

No. 654,890.

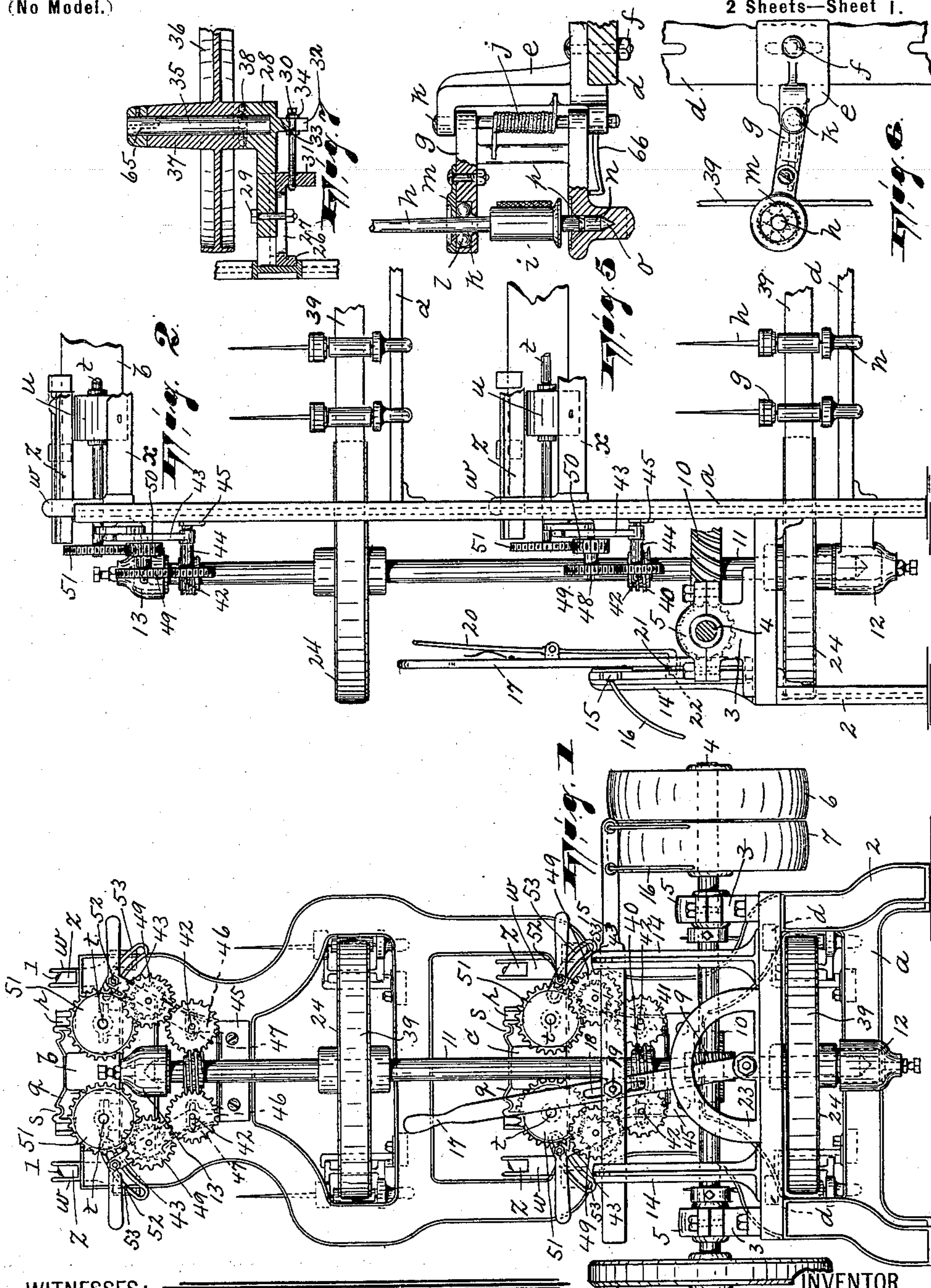
Patented July 31, 1900.

