

Aug. 16, 1938.

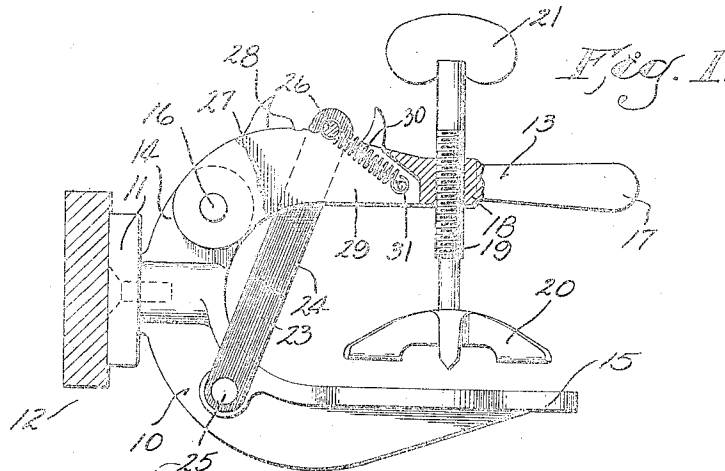
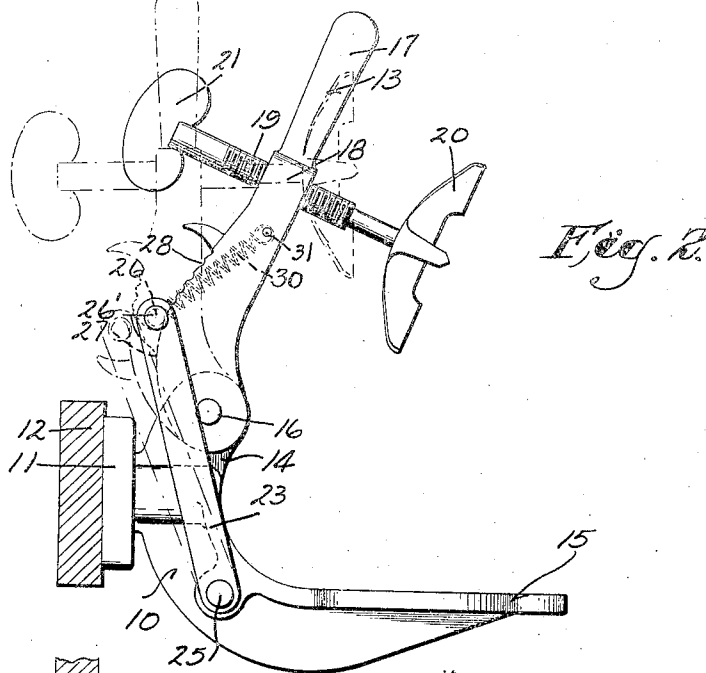
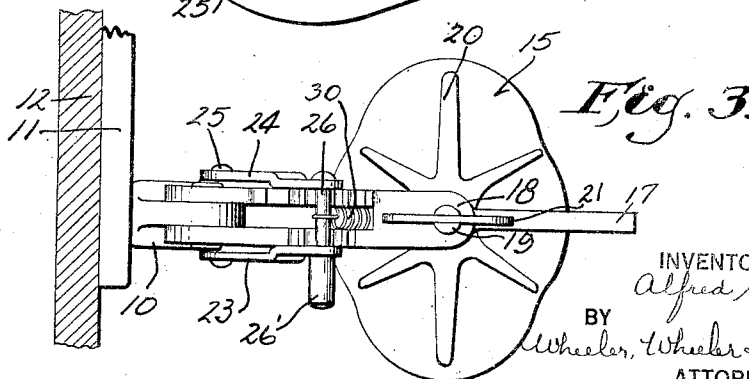
A. G. GIBBONS

2,126,767

QUICK ACTING CLAMP

Filed April 30, 1936

2 Sheets-Sheet 1



INVENTOR

Alfred G. Gibbons

BY

Wheeler, Wheeler & Wheeler

ATTORNEYS

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Fig. 4.

