Dec. 25, 1945. F. A. MELZER 2,391,435

GRIP MECHANISM FOR TESTING MACHINES

Filed April 20, 1944 2 Sheets-Sheet 1

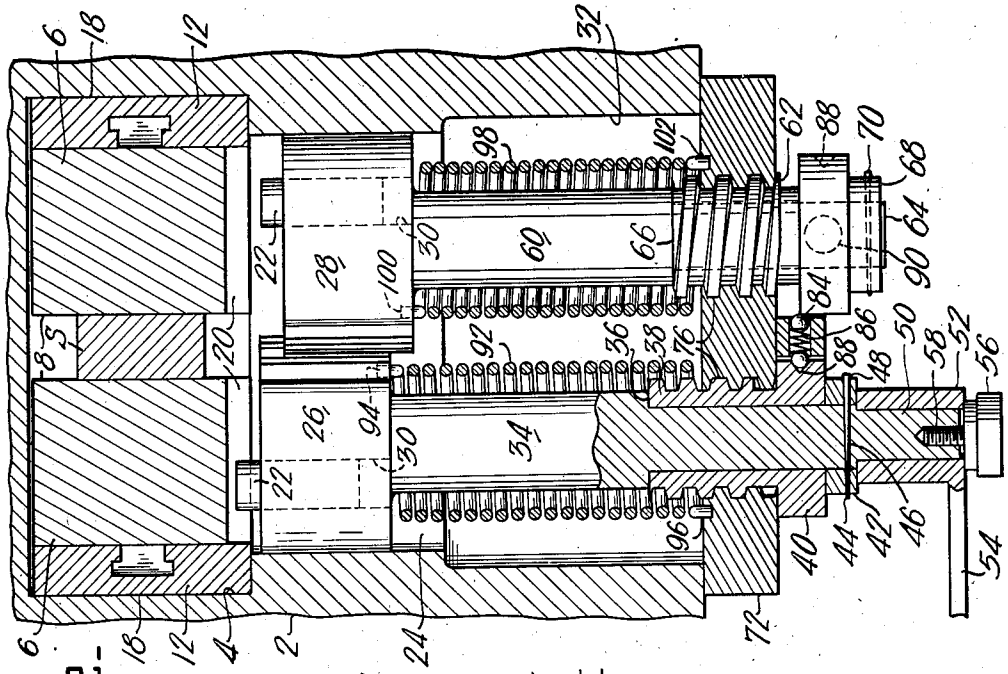


Fig. 2.

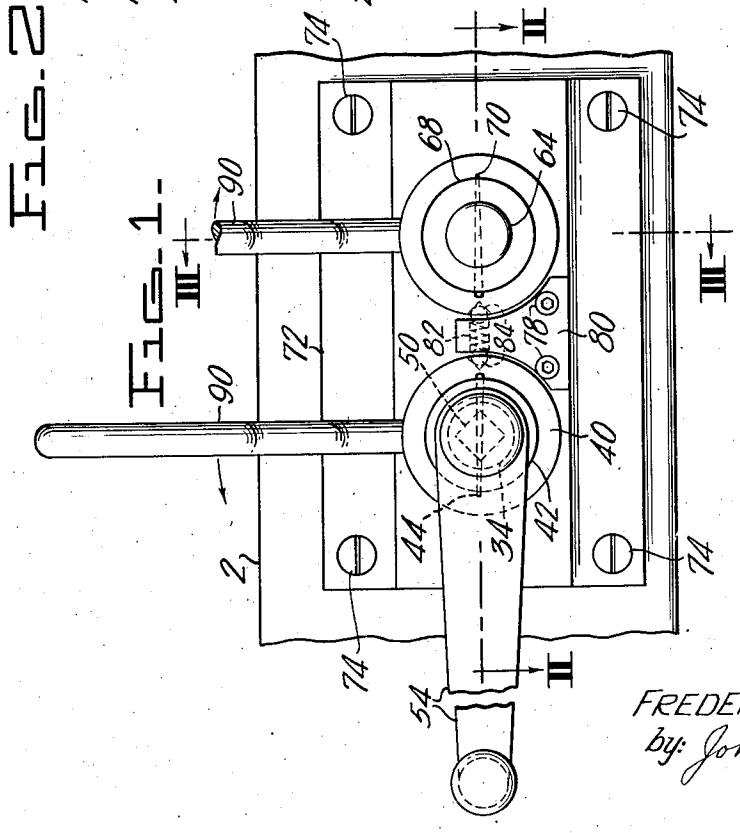


Fig. 1.

