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D. STOCKWELL.
AUTOMATIC SAFETY STOP MOTION FOR GILL BOXES.

APPLICATION FILED APR. 30, 1902.

NO MODEL.

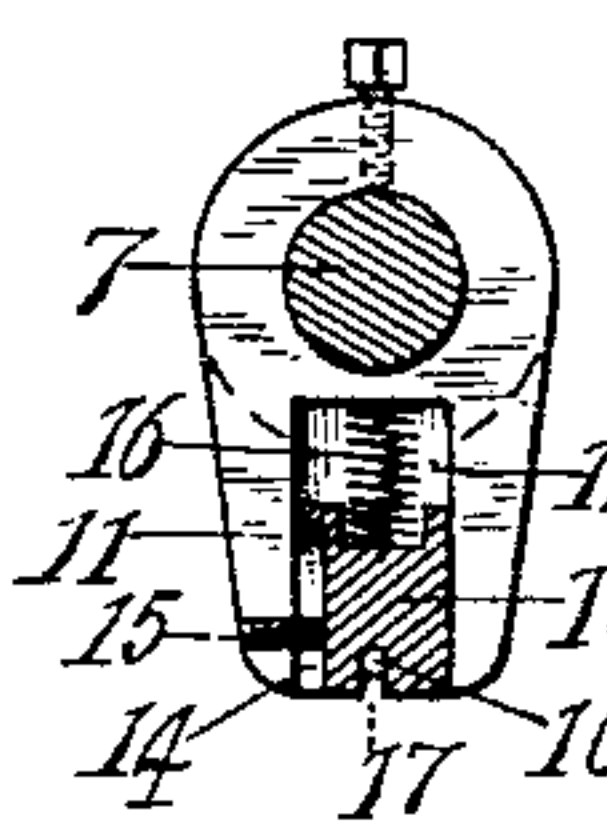
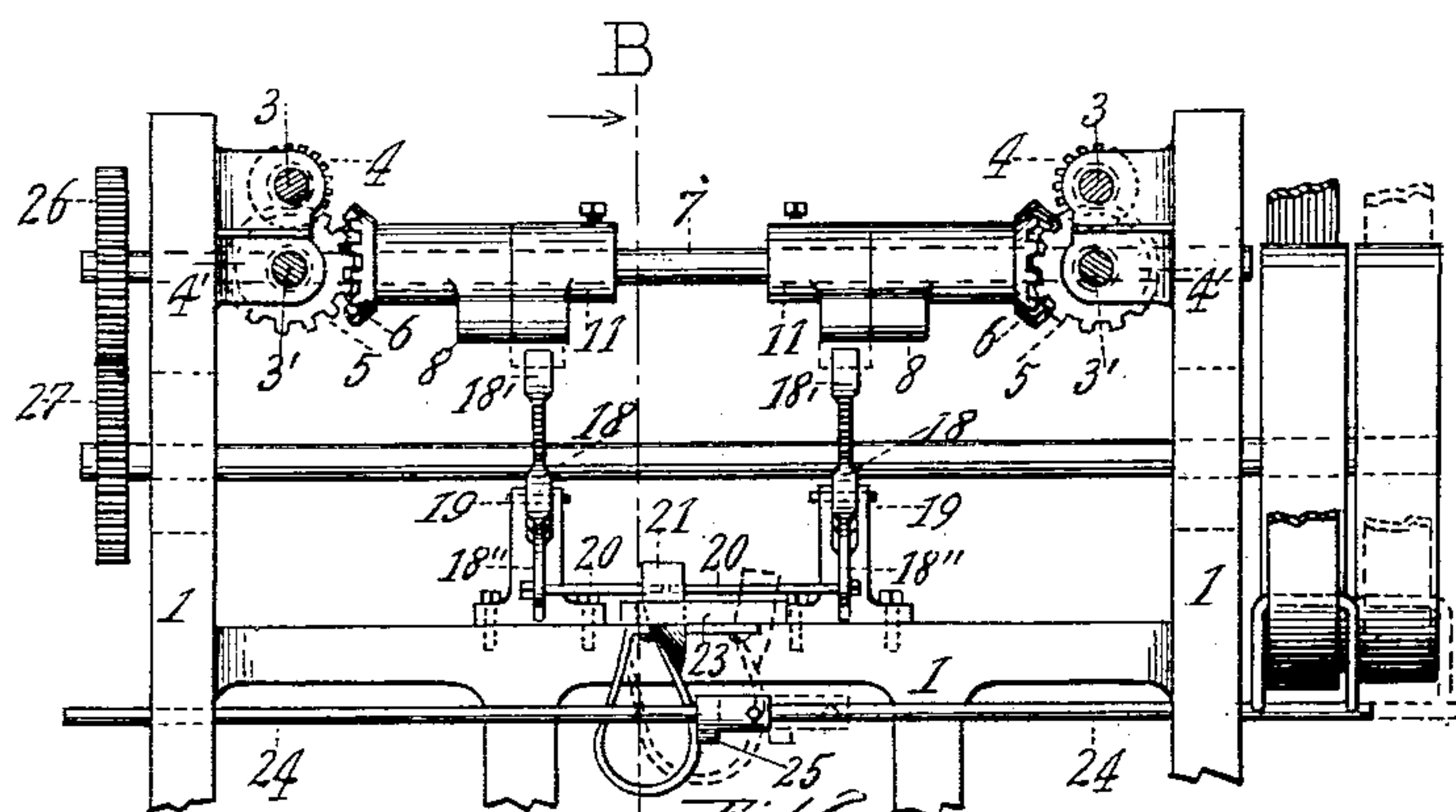
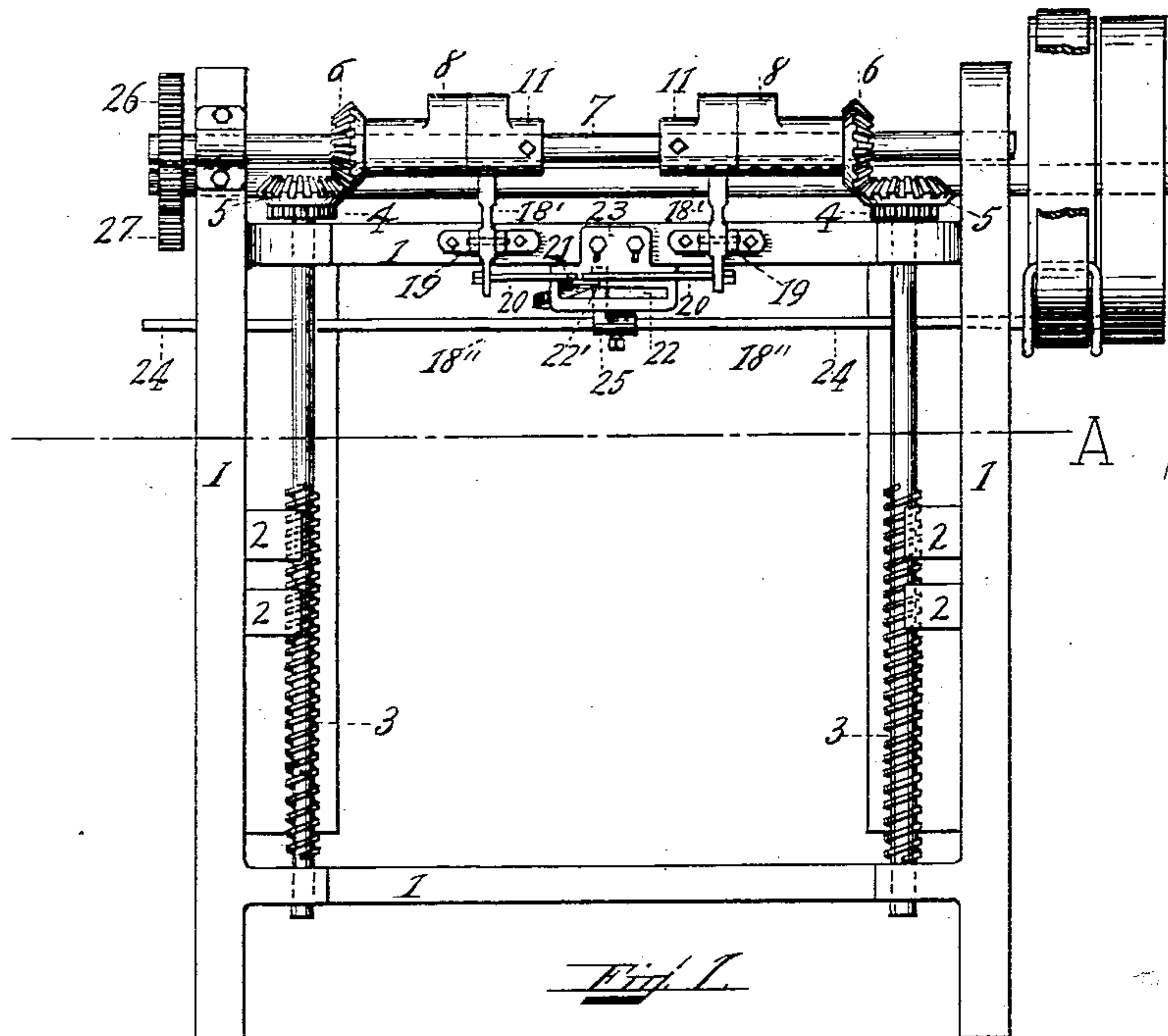