A. HAENICHEN.
SPINNING MACHINE.

(Application filed Oct. 13, 1899.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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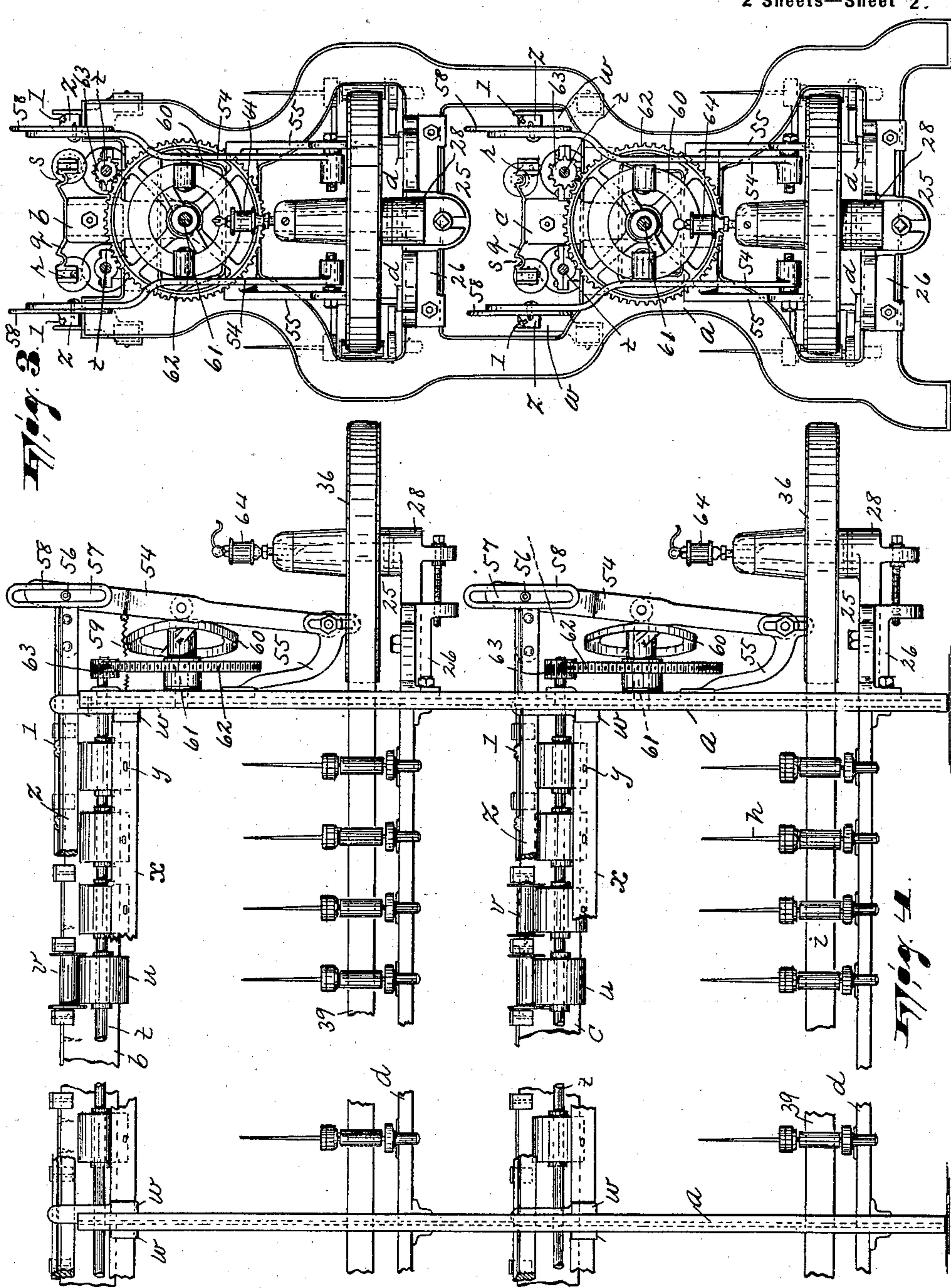
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UNITED STATES PATENT OFFICE.

ADOLPH HAENICHEN, OF PATERSON, NEW JERSEY.

SPINNING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 654,890, dated July 31, 1900.

Application filed October 13, 1899. Serial No. 733,483. (No model.)

To all whom it may concern:

Be it known that I, ADOLPH HAENICHEN, a citizen of the United States, residing in Paterson, county of Passaic, and State of New Jersey, have invented certain new and useful Improvements in Spinning-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to spinning-machines or spinning-frames; and it consists in the improved spinning-machine and in the combination and arrangement of its various parts, substantially as will be hereinafter described, and finally set forth in the claims.

