April 14, 1953 R. W. ROGERS 2,634,487

PIVOTED TEST CLAMP

Filed June 18, 1947

Fig. 1.

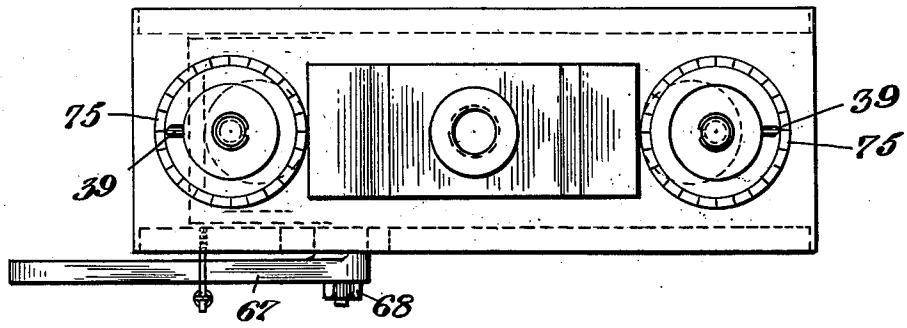


Fig. 2.

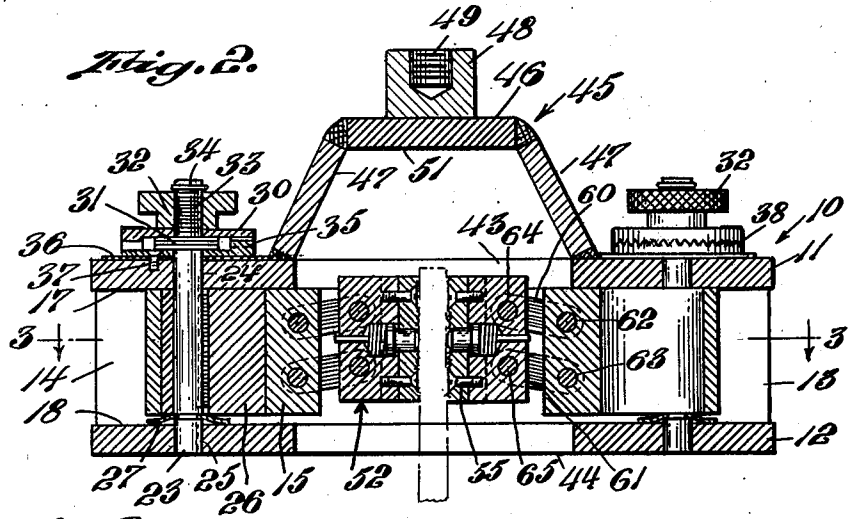


Fig. 3.

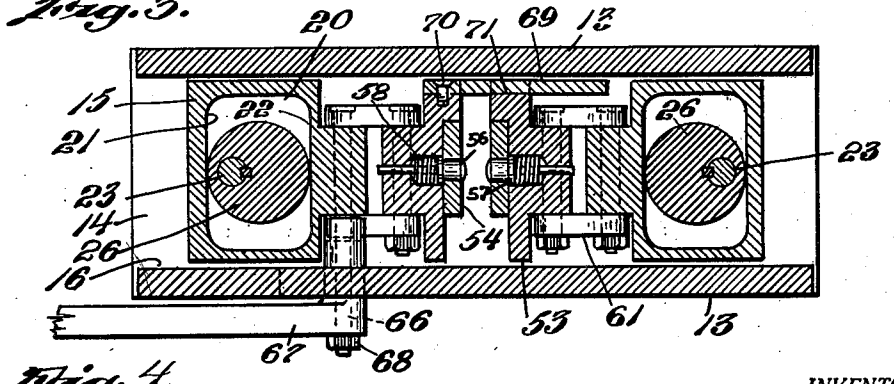
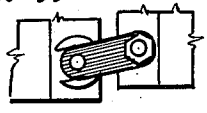


Fig. 4.



INVENTOR.
Robert W. Rogers
BY
Barlow & Barlow
ATTORNEYS.

Patented Apr. 14, 1953 2,634,487

UNITED STATES PATENT OFFICE

2,634,487

PIVOTED TEST CLAMP

Robert W. Rogers, Barrington, R. I., assignor to Scott Testers, Inc., a corporation of Rhode Island

Application June 18, 1947, Serial No. 755,531

3 Claims. (Cl. 24—248)

1

This invention relates to a clamp for gripping a specimen to be tested and more particularly to a clamp usually referred to as a toggle clamp.