Fig. 3.

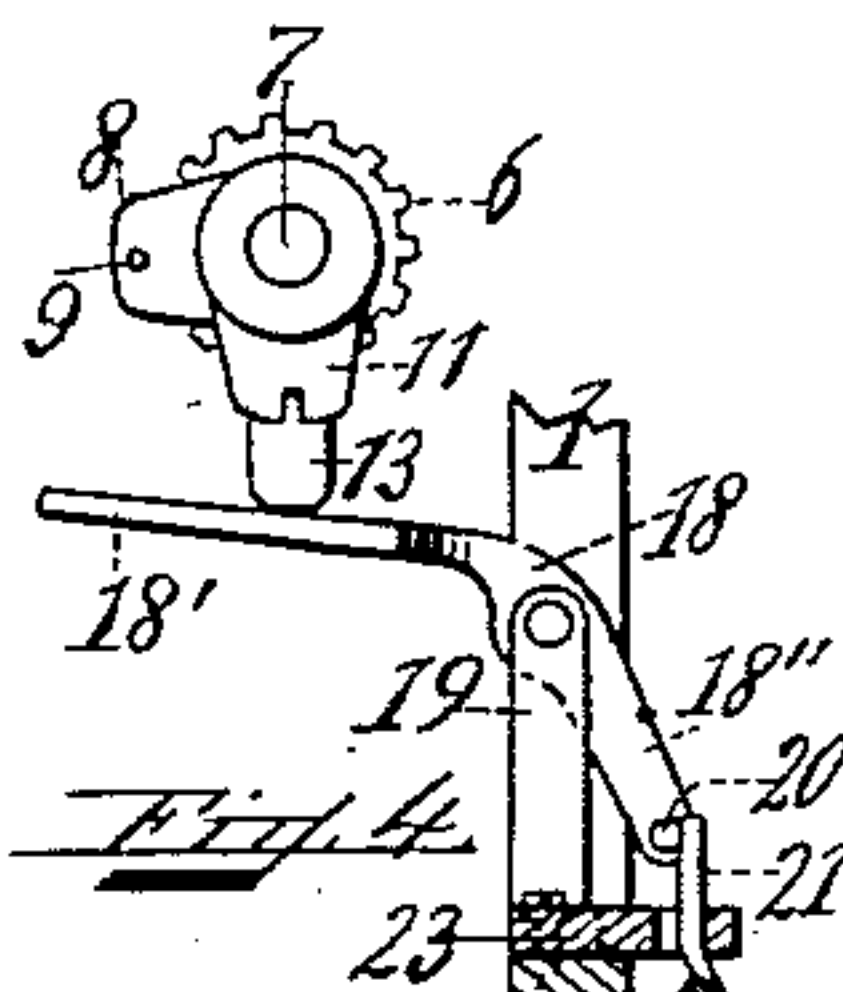


Fig. 4.