The invention is fully illustrated in the accompanying drawings, wherein corresponding letters and figures of reference indicate like parts, and wherein—

Figure 1 is a front view of one end of my improved spinning-frame—that is to say, the end where the power for driving the machine is taken into the same. Fig. 2 is a view in side elevation of a portion of that end of my spinning-machine which is shown in Fig. 1. Fig. 3 is a front view of the other end of my improved spinning-machine. Fig. 4 is a view in side elevation of a portion of that end of the machine which is shown in Fig. 3. Figs. 5 and 6 are respectively a view in side elevation and a top plan view of a certain spindle-support, certain portions of said support being shown in section in Fig. 5; and Fig. 7 is a sectional view of one of the sheaves over which the belt for rotating the spindles extends and also of the bearing-bracket for said sheave.

In said drawings, *a* designates two or more uprights or standards which are connected and braced by centrally-disposed rails or beams *b c*, that extend throughout the length of the machine, the one being situated above the other. Below each of said beams *b c* is disposed a pair of spindle-rails *d*, the one near one side and the other near the other side of the machine. Upon each of these rails are sustained the spindle-supports, each

of which supports consists of a two-part bracket, the one of which, *e*, is secured to the rail by a bolt *f* and the other of which, *g*, is substantially H-shaped and carries the spindle *h*, the whirl *i* of the spindle being disposed between the two arms of the H-shaped bracket *g*, so that the power which rotates the spindle is directed substantially centrally of the entire device. The two members are connected by a spring *j*, which is coiled about the pivoting-bolt *k* for said members and bears at its ends against each of the latter. In the upper arm of the bracket *g* and about the spindle is formed a ball-race *l*, in which are disposed antifriction-balls *l*, that are held in place by a plate *m*, secured upon said arm over the ball-race and penetrated by the spindle. In the lower arm of the bracket—that is to say, the one in which the spindle is stepped—is arranged a cylindrical block *n*, which is tapered at its lower end, as at *o*, and fits a corresponding recess in said arm, and which at its upper end is provided with a conical recess receiving the tapered lower end *p* of the spindle.

Upon the beams *b c* are mounted pairs of brackets *q*, the central portion of each of which is seated and secured upon the top of the beam, while its extremities project therefrom in opposite directions and are formed with sockets *r s*. Beneath the projecting extremities of the brackets *q* and extending parallel to the beams *b c* are journaled in suitable bearings provided in the several uprights *a* shafts *t*, each of which shafts carries a series of rollers *u*.

v designates the receiving-bobbins, which are adapted to bear against and be driven by the rollers *u*. When thus rotated, they are adapted to be seated in the sockets *r* of the pairs of brackets *q*, but when out of use they are adapted to rest in the sockets *s* of said brackets.

w are supports which are secured to the inner faces of the several uprights substantially in the horizontal plane of the beams *b* and *c*, said supports carrying rails *x*, provided with eyelets *y*, and also serving to sustain the longitudinally-movable thread-guide-carrying rails *z*, the upper extremity of each support being recessed to receive the rail, as most clearly shown in Fig. 1.

Upon each of the beams *c* is mounted a series of thread-guides 1, which thread-guides when the rail is reciprocated feed the thread taken off the several spindles and extending through the eyelets *y* uniformly onto the receiving-bobbins *d*.

From one end of the frame of the machine extends a rest 2, upon which are mounted bearing-blocks 3, the main drive-shaft 4 being journaled in said blocks and maintained therein by bridge-pieces 5, which are bolted to the blocks and pass over the shaft. One end of said shaft carries fast and loose pulleys 6 and 7, while its other end carries a fly-wheel 8. Intermediate of its bearings said shaft carries a worm-wheel 9, whose teeth engage the teeth of a worm 10, that is secured upon a vertical shaft 11. The lower end of this shaft is stepped in a bearing-bracket 12, which projects upwardly from the end upright *a* of the machine-frame, while its upper end is journaled in another bearing-block 13, also projecting from said upright and disposed near the upper end thereof.

14 designates pairs of supports that are mounted upon the rest 2 and sustain a horizontally-reciprocating bar 15, carrying a fork 16, one end of said bar being extended as far as the pulleys 6 and 7 and the said end of the bar carrying said fork.

17 is a lever that is fulcrumed at its lower end in the rest 2 and is provided with a longitudinal slot 18, with which engages a bolt 19, that projects from the bar 15, said lever 17 carrying another and spring-actuated lever or pawl 20, whose lower end is formed with a lug 21, that is adapted to engage either of two notches 22, formed in a segment 23, that is secured upon the rest. The mechanism comprised in the lever 17, the bar 15, and the fork 16 constitutes a belt-shifter, and by securing the lug of the pawl or lever 20 in either of its notches in the segment the belt after being shifted may be maintained in operative engagement with either of the two pulleys 6 or 7.