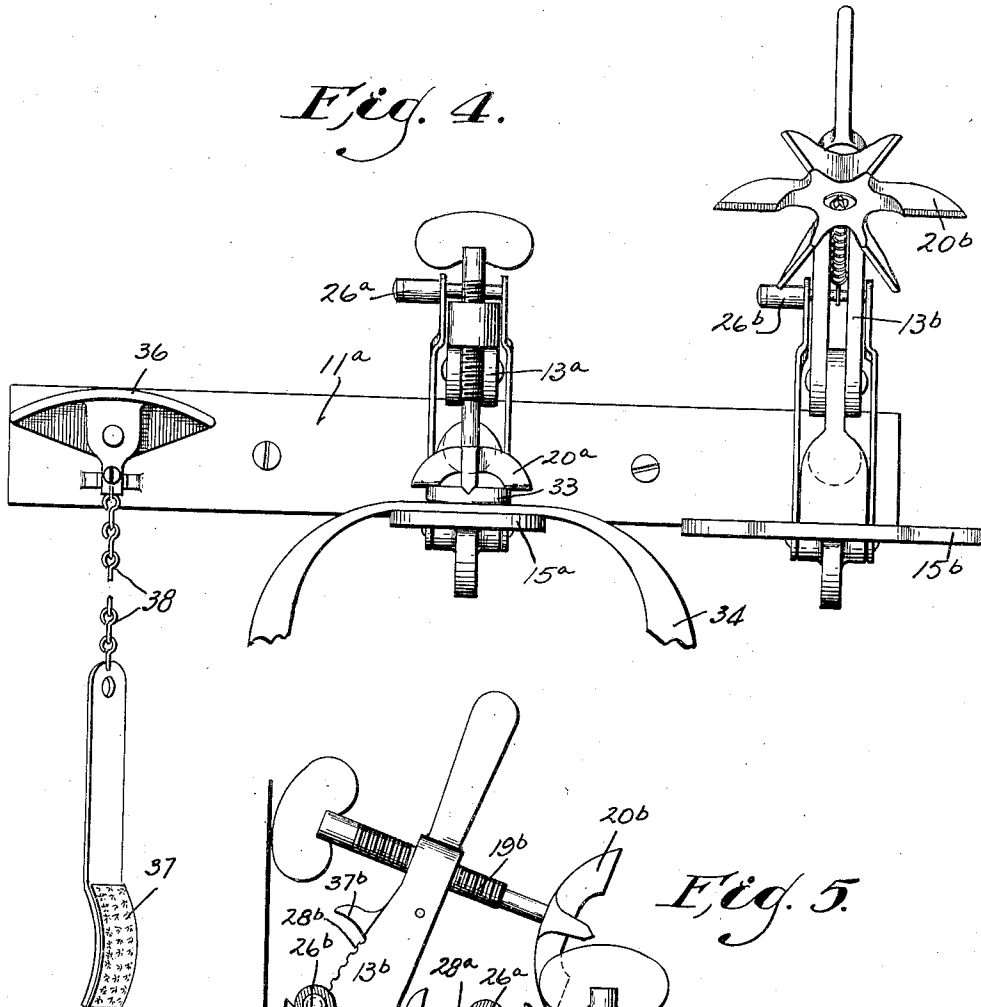
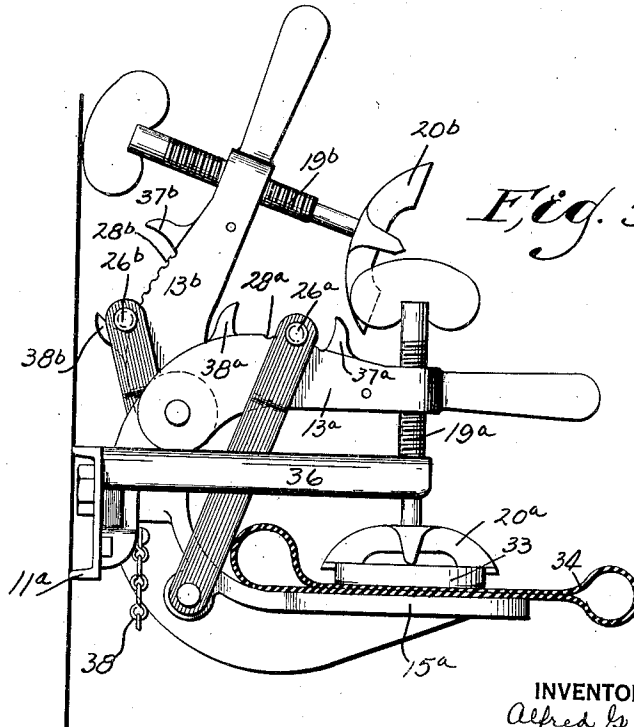


Fig. 5.



