No. 721,472. PATENTED FEB. 24, 1903.

C. SEIDEL & C. W. DAHLHAUS.

SPOOLING MACHINE.

APPLICATION FILED OCT. 18, 1901.

NO MODEL. 3 SHEETS—SHEET 1.

Fig: 1

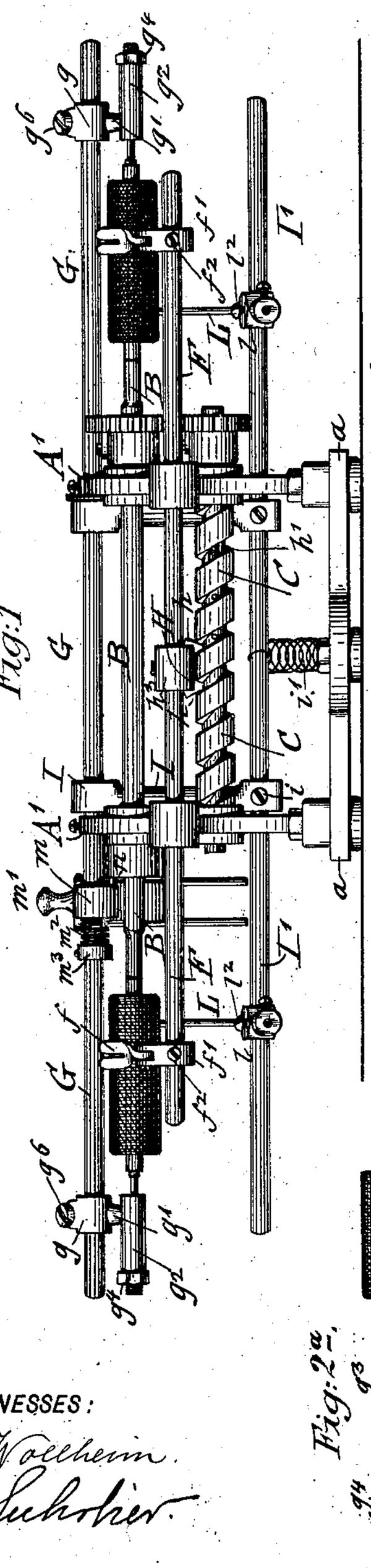

Fig: 2.

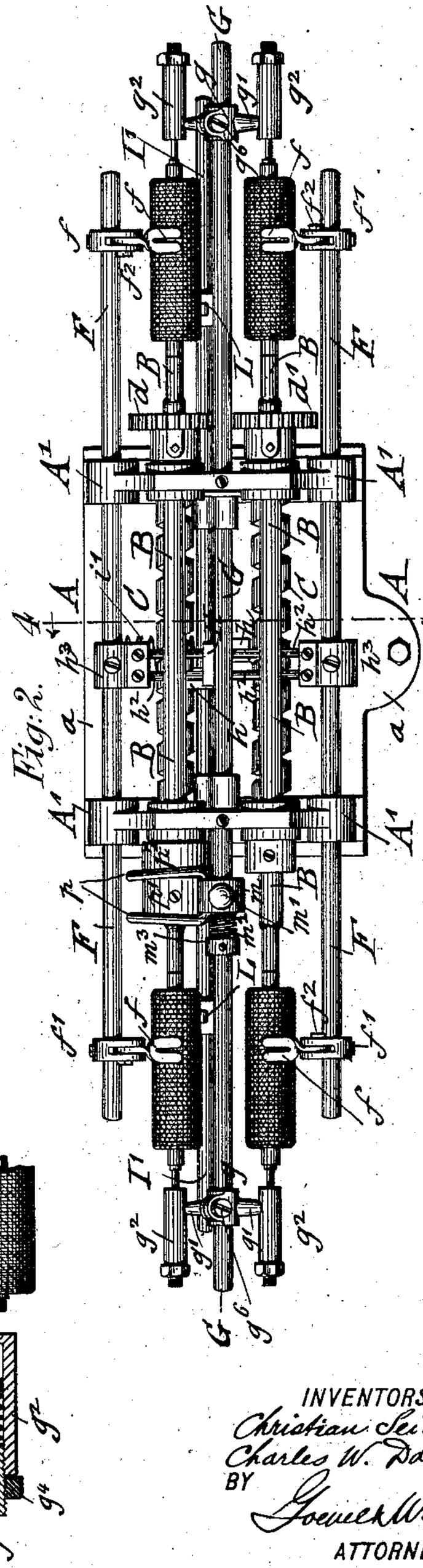

Fig: 2a.