Clamps of the character here referred to provide movable jaws which are each hung upon a pair of links to move in parallel relation as the jaw moves relative to the part to which the links are connected. The links cannot properly function at an angle higher than 20° to a perpendicular to the face of the jaws as the proper clamping action is not obtained. Thus, such a clamp has a very limited range as to the thickness of a specimen which may be received in the clamp. It is desirable that the links which mount the jaws be at approximately 10° to a perpendicular to the jaws in order that the best gripping action at maximum pull may be provided for. It is also desirable that the specimen clamped shall be on the center line of pull on the clamp in order that irregularities due to angular direction of pull may be minimized or eliminated.

One of the objects of this invention is to provide an adjustment for the jaws which will enable a single clamp to have a larger range of capacity for engaging work of different thicknesses.

Another object of this invention is to provide an adjustment which may be calibrated and marked so that the jaws may be preset for different thicknesses or for different types of specimens.

Another object of this invention is to provide an adjustment which may be provided very accurately by reason of the rotation of a member to position the blocks.

With these and other objects in view, the invention consists of certain novel features of construction as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings:

Fig. 1 is a top plan view of the clamp;

Fig. 2 is a central sectional view through the clamp;

Fig. 3 is a section on line 3—3 of Fig. 2;

Fig. 4 is a fragmental detailed view illustrating the connection between one of the jaws and one of the blocks of the clamp.

In proceeding with this invention, I provide a body of a general frame structure which has guide ways formed in it for directing the movement of a pair of blocks toward and from each other. Each of these blocks provides an anchor or mounting means for one of the gripping jaws for the work, the jaws being pivoted to the block by two pairs of parallelly arranged links. The arrangement is such that, when the work is gripped by the jaws, the links will be at an angle to a perpendicular to the face of the jaws so that, as pull occurs on the jaws, the jaws will tend to

2

swing the links and will move toward each other into firmer gripping relation. The blocks are adjustably mounted in the body so a different spaced relation of the jaws may occur, the adjustment being by means of rotary members, such as an eccentric, which will extend through the block with the eccentric working in a recess in the block for engaging the opposite walls of the recess to move the block in its guide for the accommodation of different thicknesses of specimens and a calibration is provided so that at different positions of rotation specimens of different thicknesses may be noted.

Each of the jaws may be provided with an ejecting pin, and the jaws may be equipped with a means so that through a single handle both jaws are moved together by one hand of the operator. Guides for positioning the work may be conveniently positioned in the clamp.

With reference to the drawings, the body of the clamp is designated generally 10 and comprises a pair of plates 11 and 12 which are supported in spaced relation by means of spacing members 13 placed along the longitudinal edges of the plates 11 and 12 and provide with the plates 11 and 12 guides 14 for directing the movement of blocks 15 in the body, that is, the inner surfaces 16 of the members 13 will form back and front guiding surfaces, while the inner surface 17 of the plate 11 and the inner surface 18 of the plate 12 will provide top and bottom guiding surfaces.

Each of the blocks 15 has a vertically extending recess 20 providing opposite abutting walls 21 and 22. A shaft 23 has a bearing 24 in the plate 11 and a bearing 25 in the plate 12, and on this shaft there is an eccentric 26 which engages the opposite surfaces 21 and 22 of the recess so that as the shaft 23 is rotated the block 15 will be moved inwardly or outwardly of the framework or body 10. Springs 27 support the blocks 15 in a position raised above the lower plate 12, while the blocks slide in the guide ways 14 which direct their in and out movement. A disk 30 is keyed to the shaft 23 and may move vertically along this shaft and is pressed upwardly by a spring 31 when released by the thumb nut 32 which has threaded engagement as at 33 with the shaft 23. A spring ring 34 prevents this nut from being accidentally lifted too high on the shaft.

A second disk 35 is positioned beneath the disk 30 and beneath this there is a dial or graduated plate 36. Both the disk 35 and the dial plate 36 are secured to the plate 11 by means of screws 37. The upper annular edge of the plate 35 and the lower annular edge of the plate 30 are provided with serrations, as shown at 38 in Fig. 2, so that when these disks are moved together by reason of the thumb nut 32 the shaft

is locked in position. Thus, for adjustment of the block 15 it is necessary to loosen the nut 32 which permits the spring to raise the disk 30 along its key way, thus permitting the shaft to be turned until a pointer 39 registers with the proper indication on the graduated dial 36. Then the thumb nut will move the disk into a position in engagement with the fixed serrated disk below it so as to lock it in place.

The plates 11 and 12 will have central openings 43 and 44 in alignment for positioning the specimen in the clamp; and, above the opening 23, there will be provided an attaching bridge 45 comprising a horizontal plate 46 and two inclined plates 47 spacing the plate 46 a distance above the plate 11. A boss 48 is provided on this plate 46 having a threaded socket 49 for the reception of an attaching rod upon which pull, or resistance to pull on the other end of the specimen may be applied. The under surface 51 of this bridge may serve as a means for limiting or guiding one end of the specimen into a desired position between the clamping jaws.

