

(No Model.)

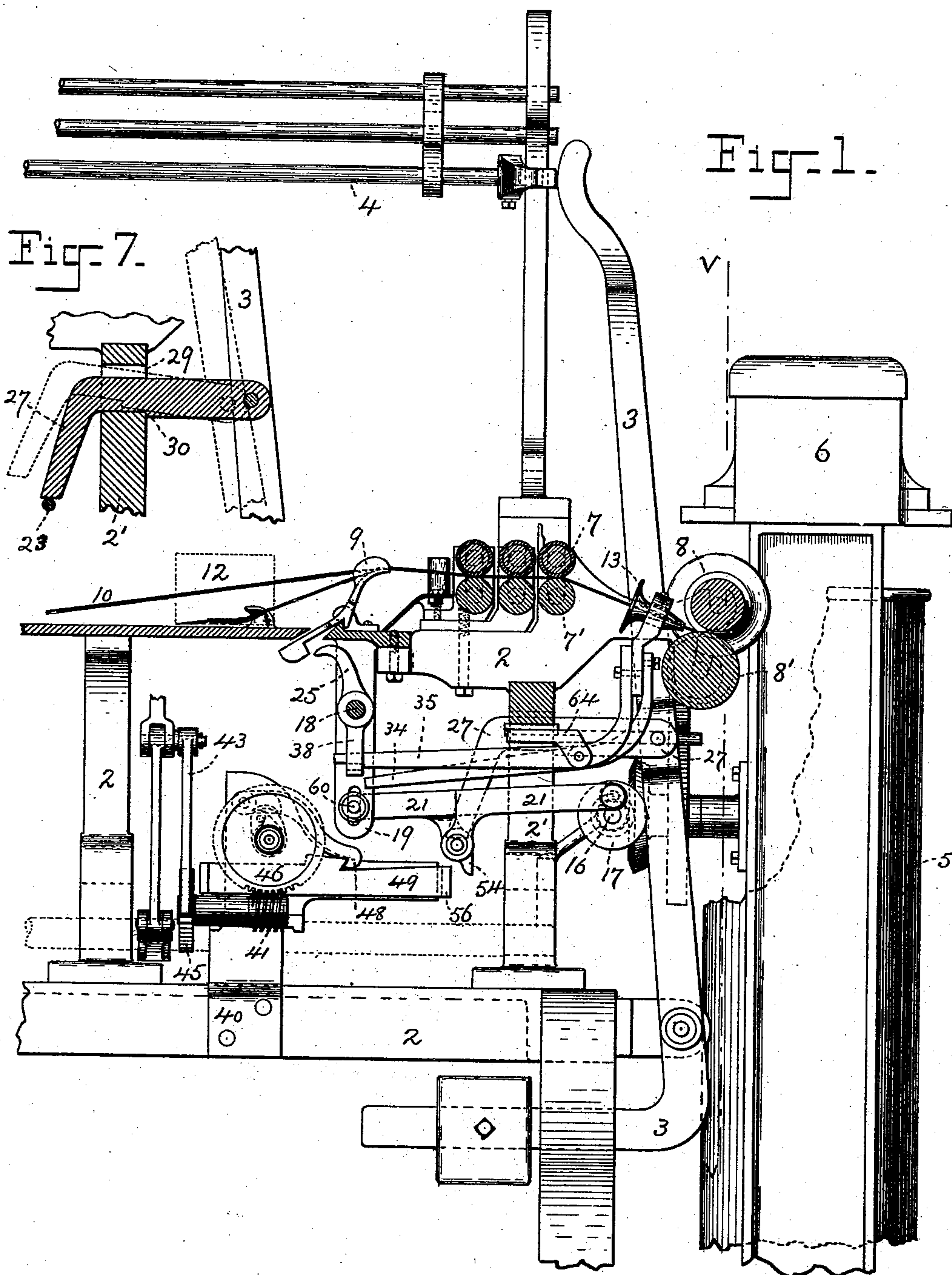
4 Sheets—Sheet 1.

J. THORP.

STOP MOTION FOR COMBING MACHINES.

No. 506,803.

Patented Oct. 17, 1893.



Witnesses.

John F. Nelson.

Francis C. Stanwood

Inventor.

James Thorp.
by H. E. Long Atty.