INVENTOR
Alfred S. Gibbons,
BY
Wheeler, Wheeler & Wheeler
ATTORNEYS

UNITED STATES PATENT OFFICE

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QUICK ACTING CLAMP

Alfred G. Gibbons, Waupun, Wis., assignor to The Shaler Company, Waupun, Wis., a corporation of Delaware

Application April 30, 1936, Serial No. 77,213

9 Claims. (Cl. 18—18)

My invention relates to improvements in quick acting clamps.

The object of my invention is to provide a quick acting device having the general configuration of a C clamp but having one arm of a C frame swingable and provided with a locking device resiliently automatically movable toward an extreme position for a clamping operation.

Another object of my invention is to provide a device as described above wherein the locking member is pivotally mounted upon a portion of the C frame and the swingable arm of the C frame is pivoted at a point with reference to the locking device such that a very short spring, housed substantially within the dimensions of the swingable arm, may be used to constantly urge the locking device to a full clamping position.

In the drawings:

Figure 1 is a side elevation of a vulcanizer clamp with portions of the swingable arm and the locking device cut away.

Figure 2 is a side elevation of the same clamp shown in Fig. 1 and with a swingable clamp arm in open position.

Figure 3 is a plan view of a complete vulcanizer clamp embodying my invention.

Figure 4 is a front elevation of garage vulcanizing equipment embodying my invention.

Figure 5 is an end view of the garage equipment.

Like parts are designated by the same reference characters throughout the several views.

My quick acting vulcanizer clamp as depicted in the drawings and to be described herein includes a base 10 which may be secured to a wall plate 11 if it is to be connected with a wall 12. A curved arm 13 is pivoted to an upwardly projecting arm 14 on the base and the latter is provided with a work receiving platform 15.

The arm 13 is pivoted at 16 to the fixed arm 14 and has a handle 17 and a thick portion at 18 is bored and threaded to receive a clamping screw 19 which carries an ordinary clamping spider 20 which may be assumed to have swiveled connection with the screw in accordance with common practice. A winged thumb-piece 21 is provided at the upper end of the screw 19.

A locking device for the pivoted arm 13 is provided. For this purpose I provide two side straps or links 23 and 24, pivoted to the fixed arm 14 at 25. These links embrace the sides of the swingable arm 13 as shown clearly in Fig. 3. Adjacent their extreme upper ends the side straps 23 and 24 are joined by a cross pin 26 adapted to ride upon the curved portion of the upper surface

27 of the arm 13 which serves as a cam and is provided with interlocking recesses or notches at 28 to receive the cross pin 26. Pin 26 may be provided with an extension 26' which serves as a handle.

The sides of the recesses 28 are curved and the surface of the cam shaped portion is therefore undulatory whereby the pin 26 may be readily pushed across the undulations when the pivoted arm 13 is not subject to clamping pressure. Therefore when the clamping pressure is released the linkage may be manually pushed backwardly and the arm 13 raised to an inoperative position to allow free adjustment of the work upon the lower or base platen.

A recess at 29 in the upper arm 13 provides a space within which a contractile spring 30 is housed. This spring is anchored upon a spring pin 31 and upon the locking pin 26. It will be noted that this spring is comparatively short despite the fact that the arm 13 has a considerable range of swinging motion in moving from the position shown in Fig. 2 to the position shown in Fig. 1. Throughout this entire range of movement the spring 30 is in protected relation to the arm 13. This is due to the fact that the pivot pin 16 upon which the upper arm 13 is mounted is so positioned with reference to the pivot pin 25 upon which the link arms 23 and 24 are mounted, that the range of movement of the locking pin 26 upon the cam surface 27 is comparatively small.