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NO MODEL. 3 SHEETS—SHEET 2.

Fig. 4.

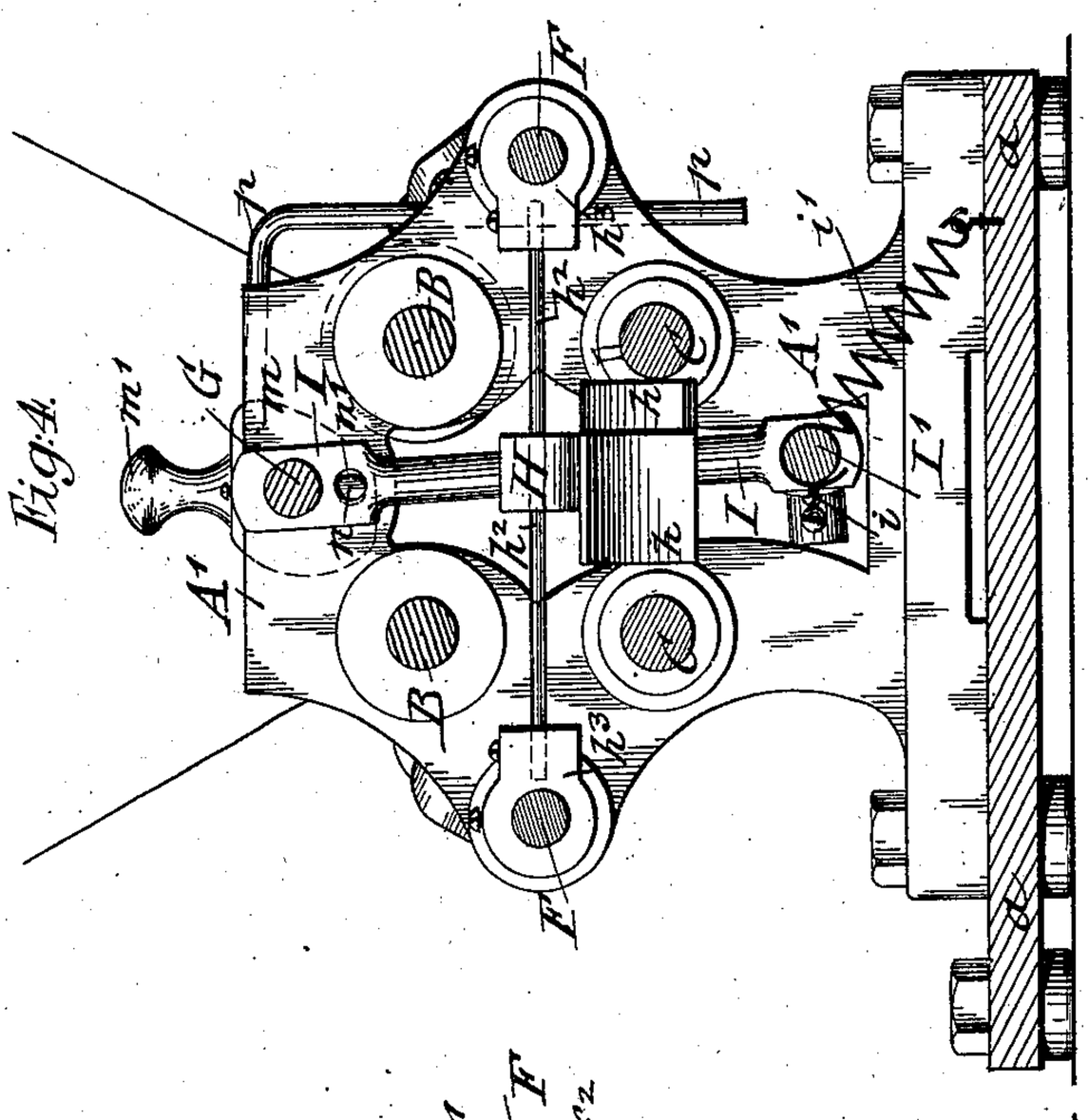
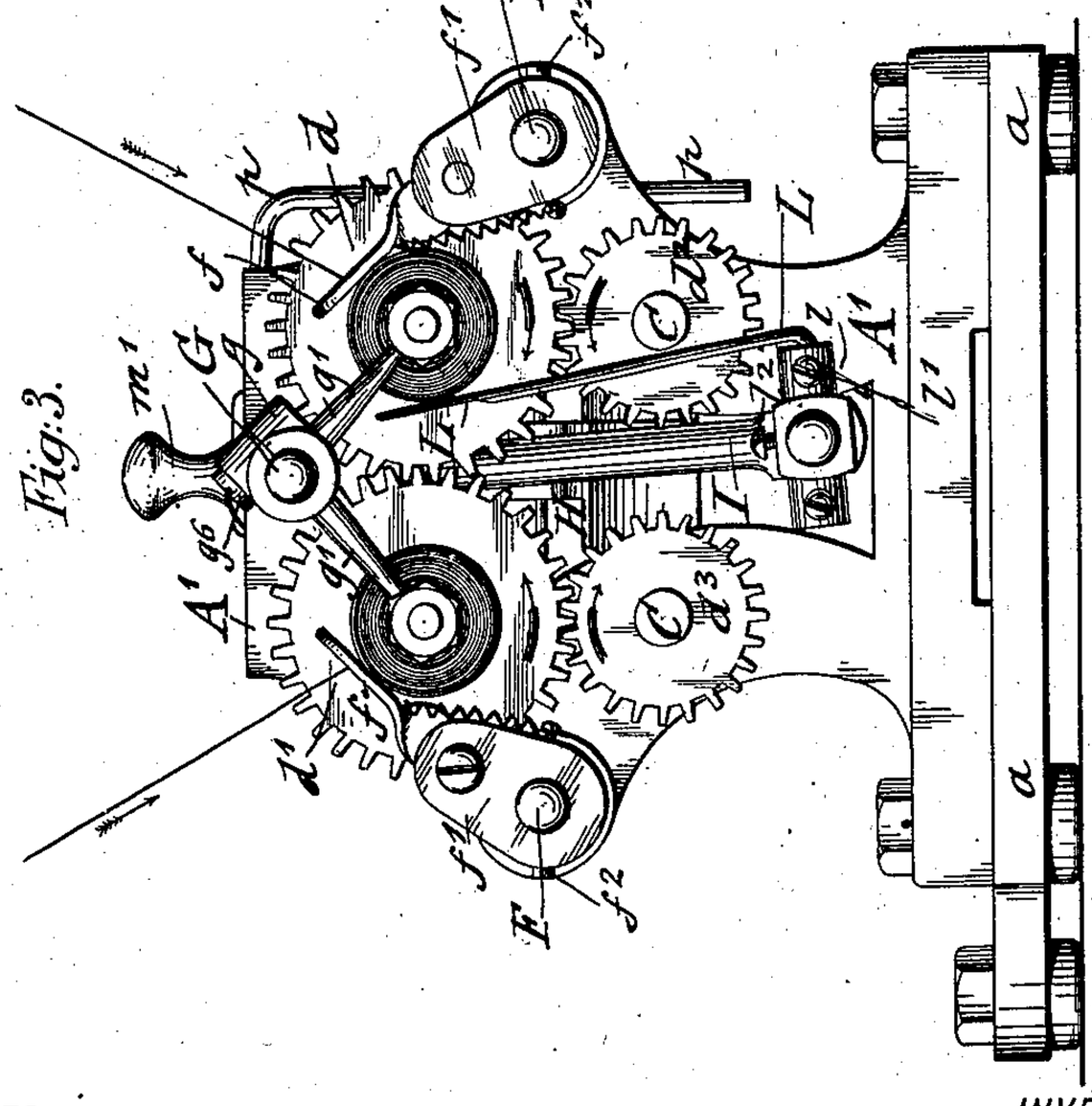


Fig. 3.



