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A. NELSON.

MECHANICAL MOVEMENT.

No. 374,423. Patented Dec. 6, 1887.

Fig. 1.

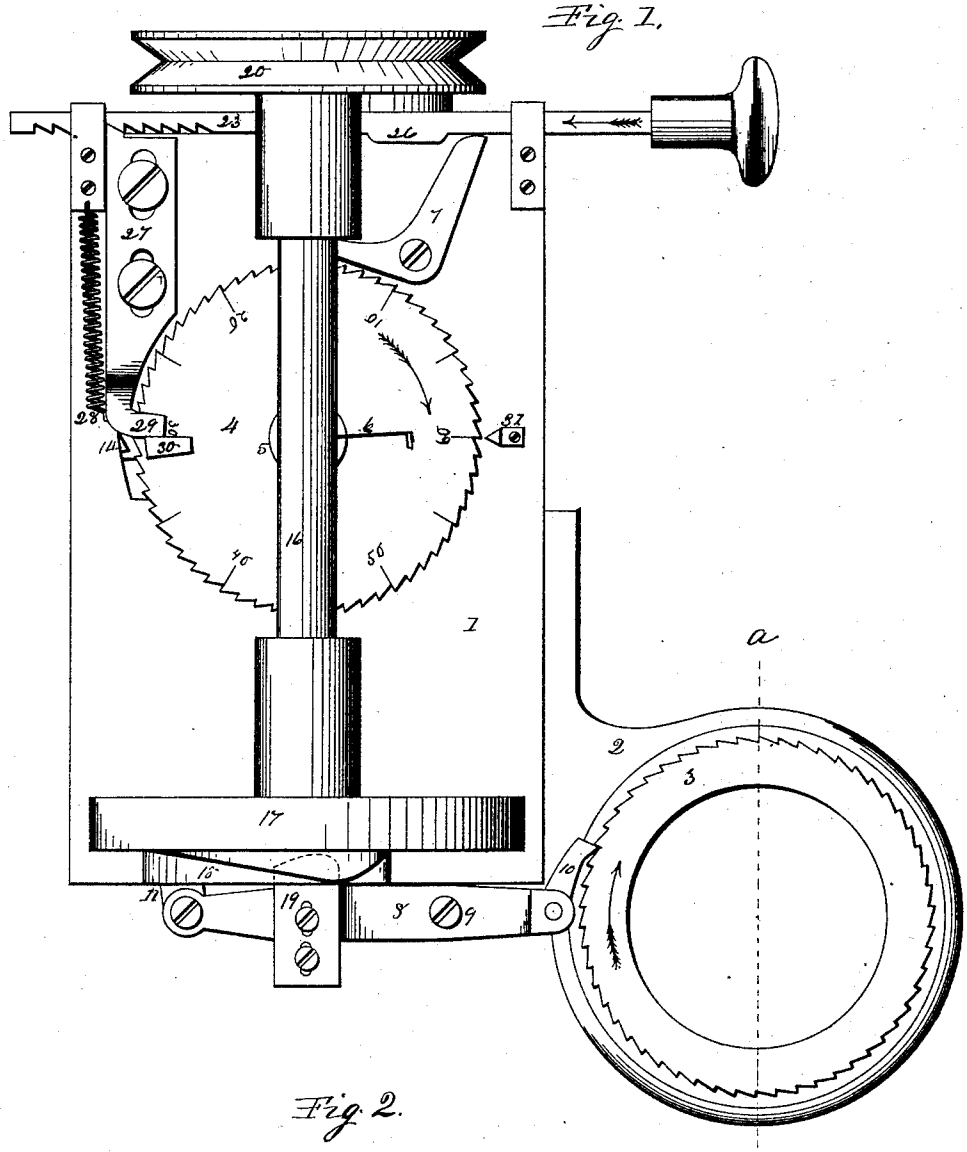
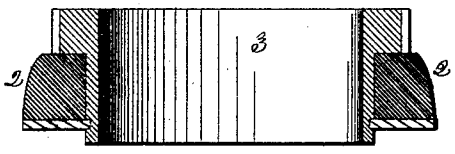


Fig. 2.



