No. 667,811.

Patented Feb. 12, 1901.

J. E. TYNAN.

TWISTING MACHINE.

(Application filed Apr. 27, 1900.)

(No Model.)

4 Sheets—Sheet 1.

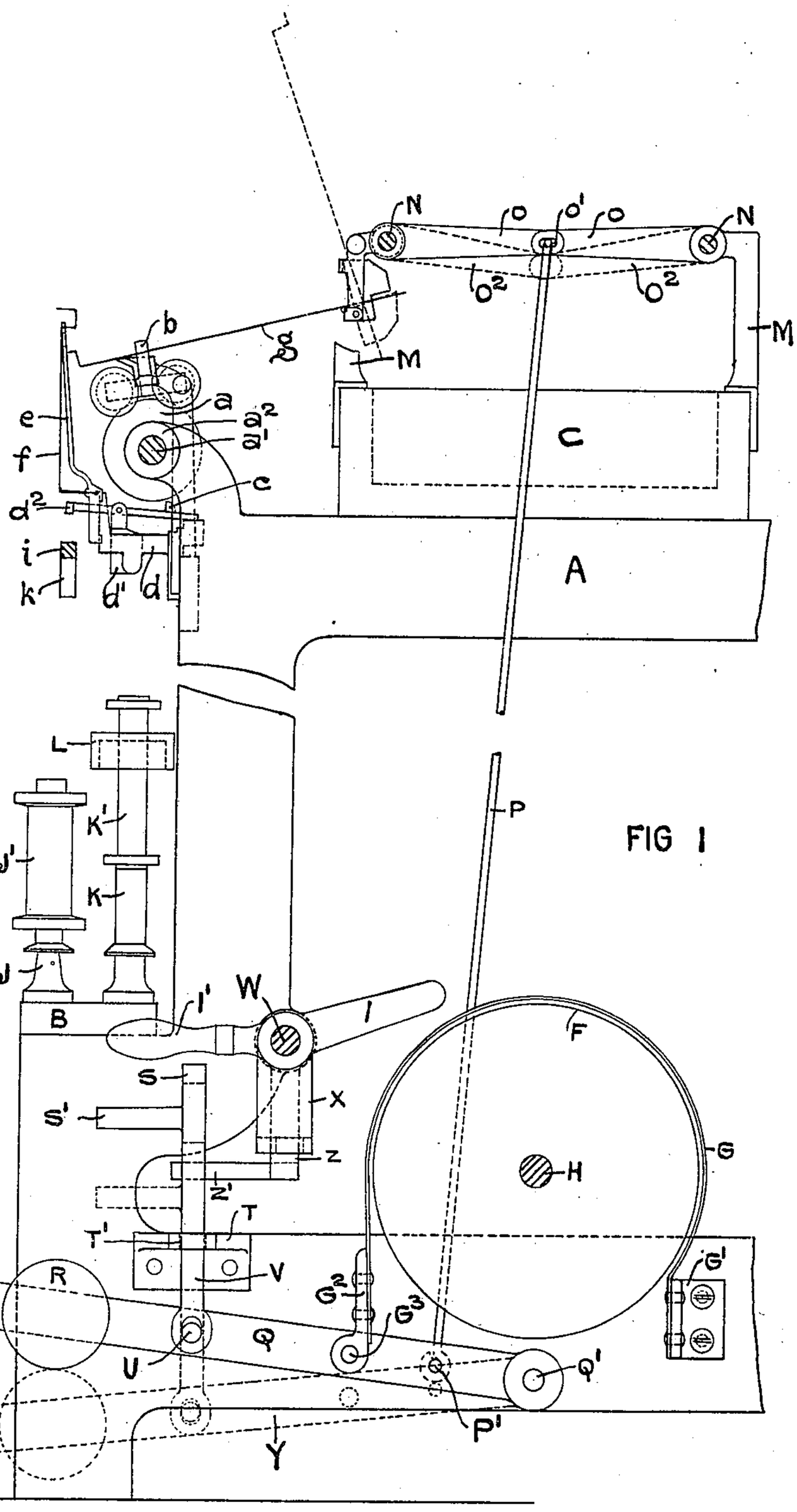

FIG 1

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FIG 2

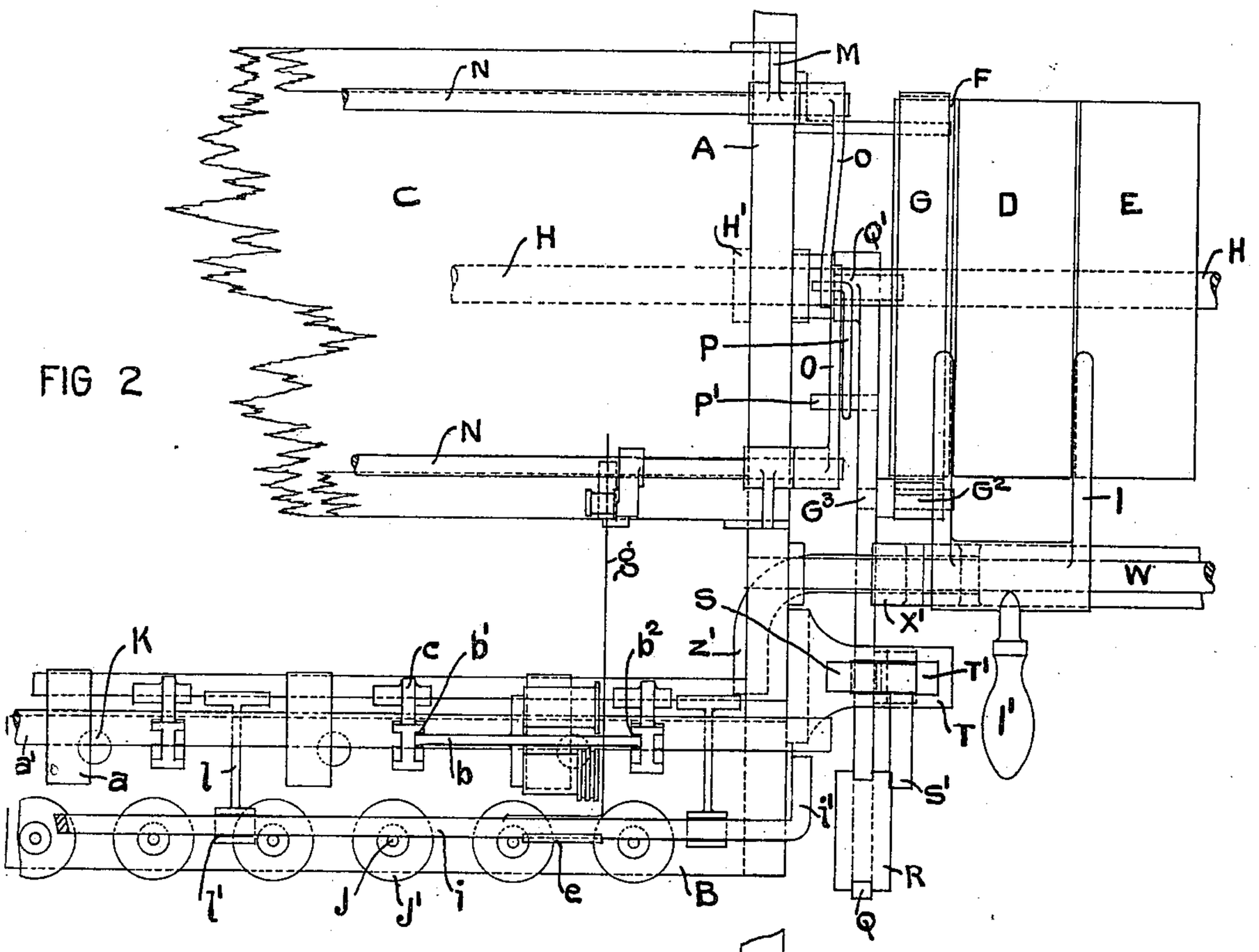