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NO MODEL. 3 SHEETS—SHEET 3.

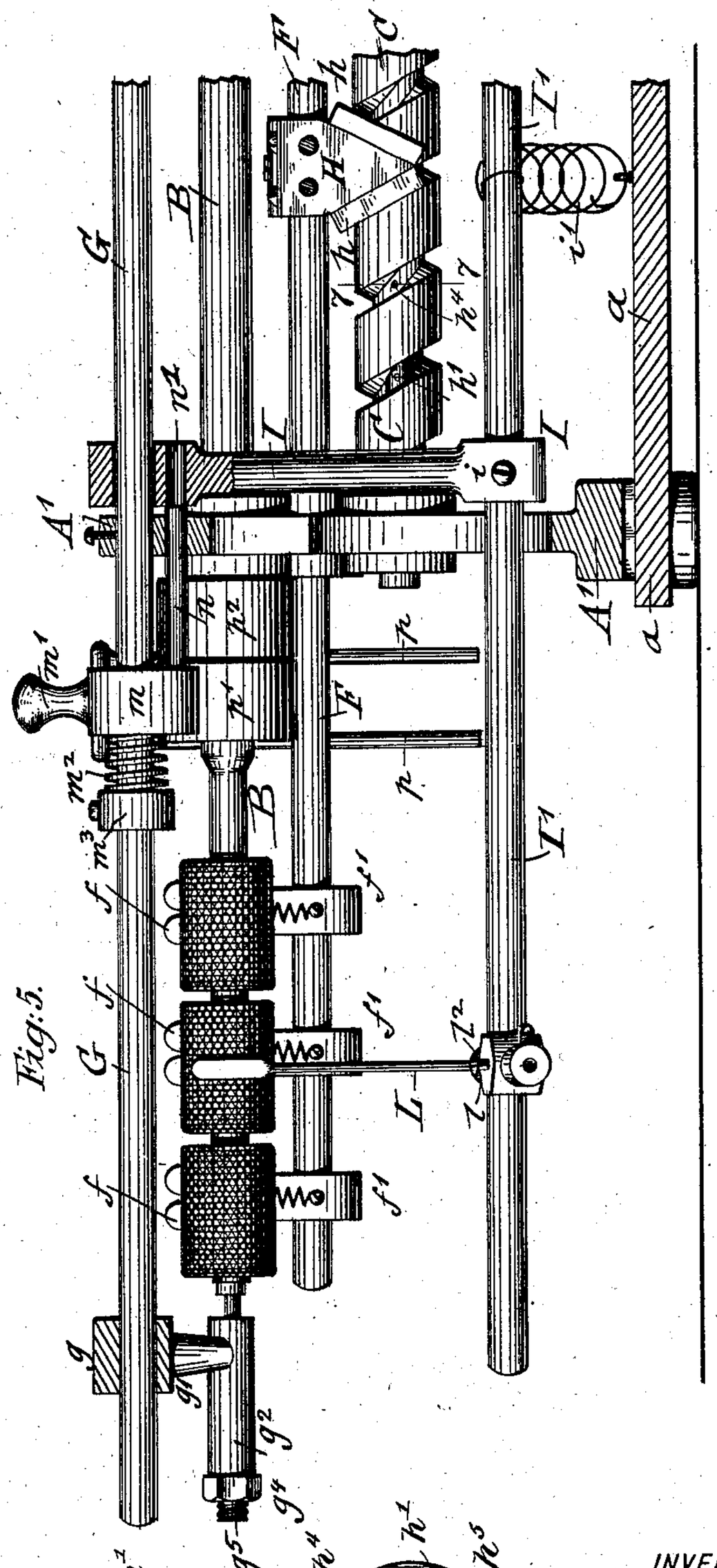

Fig. 5.