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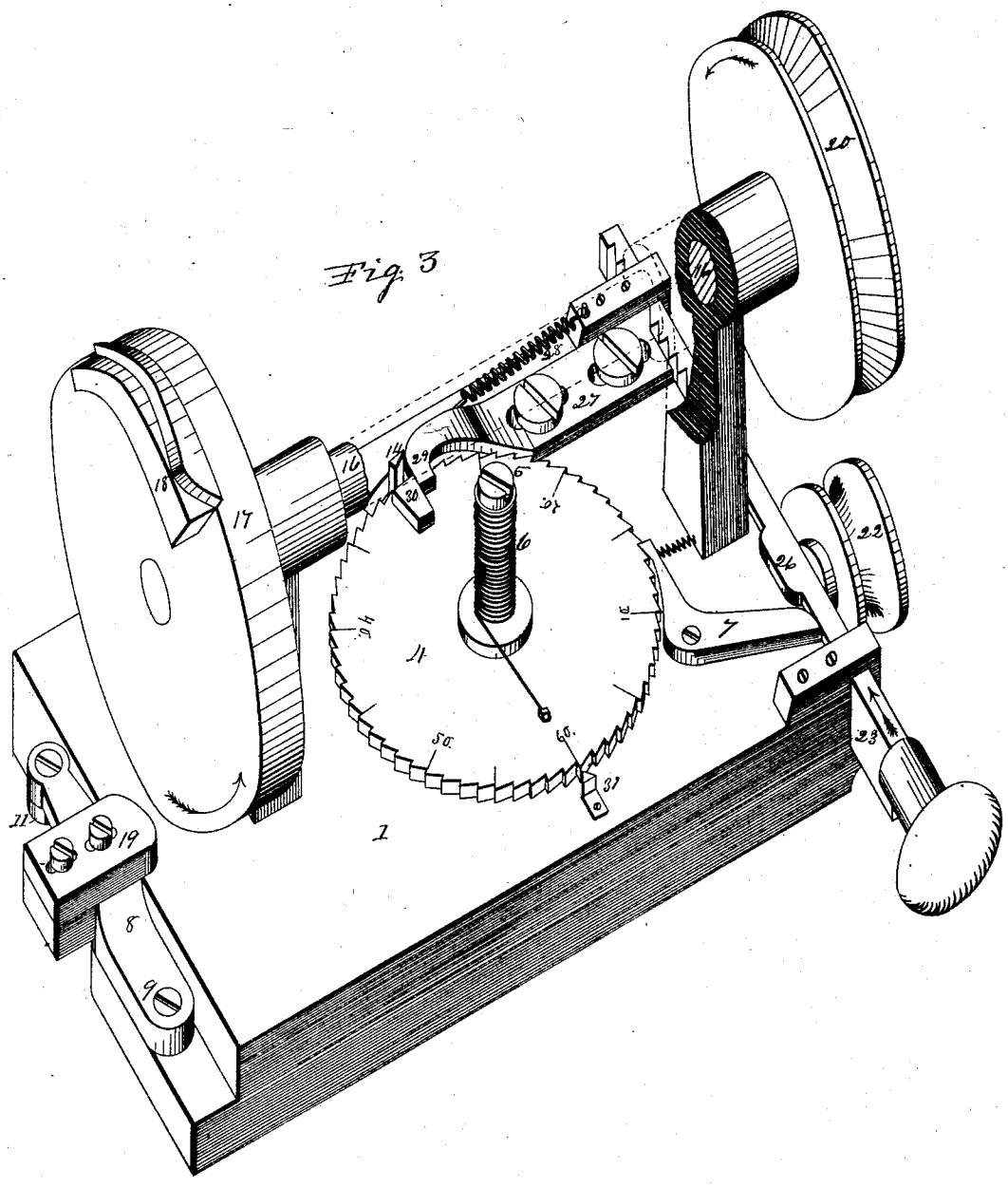
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Fig. 3



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Fig. 5.