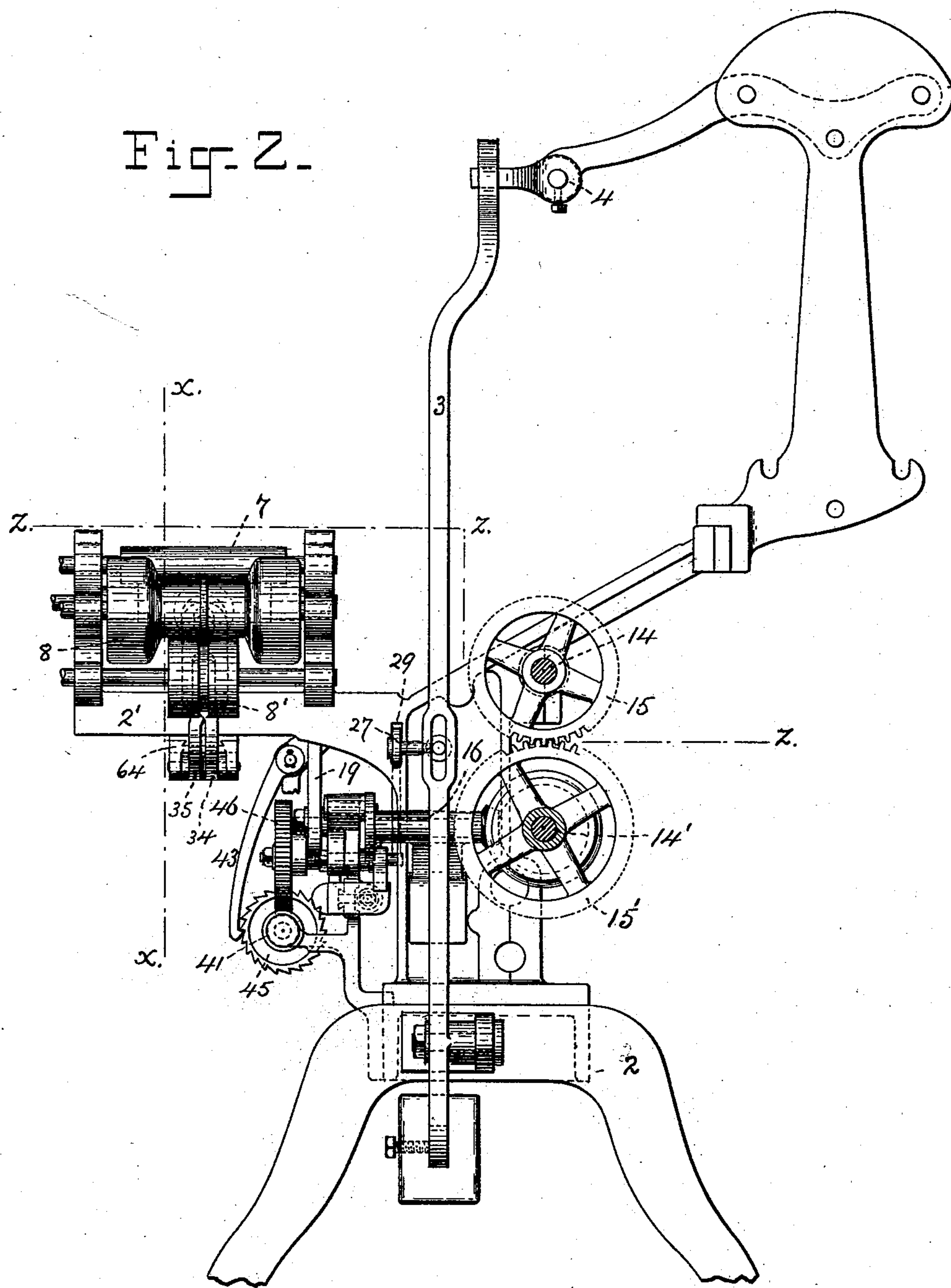
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