Fig. 6.

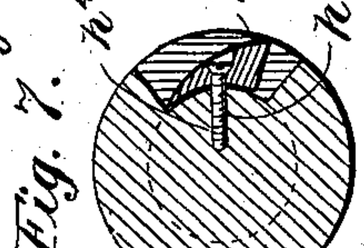

Fig. 7.

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UNITED STATES PATENT OFFICE.

CHRISTIAN SEIDEL AND CHARLES W. DAHLHAUS, OF NEW YORK, N. Y., ASSIGNORS OF ONE-THIRD TO CHRISTOPHER E. HERTLEIN, OF NEW YORK, N. Y.

SPOOLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 721,472, dated February 24, 1903.

Application filed October 18, 1901. Serial No. 79,071. (No model.)

To all whom it may concern:

Be it known that we, CHRISTIAN SEIDEL and CHARLES W. DAHLHAUS, citizens of the United States, residing in New York, in the borough of the Bronx and State of New York, have invented certain new and useful Improvements in Spooling-Machines, of which the following is a specification.

Our invention relates to certain improvements in spooling-machines by which a plurality of spools can be simultaneously wound by the operation of the machine preparatory to using the same in the shuttles of ribbon and other looms; and our invention consists of a spooling-machine which comprises a supporting-frame, rotary spindles supported in bearings of the supporting-frame, thread-guides for the spools, means for reciprocating said thread-guides, and a stop-motion for arresting the motion of the machine when spools of the required size are wound.

Our invention consists, further, in the special construction of the spool-spindles and their connection with the rotary spindles of the machine, and, lastly, of a reversing mechanism for the thread-guides of the spools, as will be fully described hereinafter.

In the accompanying drawings, Figure 1 represents a side elevation of our improved spooling-machine. Fig. 2 is a plan view of the same. Fig. 2^a is a detail section of the supporting-socket for the spool-spindle. Fig. 3 is an end elevation of the machine drawn on a larger scale. Fig. 4 is a vertical transverse section on line 4 4, Fig. 2. Fig. 5 is a side elevation, partly in section, of one end of our improved spooling-machine, showing the spool-spindle arranged for winding a number of smaller spools. Fig. 6 is a perspective view of a cam-piece that is applied to the grooved shafts of the machine; and Fig. 7 is a transverse section through one of said grooved shafts on line 7 7, Fig. 5, showing the cam-piece secured in the groove thereof.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents the supporting-frame of our improved spooling-machine. The frame consists of a base-plate a and upright standards A′, which are provided with the necessary bearings for the rotating parts of the machine. The machine is constructed throughout as a double machine, so as to wind four spools at the same time, two spools on each driving-spindle B, of which two are arranged. Below each driving-spindle B is arranged a spirally-grooved shaft C, which shafts turn, like the driving-spindles B, in bearings of the standards A′. Motion is transmitted to one driving-spindle B by a belt and pulley, and by gear-wheels d d' to the second driving-spindle B, as shown in Fig. 3. The gear-wheels d d' mesh with gear-wheels d^2 d^3 on the spirally-grooved shafts C C, so as to impart rotary motion in opposite directions to the same. Intermediately between and somewhat above the driving-spindles B B is arranged at the center of the upright standards A′ a stationary rod G, which carries at each end a split sleeve g, provided with downwardly-extending diverging arms g', provided with stationary sockets g^2, which are placed in line with the driving-spindles B B. The sockets g^2 carry interior spring-actuated pistons g^3 for receiving the ends of the spool-spindles, the tension of the springs being adjusted by means of screw-nuts g^4, which are placed on the threaded stop-screws, as shown in detail in Fig. 2^a. The ends of each driving-spindle B are made in the shape of sockets, so as to receive the ends of the spool-spindles after their opposite ends have been inserted into the sockets g^2. When it is desired to remove or insert the spool-spindles, one end of the same is inserted into the spring-actuated portion of the socket g^2, so as to force the piston back, after which the opposite end of the spool-spindle is inserted in the end socket of the driving-spindle. The sockets g^2 are adjusted on the stationary guide G by means of the split sleeves g and clamping-screws g^6, passing through the adjacent ends of the split sleeves g^3, as shown in Figs. 2 and 3. By means of the clamping-sleeves g the spool-spindle-supporting sockets g^2 can be adjusted to any desired position on the stationary rod G, according to the length of the spools to be wound on the spool-spindle. A spring-actuated thread-guide f is arranged sidewise of the spool-spindle—one for each spool—the thread-guide being slotted, so as to