From the above description it will be seen that any device to be clamped under the spider 20 may be positioned upon the work receiving platform 15 while the swingable arm 13 is in upper position as shown in Fig. 2, and because the spring 30 is in constant tension, the locking pin 26 will be urged over the cam surface 27 when lowering the arm 13 to the position shown in Fig. 1. The locking pin 26 will then assume a position in one of the depressions in the undulated portion 28 where any attempted upward swinging motion of the arm 13 will be obstructed. The operator may then make threaded adjustment of the screw 19 to press the spider downwardly to clamp the work between the spider and the work receiving platform 15.

Ordinarily the work will be engaged between the base platen 15 and any suitable clamping plate adapted for use as an upper platen to be engaged by the spider 20. For repair vulcanizers it is common to employ a fuel containing pan-shaped upper platen 33 as indicated in Figure 4, a fragment of a tire tube being illustrated at 34

in that view in a position interposed between the upper and lower platens for vulcanization of a patch upon a ruptured tube.

When the work is to be released, a slight retraction of the screw 19 and its associated spider will release the engagement of the locking pin 26 with the undulated portion of the upper surface of the arm 13 whereupon manual pressure upon the handle 26' will push the linkage rearwardly and allow the arm 13 to be swung upwardly to its position of nonuse as shown in Fig. 2. In moving to the Fig. 2 position, the tension of the spring 28 will be increased and while this will tend to increase the pressure of the locking pin 26 against the curved portion of the arm, the resultant pressure upon the arm will not be great enough to cause the arm to swing downwardly for the reason that the pull of the spring upon the arm will be exerted at a greater distance from the arm pivot 16 than that at which the cross pin 26 bears upon the arm. Therefore the spring tends to retain the arm in its raised position by reason of its greater mechanical advantage at the point of its connection with the arm than at the point of its connection with locking pin 26.

With the arm 13 thus held in the raised or inoperative position, the work and the fuel containing upper platen may be removed from the base platen and another piece of work substituted. The substitute fuel containing platen will then be placed in position if a further vulcanizing operation is to be performed, whereupon the arm 13 may be swung downwardly to bring the spider into engagement with the freshly substituted platen. During this downward movement the spring will automatically pull the linkage forwardly along the arm and the locking pin 26 will automatically engage in one of the undulation recesses, thereby locking the arm 26 against upward movement preparatory to the application of clamping pressure by turning the screw 19.

In Figs. 4 and 5, corresponding parts of the mechanism illustrated in those views are designated by like reference numerals with the letter *a* added to one of the clamping mechanisms and the letter *b* added to the reference numerals applied to the other clamping mechanism in the same assembly. In these views two clamping mechanisms are associated with a single support or back bar 11*a* which also carries a work table 35 which preferably has an upper surface arcuately curved transversely of the axis of the table extending from front to rear. A cleaning or roughing tool 37 is flexibly connected with the table preferably by a chain 38. A tube or other device to be vulcanized may be placed upon the table and the surface abraded and cleaned in the vicinity of the rupture to prepare the work for a vulcanizing operation to be performed after the work has been transferred to the base platen of one of the vulcanizing mechanisms associated with said bar 11*a*.

The equipment shown in Figures 4 and 5 is particularly adapted for use in garages and other places where frequent vulcanizing operations are being performed to produce patches of varying size. Clamping equipment similar to that shown in Figures 1 and 2 may be secured to the bar 11*a*, in an intermediate position, but in order to facilitate the adjustment of the pivoted arm 13*a* and prevent the linkage cross pin 26*a* from being displaced beyond its preferred range of adjustment, said arm 13*a* will preferably be provided with a pair of upstanding spur stops 37*a* and 38*a*. When the arm 13*a* is in the inoperative

or raised position, the pin 26*a* will be in engagement with the stop 38*a*, whereas when the arm is swung downwardly a cross pin 26*a* will be prevented by the stop 37*a* from moving beyond the undulatory recesses 28*a*.

The clamping mechanism at the right hand end of the supporting bar 11*a* may be identical with that attached to the middle portion of the bar except in the matter of size. In the drawings the right hand clamping mechanism is provided with a larger base platen 15*b* and a larger spider 20*b* and the other parts will be made proportionately large and strong or otherwise adequate to resist the strains imposed upon them.