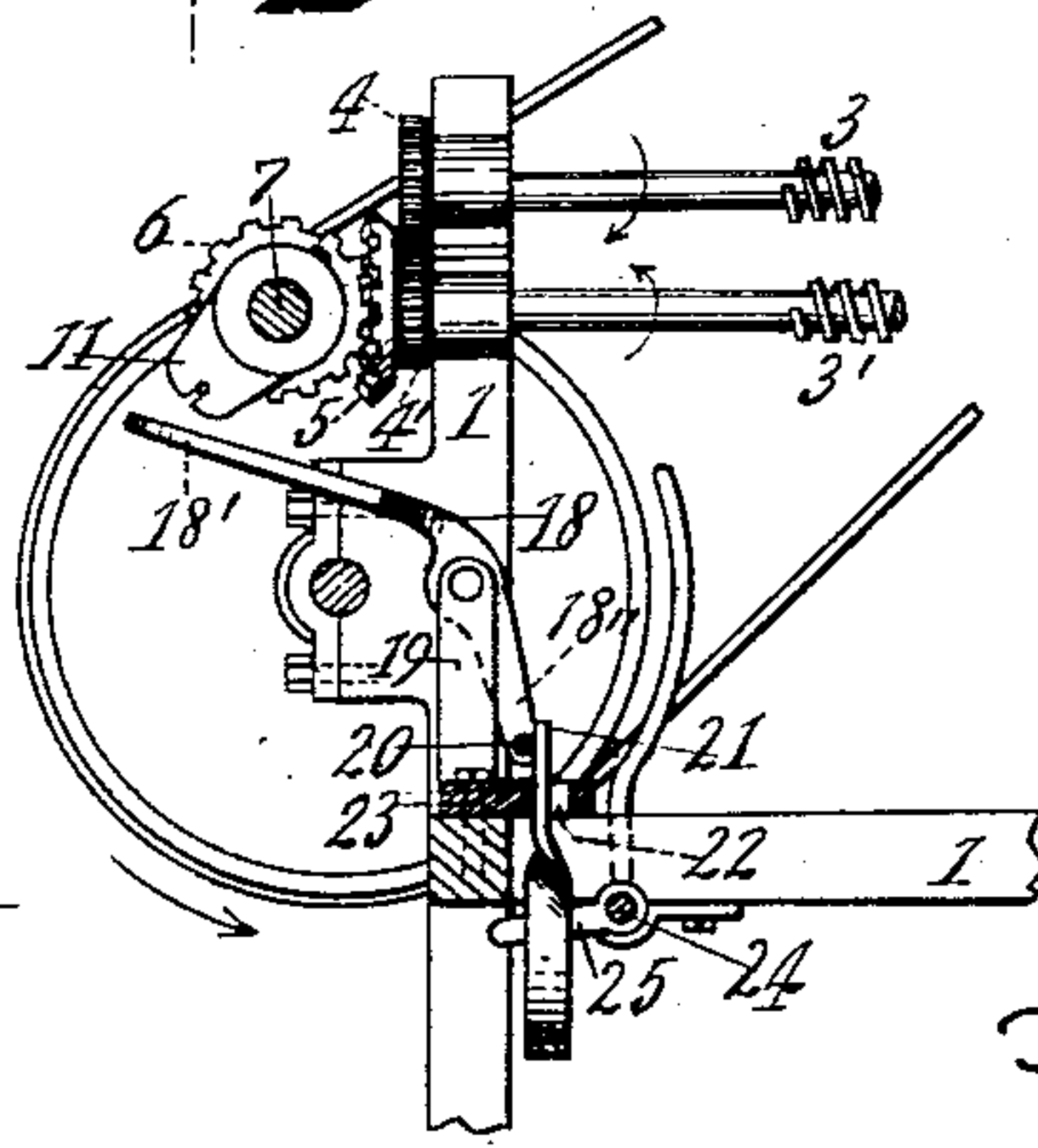


Fig. 5.