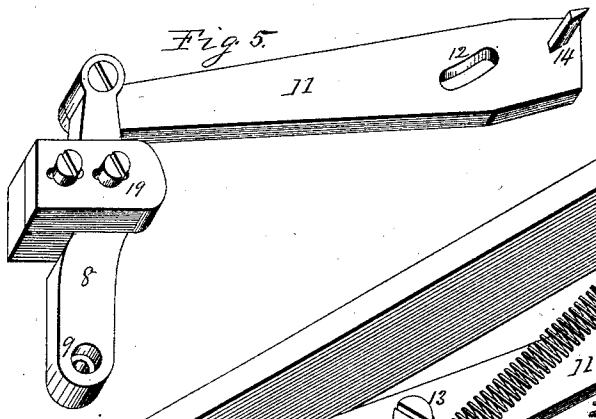


Fig. 4.

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MECHANICAL MOVEMENT.

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Fig. 6.

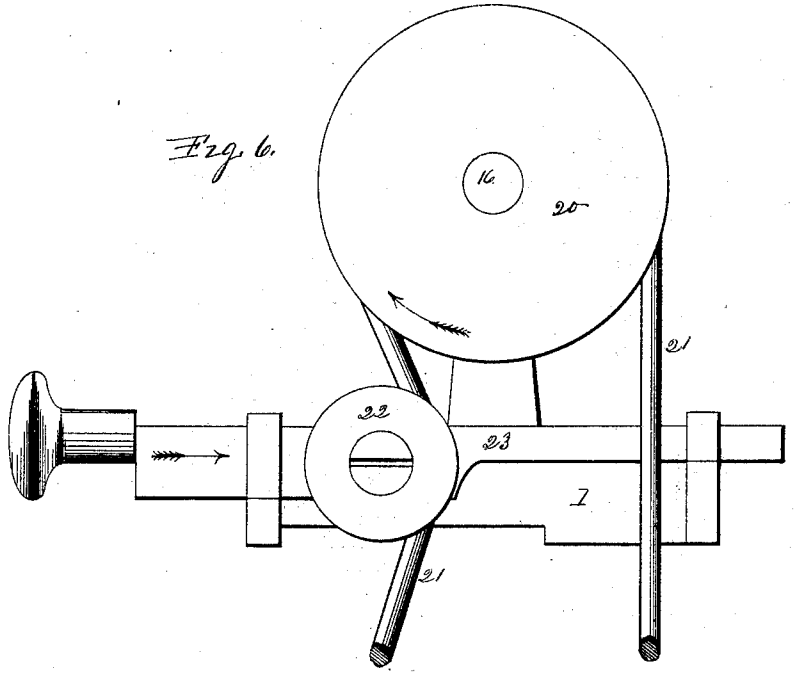
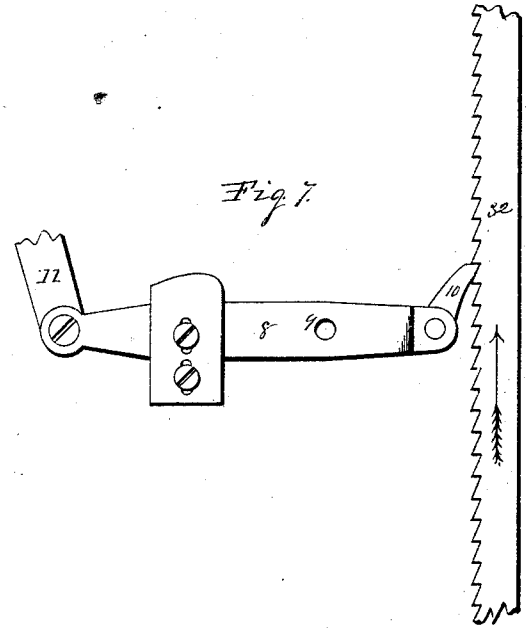


Fig. 7.



