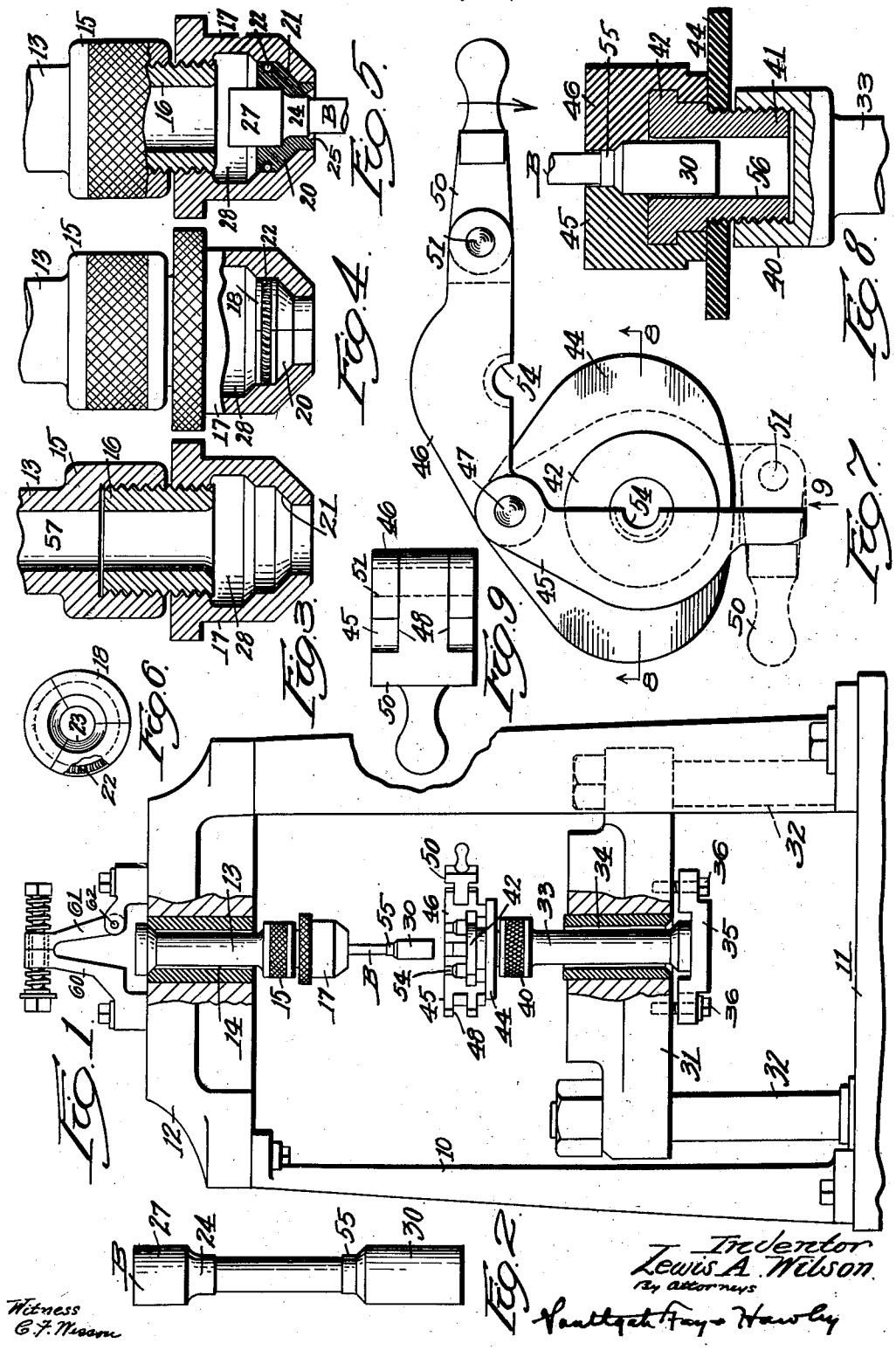
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MACHINE FOR TESTING METAL RODS

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MACHINE FOR TESTING METAL RODS.