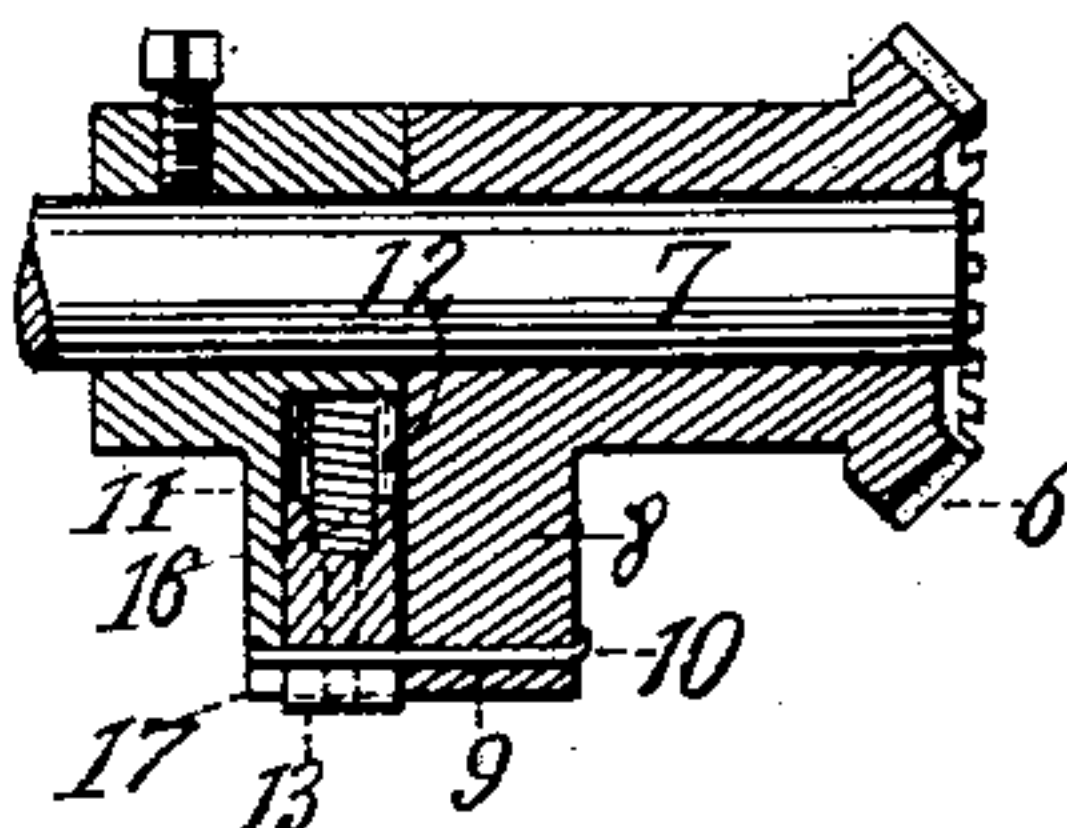


Fig. 6.

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UNITED STATES PATENT OFFICE.

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AUTOMATIC SAFETY STOP-MOTION FOR GILL-BOXES.

SPECIFICATION forming part of Letters Patent No. 751,570, dated February 9, 1904.

Application filed April 30, 1902. Serial No. 105,275. (No model.)

To all whom it may concern:

Be it known that I, DALTON STOCKWELL, a subject of King Edward VII, and a resident of South Lawrence, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Automatic Safety Stop-Motions for Gill-Boxes, of which the following is a specification.

My invention relates to improvements in gill-boxes for preparing and combing wool; and it comprises an automatic safety stop-motion adapted to all forms of screw-gill machinery.

