, substantially as described.

20. In combination with a spinning-frame having a series of spindles, of a depressor for forcing the bobbins down on said spindles having a series of yielding bobbing-engaging portions, substantially as described.

21. In combination with a spinning-frame having a series of spindles, of a depressor for forcing the bobbins down on said spindles having a series of flexible, upwardly-yielding bobbing-engaging portions, substantially as described.

22. In combination with a spinning-frame having a series of spindles, of a depressor for forcing the bobbins down on said spindles comprising a flexible band or strap extending over the ends of the spindles, and means for supporting the upper sides of said band between each spindle, substantially as described.

23. In combination with a spinning-frame having a series of spindles, of a depressor for forcing the bobbins down on said spindles comprising two parallel walls extending divergently at their lower edges and longitudinally of the line of spindles, and a bobbin-engaging device between said walls and connected thereto, and means for moving said depressor vertically, substantially as described.

24. In combination with a spinning-frame having a series of spindles, of a depressor for forcing the bobbins down on said spindles, comprising an elongated casing, a flexible strap or band connected at its ends to said casing and a series of transversely-extending bars connected to said casing above said strap or band and between each spindle, substantially as described.

25. In combination with a spinning-frame, a series of bobbin-magazines, each comprising a downwardly-inclined bottom, side supports, an end support at the lower end of the bottom, and between said side support, said bottom having a bobbin-discharge opening at its lower end and a stop adjacent said opening, and means for lifting the bobbins separately over said stop and causing them to pass through said opening, substantially as described.

26. In combination with a spinning-frame, a series of bobbin-magazines each comprising a downwardly-inclined bottom, parallel side supports for the upper and lower ends of the bobbins providing an open space between them, an end support at the lower end of the bottom and between said side support,

said bottom having a bobbin-discharge opening at its lower end and a stop adjacent said opening, and means for lifting the bobbins separately over said stop and causing them to
5 pass through said opening, substantially as described.

In testimony whereof I have signed my name

to this specification in the presence of two subscribing witnesses.

DENNIS E. CAREY

Witnesses:

SEYMOUR J. LEIGHTON,
LOUIS H. HARRIMAN.