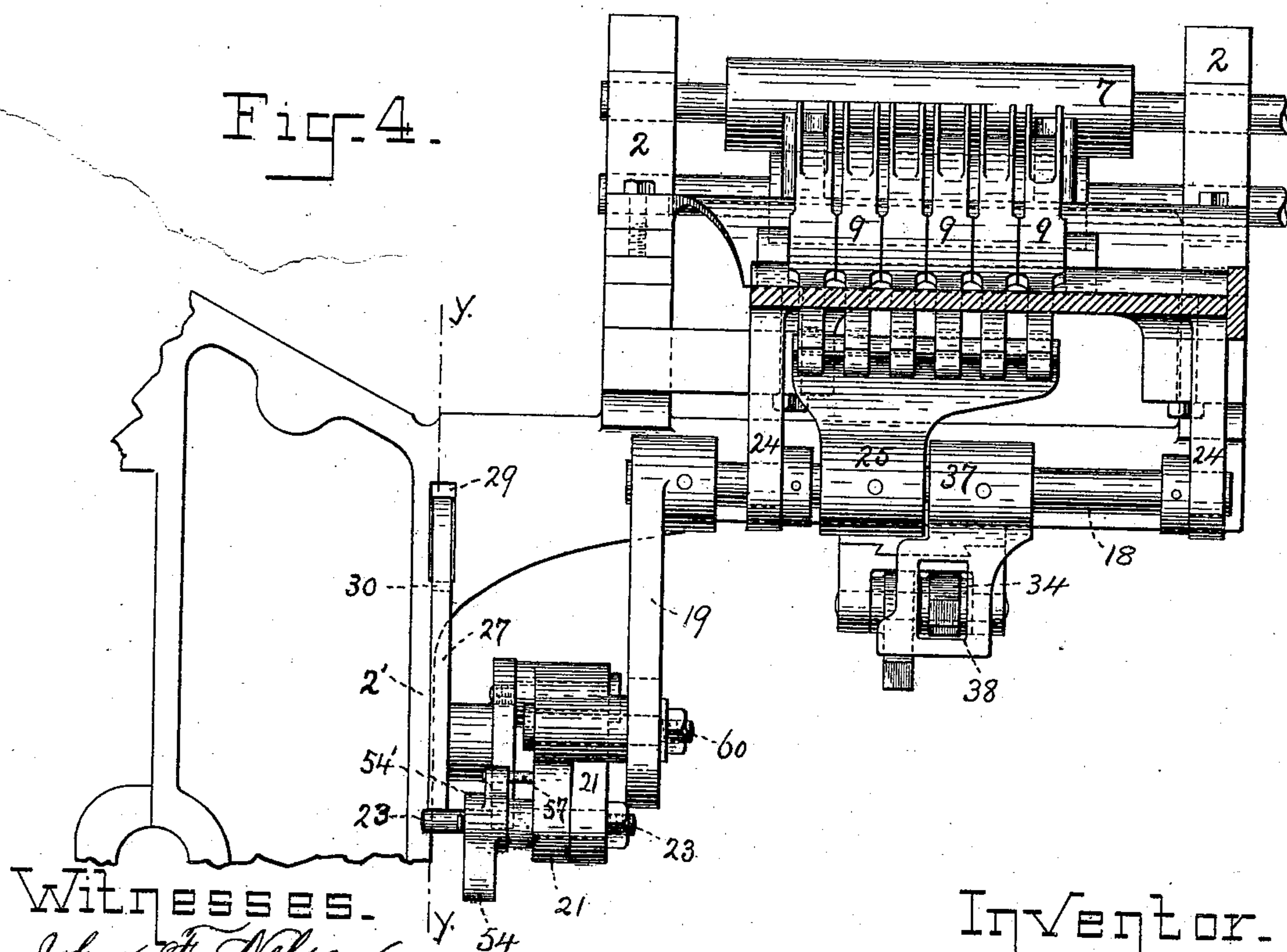
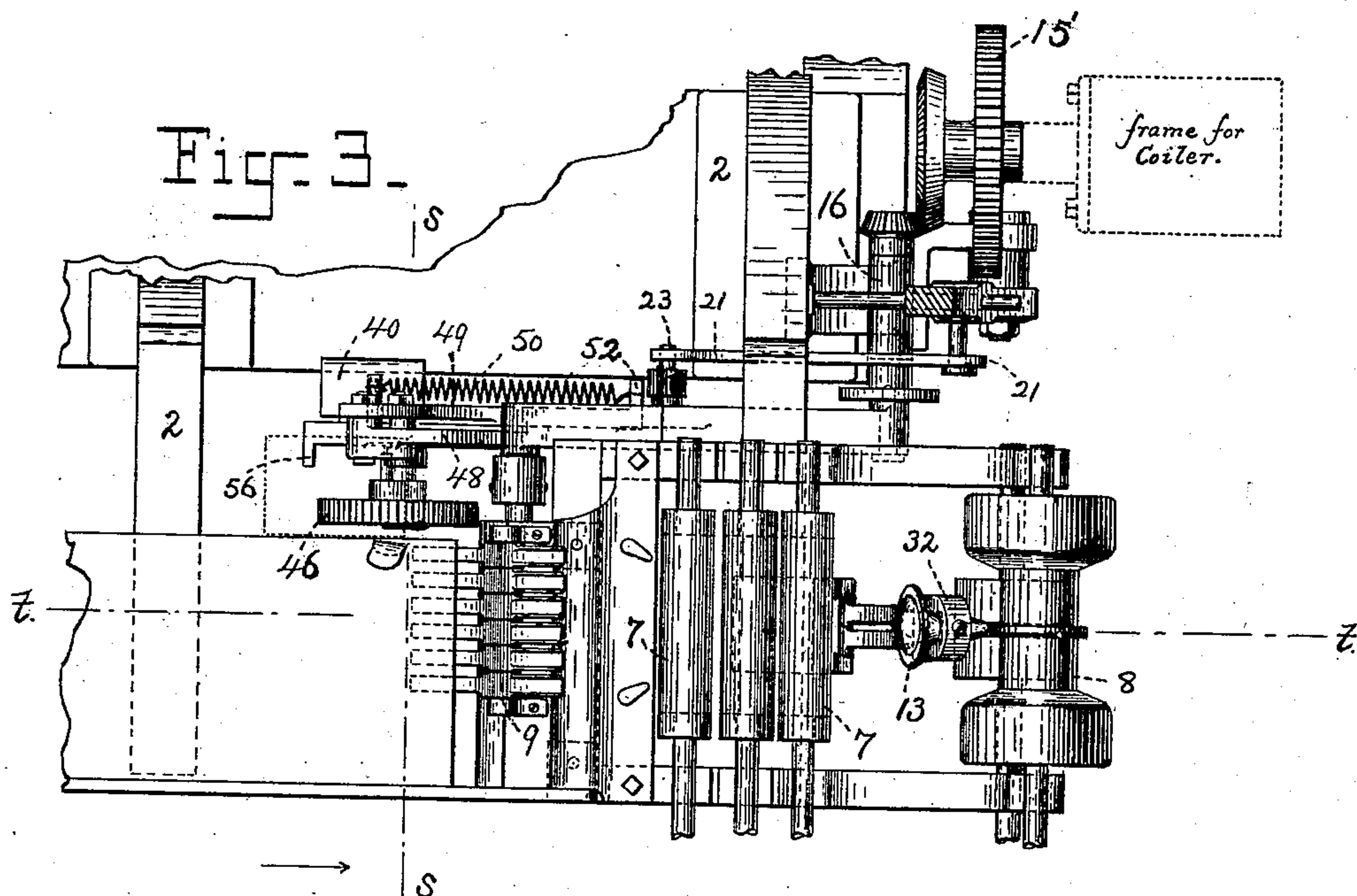
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J. THORP.