The object of my improvement is to avoid the breakage of certain parts of any gill-box mechanism occasioned by the locking of the fallers or gears, so as to prevent the stripping of the threads off the screws, injury to saddle or saddle-boxes, or breakage of the cams, and aside from the injury wrought necessitating delay and the loss of valuable time to the operatives and expense in repairs to machines.

To obviate the above difficulties is the purpose of my improved invention through the applied mechanical devices illustrated in the annexed drawings, forming a part of this specification, wherein—

Figure 1 comprises a plan of a gill-box having two sets of screws and two sets of fallers with my automatic safety stop-motion applied thereto and normally inoperative while the machine is running smoothly. Fig. 2 is a rear elevation of the upper portion of the same viewed from the dotted line A of Fig. 1 with the stop-motion mechanism normally fixed and also operative, as indicated in the dotted situation, which latter position stops the machine. Fig. 3 denotes a vertical section on line B of Fig. 2 with the gill-box smoothly running and the stop-motion in normal position. Fig. 4 is a fragmentary side elevation exhibiting said stop-motion releasing the ship-rod to change the belt from fast to loose pulley, as indicated by dotted lines, Fig. 2. Fig. 5 is an enlarged view of one of the rotative levers inclosing the spring-actuated plunger; and Fig. 6, a longitudinal section of said rotatory piece, together with its coacting extension forming a part of the hub of the bevel-gear.

Corresponding numerals designate similar

features throughout the several views, referring to which—

1 indicates the frame of the gill-box, and 2 2 the fallers, actuated by the screws 3 3, rotated by their attached pinions 4 4. The lower set of screws 3' 3' also carry the pinions 4' 4' and with them the bevel-gears 5 5, which mesh with like gears 6 6, mounted upon the revoluble shaft 7. These bevel-gears 6 6 are each provided with extensions 8 8, forming an integral part of their hubs, and are not keyed to the shaft 7. Said extensions are pierced transversely with a small hole, as at 9, Fig. 6, the purpose of which will be presently described. In juxtaposition to said extensions 8 8 are the rotative levers 11 11, which are fast on the shaft 7, as indicated. The extended arms thereof, corresponding to the extensions 8 8, (and in alinement with them when the machine is running properly,) have recesses 12 12, Fig. 5, longitudinally and open to the adjacent faces of said extensions. Plungers 13 13 slide in said recesses and are provided with lengthwise slots 14 14, into which rest the retaining dowels or screws 15 15, set into and near the ends of the arms of the levers 11 11. Said plungers are impelled by the helical springs 16 16, also within the recesses 12 12, and abut against the inner ends of the plungers, as shown in Fig. 5. The outer ends of said plungers have small slots 17 17 transversely, which coincide with the small holes 9 9 when the relative parts are alined and which receive each a slender wire or rod 10, Fig. 6, which restrains the action of the spring-impelled plungers 13 13 and also holds the extensions 8 8 and the levers 11 11 in the same revoluble plane during the correct running of the machine, as indicated in Fig. 3.

18 18 designate the rock-levers pivotally supported in the bearings 19 19, secured to the frame 1. The outward ends of said levers 18' 18' lie below and in the path of the rotative levers 11, while the inward lower ends 18'' 18'' are provided with rods 20 20, projecting horizontally from their adjacent sides, the ends of said rods lying against the free end of the curved ribbon-spring 21, movably confined within the slot 22 lengthwise the adjustable plate 23, the other end of the spring being an-

chored to the said plate, which is also secured to the frame 1. One end of said slot 22 is sufficiently widened, as at 22', to receive and hold the end of the spring 21 when it is retracted and in the position shown in Figs. 2 and 3 with the machine operating smoothly. The belt-shifting rod 24, slidingly supported on the frame 1, is provided with a projecting lug 25, adjustably attached to said shifting-rod, and rests normally against the spring 21, as shown in Fig. 2.

The mechanical devices above defined constitute my automatic safety stop-motion, the practical operation of which I will now describe.