The clamping jaws are designated 52 and consist of a T-block 53 having a separable face member 54 with serrations thereon which may be attached by means of screws 55 to the block 53. A spring-pressed pin 56 is slidable in the block and facing member and is pressed by a spring 58 outwardly and is limited in its movement by the facing member 54 engaging the shoulder formed by the head 57 on the pin 56. Each of these jaws 52 is attached to one of the blocks 15 by links 60 and 61 arranged in parallel relation and pivoted as at 62 and 63 to the block and as at 64 and 65 to the jaw. These parallelly arranged links are provided both at the front and back edge of the jaws and blocks.

One of the pivots comprises a shaft 66 (see Fig. 3) which passes through one of the blocks and has its link, such as 61, fixed to the shaft. This shaft is also provided with a lever 67 acting as a handle which is secured in place on the shaft by a nut 68 so that movement of this lever to different positions will serve to swing the link 61 and by reason of the connections above mentioned also the link 60 to move the jaw toward and from a center line through the clamp.

In order that both jaws may be moved at the same time, I provide a bar 69 secured to the jaw which is equipped with the handle as by means of a screw 70 which bar is slidably related to the other jaw in guides 71 so that as one jaw is raised the other jaw will also be raised and thus will swing toward and from the center of the clamp a like amount. This bar also may be a means for limiting the insertion of the work between the jaws by acting as a back guide in instances where desired.

From the above, it will be apparent that I have provided a pair of jaws which will remain centralized with reference to the pull rod in socket 49 at all times if the blocks which carry them are once adjusted to equal positions from the center line.

The blocks may be adjusted in small increments by the eccentrics and held there by reason of the serrations in the disks which engage face-to-face. In fact, the adjustment may be had between positive centralizing limits by adjusting one block while leaving the other block fixed although the center of pull will be slightly off in such cases.

This is a feature which is particularly useful in testing a sample in which the two gripped faces have different surface characteristics of compressibility and which by this off-center adjustment enables the sample to be kept centralized. Each block may be accurately set by its dial 75 moving under pointer 39 and will be held in position by the serrations beneath the plate.

When it is desired to release the jaws from gripping position which they will assume as the work is pulled, it is merely necessary to move the handle 67 by one hand for lifting the jaws and releasing the work. As the work is released, the spring pins will eject the work from the jaws.

When used in a testing machine, two of these clamps, one upside down with the plate 12 at the top as here shown, are utilized to grip the specimen.

I claim:

1. In a clamp for gripping a specimen for testing or the like having a body, a pair of hollow blocks slidably guided in said body, a pair of gripping jaws, links movably mounting said jaws with reference to said blocks, means for adjusting the position of at least one of said blocks comprising a rotatable shaft extending through the said one block, means carried by said shaft and extending into engagement with the inner walls of said one block for moving the same towards or from said jaws upon turning said shaft, an abutment carried by said body, an abutment slidably mounted on said shaft and movable into engagement with the first said abutment for locking said shaft against turning, and resilient means biasing said second abutment for movement away from said first abutment.

2. In a clamp as set forth in claim 1 wherein said first abutment is a serrated disk fixed on said body and said second abutment is a similar disk slidably mounted on said shaft.

3. In a clamp as set forth in claim 1 further comprising a pointer carried by the second said abutment movable over a graduated disk for indicating the adjustable position of said one block.

ROBERT W. ROGERS.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
273,195	Utter	Feb. 27, 1883
600,535	Homan	Mar. 15, 1898
675,047	MacGarvey	May 28, 1901
749,732	Hanson	Jan. 19, 1904
824,000	Elmer	June 19, 1906
920,820	Brown	May 4, 1909
1,051,585	Hiniker	Jan. 28, 1913
1,127,066	Minkler	Feb. 2, 1915
1,292,930	Unger	Jan. 28, 1919
1,566,006	Hiniker	Dec. 15, 1925
1,692,398	Weaver	Nov. 20, 1928
1,762,037	Taylor	June 3, 1930
1,837,990	Otis	Dec. 22, 1931
1,981,304	Brandt	Nov. 20, 1934
1,982,482	Rhodes	Nov. 27, 1934
2,114,305	Johansen	Apr. 19, 1938
2,173,079	Moody	Sept. 12, 1939
2,417,478	Flowers	Mar. 18, 1947
2,462,536	Muter	Feb. 22, 1949

FOREIGN PATENTS

Number	Country	Date
285,389	Germany	Apr. 24, 1914
482,984	Great Britain	Apr. 8, 1938