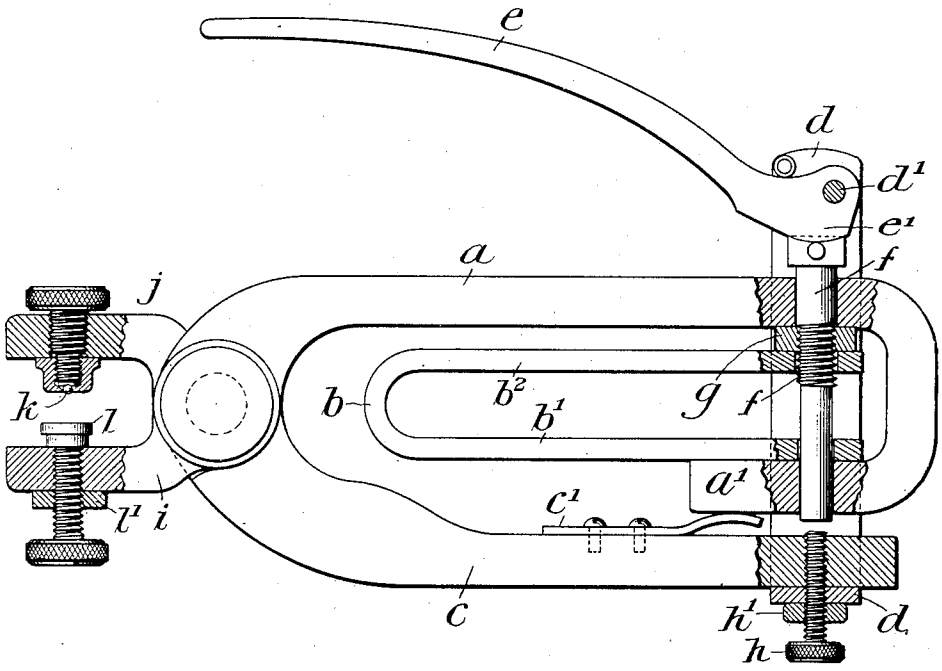
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TOOL FOR TESTING THE HARDNESS OF MATERIALS.

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TOOL FOR TESTING THE HARDNESS OF MATERIALS.

1,376,413. Specification of Letters Patent. Patented May 3, 1921.

Application filed August 21, 1920. Serial No. 405,199.

To all whom it may concern:

Be it known that we, FREDERICK CHARLES FAIRHOLME, WILLIAM HERBERT HATFIELD, and GEORGE STANFIELD, all subjects of the King of England, residing in Sheffield, in the county of York, England, have invented a new and useful Tool for Testing the Hardness of Materials, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification, in which the figure is a side elevation, partially in section, of a tool embodying the present invention.

The present invention relates to tools for testing the hardness of materials and more particularly to a portable tool preferably in the form of tongs or pincers for testing the hardness of metals by the Brinnell system. As shown in the drawing, our tool or device preferably is of the above type in which a relatively high pressure is developed between the impression ball and the anvil by means of a helical U shaped or other suitable spring fitted between the handles of the device, and having manually operable means for bringing the spring into action to force the work engaging jaws together.

Referring to the embodiment of the invention illustrated in the drawing, we form one of the handles a of the pincer-like device with an inwardly curved bow a' to the short free end of which we secure one member b' of the spring b, which thus lies in the gap between the two handles a and c, the bow end of the spring b being toward the pivot of the device. At or near the end of the other or straight handle c of the device, we secure a U strap or bridle d in such a manner that it embraces both handles a and c, and projects beyond the outer edge of the bow-ended side a. Pivoted within this projecting end of the bridle d, is a hand lever e with a cam shaped end e', adapted to bear upon the head of a pin or spindle f passing through the bow-ended handle a, through the two members b^2 and b' of the spring b and into a guide hole in the free end of the bow a'. The pin f is threaded for the whole or part of its length and a nut g is placed upon such threaded portion, so that it engages the outer face of the free member b^2 of the spring b.

Through the fast end of the bridle d, we place a screwed limiting stop h, with a lock nut h', and on the inner side of the straight handle c, we secure a flat strip or other suitable form of spring c', which engages with the bow end a' of the handle a, and is for the purpose of separating the handles a and c and consequently also the jaws i and j of the device after each operation.

