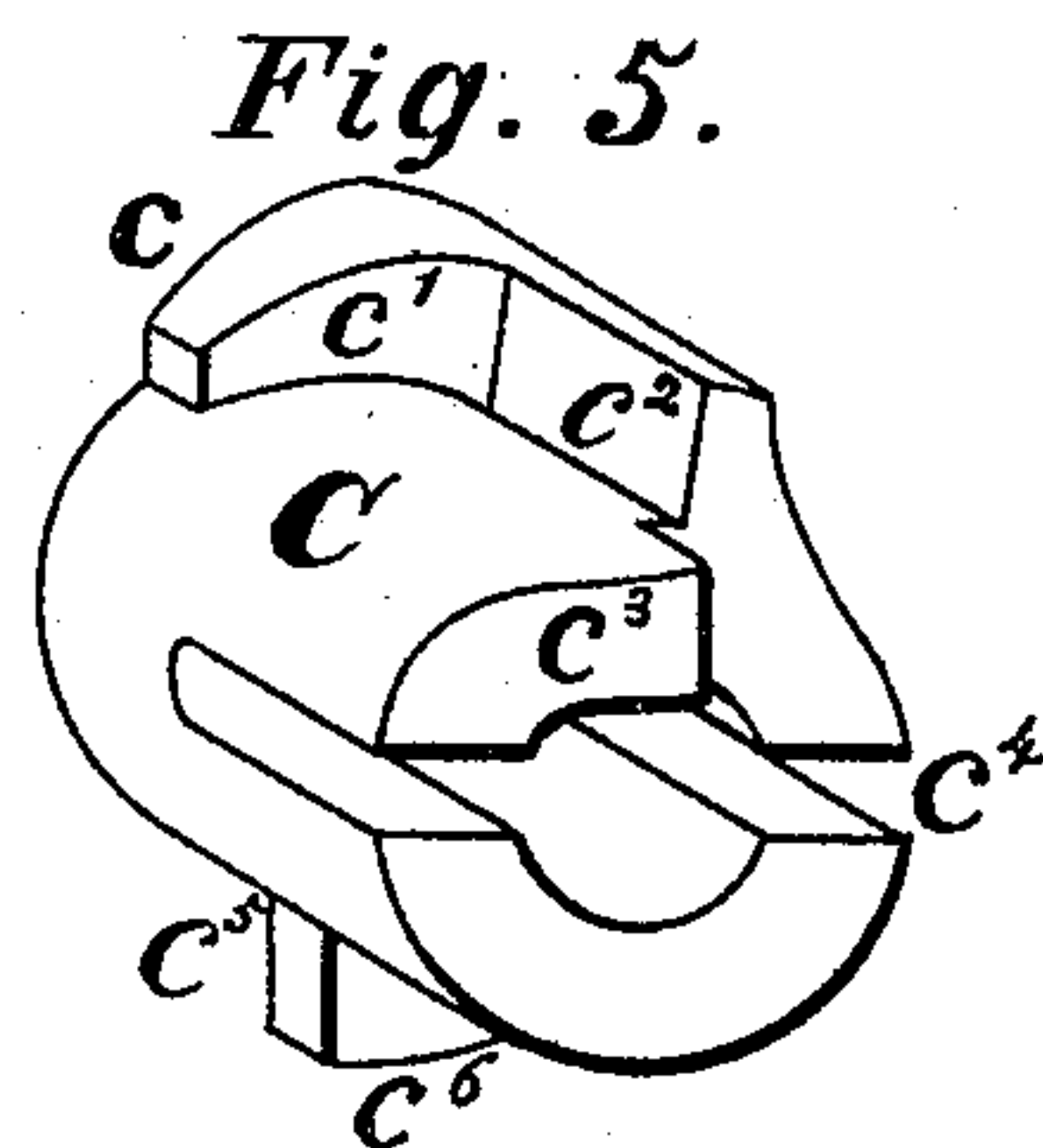