FIG 3

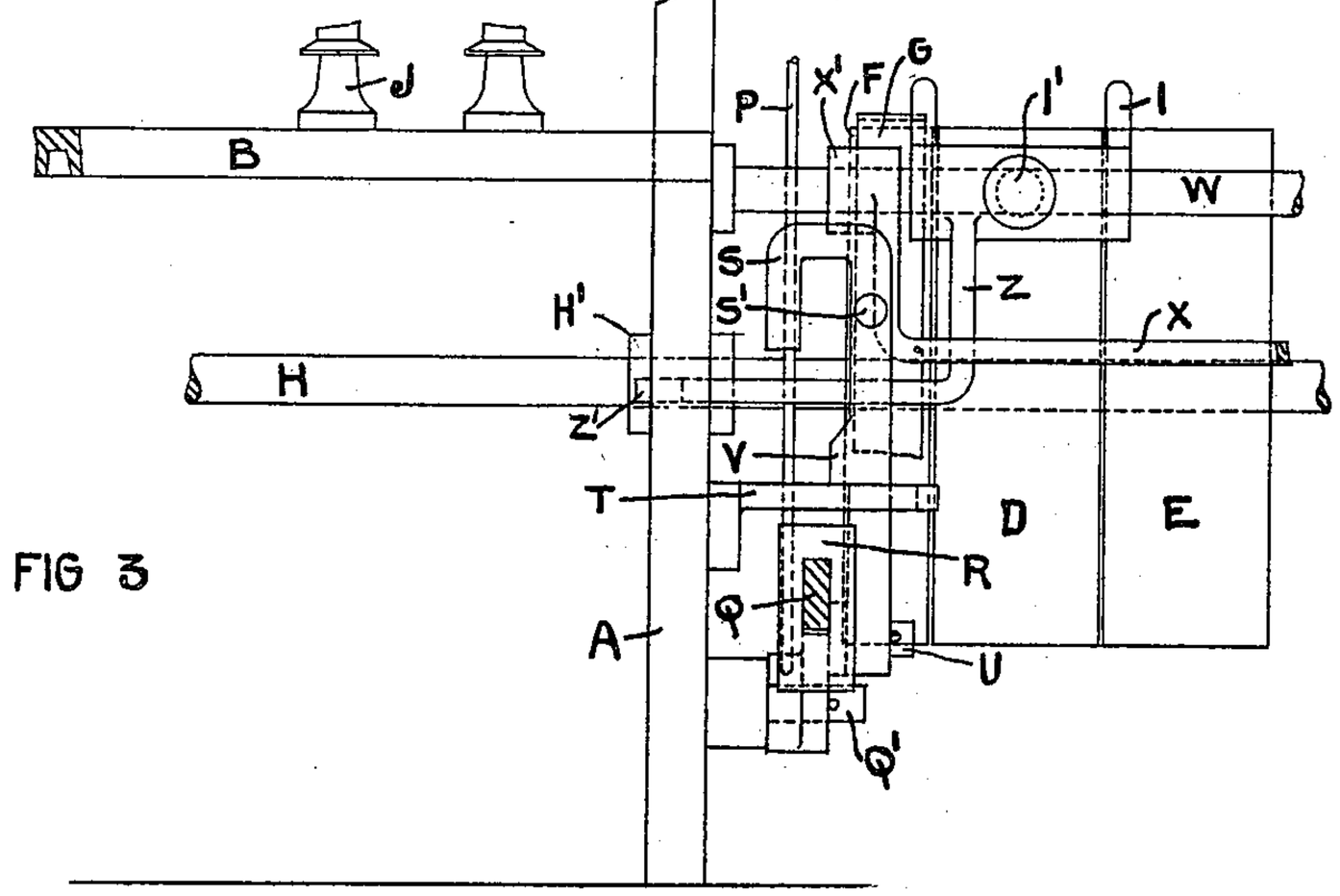

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FIG 4

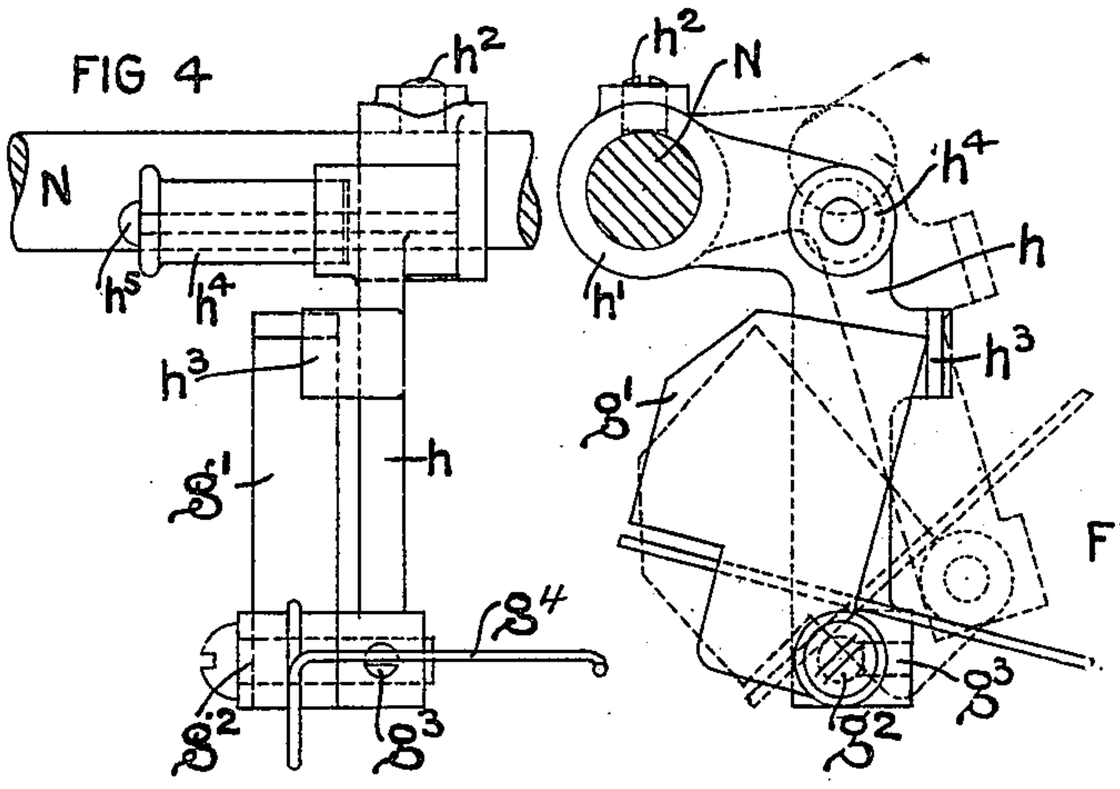