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This invention relates to a machine for determining the tensile strength of metal rods or test bars, such machines being most commonly used in testing samples of steel taken from shafting or forgings or from other products in the process of manufacturing. These samples are usually taken from successive lots of material passing through a plant and are tested in considerable numbers. Consequently quick and convenient insertion and removal of the test bars becomes essential, and it is an important object of my invention to provide improved devices for engaging and holding such test bars while under tension in the machine.

My invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

A preferred form of the invention is shown in the drawings in which

Fig. 1 is a front elevation, partly in section, of a testing machine embodying my improvements;

Fig. 2 is a front elevation of a standard test bar;

Fig. 3 is a sectional view of certain parts of the upper chuck for holding the bars;

Fig. 4 is a front elevation of the chuck, partially broken away to show the clamping jaws;

Fig. 5 is a sectional front elevation of the chuck;

Fig. 6 is a plan view of the chuck jaws, partially broken away to show the retaining spring;

Fig. 7 is a plan view of the lower clamp or chuck;

Fig. 8 is a sectional elevation, taken along the line 8—8 in Fig. 7; and

Fig. 9 is a side elevation, taken in the direction of the arrow 9 in Fig. 7.

Referring to the drawings, I have shown a testing machine comprising frame members 10 mounted on a base 11 and supporting an upper cross bar or head 12. A supporting member 13 is loosely mounted in an opening 14 in the head 12. The member 13 is enlarged at its lower end as indicated at 15 (Fig. 3) and is internally threaded to receive the upper end of a threaded sleeve 16.

A chuck casing 17 is threaded on the lower end of the sleeve 16 and is held in position thereby. A plurality of chuck jaws 18 are mounted in the contracted lower end portion of the casing 17, these jaws being provided with inclined portions 20 (Fig. 5) cooperating with similarly inclined surfaces 21 on the inside of the casing 17. The jaws are preferably made in three or more parts, as indicated in Fig. 6, and are grooved to receive a circumferential spring 22, by which they are held yieldingly in assembled relation.

The assembled jaws are provided with an inner opening 23 to receive the neck 24 of the test bar B, and the clutch jaws are beveled adjacent the central opening, as indicated at 25 (Fig. 5) to facilitate insertion of the test bar. When the bar is pushed upward into the chuck casing 17, the jaws 18 are also pushed upward, and the head 27 of the test bar, engaging the beveled edges 25, separates the jaws 18 as soon as they reach the upper and wider portion 28 of the casing 17. The head 27 of the bar then passes above the jaws, which are immediately contracted by the spring 22 and fall back into their normal position, retaining the head 27 of the test bar above the jaws. The casing 17 and jaws 18 have cooperating inclined surfaces which assist in contracting the jaws and they also have cooperating cylindrical surfaces which prevent outward separation of the jaws when in operative position.

The test bar is provided with a similar lower head 30 which is adapted to be grasped by the lower clutch to be now described. The movable or lower head 31 of the machine may be mounted on posts or columns 32, connected to the moving element of a hydraulic cylinder or other convenient means of operation, not shown.

A supporting member 33 is loosely mounted in an opening 34 in the head 31 and is held in raised position by a loose cap 35 secured to the lower side of the head 31 by bolts 36. The member 33 is enlarged at

its upper end, as indicated at 40 in Fig. 8, and is recessed and threaded to receive the lower end of a bushing 41 having a flanged or enlarged upper end portion 42.

A plate 44 is also threaded on the bushing 41 and supports a pair of clamping members 45 and 46, mounted on a common pivot 47 supported by the plate 44. The clamping member 45 is notched or recessed at its free end, as indicated at 48 in Fig. 9, and the clamping member 46 is provided with a latch 50 (Fig. 7) pivoted at 51 to the clamping member 46. When the parts are in locking position, the latch may be swung around to the position indicated in dotted lines in Fig. 7, thus preventing separation of the parts when under tension.