The shaft 11 may have ball or any other suitable antifriction bearings. It carries two sheaves 24, each of which is disposed in the horizontal plane of a corresponding set of spindles.

Projecting from the upright *a*, at the end of the machine opposite to that where the main driving mechanism is disposed, is a pair of other bearing-brackets 25. One of these bearing-brackets is shown in detail in Fig. 7, where it is shown as comprising two members, the one, 26, being secured to the frame and provided with a longitudinal slot 27 and the other, 28, resting on said first-named member and having a bolt 29, which penetrates the slot and whereby said last-named member may be held in any position to which it is adjusted. Adjustment between the members is effected by a set-screw 30, whose threading engages a lug 31 on the member 26 and which works in an upwardly-extending notch 32, formed in a

lug 33, that projects downwardly from the member 28, said set-screw having a pair of collars 34, engaging opposite sides of the lug. Projecting upwardly from the member 28 is a vertical stub-shaft 35, which affords a journal for a sheave 36, between the lower end of whose hub 37 and the member 28 are antifriction-balls 38, said sheave being kept in position by a collar secured above it upon the shaft. The sheaves 36, like the sheaves 24, are disposed in the planes of the respective sets or groups of spindles, and connecting said sheaves are continuous bands or belts 39. All of the whirls and both the upper and lower sets of spindles bear against these belts, being maintained in effectual contact therewith by the springs *g* of the supports which carry the spindles.

The vertical shaft 11 carries worms 40, each of which is disposed above a worm 10, and with each of said worms 40 engages a worm-wheel 41. This worm-wheel is journaled upon a stub shaft 42, which penetrates the lower end of an L-shaped frame 43, said worm-wheel being spaced from the end of said frame by a sleeve 44 on the stub-shaft.

45 is a bracket secured to the outer face of the upright *a* and provided with two upwardly-projecting arms 46, having horizontal slots 47, in which the stub-shaft may be adjustably and firmly set, by means of a nut screwed onto its innermost end, for instance, and taking against the rear face of the bracket, according to the diameter of the worm-wheel which said stub-shaft carries. Said L-shaped frame carries another stub-shaft 48, on which are journaled rigidly-connected pinions 49 50, the pinion 50 being in engagement with a gear 51, that is secured upon the end of one of the shafts *t*. It should be remarked that the L-shaped frame and the gearing which it carries are duplicated, so that power may be transmitted from the worm 40 to each of the shafts *t*. The pinions 49 50 are adapted to be removed and changed for others of different diameter, so that variations in the speed of the shafts *t* may be secured. For this purpose the L-shaped frames are rendered adjustable about the stub-shafts 42 by means of bolts 52, that penetrate slotted arc-shaped guides 53, secured to the upright *a*. It will be seen that the upper end of the L-shaped frame affords a handle for operating it. The lower end of this frame is simply made adjustable in the slotted arms 46, so that when necessary the gearing can be disconnected. If desired, however, this adjusting means may be made use of in changing the pinion 41 for other pinions of different diameter, as in the case of the pinions 50.

In order to reciprocate the thread-guide-carrying rods, levers 54, adjustably fulcrumed in brackets 55, projecting from the upright *a*, which supports the brackets for the sheaves 36, are provided, said levers having pins 56, which engage vertical slots 57 in T-shaped projections 58, that are secured to the adjoining ends of the thread-guide-carrying

rails. The levers are normally held inwardly by spiral springs 59, which connect them with the upright, and they are vibrated by cams 60, journaled on stub-shafts 61, projecting from said upright, a gear 62 being connected to each cam and engaging a pinion 63 on the corresponding shaft *t*.

The device 64 (shown in Figs. 3 and 4 and which surmounts each stub-shaft 35 for the sheave 36) is simply a lubricating device, with which communicates a duct 65, penetrating the shaft and deflected at its lower end, so as to conduct the lubricant to the bore of the hub of the sheave.

I have provided a spring-clip 66, which projects from the stationary member *e* of the two-part bracket outwardly beneath the other or movable member *g* of said bracket and which has a hook-shaped free end that is adapted to engage one side of said last-named member in an obvious manner, so as to hold it at right angles to the spindle-rail, and thus prevent operative contact between the spindle-whirl and the belt in case it is desired to stop the action of any individual spindle.