Assuming a rotary motion imparted to shaft 7 through the medium of the spur-gears 26 27, both sets of the coacting members 8 11 revolve together through their connection by the pins 10 10 so long as the machine works efficiently. Should any breakage of parts (as previously noted) occur, the interrupted rotation of one or the other of the fixed bevel-gears 5 5 necessarily arrests the motion of its coöperative gear 6. The continued rotation of the (fixed) lever 11 instantly severs the pins 10, the severed portion dropping away, which releases the plungers 13, the action of the springs 16 forcing said plunger outwardly, thus depressing the rock-lever arm 18' to the position shown in Fig. 4. The contiguous rod 20 is now pressed laterally against the locked end 21 of the spring, releasing it from the recess 22'. The lug 25, receiving the impetus of said expanding spring, throws the shipping-rod 24, and through it the belt, from the fast to the loose pulley, thus stopping the machine.

Having described the preferred construction and operation of my improved automatic safety stop-motion, I desire not to be held to the strict interpretation of the details herein illustrated, but may adapt such fair equivalents therefor as would come within the scope and spirit of my invention.

I claim—

1. In a safety stop-motion for gill-boxes, a pair of loose gears provided with extensions forming an integral part of their hubs and having each a hole transversely through the ends, a set of rotative levers having arms slotted at their ends and corresponding in their length to said extensions and operatively alined with them, a brace of severable pins filling said holes and slots and uniting said extensions and levers during normal operation of the machine, there being recesses in said levers opening outwardly, a pair of plungers arranged to slide therein and provided with lengthwise slots, means entering said slots to limit the outward movement of said plungers from their respective recesses and means to eject them, a brace of rock-levers operated by said plungers when one or both of the pins are severed, and having horizontal rods adjacently projecting from their lower ends arranged and adapted

to contact with and release the spring 21 to throw the ship-rod and carry the belt to the loose pulley, thus automatically stopping the machine.

2. In an automatic safety stop-motion, a pair of extensions pierced transversely at their ends for the reception of pins and forming integrally a part of the gear-hubs 6 6, a pair of coacting recessed rotative levers secured to the shaft, a set of pins temporarily uniting said hubs and levers during the normal operation of the gill-box, and a pair of spring-impelled plungers having transverse slots receiving said pins in a manner to temporarily retain them in the ends of the plungers, and additionally provided with lengthwise slots to receive the retaining-dowels securing the plungers movably within the rotative levers, in combination with a pair of rock-levers having arms 18' 18' arranged to lie in the rotating path of the plungers and to receive the impact of said plungers when released by the severance of the pin or pins, and a set of horizontal rods 20 20 forming a part of said rock-levers, adapted when said arms are depressed by the plungers to release the spring 21 so as to actuate the ship-rod and transfer the belt from the fast to the loose pulley substantially as specified.

3. In a gill-box, the combination with a shaft 7 and means for its rotation, a hub loosely mounted on said shaft provided with a gear and having a pierced extension, a rotating lever fast to the shaft having an arm normally alined and coacting with said extension and having a recess radially, a plunger seated in said recess and restrained therein only during the proper running of the mechanism, and means to temporarily connect the hub and lever and to retain the plunger within the recess; of a rock-lever provided with an upper arm lying in the path of the projected plunger when released and a lower arm bearing a horizontal rod, a spring contacting with said rod when in a retracted and a locked position, a plate provided with a slot to receive, and a recess in said slot to confine the retracted spring, and a ship-rod having a lug adjusted thereon to receive the impetus of the spring upon its expansion in a manner to throw the ship-rod and transfer the belt from the fast to the loose pulley to instantly arrest the motion of the gill-box.

4. In a gill-box safety stop-motion, a pair of gears 5, 5, adapted in the unimpeded motion of the machine to be rotated by the gears 6, 6, and having extensions, a pair of rotating levers keyed to the shaft 7, and means for the temporary and separable union of said extensions and levers, a pair of plungers operative within recesses in said levers and provided each with a transverse slot on the outer end, and a lengthwise slot in one side thereof, means coacting with the latter slot to limit the outward throw of said plungers, the means

hereinbefore described to actuate the plungers when released from their normal positions, arms 18' 18' depressed by the release of said plungers, a pair of rods 20 20 each forming a
 5 part of the rock-levers, a spring 21 arranged to be in continuous contact with said rods so long as the machine is properly working and adapted to be released by said rods when the functions of the machine are disturbed by
 10 breakage, and the ship-rod actuated by the springs to throw the belt onto the loose pulley and to arrest the machine.