Of the two jaws, one j is fitted with a hardened impression ball k characteristic of Brinnell machines and the other i is fitted with a screw adjusted anvil l of suitable shape, with a locking nut l'.

The spring b before referred to, has its members b' and b^2 under a compression of any predetermined intensity when placed in position, and when the device is at rest, the two oppositely acting forces in the spring are balanced or neutralized by pressing against the two sides a and a' of the bow-ended handle, in one case the nut g on the sliding pin f is interposed between the spring and the side of the handle a.

The operation of our improved device is as follows:

The article to be tested, such as a strip of cutlery steel, is firmly held between the impression ball k and the anvil l in the jaws. The hand lever e is then depressed, the cam end e' of which causes a movement of the sliding pin or spindle f, the nut g on which bears against the free member b^2 of the spring b, and thus relieves the pressure of that member on the inner face of the bow-ended handle a. The result of this, is that the energy in that particular member of the spring then acts through the nut g, pin f and cam end e' of the hand lever e, on to the pivot pin d' in the bridle d, thus tending to push the latter outward, and in so doing, it of course moves the handle c to which the bridle d is attached, and in consequence also, the jaw j connected to such handle is moved inward toward its fellow.

Simultaneously, with the before described action, the effect of removing the pressure of the free member b^2 of the spring b from the inner face of bow-ended handle a is to allow the other member b' of the spring b to exert a predominating influence on the free end a' of the bow of the handle a, thus causing the said handle a to move inward, with a consequent movement of the connected jaw i, which is thus moved toward its fellow.

The result of the two jaws *i* and *j* moving toward each other under the impelling influence of the powerful spring *b*, is to cause the test piece to be tightly nipped between the impression ball *k* and the anvil *l*, and since the power of the spring is known, the relative hardness of the material can be ascertained from the size of the indentation of the test piece resulting from the pressure of said spring.

It will be observed that the pressure exerted on the hand lever *e*, to relieve the spring *b*, does not in any way effect the pressure exerted between the jaws *j* and *i*.

It is to be understood that the present invention is not limited to its preferred embodiment as above described, but may be otherwise embodied within the scope of the following claims.

We claim:

1. A tool for testing the hardness of materials, comprising work engaging jaws, a spring, means for normally holding the spring under strain and manually operable means for causing the force of the spring to be applied to the jaws and thereby force them toward each other with spring pressure, substantially as described.

2. A tool for testing the hardness of materials, comprising pivoted work engaging jaws and their handles, a spring mounted between the handles, and relatively stationary abutments normally holding the spring under strain and manually operable means for causing the force of the spring to be applied to the handles and thereby force the jaws toward each other with spring pressure, substantially as described.

3. A tool for testing the hardness of materials, comprising pivoted work engaging jaws and their handles, a spring, relatively stationary abutments against which the force of the spring is normally expended and manually operable means for transferring the force of the spring to the handles to thereby force the jaws toward each other with spring pressure, substantially as described.

4. A tool for testing the hardness of materials, comprising pivoted work engaging jaws and their handles, one of which handles has a bowed end, a spring mounted under compression within said bowed end and normally exerting its force against the opposite sides of the bow, a manually operable means for transferring the force of the spring from the bow to the other handle to force the jaws toward each other with spring pressure, substantially as described.

5. A tool for testing the hardness of materials, comprising pivoted work engaging jaws and their handles, one of which handles has a bowed end and a spring mounted under compression within the said bowed end and normally exerting its force against the opposite sides of the bow and manually operable means for transferring the force of the spring from the bow to the other handle comprising a bridle fitting over the handles, a manually operable cam ended lever pivoted in the bridle and a pin passing through the bowed handle and the spring and having a nut which bears upon one end of the spring, substantially as described.

6. A tool for testing the hardness of materials, comprising pivoted work engaging jaws and their handles, one of which handles has a bowed end, a spring mounted under compression within the said bowed end and normally exerting its force against the opposite sides of the bow, a manually operable means for transferring the force of the spring to the other handle, comprising a bridle embracing the ends of the handles, a pin extending through the bowed handle and the spring, a cam ended lever pivoted on the bridle and engaging one end of the pin and a nut threaded on the pin and engaging one end of the spring, substantially as described.

In testimony whereof, we have hereunto set our hands.

FREDERICK C. FAIRHOLME.
WILLIAM HERBERT HATFIELD.
GEORGE STANFIELD.