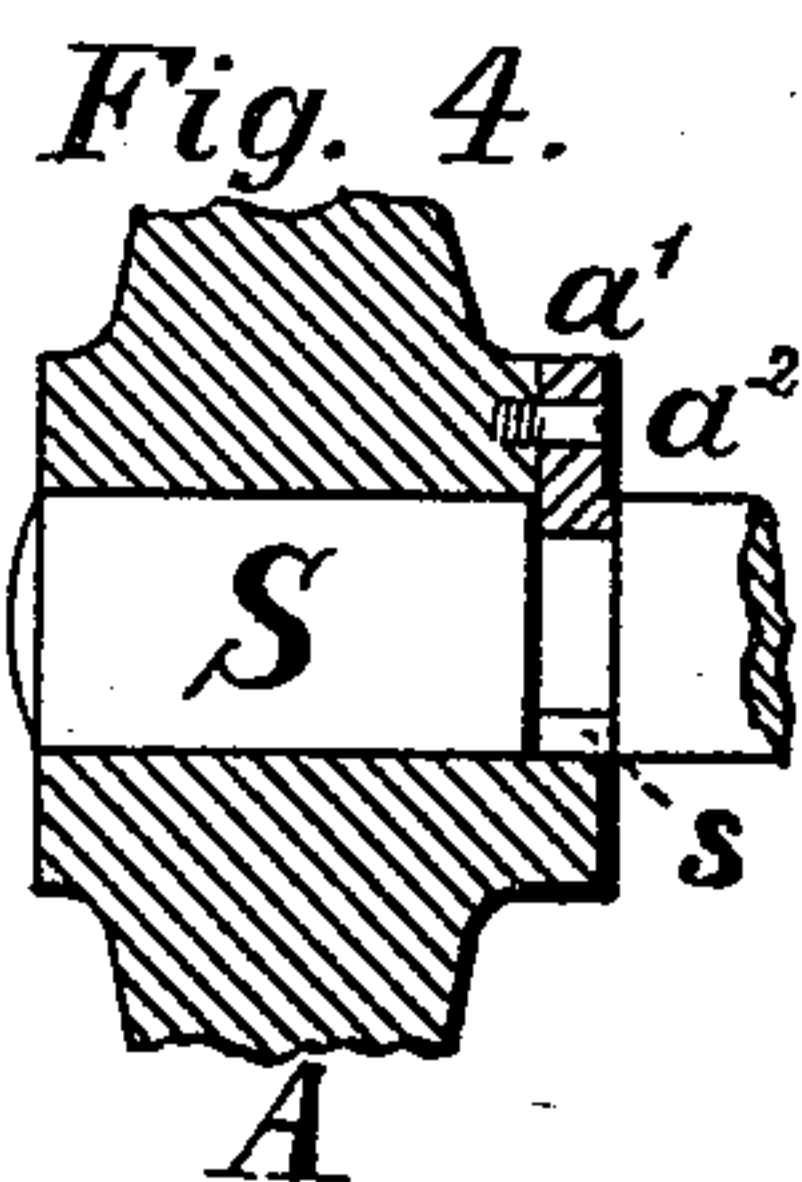