In Figs. 4 and 5 the arm 13*b* is illustrated in the raised or inoperative position, whereas the arm 13*a* is in the downwardly swung or operative position with the spider 20*a* engaging the upper pan-shaped platen 33 to clamp the tube T between it and the lower platen 15*a*.

I claim:

1. Clamping mechanism comprising the combination with a support and a base platen, of an arm pivotally connected with the support and provided with an adjustable clamping member adapted to engage devices on the base platen, and an arm holding device pivotally connected with the support and interlockingly engageable with the pivot arm at various points along its length and adapted to hold the arm unyieldingly in clamping position, said holding device also having resilient connection with the arm between it and the clamping member to automatically pull the holding device toward its operative position when the arm is swung to a clamping position.

2. Clamping mechanism comprising two pivotally connected clamping jaws, linkage connected with one of the jaws and slidably engageable with the other, and a spring adapted to urge the linkage for progressive engagement with the last mentioned jaw when it is being swung toward clamping position.

3. Clamping mechanism comprising two pivotally connected clamping jaws, linkage connected with one of the jaws and slidably engageable with the other, and a spring adapted to urge the linkage for progressive engagement with the last mentioned jaw when it is being swung toward clamping position, said spring being also adapted to hold said last mentioned jaw in a raised position when swung to a predetermined raised position of retraction from the clamping position.

4. Clamping mechanism comprising two pivotally connected clamping jaws, linkage connected with one of the jaws and slidably engageable with the other, and a spring adapted to urge the linkage for progressive engagement with the last mentioned jaw when it is being swung toward clamping position, said linkage being adapted to swing across the pivotal axis of the clamping jaws when one jaw is being swung to and from clamping and retracted positions respectively.

5. A clamping vulcanizer mechanism comprising a base platen, a superposed lever pivoted to the base platen and provided with a clamping screw and associated swiveled member, and lever holding devices automatically movable along the lever to a lever locking position as the lever approaches its clamping position.

6. A clamping vulcanizer mechanism comprising the combination of a platen carrying base, a curved lever pivoted to the base, and linkage pivoted to the base below the lever pivot and interlockingly engageable with the lever, said lever

having clamping devices adapted to be swung by the lever into and out of operative relation to a platen carried by the base, said linkage being adapted to hold the lever approximately in clamping position preparatory to adjustment of the clamping devices, while also allowing the lever to be freely swung to a position of non-use when said devices are not in clamping relation to the base.

7. A clamping vulcanizer mechanism comprising the combination of a base having a platen and an upwardly projecting arm at one side, a curved arm pivoted to the upwardly projecting arm, linkage embracing the curved arm and pivoted to the base below the pivotal connection of curved arm and adapted for interlocking engagement with the curved arm at various points along its curved portion, a resilient connection between the linkage and the curved arm adapted to urge the linkage toward the free end of the arm, and screw actuated clamping means carried by said curved arm in clamping relationship to objects on the base platen.

8. A vulcanizer clamp comprising the combination of a base having a work supporting platen, a lever pivotally connected with the base, a clamping screw having threaded connection with said lever and provided with a clamping spider adapted to be swung by said lever into and out

of engagement with work supported on said base, a set of links pivoted to the base and adapted to swing across the pivotal axis of the lever when the latter is swung from operative to inoperative position, the upper ends of said links having means for engaging the upper surface of the lever, and a spring connection between said links and the lever adapted to urge the links toward holding engagement with the lever progressively along its length when the lever is being swung in a direction to carry the clamping spider into engagement with the work.

9. Clamping mechanism comprising the combination with a support and a base platen secured thereto, of an arm pivotally connected with the support and adapted to be swung across the space above the base platen, a clamping screw having threaded connection with said arm and provided with a clamping member adapted to adjustably engage devices on the base platen, and means connected with the support and operable independently of the clamping member for engaging the pivoted arm at various points to position said adjustable clamping member with reference to the base platen preparatory to operation of the clamping screw for applying clamping pressure to the work.

ALFRED G. GIBBONS.