In operation the belt which the pulleys 6 and 7 are adapted to receive being thrown over by the belt-shifting mechanism from the loose to the fast pulley the shaft 4 will be rotated and power transmitted therefrom through the gearing comprised in the worm 10 and worm-wheel 9 to the vertical shaft 11. As this shaft rotates the belts 39, which it drives, revolve the several sets of spindles, said spindles being held in effective contact with the belts in the manner above set forth. At the same time through the gearing comprised in the worms 40, the gears 51, and the gearing which the frames 43 carry the rotary motion of the shaft 11 is transmitted to the several shafts *t*, whereon are mounted the rollers *u*. These rollers of course rotate the several sets of bobbins, so that as the spindles are revolved by the belts 39, so as to twist the threads, the latter are taken off of said spindles and wound on the bobbins. It will be observed that since the barrel or body portion of each bobbin—that is to say, that portion thereof upon which the thread is wound—directly bears on the driving-rollers *u* the tension which the bobbins exert on the cops on the spindles *h* is maintained constantly uniform, because though the diameters of the cops on each bobbin and the corresponding spindle are constantly changing as the former increases in size the speed of rotation at which each bobbin is revolved by its roller is gradually reduced. Of course as the several shafts *t* revolve the levers 54 are caused to vibrate by virtue of the action of the gearing 62 63 and the cams 60, thus reciprocating the thread-guide-carrying rails *z* and so laying the threads evenly on the barrels of the several bobbins.

It will be apparent that it is only necessary in order to tighten up the belts 39 to release the bolts 29 and manipulate the set-screws

30, so as to shift the sheave-carrying members of the brackets 25 inwardly and outwardly with reference to the machine.

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

1. In a spinning-machine, the combination, with the frame and with sets of alined revolvable spindles mounted in said frame, of a vertical shaft, bearing-brackets for said shaft projecting from one end of said frame, a rest extending from said end of the frame, bearing-blocks mounted on said rest, a drive-shaft journaled on said bearing-blocks, operative connection between said shafts, pairs of sheaves, and belts extending over said sheaves and engaging said spindles, one sheave in each pair being mounted on said vertical shaft, substantially as described.

2. In a spinning-machine, the combination, with the frame and with sets of alined revolvable spindles mounted in said frame, of a vertical shaft, bearing-brackets for said shaft projecting from one end of said frame, a rest extending from said end of the frame, bearing-blocks mounted on said rest, a drive-shaft journaled on said bearing-blocks, pulleys carried by said drive-shaft, a belt-shifting mechanism also mounted on said rest, operative connection between said shafts, pairs of sheaves, and belts extending over said sheaves and engaging said spindles, one sheave in each pair being mounted on said vertical shaft, substantially as described.

3. In a spinning-machine, the combination, with the frame and with sets of alined revolvable spindles mounted in said frame, of a vertical shaft, bearing-brackets for said shaft projecting from one end of said frame, a rest extending from said end of the frame, bearing-blocks mounted on said rest, a drive-shaft journaled on said bearing-blocks, operative connection between said shafts, adjustable bearing-brackets extending from the other end of said frame, pairs of sheaves, one sheave in each pair being carried by one of said last-named bearing-brackets and the other by the vertical shaft, and belts extending over said sheaves and engaging said spindles, substantially as described.

4. In a spinning-machine, the combination, with the frame and with sets of alined revolvable spindles mounted in said frame, of a vertical shaft, bearing-brackets for said shaft projecting from one end of said frame, a rest extending from said end of the frame, bearing-blocks mounted on said rest, a drive-shaft journaled on said bearing-blocks, operative connection between said shafts, adjustable bearing-brackets extending from the other end of said frame, pairs of sheaves, one sheave in each pair being carried by one of said last-named bearing-brackets and the other by the vertical shaft, belts extending over said sheaves and engaging said spindles, roller-carrying shafts journaled in said frame, and operative connection between said roller-

carrying shafts and the vertical shaft, substantially as described.

5. In a spinning-machine, the combination, with the frame and with sets of aligned revoluble spindles mounted in said frame, of a vertical shaft, bearing-brackets for said shaft projecting from one end of said frame, means for rotating said shaft, adjustable bearing-brackets extending from the other end of said frame, pairs of sheaves, one sheave in each pair being carried by one of said last-named bearing-brackets and the other by the vertical shaft, belts extending over said sheaves and engaging said spindles, roller-carrying shafts journaled in said frame, adjustable frames carried by the main frame, gears carried by said roller-carrying shaft, worms mounted on the vertical shaft, and gearing carried by each adjustable frame and connecting the corresponding worm and gear, substantially as described.