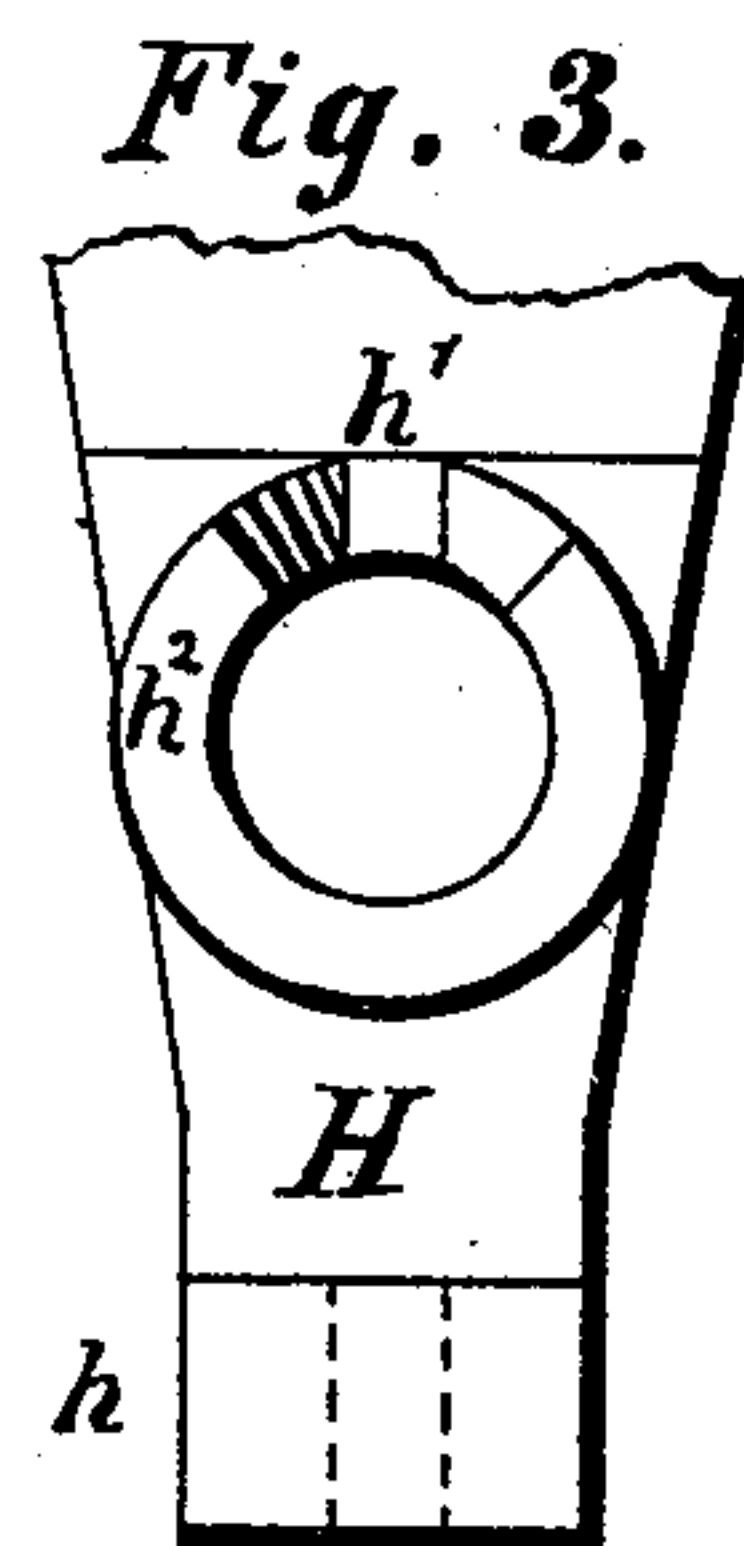
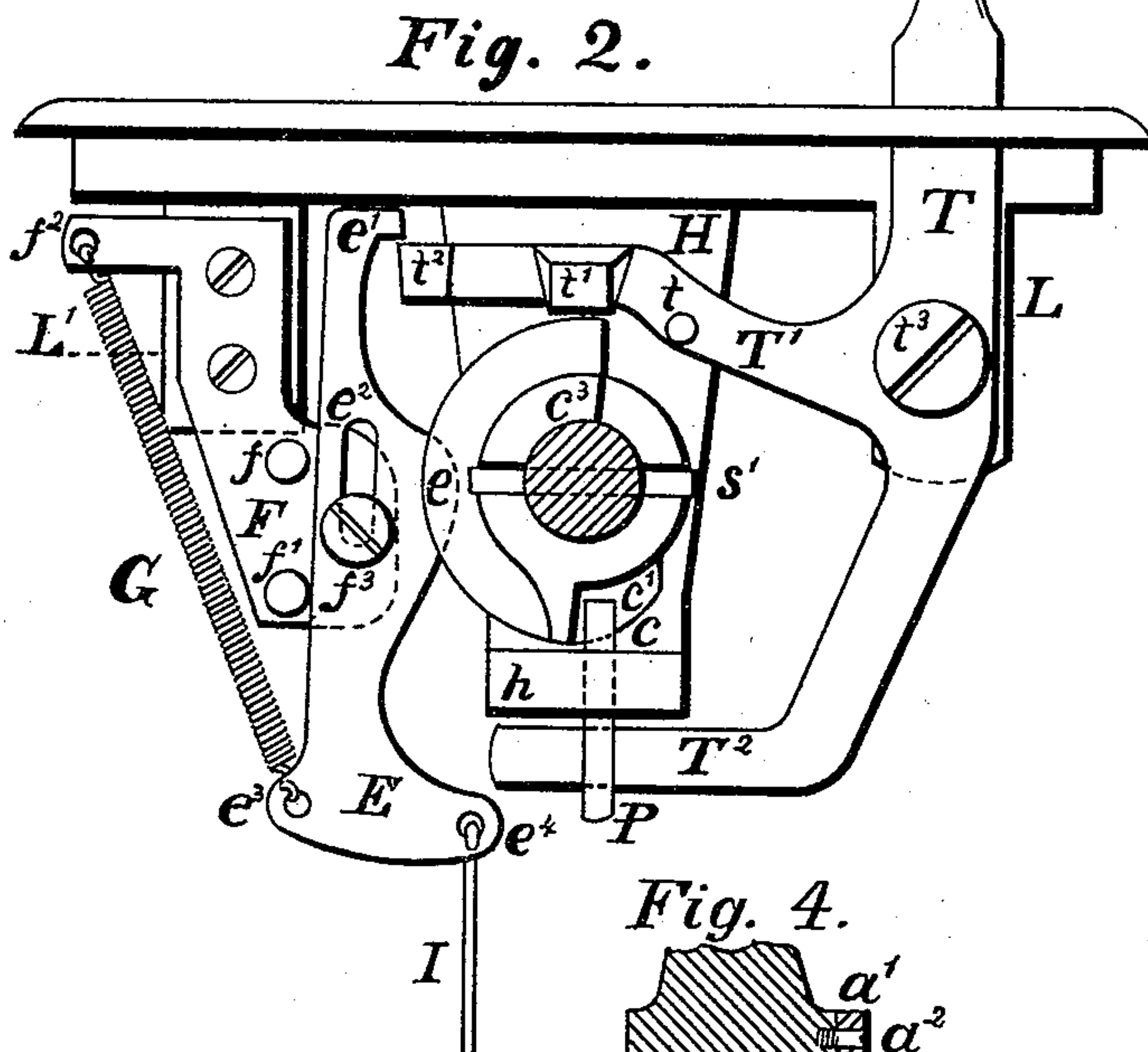