5. In a stop-motion, a set of spring-impelled plungers provided with longitudinal and trans-
 15 verse slots, the former adapted to receive a dowel arranged to prescribe the radial throw of said plungers, and the latter to embrace pins to support the plungers against the springs, a pair of springs, there being a set of recesses
 20 in the rotative levers adapted to receive said plungers and to retain them from total ejection after said pins are severed, a brace of rock-levers having arms arranged to coact with the plungers when the latter are partially
 25 projected, a plate having a slot, having a recess therein, and a spring retractile in said slot and held in said recess when retracted, in combination therewith a ship-rod, and a lug
 30 adjustably confined thereon in a manner to receive the impact of the spring after its release from the recess 22' to actuate the ship-rod to shift the driving-belt over the loose pulley.

6. In combination with gill-box machines
 35 the following instrumentalities comprising a safety stop-motion automatically operated, a ship-rod having an adjustable lug, and establishing connections with the driving-belt, a spring adapted in its expanded form to actu-
 40 ate said rod, a plate supporting said spring and provided with a lengthwise slot having a recess therein to receive and temporarily secure the free end of the spring when retracted, horizontal rods operative to release said
 45 spring, and rock-levers carrying said rods, in combination therewith a pair of spring-actuated plungers, means to actuate and to limit their movement, a set of rotating levers provided with recesses receiving said plungers,
 50 the extensions having holes transversely in their ends forming an integral part of the bevel-gears 6 6', a shaft upholding without rotating said gears, and means to temporarily connect said levers and gears to cause them
 55 to revolve in unison while the functions of the operating gill-box are uninterrupted, and

to disconnect said members when said operation is interrupted and thus bring the machine to rest.

7. In a stop-motion, a set of spring-impelled
 60 plungers provided with longitudinal and transverse slots, the former adapted to receive a dowel arranged to prescribe the radial throw of said plungers, and the latter to embrace pins to support the plungers against the impelling
 65 force of the springs, there being a set of recesses in the rotative levers adapted to receive said plungers and to retain them from total ejection after said pins are severed, a pair of springs radially actuating the said plungers, a
 70 brace of rock-levers having arms arranged to coact with the plungers when the latter are partially projected, a plate having a slot and a recess therein, and a spring retractile in said slot and held in said recess when retracted, in
 75 combination therewith a ship-rod, and a lug adjustably confined thereon in a manner to receive the impact of the spring after its release from the recesses 22' to actuate the ship-rod to shift the driving-belt over the loose pulley. 80

8. In combination with gill-box machines the following instrumentalities comprising a safety stop-motion automatically operated, a ship-rod having an adjustable lug, and establishing connection with the driving-belt, a
 85 spring adapted in its expanded form to actuate said rod, a plate supporting said spring and provided with a lengthwise slot having a recess therein to receive and temporarily secure the free end of the spring when retracted,
 90 a horizontal rod operative to release said spring, and rock-levers carrying said rods, in combination therewith spring-actuated plungers, means to actuate and to limit their movement, rotating levers provided with recesses
 95 receiving said plungers, extensions having holes transversely in their ends and forming an integral part of the bevel-gears 6 6, a shaft upholding without rotating said gears, and means to temporarily connect said levers and
 100 gears to cause them to revolve in unison while the functions of the operating gill-box are uninterrupted, and to disconnect said members when said operation is interrupted and thus bring the machine to rest. 105

Signed by me at Lawrence, in the county of Essex aforesaid, this 22d day of April, A. D. 1902.

DALTON STOCKWELL.

Witnesses:

DAVID PARKER,
 FRED JACKSON.