6. In a spinning-machine, the combination, with the frame and with roller-carrying shafts and sets of spindles journaled therein, of a vertical shaft having bearings in said frame, belts driven by said shafts and engaging said spindles, gears carried by said roller-carrying shafts, worms mounted on said vertical shaft, adjustable frames mounted in the main frame, and gearing carried by said last-named frame and adapted to engage and connect said worms and the gears, substantially as described.

7. In a spinning-machine, the combination, with the frame and with roller-carrying shafts and sets of spindles journaled therein, of a vertical shaft having bearings in said frame, belts driven by said shafts and engaging said spindles, gears carried by said roller-carrying shafts, worms mounted on said vertical shaft, a bracket projecting from said frame, arc-shaped guides secured to said frame, L-shaped frames adjustably mounted in said bracket and the guides, and gearing carried by said last-named frame, adapted to engage and connect said worms and the gears, and comprising an interchangeable member or members, substantially as described.

8. In a spinning-machine, the combination, with the frame, of spindles journaled in said frame, spindle-driving means, a roller-carrying shaft also journaled in said frame, means for rotating said shaft, bobbins having operative engagement with the rollers on said shaft, a reciprocating thread-guide-carrying rail mounted in said frame in operative contiguity to said bobbins, a lever fulcrumed in said frame and connected to said rail, and a cam engaging said lever and operatively connected to said roller-carrying shaft, substantially as described.

9. In a spinning-machine, the combination, with a frame including spindle-rails, of a suitably-driven shaft vertically arranged in said frame at one end thereof, adjustable brackets projecting from the other end of said frame, pairs of sheaves, one sheave in

each pair being journaled on a bracket and the other being carried by said vertical shaft, belts extending over said sheaves, spindles journaled on said spindle-rails and engaging said belts, bobbin-sustaining brackets arranged in said frame, roller-carrying shafts also journaled in said frame in proximity to said brackets, operative connection between said roller-carrying shafts and the vertical shaft, reciprocating thread-guide-carrying rails arranged in said frame, levers operatively engaging said thread-guide-carrying rails, and operative connection between said levers and the roller-carrying shafts, substantially as described.

10. In a spinning-machine, the combination, with the frame, of spindles journaled in said frame, a belt connecting said spindles, a shaft journaled in said frame, said belt receiving its power from said shaft, a roller-carrying shaft also journaled in said frame and operatively connected to said first-named shaft, bobbin-brackets disposed in proximity to said roller-carrying shaft, a reciprocating thread-guide-carrying rail mounted in said frame in operative contiguity to said brackets, a lever fulcrumed in said frame and connected to said rail, and a cam contacting with said lever and operatively connected to said roller-carrying shaft, substantially as described.

11. In a spinning-machine, the combination, with the frame, of a shaft-carrying bracket comprising two members, one of which is secured to the frame and is provided with a slot and the other of which is mounted on said first-named member and is provided with a bolt engaging said slot, said members having downwardly-projecting lugs, a set-screw connecting said lugs, a shaft carried by said last-named member, a sheave journaled on said shaft, antifriction-bearings disposed between the hub of said sheave and the sheave-carrying member of the bracket, said shaft being penetrated by a lubricant-duct, and a lubricating device controlling said duct and mounted on the shaft, substantially as described.

12. A spindle-supporting device consisting of two hinged members, an elastic connection between them, one of said members being adapted to be secured to the spindle-rail or other sustaining means and the other of said members being adapted to provide bearings for the spindle both sides of the point of applying the driving power thereto, and a stop carried by said first-named member and adapted to engage the other member to secure the same against movement under actuation of said elastic connection and out of engagement with the driving means, substantially as described.

13. A spindle-supporting device consisting of two hinged members, a spring connecting them, one of said members being adapted to be secured to the spindle-rail or other sustaining means and the other of said members being adapted to provide bearings for the spindle

both sides of the point of applying the driving power thereto, and a clip projecting from said first-named member and having a hooked extremity adapted to engage the other member to secure the same against movement under actuation of said spring and out of engagement with the driving means, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 12th day of 10 October, 1899.

ADOLPH HAENICHEN.

Witnesses:

ALFRED GARTNER,
MARGARET BRITTON.