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UNITED STATES PATENT OFFICE.

ALFRED NELSON, OF ROCKFORD, ILLINOIS.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 374,423, dated December 6, 1887.

Application filed October 7, 1886. Serial No. 215,595. (No model.)

To all whom it may concern:

Be it known that I, ALFRED NELSON, a citizen of the United States, residing in the city of Rockford, in the county of Winnebago and State of Illinois, have invented a new and useful Mechanical Movement, of which the following is a specification.

This invention relates to mechanical movements known as "stop mechanism." Its object is to produce an adjustable automatic stop mechanism; and it consists in the apparatus represented in the accompanying drawings, which will be hereinafter more fully described, and in which—

Figure 1 is a plan view of an apparatus embodying my invention. Fig. 2 is a transverse vertical section on dotted line *a*. Fig. 3 is an isometrical upper-face representation of the essential parts. Fig. 4 is an isometrical under-face representation. Fig. 5 is a detail in isometrical. Fig. 6 is an elevation of the belt end, and Fig. 7 shows a ratchet-bar attachment.

The working parts of my adjustable stop mechanism are supported on a rectangular base, 1, recessed on its under face to receive a portion of the operating parts. A ring-formed bracket, 2, is fixed to the left-hand end portion of the front edge of the base, and projects forward in a plane parallel thereto. A ratchet-wheel, 3, in this instance of annular or ring form, is mounted to revolve within the ring-formed bracket 2, and its portion resting on and rising above the ring-bracket is produced on its periphery in saw-tooth-ratchet form. A gage-wheel, 4, having its periphery fitted in saw-tooth-ratchet form, is supported on the base to oscillate on a stud-journal, 5, rising therefrom. A spiral spring, 6, surrounds the stud-journal 5, having one of its ends fixed thereto and its other end fixed to the gage-wheel in such a manner that its spring action tends to carry the wheel in the direction of its inclined teeth, as indicated by the arrow thereon. A spring-actuated detent, 7, pivoted to the base in position thereon to engage the teeth of the gage-wheel, serves to hold the wheel against the action of the spring 6. A pawl-lever, 8, is pivotally connected at 9 to the base, and its free forward end is provided with a pivoted spring-actuated pawl, 10, to engage the teeth of the ring-ratchet wheel. A pawl-bar, 11, is pivotally connected at one end to the rear free end of the pawl-lever 8, to vibrate therewith, and its inner end is provided with a curved slot, 12, to receive a stud-pin, 13, to control the lateral movements of its inner end. The pawl-bar 11 is provided with a tappet-pawl, 14, rising therefrom through an opening in the base in position to engage the teeth of the gage-wheel in its outward endwise movement to carry the wheel the space of a tooth at each outward stroke. A spring, 15, connects the pawl-bar with the base diagonally inward on its under face, and operates to retract the bar and the lever 8, with which it connects, to retract the pawls that engage the annular or ring-formed ratchet-wheel and the gage-wheel. A driving-shaft, 16, is supported to revolve in bearings rising from the base, and a belt-pulley, 17, is fixed on one of its projecting ends to revolve therewith. The peripheral edge of the wheel 17 is provided on its outer face with a side enlargement, 18, forming a cam to engage the tappet-head 19, fixed to the pawl-lever, to cause it to vibrate to impart an intermittent movement to the ratchet-ring wheel and to the gage-wheel. The tappet-head 19 is made adjustable in its connection with the lever, to regulate the throw thereof, to impart a greater or less movement to the ratchet-ring wheel and to the gage-wheel. In each revolution of the pulley 17 the cam 18 will engage the tappet-head 19 and vibrate the lever to which it is fixed, and by means of the pawls connected with the lever and with the pawl-bar will impart an intermittent movement to the ring-ratchet wheel and to the gage-wheel. A driving-sheave, 20, to receive a driving-belt, 21, is fixed on the projecting end of the driving-shaft 16. A tightening-sheave, 22, is supported to revolve on a stud-journal projecting from a slide-bar, 23, supported to move endwise in guides fixed to the base. A bell-crank lever, 24, placed on the under side of the base, is pivoted at one end thereto, and its slotted free end has a free connection with the under edge of the slide-bar. A spring, 25, connects the short arm of the bell-crank lever with the base and operates to carry the slide forward when liberated. The inner face upper edge of the slide-bar is provided with a tappet enlargement, 26, which in the forward movement of the bar will engage the free arm of the spring-actuated detent 7 to