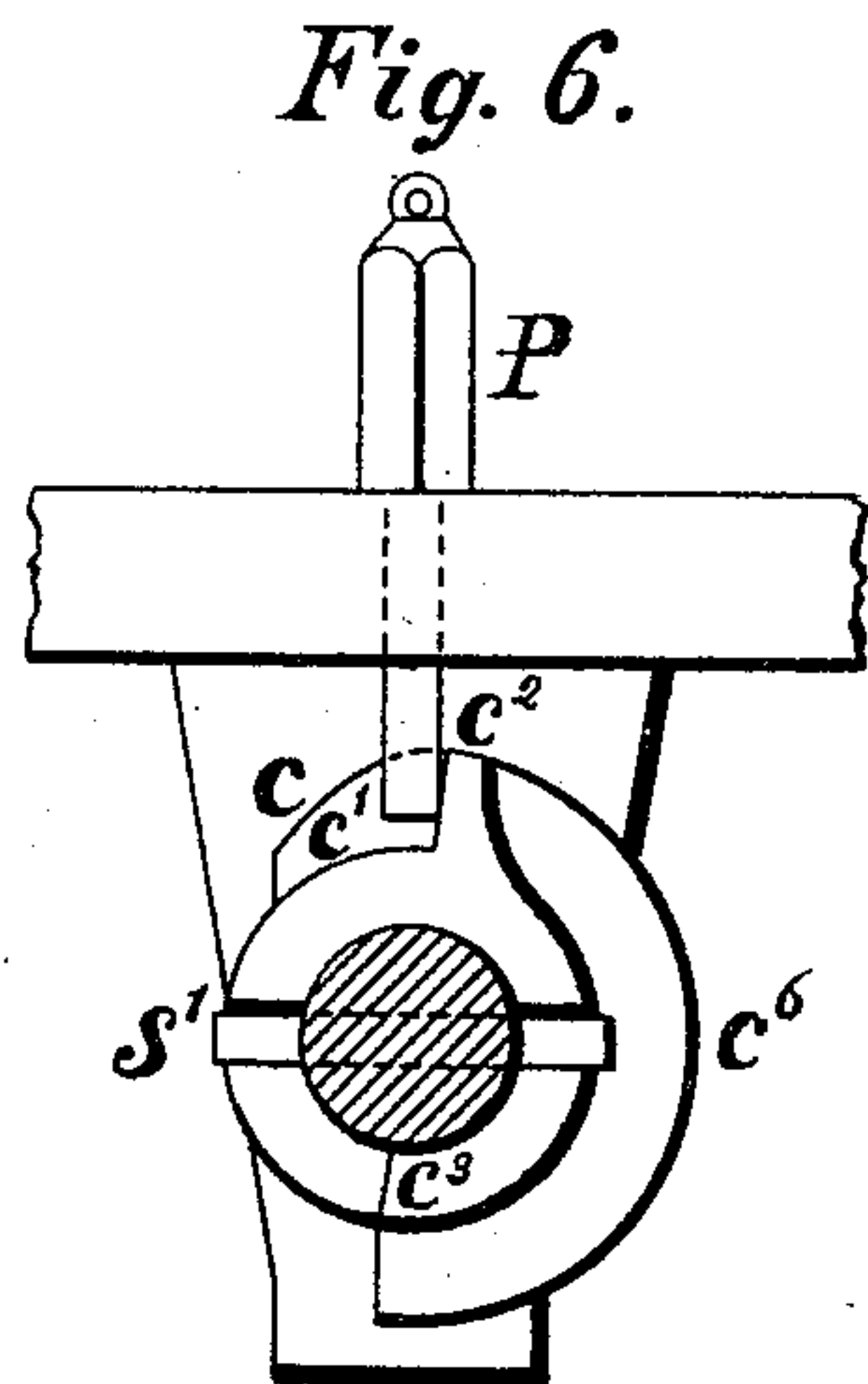