The members 45 and 46 are provided with recesses 54 adapted to fit over the lower neck 55 and lower head 30 of the test bar B. The head 30 is loosely centered in the axial opening 56 of the bushing 42, and the members 45 and 46 are recessed to clamp around the head 42 of the bushing 41, being thus held firmly against upward tension.

When a test bar is broken, the upper end of the test bar commonly flies upward with considerable force through the axial opening 57 of the supporting member 13 and a stop device is accordingly provided on the upper head 12, comprising a fixed arm 60 and a second arm 61 pivoted at 62 and yieldingly connected to the arm 60. When the upper head 27 of the test bar B flies upward through the member 13 it becomes wedged between the arms 60 and 61, which yield to receive the head 27 and then clamp thereon, retaining the head in convenient position for removal.

I have thus described the details of construction of my improved machine, and the uses and advantages thereof will be readily apparent.

In order to use the machine, a test bar is simply pushed upward against the beveled jaws 25 of the upper clutch, which jaws rise and separate to permit insertion of the bar and immediately drop back into operative position as soon as the bar is inserted. The lower or movable head 31 is then raised to operative position, and the swinging jaws 45 and 46 are advanced to holding position and are locked in such position by the latch 50.

The lower movable head 31 is then caused to move downward by hydraulic or other pressure, exerting strong tension upon the test bar B and eventually breaking the same in a well known manner. The upper portion of the test bar flies upward through the member 13 and is caught by the stop arms above the head 12, while the lower part of the bar remains clamped by the jaws 45 and 46 until manually released therefrom.

By this construction a large number of bars may be quickly inserted and tested with very slight delay for removing old bars and inserting new bars.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed otherwise than as set forth in the claims, but what I claim is:

1. A testing machine having fixed and movable members and having quick-acting clamping devices mounted on said members, one of said devices having a plurality of clamping jaws and a supporting structure therefor, said jaws being automatically and yieldingly movable to engage an inserted test bar, and the other device having a second supporting structure and having a plurality of gripping members associated therewith and manually movable to grip and hold the opposite end of said test bar.

2. A testing machine having fixed and movable members and having quick-acting clamping devices mounted on said members, one of said devices comprising a casing, having a central recess with contracted lower end portion, a plurality of assembled segmental clamping jaws mounted therein for yielding movement longitudinally of said recess, said assembled jaws having a central opening with a bevelled lower end portion, and said jaws having an encircling spring yieldingly retaining said jaws in clamping position.

3. The combination in a testing machine as set forth in claim 2, in which the jaws are peripherially grooved to receive said spring and in which the spring has the form of a continuous annular coil.

4. The combination in a testing machine as set forth in claim 2, in which the contracted lower end portion of said recess has a downwardly and inwardly inclined bearing surface, and in which said jaws have co-operating inclined bearing surfaces.

5. The combination in a testing machine as set forth in claim 2, in which the contracted lower end portion of said recess has a downwardly and inwardly inclined bearing surface, and in which said jaws have co-operating inclined bearing surfaces, said casing and jaws having also co-acting cylindrical portions preventing outward separating movement of said jaws when in operative position.

6. A testing machine having fixed and movable members and having quick-acting clamping devices mounted on said members, one of said devices comprising a flanged bushing and a pair of clamping arms associated therewith, said arms being movable toward and away from each other and having portions effective when said arms are moved together to engage and hold one end

of the test bar and having other portions effective when said arms are moved together to engage under the flange of said bushing, thereby connecting said test bar to said bushing and preventing movement of said clamping arms with said test bar when said bar is tensioned.

7. The combination in a testing machine as set forth in claim 6, in which one of said clamping arms is provided with a latch engaging the other arm to lock said arms in clamping relation.

In testimony whereof I have hereunto affixed my signature.

LEWIS A. WILSON.