STOP MOTION FOR COMBING MACHINES.

No. 506,803.

Patented Oct. 17, 1893.



Witnesses.

John F. Nelson

Francis C. Hammond

Inventor.

James Thorp.

by H. L. Lodge Atty.

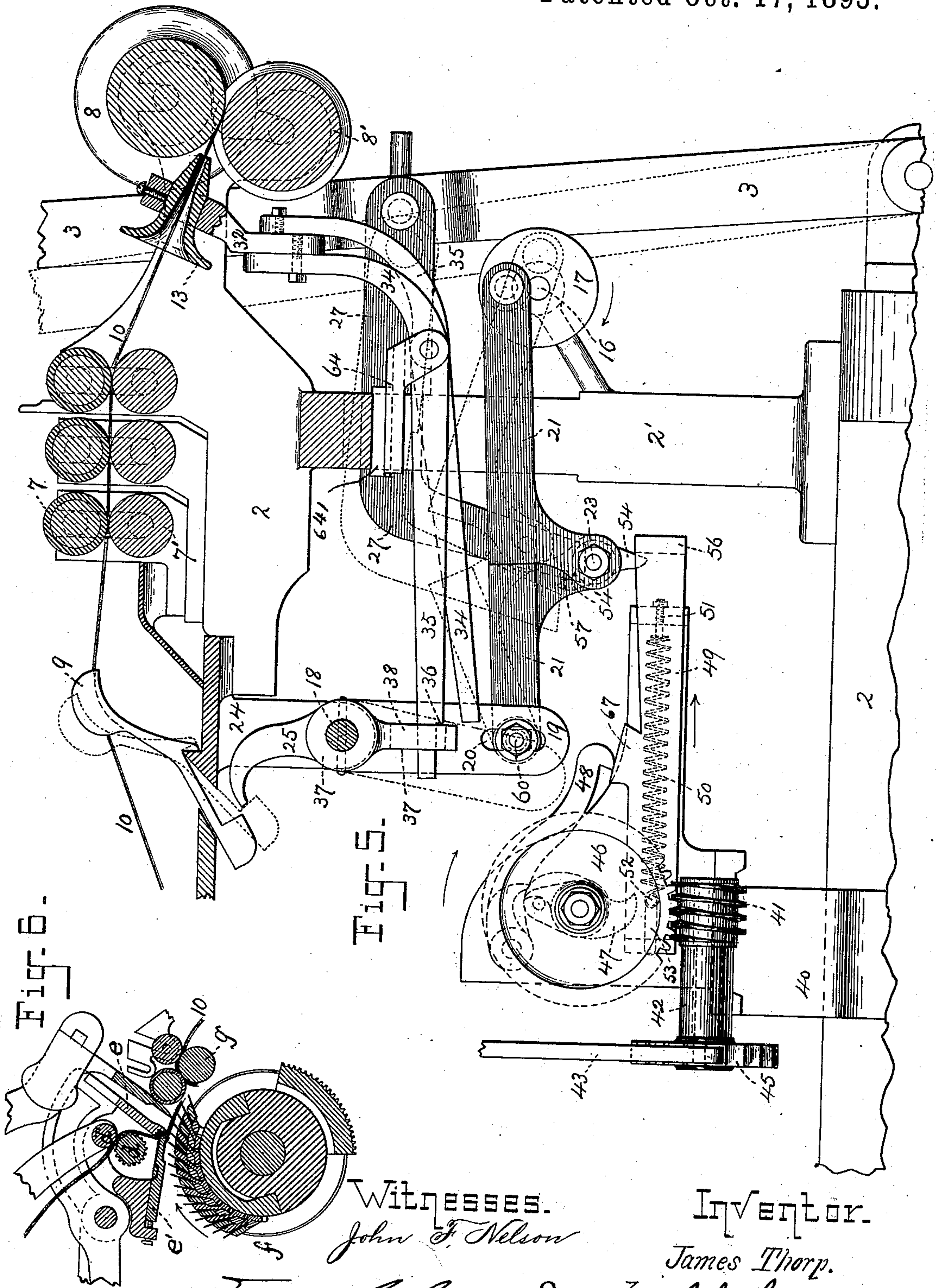
(No Model.)

4 Sheets—Sheet 4.

J. THORP.
STOP MOTION FOR COMBING MACHINES.

No. 506,803.

Patented Oct. 17, 1893.



Witnesses.

John F. Nelson

Francis C. Steward

Inventor.

James Thorp.

by H. C. Lodge Atty.

UNITED STATES PATENT OFFICE.

JAMES THORP, OF LAWRENCE, ASSIGNOR OF ONE-HALF TO EVAN A. LEIGH & CO., OF BOSTON, MASSACHUSETTS.

STOP-MOTION FOR COMBING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 506,803, dated October 17, 1893.

Application filed September 16, 1892. Serial No. 446,036. (No model.)

To all whom it may concern:

Be it known that I, JAMES THORP, a citizen of the United States, residing at Lawrence, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Stop-Motions for Combing-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 letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to combing machines and consists in stop-mechanism, which is intended to bring the machine to rest provided the "sliver," so called, passing therethrough is not in a normal condition, either by breakage through any cause, as roller-lap, or in case the sliver is of light weight.

In fact the object of my invention is to prevent the combing machine from producing anything but first class work, and in bringing it to a standstill, when it does not so act.

Briefly stated, my improvements are such as to stop the machine for any one of the following causes: First, when roller-lap occurs on feed-roll; secondly, when the sliver breaks from any cause whatsoever, or should it be light in weight; thirdly, should a bunch in the sliver stop in the trumpet; fourthly, when roller-lap occurs on drawing-rolls; fifthly, when the coiler-can has received its proper amount of material. All of the above described accidents which affect the proper formation of the sliver operate to stop the machine, primarily by means of a jointed connecting rod serving to oscillate pivotal fingers, and likewise by means of suitable levers from the trumpet, which co-operate with a latch. Movement of the latter serves to release the shipping bar, and it is to be understood that said bar is controlled either through a change in the position of said tumblers or of the trumpet, or when the coiler is full, or should roller-lap occur, all which movements will be more fully hereinafter described.