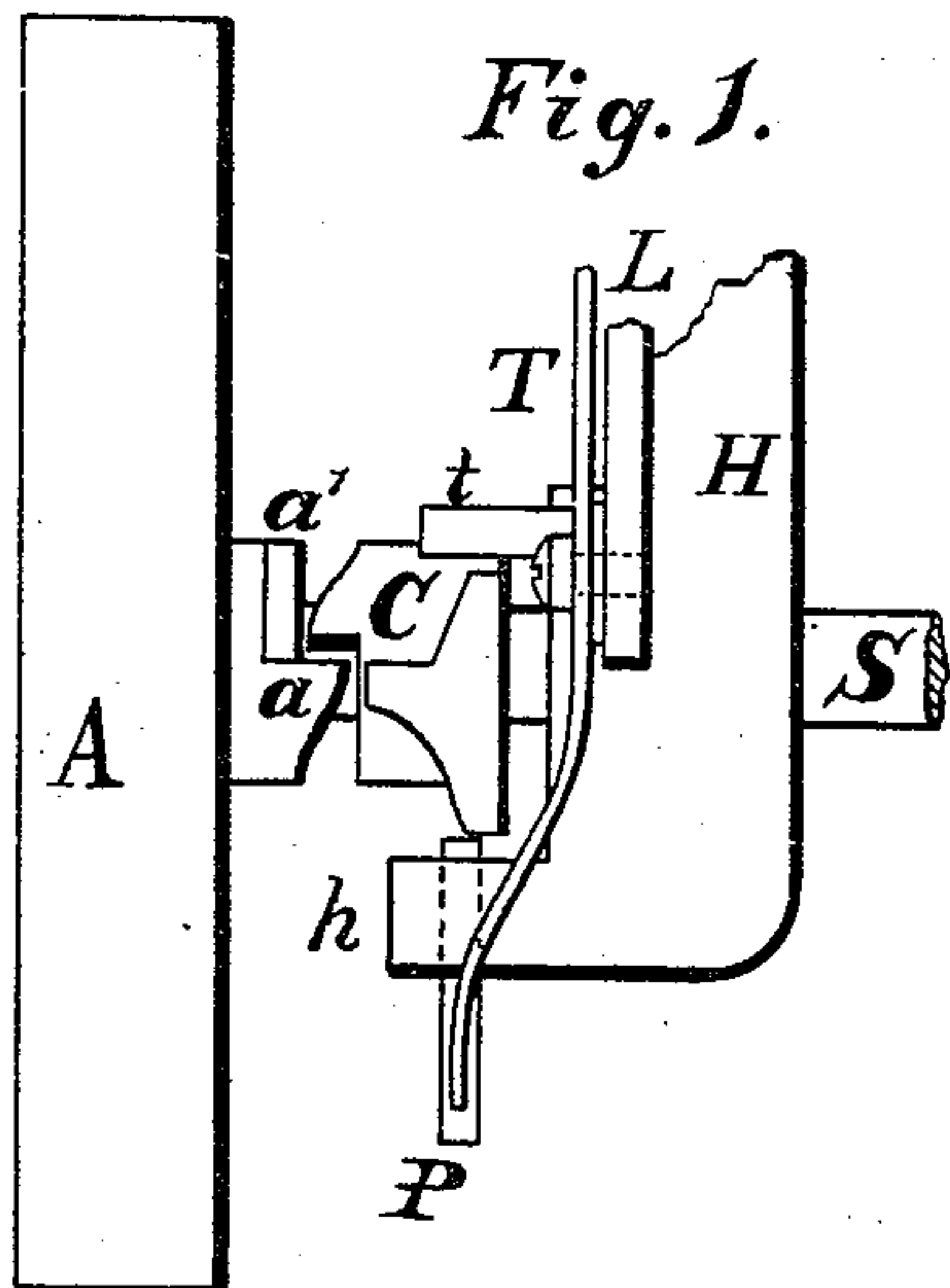