guide the thread from a suitable cop to the spool-spindle for being wound up thereon. Each thread-guide f is pivoted to an adjustable lug f', which is securely attached by a clamping-screw f^2 to a longitudinally-reciprocating thread-guide-carrying rod F, which is guided in eyes of the upright standards A'.

Reciprocating motion is imparted to the thread-guide-supporting rod F by means of the wedge-piece H, which is provided with oppositely-extending inclined flanges h, that are adapted to simultaneously engage with the groove of one of the shafts C C and disengage from the groove of the other when the engaging or meshing flange reaches the end of the groove. The wedge-piece is adapted to have a slight transverse reciprocating motion, so as to permit simultaneously the flange projecting from one side thereof to engage with the spiral groove of one of the grooved shafts C C and the flange projecting from the opposite side of the wedge-piece H to disengage from the groove of the other grooved shaft. The flanges h are adapted alternately to mesh and move along the grooves of the shafts during the rotation thereof, one flange moving along the groove of one shaft until it passes over the cam-surface of the cam-piece h', whereby the wedge-piece is shifted transversely, so that the flange on the opposite side thereof meshes with the groove of the other shaft. The wedge-piece H is guided at its upper part on two parallel rods h^2, which extend transversely between stationary sockets h^3, placed on the longitudinally-reciprocating rods F, said sockets being clamped to the rods F, so that they move forward and backward with the same and carry thereby the wedge-piece H along with the same. One cam-piece h' is provided in each groove of the grooved shafts and at diagonally opposite ends thereof. A plurality of tapped apertures h^4 is provided at said ends for receiving the screws h^5, that secure the cam-pieces in the grooves. By this arrangement the cam-pieces can be adjusted in inward or outward direction relatively to each other, so as to govern the length of the reciprocating motion of the wedge-piece and the thread-guide-supporting rods F, according to the length of the spool to be wound. One of the inclined flanges h of the wedge-piece H is always in mesh with one of the grooved shafts. Consequently the same is moved with the reciprocating rods F toward the end of the grooved shaft C until its meshing flange passes over the cam-surface of the cam-piece h', which causes the wedge-piece H to be shifted on the transverse rods h^2 until the opposite flange of the wedge-piece H engages the groove of the second grooved shaft C and is moved, together with the rods F, in an opposite direction, for the reason that the second grooved shaft is rotated in a reverse direction to the first grooved shaft. The wedge-piece H moves along the grooved shafts until its meshing flange passes over the cam-surface of the cam-piece in the groove of the second shaft, which again shifts the wedge-piece on the transverse rods h^2 and causes the opposite flange to mesh with the first grooved shaft C, so that its motion and that of the rods F and thread-guides is again reversed, and so on alternately.