The drawings represent in Figure 1. a vertical sectional elevation in part of the front coiler-end of a combing machine embodying

my invention, on line $x x$ in Fig. 2. Fig. 2 is an end sectional view in part on line $v v$ in Fig. 1. Fig. 3 is a plan in part of a combing machine on line $z z$ in Fig. 2. Fig. 4 is a vertical rear sectional elevation on line $s s$ in Fig. 3. Fig. 5 is a vertical longitudinal section on line $t t$ in Fig. 3. Fig. 6. is a vertical section in part of a Heilman combing machine showing the feed-rollers, nipper, combing cylinder, detaching roller and its accessory rollers for purposes of illustration in connection with the stop-motion embodied in this invention. Fig. 7. is an enlarged view of the latch, which holds the shipping lever, on line $y y$ in Fig. 4. In these drawings it will be understood that the fine dotted lines indicate changes in the relative positions of parts, while the broken lines have their usual significance.

In the above drawings 2, 2, 2 represent the fixed portions or frame in part of a combing machine, having the usual instrumentalities as follows: A pivotal weighted shipping lever 3 and rod 4, a coiler-can 5, coiler-cap 6, and a drawing-head, consisting of three pairs of drawing rollers 7, 7', and a pair of calender rolls 8 8'. Moreover, in connection therewith are employed a group of tumblers 9, 9, each one of which conducts the sliver 10 coming forward from the various combing heads 12, one of which is shown diagrammatically in broken lines in Fig. 1. into and between the drawing-rollers, while a trumpet 13 receives said sliver. The latter thence passes to the calender-rolls. The operation of the whole is to consolidate the sliver in order that it may be more readily lifted out of the coiler-can in which it is temporarily placed.

The general arrangement and mode of operating these before-mentioned parts are the same as heretofore practiced, and I have shown only such portions of a combing machine, as are deemed necessary to accurately describe my invention. The main shaft is shown at 14 see Fig. 2, and a counter at 14'; each is fitted with intermeshing spur-wheels 15, 15'; the latter rotates a sleeve-shaft 16 mounted upon the frame and furnished at one end with a pin or face-plate 17. Rigidly fastened upon a rocker-shaft 18, see Fig. 5, is a pendent oscillating plate 19 slotted at its lower free end at 20, while a pivot-pin 60

therein serves to attach one end of a connecting rod 21, jointed at 23, thereto, the opposite extremity of said rod being affixed to the face-plate 17. Furthermore; upon the shaft 18 in the hangers 24, see Fig. 4, is affixed a curved finger 25, which is adapted to co-operate with each and all of the tumblers 9; in the present instance six in number and each representing a combing-head. Whenever one of the tumblers independently pivoted on the frame, as shown in Fig. 5, deviates from its normal position by breakage of the sliver, or when the light weight of the latter permits the head of the tumbler to rise; said finger 25, continuously oscillating, now engages with and is locked by the lower end of the tumbler, with the result of stopping the oscillations of the finger as likewise that of the shaft 18 and the pendent plate 19. Further, by such action the end of the connecting rod at this point is now held rigid, while continued rotation of the face-plate causes the said rod to be broken upwardly, as shown in dotted lines in Fig. 5.

As before mentioned, the shipping-lever 3, weighted at its lower end to keep it unbalanced, is locked in an inactive position and held by the latch 27. This element engages the shipping-lever at one end in a slot formed in the said lever, while its opposite extremity, bent downward, rests upon the projecting joint pin 23 which unites the two parts of the connecting-rod. Moreover the upright post 2' of the frame is apertured at 29 see Fig. 7, while the under side of the latch has a shoulder or catch 30, adapted to engage said post. Immediately upon the breaking of the connecting rod and rising of the joint, the latch 27 is lifted by the pin 23, the catch 30 is disengaged from the post and slides in part through the post, while the upper end of the shipping lever, see Fig. 1, is permitted thereby to advance and strike the rod 4, with the result of shipping the driving belt (not shown) and stopping the machine.

By the above arrangement of parts I have provided that the machine shall stop, whenever the sliver is light in weight, or whenever there is a cessation from any one of the combing heads, as at 12 in Figs. 1 and 3. Frequently such cessation or stoppage of the sliver is caused by roller-lap on the feed-rolls: these elements, see Fig. 6, are here shown at *d d'*, the nipper consisting of two blades, at *ee'*, the combing cylinder at *f* and the detaching roller at *g*. By such lap forming around the feed-rolls, the lower blade *e'* of the nipper is depressed and as the combing cylinder rotates, the comb contacts with said nipper blade *e'* and is broken, causing much damage. By my stop motion this accident cannot occur, and this is the first function of my invention as stated hereinbefore. In case the sliver breaks or ceases to pass over the tumblers for any other cause than the roller-lap or should it be light in weight, the change in the position of the tumbler, where such defect in this

particular sliver has occurred, acts to stop the machine in the manner just previously described. Thus I have provided mechanism the action of which is such, that, for any defect in the sliver prior to its entrance between the drawing rolls 7 7', the combing machine shall be stopped, and this is effected by the second function of my invention through action of the tumblers.