A. W. WEEKS.
AUTOMATIC STOP MOTION.

Patented Nov. 3, 1885.



Witnesses:

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AUTOMATIC STOP-MOTION.

SPECIFICATION forming part of Letters Patent No. 329,520, dated November 3, 1885.

Application filed March 20, 1885. Serial No. 159,609. (No model.)

To all whom it may concern:

Be it known that I, ALBERT WALTER WEEKS, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented a new and useful Automatic Stop-Motion, of which the following is a specification.

The object of my invention is to provide for that class of machines and machinery which require to be stopped at the conclusion of performing a certain operation or definite amount of work a mechanism which automatically stops such machines at the desired time.

My further objects are to provide such a mechanism for the above purpose as shall make the movements of the machine to which it is applied definite and positive when operating, the stopping of said machine at an exact point or place with reference to its work, and to guard against neglect of the operator.

My invention consists in the combination, with the driving-shaft of a machine, of a reciprocating sleeve, and of a rotating driving-pulley having upon its hub a lug for engaging with the above sleeve.

It further consists of a lever for starting the machine with the hand and a sliding latch for starting the machine with the foot.

The invention further consists in various details and parts and combination of parts, as will be fully set forth and described hereinafter.

Reference is to be had to the accompanying drawings, which form a part of this specification, and in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of my improved stop-motion, showing the relation and position of the parts of the same to each other, and also the relation and method of applying it to the driving-shaft of a machine. Fig. 2 is a detailed front elevation of the improved stop-motion, taken at right angles to the driving-shaft, and having the driving-pulley and a portion of said shaft removed, and showing the operating hand-lever with its arms and lugs, and, further, showing the slotted sleeve which slides upon the drive-shaft, and the slotted latch-bar, by means of which the machine may be started with the foot. Fig. 3 is

a front view of the hanger in which the drive-shaft is secured, the face of which also forms a part of the stop-motion. Fig. 4 is a longitudinal view of a portion of the driving-shaft, showing also a section of the driving wheel or pulley, and, further, showing the method of retaining the said driving-pulley in position upon the said shaft. Fig. 5 is a detailed perspective view of the sliding sleeve which forms a part of the stop-motion. Fig. 6 is an end elevation of the sliding sleeve forming a part of the automatic stop-motion, showing a method of adapting the stop-motion to looms or other machinery, where the simple dropping of a pin may at any time be made to stop the machine.