As there are two driving-spindles B and a spool-spindle at each end of the same, four spools are wound simultaneously by the machine. When the required thickness of the spools is obtained, the motion of the machine is automatically arrested by means of a stop-motion, so as to permit the removal of the spools, with their spindles, and the insertion of new spool-spindles. The stop-motion consists of two pendent arms I, which are arranged adjacent to the upright standards A' and placed by eyes at their upper ends loosely on the longitudinal rod G, their eye-shaped lower ends carrying an oscillating rod I', which is attached to the arms by set-screws i. A helical spring i' is connected to the longitudinal rod I' and to a suitable point at one side of the base-plate a, as shown in Fig. 4, said spring holding the rod I on one side of the vertical longitudinal plane of the machine, as shown in Figs. 3 and 4. To each end of the longitudinal rod I' is applied a laterally-extending socket l, which socket receives the lower bent end of an upwardly-extending rod L, which is flattened on its upper end and which is pressed by the action of the spring i' on the rod I' on the spool that is wound upon the spool-spindle above the rod I'. The bent end of the rod L is firmly held in its socket by means of a set-screw l', while the socket is clamped to the rod I' by a sleeve and set-screw l^2, as shown in Fig. 3. To the stationary rod G at the upper part of the standards A' is applied a sleeve m, which is provided with a handle m', said sleeve being placed loosely on the rod G and provided with a longitudinal pin n at its lower end, which is arranged parallel with the guide-rod G and which is adapted to engage an opening n' in the upper part of one of the pendent arms I. A helical spring m^2 is interposed between the sleeve m and a stationary collar m^3, attached to the rod G, so that as soon as the opening n' is moved into alinement with the pin n, which is accomplished by the gradual moving over of the pendent arms I and the longitudinal rod I', due to the pressure of the increased thickness of the spool on the upper end of the arm L, the sleeve m is moved forward on the rod G by the action of its spring, so that the belt-shifting fork p, which is carried by the sleeve m, is shifted and the driving-belt moved from the fast pulley p' over to the loose pulley p^2, as shown in Figs. 1, 2, and 5, whereby the motion transmitted to the driving-spindle C is immediately interrupted and the machine stopped. The spools are then removed, with their spindles, from the opposite ends of the driving-spindles and the latter withdrawn

from the spools and placed again in position in the receiving-sockets at the ends of the driving-spindles. The ends of the threads are then attached to the spool-spindles. The sleeve m is moved back by its handle m' against the tension of its spring, so that the pin is withdrawn from the opening n' in the pendent arm I, the pin n of the latter being immediately moved, by the action of the spring i'', acting on the longitudinal rod I', out of engagement with the opening n', so that the pendent arms I assume their former inclined position at one side of the vertical longitudinal center plane of the machine, as shown in Figs. 3 and 4. The shifting motion of the sleeve m brings the driving-belt back to the fast pulley p', so that motion is again imparted to the driving-spindle B, and thereby to the other parts of the spooling-machine.

Instead of winding four large spools—one at each end of the two driving-spindles—a plurality of spool-spindles may be inserted at each end of the driving-spindles when the winding of smaller spools is required. This is shown at the left-hand end of Fig. 5. In this case several shorter tubular spool-spindles are connected with each other by means of a longer spindle, which is passed through the shorter tubular spindles, said longer spindle being then inserted into the receiving-sockets g^2 and the sockets at the end of the driving-spindles in the same manner as the spindles of the larger spools hereinbefore described. The machine can be thus used for winding simultaneously a larger number of smaller spools. In this case it is necessary that there should be the same number of thread-guides as there are spools to be wound, while one stop-arm L at one of the spools is sufficient for actuating the stop-motion when the required size of the spools is obtained.

Our improved spooling-machine has the advantage that the spooling operation takes place in a perfectly-reliable manner until spools of the required size are obtained, when the stop-motion is operated and the motion of the machine interrupted, so as to permit the removal of the spools and the replacing of new spool-spindles, after which the machine is again started. The reciprocating motion of the thread-guides is automatically accomplished by the action of the reversing mechanism, the motion of the wedge-piece being controlled by the cam-pieces in the grooves of the shafts and by which the length of the reciprocating motion of the thread-guides is controlled.