disengage its pawl end from the gage-wheel. The rear end portion of the slide-bar 23 is fitted on its inner in saw-tooth-ratchet form to receive a detent. A bar-detent, 27, having its outer end fitted to engage the ratchet-teeth of the slide-bar, is capable of an endwise-sliding movement in its connection with the base, and a spring, 28, connected with the slide-detent and with the base, tends to hold it engaged with the slide-bar. The inclined sides of the detent and of the teeth in the slide-bar permit a rearward movement of the bar, and the engagement of their perpendicular sides prevents its return until liberated. The inner end of the slide-detent is provided with a hook-arm, 29, which overlaps the upper face of the gage-wheel in position to receive a stop, 30, fixed to the upper face of the wheel. The stop 30 in the movement of the wheel, when carried by the tappet-pawl 14, will engage the hook-arm 29 of the slide-detent and disengage it from the slide-bar and permit it to move forward by the action of the spring 25, assisted by the action of the driving-belt on the tightening-sheave or by the independent action of either the spring or the belt. The forward movement of the slide-bar operates to slacken the driving-belt 21 and stop the rotation of the driving-sheave 20, and by means of its tappet enlargement 26 will disengage the spring-actuated detent 7, when the gage-wheel will be carried back by the action of spring 6, connecting it with its stud-journal support, until the stop 30 engages the side of the hook-arm of the slide-detent, as shown in Figs. 1 and 3, to stop the return movement of the wheel. The gage-wheel is graduated in equal divisions, corresponding to the ratchet-teeth formed in its periphery, and these graduations are numbered from 0 to 60, being the number of teeth in this instance contained in the wheel. An index-finger, 31, is fixed to the base and its index-point is in position relatively with the teeth of the wheel to indicate the position of the wheel relatively with the index-finger, in such a manner that, the wheel being turned to any position, the index-finger will indicate the number of revolutions of the driving-shaft at which it will be automatically stopped. As an instance, if the wheel is turned in the direction opposite that indicated by the arrow thereon until No. 50 is opposite the index-finger, then fifty revolutions of the shaft will disengage the slide-detent from the slide-bar and permit it to slide forward, slacken the driving-belt, and stop the driving-shaft and consequently all movements controlled by it.

To connect the driving-shaft with the movement of the prime mover to impart motion to the apparatus, the slide-bar 23 is shoved rearward in the direction indicated by the arrow thereon, which will carry with it the tightening-sheave 22 against the driving-belt 21 and cause it to embrace the driving-sheave 20, to impart motion to the apparatus.

From the foregoing it will be seen that motion imparted through the driving-belt 21 to the driving-shaft 16 will be transmitted through the lever-pawl mechanism to the ratchet-wheel 3, and by means of the pawl-bar 11 to the gage-wheel, which in its rotation will disengage the bar slide-detent 27 from the slide-bar 23 and stop the movement. In this instance I have employed a ratchet-wheel, 3, of annular or ring form; but evidently other known forms of wheels, or a segment or sector thereof, may be employed, mounted in any known manner to rotate on its axial center, and instead of the wheel a ratchet-bar, 32, as represented at Fig. 7, may be employed; or instead of either of the above a belt upon the pulley 17 may connect with any machinery requiring a rotary movement; or instead of the pulley 17 and belt a gear-wheel of any of the known varieties capable of use may be employed to connect the stop mechanism with machinery requiring rotary movement.