The third function of my stop-mechanism is to provide for such defects in the sliver, as shall effect the trumpet, or in other words provide for accidents during that portion of its progress between the drawing rollers and the calender rolls and I will instance a bunch in the sliver, as the first cause of the stopping of the machine. It is to be understood that the trumpet has two motions, a forward one, or pull toward the calender rolls produced by a bunch, and a reverse movement caused by cessation of the sliver therethrough and brought about by roller-lap around the drawing-rolls. In other words the sliver may be passing normally above all the tumblers, but may be lapping about one set of the drawing-rollers. In this case the sliver will be light and the normal pull through the trumpet does not take place. The trumpet 13 is fastened in a bracket or holder 32, which is supported by two stop-levers, respectively 34, 35. These are pivoted upon a sliding adjustable arm 64 secured upon a collar 641 on the post 2' of the machine frame. The drawings, see Fig. 4, show that this arm moves upon a dove-tailed or under-cut rib, and can be adjusted transversely of the post 2' in order to bring the stop-levers, as well as the trumpet into proper positions relatively to their co-operating parts, namely a rocker-arm 37 and the calender-rolls 8, 8'. These two levers extend toward the rocker arm 37 and engage therewith at such times as the defective condition of the sliver, when passing through the trumpet, warrants that stoppage of the machine should occur. In the instance of a bunch in the sliver this defect produces an abnormal pull upon the trumpet in the direction of the calender-rolls with the result to raise the free end of the stop-lever 34, which is of a length adapted to swing by, and intercept and stop the oscillation of the rocking arm 37 rigidly mounted upon the shaft 18; in its normal position this end of the stop-lever 34 is below and clear of the arm 37, as shown in Fig. 5. The reverse movement of the trumpet, due to an insufficient pull arising from causes before specified, results as follows: it being understood by reference to Fig. 4 that the rocker-arm 37 is slotted at 38 and that the free-end of the stop-lever 35 projects therethrough being formed with a shoulder or catch 36. Ordinarily the free-end of the lever 35 is so raised that unimpeded oscillations of the rocker-arm are allowed, but when motion of the trumpet lowers the free-end of said stop-lever 35, the catch 36 engages the edge of the slot, while the rocker-arm 37 and rocking shaft

18 are held fixed. As a consequence the jointed connecting rod is broken, the latch 27 tripped and the shipper-lever is free to act and stop the machine. In the drawings, Fig. 5, the finger 25, the rocker arm 37 and the lever 35 are all shown in working positions.

The above operation of the mechanism provides for the fourth prominent feature of my improvements, whereby in the event of a roller-lap taking place, on the drawing rollers the machine is stopped, and the liability of breaking the stands in which such rollers are mounted is obviated.

Lastly my invention consists in the arrangement of the coiler, whereby at certain predetermined times or when the coiler-can has received a proper amount of sliver the machine is stopped. This is effected as follows: The coiler-can at 5, see Fig. 1, is operated in the usual manner, but acting in conjunction therewith I have attached to the frame a casting or stand 40 in which is mounted time mechanism consisting of a worm 41, and worm-shaft 42 rotated by a pawl 43 and ratchet 45. These latter parts are operated from some continuously moving portion of the combing machine. Co-operating with the worm is a worm-gear 46 adapted to carry a cam 47, which controls a gravity dog 48 pivoted upon the stand 40. Furthermore I have mounted a spring-impelled bolt 49 formed with a lug 67 to engage the dog. The spring 50 is made fast to the casting at 51, while a pin 52 secured to the bolt engages the free-end of the spring; a slot 53 in the casting permits proper throw of the bolt, in the direction of the arrow, beneath a two pronged catch 54, 54', which is adapted to strike an offset or tooth 56 on the end of the bolt. This catch is mounted on the pivot-pin 23 of the jointed connecting-rod, while the upper prong 54' of the catch rests against a stop-pin 57, see Fig. 5, secured in one portion of the connecting rod.