FIG 5

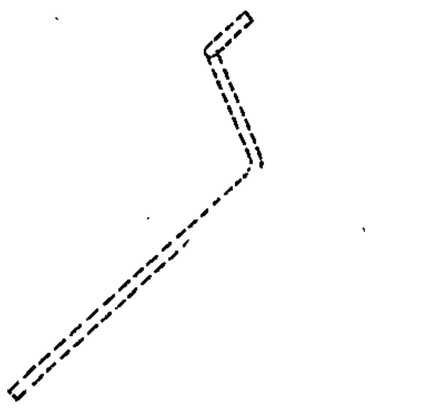


FIG 6

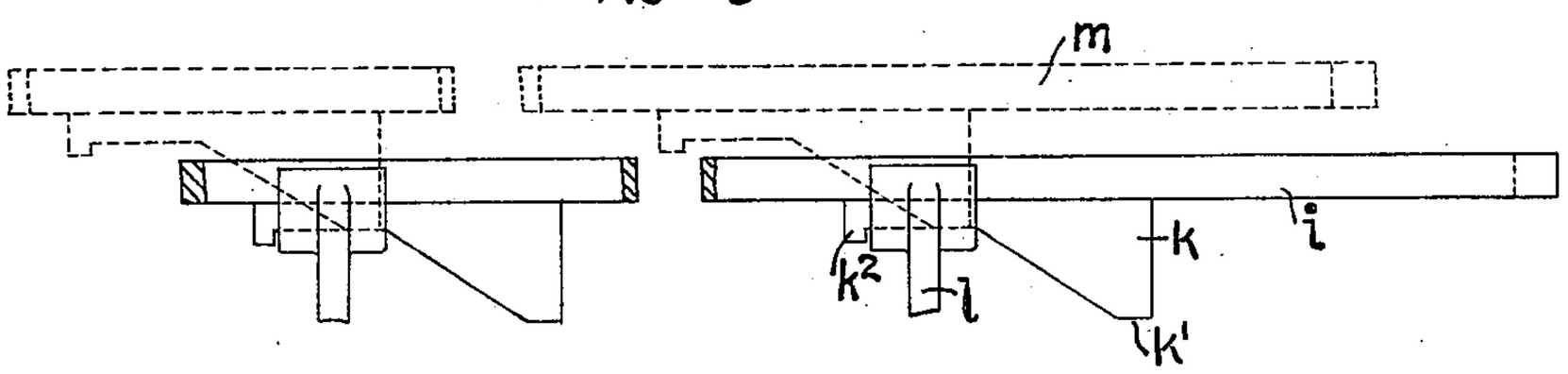
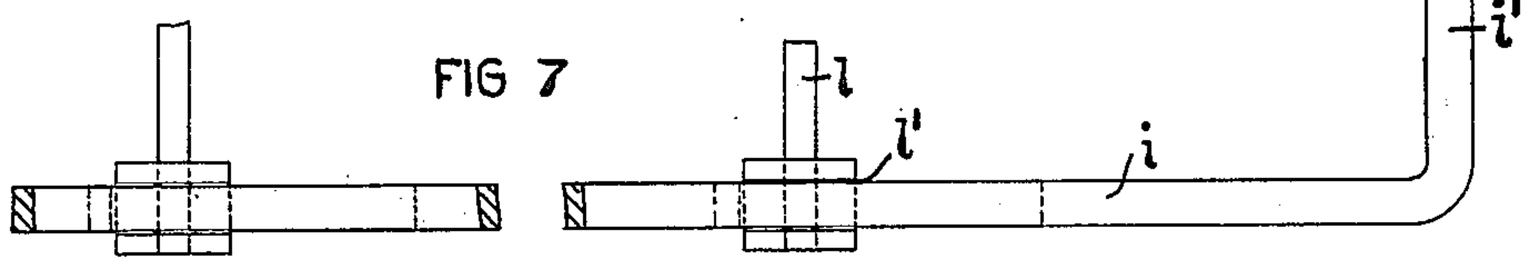