The improved spooling-machine being driven by power can turn out a large number of spools for the shuttles of looms of all kinds.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. In a spooling-machine, the combination, with a supporting-frame, of driving-spindles having opposite rotary motion, a stationary rod supported on said frame centrally above said driving-spindles, divergent socket-supporting means adjustably mounted at the ends of said stationary rods, spool-sockets arranged on said socket-supporting means, spool-spindles, reciprocating thread-guides, grooved shafts supported in said frame, means for imparting opposite rotary motion thereto, and means alternately engaging said grooved shafts for reciprocating said thread-guides, substantially as set forth.

2. In a spooling-machine, the combination, with a supporting-frame, of reciprocating rods, thread-guides secured thereon, transverse rods connecting said reciprocating rods midway their ends, a wedge-piece slidably mounted on said transverse rods, two oppositely-projecting inclined flanges provided on said wedge-piece, grooved shafts mounted on said frame, said grooved shafts each having a single spiral groove for engaging said inclined flanges, a cam means provided in each of said grooves and at diagonally opposite ends thereof, and means for adjusting the position of said cam means in inward or outward direction relatively to each other, substantially as set forth.

3. In a spooling-machine, the combination, of driving-spindles, means for imparting opposite rotary motion to the same, a stationary rod supported centrally above said driving-spindles, a laterally-movable rod supported from said stationary rod, sockets arranged on said stationary rod, spool-spindles, reciprocating thread-guides means for reciprocating the same, a stop mechanism, and an adjustable arm secured on said laterally-movable rod for operating said stop mechanism, substantially as set forth.

4. In a spooling-machine the combination of driving-spindles, sockets in line with said spindles, spool-spindles supported by the driving-spindles and sockets, reciprocating thread-guides for the spools, means for reversing the motion of the thread-guides at the proper time, and a stop-motion for interrupting the motion of the driving-spindles and thread-guides, said stop-motion consisting of pendent arms, a longitudinal rod supported on said arms, arms on said rod forming contact with said spools, a spring-actuated belt-shifting device, a stop-pin on said belt-shifting device and an opening in one of said pendent arms for the entrance of said stop-pin when the proper thickness of spool is produced, substantially as set forth.

5. In a spooling-machine, the combination, of a supporting-frame consisting of a base and end supporting-standards, parallel driving-spindles mounted on said frame, and having their ends projecting from said supporting-standards, a stationary rod mounted on said frame centrally above said driving-spindles, spool-sockets depending from said stationary rod, parallel grooved shafts arranged below said driving-spindles, meshing gear-wheels for said driving-spindles and grooved shafts, reciprocating rods having thread-

guides, transverse rods connecting said reciprocating rods, and means on said transverse rods alternately coöperating with each of said grooved shafts for reciprocating said rods, substantially as set forth.

6. In a spooling-machine, the combination, of a supporting-frame having a base and end supporting-standards, parallel driving-spindles, grooved shafts arranged vertically below said driving-spindles and in a horizontal plane, a stationary rod arranged horizontally and centrally above said driving-spindles, a laterally-movable rod supported from said stationary rod and vertically below the same, spool-spindles, means for supporting the same, means for rotating said driving-spindles and grooved shafts in reciprocal motion, an adjustable upright arm secured on said laterally-movable rod, a spring-actuated belt-shifting means on said stationary rod, and means connected with said laterally-movable rod for operating the spring-actuated belt-shifting means, substantially as set forth.

7. In a spooling-machine, the combination, of a supporting-frame having a base and end supporting-standards, parallel driving-spindles, grooved shafts arranged below said driving-spindles, driving-gear mechanism for said spindles and shafts, a stationary rod arranged centrally above said driving-spindles, reciprocating rods arranged parallel with said driving-spindles in a position obliquely below the same, inwardly-inclined thread-guides adjustably secured on said reciprocating rods, longitudinally-adjustable supports provided at opposite ends of said stationary rods and having outwardly-depending arms, sockets provided at the ends of said arms, a belt-shifting mechanism, and means for automatically stopping the operation of the spooling-machine, substantially as set forth.

In testimony that we claim the foregoing as our invention we have signed our names in presence of two subscribing witnesses.

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CHARLES W. DAHLHAUS.

Witnesses:
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