The operation of these above described elements is as follows; it being understood that the worm-wheel 46 is to rotate only once during the act of filling the can 5. When such result is accomplished the cam 47 has reached the dog and wiping thereagainst disengages said dog from the lug 67 on the bolt. The latter is shot forward by the spring and its front end wipes across the nose of the prong 54, and causes the latter to engage with the tooth 56 on the bolt. Simultaneously the necessary forward movement of the connecting rod 21 is retarded until the pull of the face plate causes the prong 54 to sweep up over the tooth 56, the catch being held fixed by the prong 54' which now bears against the stop-pin 57; by this means the jointed connecting-rod is again broken, when as previously described the pin 23 lifts the latch 27 and the shipping lever is free to act and by striking the rod 4 shifts the belt and brings the combing machine to rest.

By means of the various above-described instrumentalities, and their several move-

ments relatively to each other I have provided that the machine shall be stopped, whenever the sliver is not passing through in a normal condition. In this way I have endeavored to prevent any breakage or injury to the machine caused by the sliver not progressing in the duly prescribed paths, likewise for any cause which may make the sliver break, or for such accidents as will create a light weight sliver. In this way the product of the machine is improved, as the machine is not permitted to continue operations unless first class work is being produced.

What I claim is—

1. The combination with one or more unbalanced tumblers, of a moving striker for engaging with said tumblers, a break-joint rod connected with the said striker, means for moving the said rod and thereby actuating the striker, a shipping lever, and a locking latch therefor which is tripped when the joint is flexed in consequence of an arrest of the movement of the striker, substantially as described.

2. The combination with the drawing rollers and other operating parts of a drawing head, and one or more unbalanced tumblers, of a striker for engaging with said tumblers, a rock-shaft on which said striker is mounted, a break-joint rod operatively connected with said rock-shaft whereby to rock the same, means for reciprocating the said rod, a shipping lever, and a locking latch therefor which is tripped when the joint is flexed in consequence of arrest of the movement of the striker and rock-shaft, substantially as described.

3. The combination with a trumpet adapted to conduct a sliver therethrough, and a detent moving therewith, of a striker for engaging with said detent, a break-joint rod connected with the said striker, means for moving the said rod and thereby actuating the striker, a shipping lever, and a locking-latch therefor which is tripped when the joint is flexed in consequence of an arrest of the movement of the striker, substantially as described.

4. The combination with a trumpet adapted to conduct a sliver therethrough, and supporting or carrying levers for the trumpet having separated detent portions, of a striker having a path of movement which normally passes between the detent portions, a break-joint rod connected with the said striker, means for moving the said rod and thereby actuating the striker, a shipping lever, and a locking latch therefor which is tripped when the joint is flexed in consequence of an arrest of the movement of the striker, substantially as described.

5. In combination with the drawing head of a combing-machine, its revoluble coiler can, and a shipping-lever with its locking-latch, of a spring bolt, its time-operating mechanism, a reciprocating connecting rod and means for interconnecting said bolt with said recipro-

cating connecting rod, whereby the latter shall trip the latch of the shipping-lever and stop the combing-machine when the coiler-can is filled, substantially as set forth.

5 6. In a combing-machine the combination with a movable trumpet, the pivotal stop levers which support the same, and a rocking-shaft with its pendent arm rigid thereupon,
10 of a jointed connecting rod connected with said rocking-shaft, with mechanism for reciprocating the same, a latch mounted in a fixed post and adapted to be disengaged in consequence of flexure of the connecting-rod, an
15 unbalanced shipping-lever with which said latch is connected, the said stop-levers being engaged at different times by the pendent arm to break the connecting rod, substantially as specified.

20 7. In combination with a coiler-can, a shipping-lever, its locking latch, and a continuously reciprocating jointed connecting rod adapted to release the latch, time-mechanism consisting of a revoluble disk, its cam, and a
25 spring-actuated bolt adapted to be released by said cam, together with means for tempo-

rarily causing the bolt to engage the connecting rod and break the latter, thereby bringing the combing-machine to a stop, substantially as stated and set forth.

8. The combination with a shipping-lever, 30 a fixed post, the locking-latch connected to the shipping lever and acting to engage with said post, the said latch being adapted to be disengaged in consequence of flexure of the connecting-rod, and a jointed continuously 35 reciprocating connecting rod, of a movable trumpet, a pendent rocker-arm and shaft with which the rod is connected, and the pivotal stop-levers adjustably mounted on a sliding bracket, said levers being adapted to support 40 the trumpet, engage the oscillating arm and prevent movement of the latter at times dependent upon the position of the trumpet, substantially as described.

In testimony whereof I affix my signature in 45 presence of two witnesses.

JAMES THORP.

Witnesses:

H. E. LODGE,

R. C. BRIDGHAM.