FIG 7



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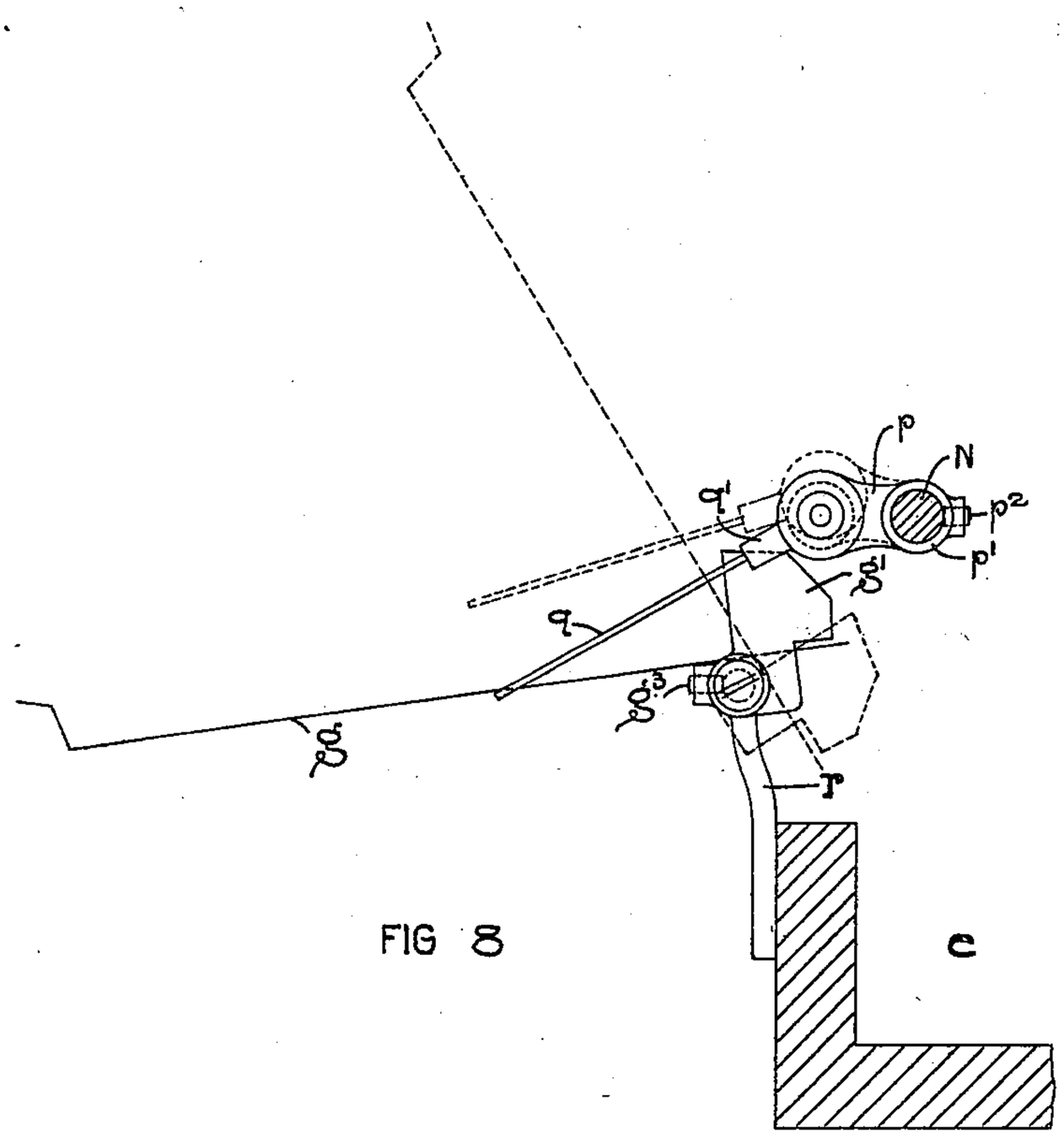