The device herein described is adapted for use in a seaming-machine for securing together knit fabrics, as specified in my application Serial No. 172,081, filed July 20, 1885; but I do not limit my claims herein to such use.

I claim as my invention—

1. The combination, with the cam and the pivoted lever-pawl mechanism for operating the gage-wheel, of a tappet-head made adjustable in its connection with the lever, substantially as and for the purpose set forth.

2. In combination, the ratchet-wheel, the gage-wheel, the pivoted pawl-lever carrying at one end a pawl to engage the teeth of the ratchet-wheel and at the other a pivoted pawl-bar provided with a tappet-pawl to engage the teeth of the gage-wheel, and a cam to move the pawl-lever, substantially as described, whereby the wheels are synchronously moved tooth by tooth.

3. In combination, the gage wheel, the tappet-pawl mechanism, a detent engaging the teeth of the gage-wheel, releasing mechanism operated by the gage-wheel to release the detent, and a spring to revolve the gage-wheel when the detent is released, substantially as specified.

4. In combination, the gage-wheel, the tappet-pawl mechanism, a detent engaging the teeth of the gage-wheel, releasing mechanism operated by the gage-wheel to release the detent, a spring to revolve the gage-wheel when the detent is released, and a stop to limit the movement of the gage-wheel under the action of the spring.

5. In combination, the graduated gage-wheel, the tappet-pawl mechanism, a detent engaging the teeth of the gage-wheel, releasing mechanism operated by the gage-wheel to release the detent, a spring to revolve the gage-wheel when the detent is released, a stop to limit the movement of the gage-wheel under the action of the spring, and index-fingers, substantially as specified, whereby when the gage-wheel is

set it will be freed from the detent after a predetermined number of movements and returned to the position determined by the stop.

6. The combination of a graduated gage-wheel, a tappet-pawl engaging its teeth to rotate it, a spring acting in opposition to the pawl, a detent to hold the gage-wheel against the action of the spring when the pawl is released from a tooth, a releasing mechanism to release the detent, and a stop serving to actuate the releasing mechanism and also limit the movement of the wheel by the force of the spring when the detent is released, substantially as specified.

7. The combination of a gage-wheel, mechanism to move the same tooth by tooth, a detent, a detent-releasing mechanism, and a stop carried by the wheel which serves to actuate the releasing mechanism and limit the movement of the wheel, substantially as specified.

8. The combination of a gage-wheel, mechanism for moving it, a detent, mechanism for releasing the detent, mechanism for returning or moving backward the wheel, and a stop which serves both to operate the releasing mechanism and limit the backward movement of the wheel, substantially as specified.

9. The combination, with the slide-bar carrying the tightening-sheave, of a slide-detent to engage the slide-bar, substantially as and for the purpose set forth.

10. The combination, with the slide-detent and the gage-wheel, of a stop fixed to the gage-wheel to limit the return movement of the wheel.

11. The combination, with the gage-wheel and its operating mechanism and the tightening-sheave and its slide-support, of a detent made automatic in its disengagement to stop the machine, substantially as set forth.

12. The combination, with the slide-bar carrying the tightening-sheave, of a spring-actuated lever to impart a return movement to the tightening-sheave, substantially as and for the purpose set forth.

13. The combination of the belt-carrying driving-sheave mounted on the driving-shaft, a tightening-sheave to engage the driving-belt, said sheave having a slide support, a detent to engage the slide-support of the sheave, and a gage-wheel to disengage the detent, substantially as and for the purpose set forth.

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