The following is a more minute and detailed description of my improved automatic stop-motion: Upon the driving-shaft of a machine, the said shaft being represented by S, and operating between the hanger H and the drive-pulley A, is the sliding sleeve C. The said sleeve has upon its back edge the lug c^5 , and upon its front edge the lug c^3 . It further has upon its cylindrical surface the cam c , the cam-edge c' , the square stop or lug c^2 , and the semi-circumscribing band c^6 . The said sleeve further has the slot c^4 , in which the pin s' plays, which pin is driven tightly into and through the shaft S, thus permitting the sleeve C to have a free reciprocal motion upon the said shaft, but preventing any rotary motion, except as both sleeve and shaft turn together. It is to be understood that any other suitable means may be employed of preventing the sleeve C from rotating upon the shaft S, while permitting a reciprocal motion thereon—*e. g.*, a spline in the said shaft and a groove in the said sleeve. The hanger H has upon that side which is nearest the sleeve C the recess h' . Upon this same side, and directly under the sleeve C, is the projection h , through which plays the slotted pin P. Pivoted upon a lug, L, by means of the screw t^3 is the hand-lever T. This lever T has upon its lower part the arms T' and T^2 , the latter arm adapted to enter the slot in the pin P, as shown in Fig. 1. The arm T' carries upon its surface the wedge-shaped lug or cam t' , the lug t^2 , and the projecting pin t . Working in connection with

and forming a part of this stop-motion is the wheel A. The said wheel has upon that side of its hub which is nearest the sleeve C the projecting lug a . The wheel A runs loose upon the shaft S, and is held thereon and prevented from having any lateral motion by the semicircular flange a' , which projects into a groove, s , of the shaft S, the said flange being secured to the hub of the wheel A by screws, as seen at a^2 , Fig. 4.

It is to be understood that any other suitable means may be employed to properly secure the wheel A upon the shaft S.

The operation of the automatic stop-motion is as follows: The upper portion of the lever T is pressed toward a point directly above the hanger H. In the first stages of its motion in this direction the pin P is withdrawn in a downward direction from in front of the cam-edge c' and the square stop c^2 upon the sleeve C. By this time the thin edge of the cam-lug t' has reached the lug c^5 upon the back edge of the sleeve C. As the lever T is pressed still farther in the above-mentioned direction, and under the influence of the cam-lug t' and its contact with the lug c^5 , the sleeve C is pressed toward the wheel A until their respective lugs a and c^3 are interlocked, as shown in Fig. 1. The rotary motion of the wheel A is now communicated to the sleeve C, and through it to the shaft S. By pressing forward the lever T in the direction indicated the projecting pin t has of course been lowered in a like manner and proportion as the lug t' . When, therefore, the shaft and sleeve have made about a semi-revolution, the cam-face c strikes the projecting pin t , and thus drives the lever T back again into its original position, while the band c^6 , remaining in contact with the pin t , prevents the lever from being again pressed in the direction of a point directly above the hanger H during that same revolution of the shaft. By this automatic resetting and retaining in position of the lever T a negligent operator is prevented from keeping the lever pressed forward, and thus keeping the machine running. This replacing of the lever T has thrown the pin P upward into its original position. When, therefore, the shaft S and sleeve C have nearly completed a revolution, the upper portion of the pin P comes into contact with the cam-edge c' , by which means the sleeve C is withdrawn from the wheel A until the lugs a and c^3 are disconnected. Just after this disconnection the pin P comes into contact with the square stop or lug c^2 , which stops the shaft, and therefore the machine, every time after one exact revolution has been made.

To prevent the possibility of a disconnection of the lugs a and c^3 during the revolution of the shaft S, the lug c^5 comes into contact with the face h^2 of the hanger H, and when the sleeve C is slid back under the influence of the pin P and the cam-edge c' the said lug c^5 passes into the beveled-lipped recess h' in the hanger H.

In order that the machine may be started

with the foot as well as with the hand, the following attachment has been provided: Upon a lug, L' , is fixed the plate F, having the projecting pins f and f' and the arm f^2 . Pivoted to this plate by the screw f^3 is the latch-bar E, which has upon its upper end the beveled-faced lip e' , and at its center the slot e^2 and the protruding breast e . The lower end of this slotted rod is boot-shaped, having the hole e^4 at its toe and the hole e^3 at its heel, as seen in Fig. 2. Connecting this heel with the arm f^2 of the plate F is the spring G.