FIG 8

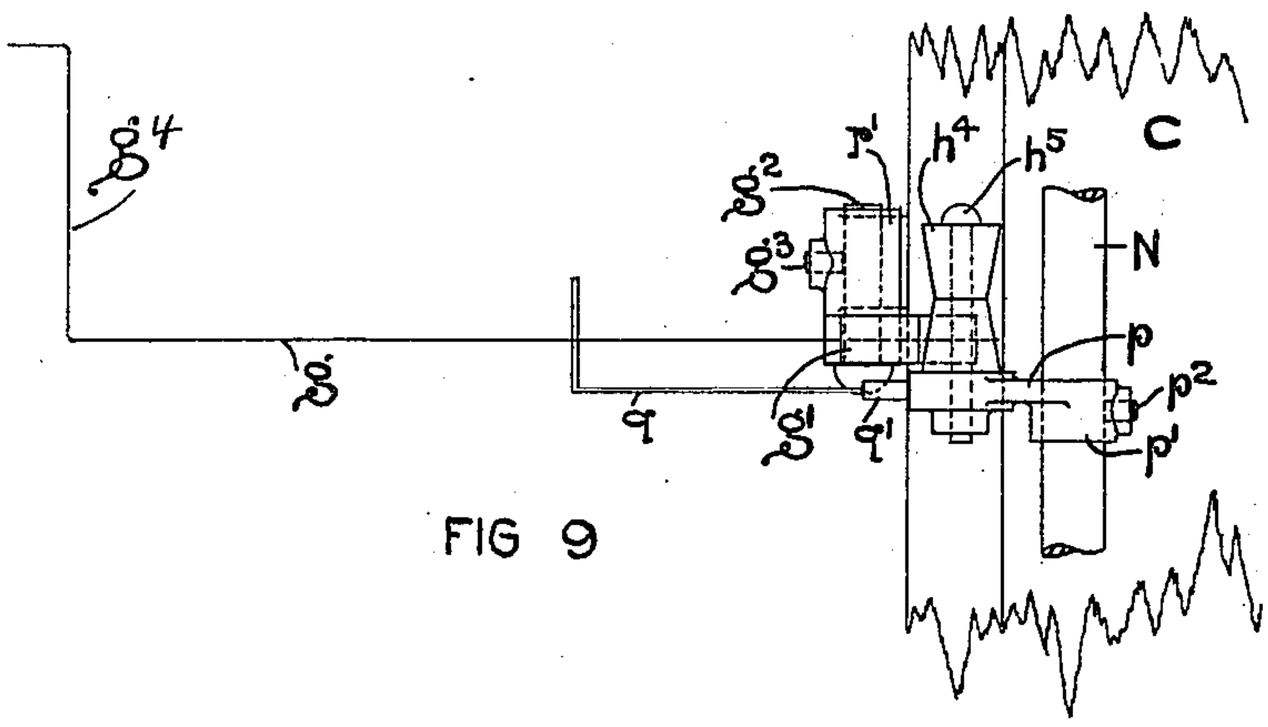

FIG 9

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UNITED STATES PATENT OFFICE.

JOSEPH E. TYNAN, OF PATERSON, NEW JERSEY.

TWISTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 667,811, dated February 12, 1901.

Application filed April 27, 1900. Serial No. 14,594. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH E. TYNAN, a citizen of the United States, residing at Paterson, in the county of Passaic and State of New Jersey, have invented a new and useful Improvement in Twisting-Machines, of which the following is a specification.

My invention relates to that class of machines in which threads are drawn from bobbins, doubled and twisted together, and laid upon other bobbins.

My improvements relate particularly to mechanism brought into action at the time of stopping a machine to keep the machine and the threads upon it in such a condition that kinks will not form in the threads and on the starting of the machine the twisting and feeding of the threads will be resumed at once.

In the drawings, Figure 1 is an end view of the machine with my several improvements mounted thereon. Fig. 2 is a plan view of one side of the machine, and Fig. 3 is a front elevation of the lower part of the machine. Fig. 4 is a front elevation, and Fig. 5 is an end view, of a device intended to take up the slackness of the threads at the time of stopping the machine. Fig. 6 is a front elevation, and Fig. 7 is a plan view, of a part of the machine, the purpose of which is to prevent the stop-motion mechanism relating to the individual groups of threads from acting at the time the machine is stopped. Figs. 8 and 9 are a variation of the device shown in Figs. 4 and 5.

Throughout the drawings similar letters indicate similar parts.

The frame of the machine is shown at A in Figs. 1, 2, and 3. B is a spindle-rail upon which the spindles J and K, having the bobbins J′ and K′, respectively, are mounted. C is a box secured to the top of the machine to hold bobbins. D is a fast pulley mounted on the shaft H, by which the machine is driven. E is a loose pulley mounted on the same shaft H, and F is a brake-pulley mounted upon and secured to said shaft H. The shaft H has bearings in the uprights of the machine, one of which is shown at H′. G is a brake-band, preferably made of leather covered with sheet metal. One of its ends is secured to a bracket G′, extending from the machine, while its other end is secured to the buckle G^2, which is pivoted on the pin G^3, secured in the weighted lever Q. This lever Q swings upon the pin Q′, projecting from the machine, and has at its outer end the weight R. V is a latch having at its upper end the hook S and also having the handle S′. This latch is inclosed within the slot T′ of the bracket T and when the machine is running is supported by the inner end of the bracket T. The weighted lever Q has a pin at U, which rests in an oval hole at the bottom of the latch V by means whereof the weighted lever is sustained by the latch and maintained, when the machine is running, in the position shown in full lines in Fig. 1. A belt-shipper I is provided with a handle I′ and is capable of being moved upon the stud W, which projects from the machine. X is a slotted bracket secured at X′ to the rod W. Z is the usual belt-shipper extension, extending through the slotted bracket X and capable of sliding in the slot in said bracket. The slot acts as a steadier to the belt-shipper. This belt-shipper extension is continued laterally after passing through the slotted bracket X and has upon its end the part Z′. The operation of this part of the mechanism is as follows: When the operator desires to stop the machine, he grasps the handle I′ of the belt-shipper I and, moving the belt-shipper, throws the belt from the fast pulley D to the loose pulley E. During this movement of the belt-shipper the belt-shipper extension Z slides in the slotted bracket X and the hook Z′ on the end of the belt-shipper extension is moved laterally until it strikes the latch V and thrusts it from the shoulder at the inner end of the bracket T. The weighted lever Q thereupon pulls the latch V downward until the hook S on the upper end of the latch V straddles the part Z′ at the end of the belt-shipper extension. When the weighted lever Q falls, it swings upon the pin Q′ and assumes the position shown in dotted lines at Y in Fig. 1. In falling it causes the brake-band G to tighten upon the brake-pulley F, and the friction of the brake-band upon the brake-pulley causes the driving-shaft H to cease to revolve. The fact that the hook S when the parts are thus stopped is straddled over and locked upon the part Z′ makes it

impossible for the operator to shift the driving-belt back to the fast pulley until by means of the handle S′ he has raised the latch V and the weighted lever Q, latched the latch again upon the inner end of the bracket T, and thereby slackened the brake-band upon the brake-pulley. This method of applying a brake to the machine is applicable either to a machine in which fast and loose pulleys are used, as in the present instance, or to a machine which is driven by a friction-clutch pulley. In the latter case the shipper employed to operate the friction-clutch would perform the same function of knocking off the latch V as is herein performed by the belt-shipper I.

The twisting and feeding mechanism for the threads upon the machine is the same as has been shown in former patents granted to me and does not form part of the present invention. The driving-roller is shown at *a*. It is mounted upon and revolves with the shaft *a′*, having bearings in the uprights of the machine, as at a^2. At B, Fig. 2, is shown the feed-roller frame, carrying the feed-rollers and having bearings at *b′* and b^2 in the stands *c*. Referring to Fig. 1, *e* is the faller-stand. *f* is one of the fallers. *d* is the stop-motion bracket. *d′* is a swing-yoke that swings therein, and d^2 is a rock-lever pivoted in the swing-yoke and having a tooth at its inner end to catch in mortises in the driving-roller when its rear end is raised and its front end lowered by having the faller *f* fall upon it at the breakage of a thread. The pivoted lever *g*, having the part g^4, and the weight *g′* form a kink-preventer, the operation of which on the breakage of a thread and at the time of doffing the full bobbin is shown in a former patent granted to me, dated February 21, 1899, and numbered 619,807. The course of the threads is from the bobbins J′, around the fallers *f*, around a guide hereinafter referred to and lettered h^4 in Figs. 4 and 9, around the feed-rollers, and down to the bobbin K′, on which the finished thread is laid by a ring and traveler device mounted on the ring-rail L.

As shown herein, the kink-preventer is adapted for operation when the entire machine is stopped, as well as when a thread breaks or the bobbins are being doffed, and operates at the stopping of the machine without the individual stop-motions coming into action, which was not so in the former patent granted to me, above referred to. I will now explain the operation of this kink-preventer, referring first to Fig. 1. M is a bracket secured to the bobbin-box C. N is a shaft running the length of the machine and free to be revolved in its bearings in the brackets M. Each side of the machine is provided with a series of the brackets M and one of the shafts N. On the driving end of the machine, secured to each shaft N, is a link O, and the two links meet in the center, and each has an oblong hole, which holes are opposite to each other, as at O′. Into these holes is hooked one end of the rod P. The other end of the rod P is secured at P′ to the weighted lever Q. When the weighted lever Q falls at the stopping of the machine, as heretofore explained, the rod P is pulled downward, the links O assume the position shown by dotted lines at O^2, and both the shafts N are partly revolved in their respective bearings in the brackets M. To show the object of partly revolving said shafts, I refer to Figs. 4 and 5, in which the construction of the kink-preventer is shown in detail. A bracket is shown at *h*, having a hub *h′* upon the shaft N, and secured to the shaft by the set-screw h^2. Secured to the bracket *h* is a guide for the thread h^4, mounted upon the pin h^5. The lever *g*, having the part g^4 to come in contact with and raise the threads, is secured to the hinged weight *g′*, which hinged weight swings upon the screw-bearing g^2, locked in the bracket *h* by the screw g^3. The bracket *h* has a stop-piece h^3, against which the hinged weight *g′* rests when the parts are in their running position, as shown in full lines in Fig. 5. When the entire machine is stopped and the weighted lever Q falls, as hereinbefore described, and the rod P is pulled downward and causes the links O partly to revolve the shaft N, the bracket *h* assumes the position shown in dotted lines in Fig. 5, and as the hinged weight *g′* is carried farther outward at g^2 than the stop-piece h^3 will allow it to go at its upper part said weight becomes overbalanced and falls to the position shown in dotted lines in Fig. 5. The lever *g* is thereby raised and raises the threads with it in the same manner and for the same purpose as set forth in my former patent, No. 619,809, above referred to. I am thus enabled to operate all the kink-preventers on the machine at once by the act of stopping the machine and without the operation of any of the individual stop-motions, as was required in my former patent. This is of particular advantage, for the reason that by means of the device shown in Figs. 6 and 7, which I will hereinafter explain, I absolutely prevent the stop-motions from coming into action at the time of stopping the machine.

While I provide, by means of the links O and the rod P, for operating the levers *g* on both sides of the machine at the same time, yet it is obvious that the device could be so arranged that all the levers *g* on one side of the machine could be thrown up at once by the operator independently of the levers *g* on the other side of the machine.