When it is desired to start the machine with the foot in preference to starting it with the hand-lever T, the above-described attachment is applied, as seen in Fig. 2, and the relation of the parts of the attachment to the other portion of the stop-motion is also illustrated in the same figure.

A rod or wire, I, connects the latch-bar E to a treadle. Its operation is as follows: When the treadle is depressed by the foot, the latch-bar E is similarly depressed by the connecting-rod I, and as the bevel lip or projection e' of the said latch-rod extends over and upon the lug t^2 of the lever T the arm T' of the said lever T is also depressed and the machine started, as above described. When about one-third of a revolution of the sleeve C has been made, the lug c^5 of the said sleeve strikes the protruding breast e of the latch-rod E, driving the upper portion of the said latch-rod back against the pin f , and thereby completely disengages the lip e' from the lug t^2 . At this time the cam c begins to throw back the lever T and the machine is stopped, as and in the manner before described, regardless of the fact that the treadle and latch-rod E may be still depressed by the foot. When the foot is raised, the spring G, acting upon the heel e^3 of the latch-bar E, brings the said latch-bar upward and again latches the beveled lip e' over the lug t^2 , and leaves it in its original position, as shown in Fig. 2, ready to be again used.

Fig. 6 represents a method of applying the whole or a part of my automatic stop-motion to machines which do not necessarily require to be stopped and started at every revolution, but which do require occasionally to be stopped easily and quickly. The sleeve C is here represented as placed upon the driving-shaft and holding substantially the same relation to the said shaft and also to the driving wheel or pulley as is shown in Fig. 1. When for any reason it is desirable to stop the machine, the pin P is simply dropped into the position shown in Fig. 6, thereby withdrawing the sleeve C from connection with the driving-wheel, substantially as has been heretofore described. The advantage of such an arrangement is clearly seen, there being no transfer of power, as in shipping a belt from one pulley to another, for the driving-pulley continues to revolve exactly as before. Further, the machine or machinery is at once deprived of all motive power, and must come to

a dead stop before a single revolution has been made, when the pin P comes against the square lug c^2 , which in case of an accident is a great desideratum. The dropping of the pin P may also be made to depend upon the breaking of a thread, specially adapting the stop-motion for use upon looms or other similar machines.

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

1. In a stop-motion device, a reciprocating sleeve, C, adapted to either connect or disconnect the motion of the driving-pulley with or from the driving-shaft of a machine, substantially as herein described.

2. In an automatic stop-motion, the sleeve C, having the lugs c^3 and c^5 , the cam-edge c' , and the square lug or stop c^2 , and having, further, the cam-surface c and the semicircular projecting band c^6 , all substantially as shown and described, and for the purpose set forth.

3. In an automatic stop-motion, the combination consisting of the reciprocating sleeve C, having the lugs c^2 , c^3 , and c^5 , the cam-face c , and cam-edge c' , the semicircular band c^6 , and the lateral slot c^4 , further consisting of the lever T, pivoted by the screw t^3 , and having the arms T^1 and T^2 , the former carrying the cam-lug t' , the lug t^2 , and the projecting

pin t , consisting, further, of the slotted pin P and of the pin s' , and consisting, further, of the shaft-hanger H, having the beveled-lipped recess h' and the face-surface h^2 , all adapted to co-operate in starting and stopping a machine, substantially as herein shown and described.

4. In an automatic stop-motion device, the combination, with a reciprocating sleeve, C, and lever T, of a driving wheel or pulley, A, having the projecting lug a , and secured to the driving-shaft by the semicircular flange a' , substantially as and for the purpose shown and specified.

5. In an automatic stop-motion, the combination, with the lever T, of a latch-bar, E, having the projecting lip e' , the slot e^2 , and the protruding breast e , and having at its lower end the holes e^3 and e^4 , of a plate, F, having a pivot-screw, f^3 , a projecting arm, f^2 , and the studs f and f' , and of the spring G, connecting the said latch-rod E with the plate F, all adapted to co-operate in starting the machine, substantially as and in the manner specified.

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