In Figs. 6 and 7, *l* is a bracket secured to the machine and having the slot *l′*. There are several of these brackets on each side of the machine. A rod *i* extends the length of each side of the machine and slides in the slots *l′*. This rod has a handle *i′*. Secured to the rod *i* at various points along its length and of a number sufficient to correspond with the brackets *l* are wedges *k*, which slide in the slots *l′* and have stop-pieces k^2 to limit their

movement in one direction. In Fig. 1 the rod i and the wedge k are shown in the position they assume when the machine is running. In Fig. 2 the rod is shown resting in the slots l' of the brackets l. The object of the device is to maintain the outer ends of the rock-levers d^2 in their running position at the time of stopping the machine and so prevent the stop-motions from acting. When the machine is stopping, the threads become slackened and the fallers f fall upon the outer ends of the rock-levers d^2 and incline to tip the levers, which tipping would cause the stop-motions to act if it were not for this device. In Fig. 6 the full lines show the position of the rod when the machine is being operated. Just before stopping the machine the operator pushes the handle i', the wedge k slides in the slots l' until the part k' of each wedge rests in the bottom of its respective slot, and the rod i assumes the position shown by dotted lines at m. This, as reference to Fig. 1 will show, will bring the rod i in contact with and cause it to act as a support for the outer ends of the rock-levers d^2 along the entire length of the machine. The entire process, therefore, of stopping a machine consists, first, in pushing in the wedge-rods i on each side of the machine, thereby preventing the stop-motion mechanism from coming into action, and, second, shipping the driving-belt from the fast pulley to the loose pulley, which throws off the latch V, releases the weighted lever Q, causes the brake-band G upon the brake-pulley F to bring the machine to a sudden stop, and, through the rod P and the links O, causes the shafts N to partly revolve and throw all the kink-preventers on both sides of the machine into action. The machine is then in a condition to be started up again, and all the threads are in good order and free from kinks. In starting the machine the operator cannot shift the belt until by means of the handle S' he has replaced the latch V, owing to the hook S locking on the part Z'. When the latch V is replaced and the brake-band thereby released from pressure on the brake-pulley, the rod P, rising with the weighted lever Q, pushes the links O back to their normal position. The belt then being shipped, the machine is put in motion and the twisting and feeding of all the threads begins at once. The operator then by means of the handle i' withdraws the wedge-rods i from contact with the rock-levers d^2, and said wedge-rods again assume the position shown in full lines in Fig. 6. The levers g are then, one by one, lowered to their running position by the operator.

Figs. 8 and 9 show a somewhat-different form of the kink-preventing device from that hereinabove described. In these views the lever g is secured in the weight g', which weight swings upon the screw or pin g^2, secured by the screw g^3 in the hub r' of the bracket r, which bracket r is secured to the box C. A bracket p has a hub p' upon the shaft N, to which it is secured by the screw p^2. The thread-guide h^4 is mounted, by means of the pin h^5, upon the bracket p, and an extension q of the bracket extends under the lever g, and when the shaft N is partly revolved, as hereinbefore described, the bracket p, rising, throws the lever g upward and overbalances the weight g', as shown in dotted lines in Fig. 8.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with the fallers f of the several stop-motions, and a series of guides h^4, of a series of stands, M, the shaft N, having bearings in the stands M, a series of pivoted levers, g, each lever having the part g^4, and said levers being arranged to be brought into action by a partial revolution of the shaft N, and means for partly revolving the shaft N, substantially as and for the purpose described.

2. Two series of stands, M, one series on each side of the machine, the shafts, N, one on each side of the machine, each of said shafts having bearings in its respective stands M, and a series of pivoted levers, g, on each side of the machine, each of said levers having the part g^4, and said levers being arranged to be brought into action by a partial revolution of the shafts N, in combination with the links O, the rod P, and means for actuating the rod P at the time of stopping the machine, substantially as and for the purpose described.

3. The fallers f of the several stop-motions, a series of guides h^4, a series of stands M, the shaft N, having bearings in the stands M, a series of pivoted levers g, each lever having the part g^4, said levers being arranged to be brought into action by a partial revolution of the shaft N, and means for partly revolving the shaft N, in combination with the rock-levers d^2 of the several stop-motions, and means for sustaining the outer ends of said rock-levers at the time of stopping the machine, substantially as and for the purpose described.

4. Two series of stands, M, one series on each side of the machine, the shafts, N, one on each side of the machine, each of said shafts having bearings in its respective stands M, and a series of pivoted levers, g, on each side of the machine, each of said levers having the part g^4, and said levers being arranged to be brought into action by a partial revolution of the shafts N, in combination with the links O, the rod P, the weighted lever Q and its pivot, the latch V and its support, and means to thrust the latch V from its support at the time of stopping the machine, substantially as and for the purpose described.

5. Two series of stands, M, one series on each side of the machine, the shafts, N, one on each side of the machine, each of said shafts having bearings in its respective stands M, and a series of pivoted levers, g, on each side of the machine, each of said levers hav-

ing the part g^4, and said levers being arranged to be brought into action by a partial revolution of the shafts N, in combination with the links O, the rod P, the weighted lever Q and its pivot, the latch V and its support, the brake-pulley F, the brake-band G, and means to thrust the latch V from its support at the time of stopping the machine, substantially as and for the purpose described.

JOSEPH E. TYNAN.

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