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FIG. 4.

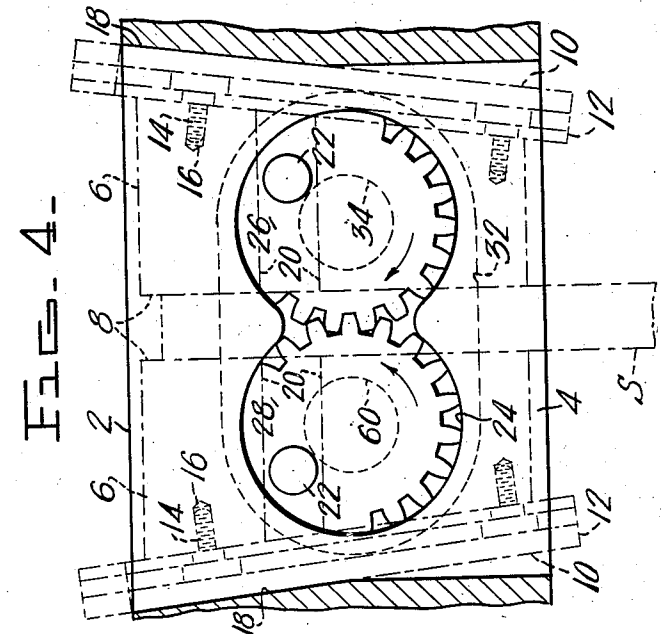
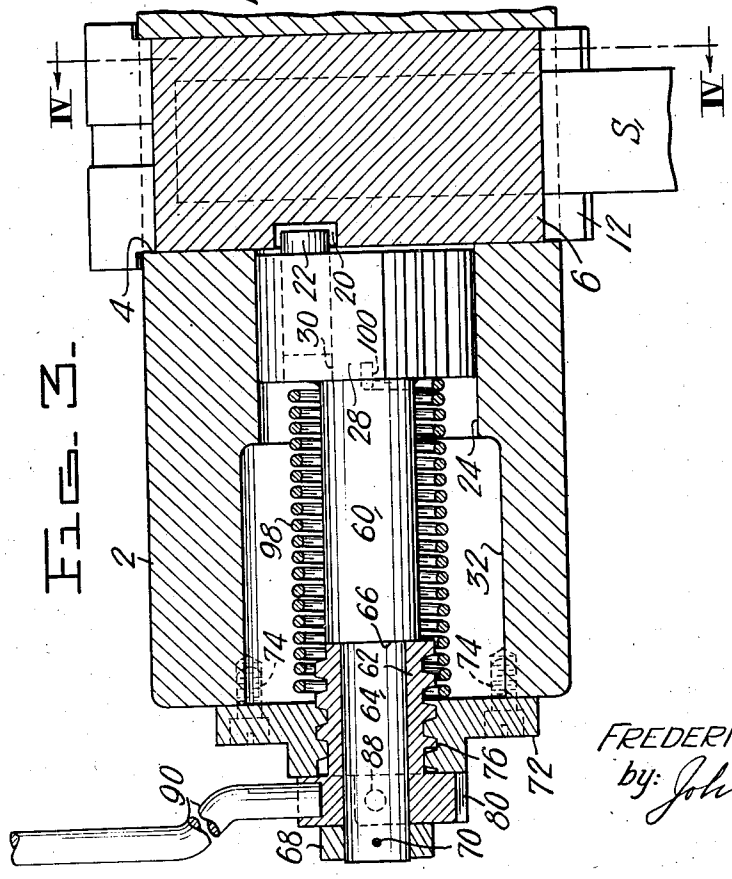


FIG. 3.



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Patented Dec. 25, 1945 2,391,435

UNITED STATES PATENT OFFICE

2,391,435

GRIP MECHANISM FOR TESTING MACHINES

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Application April 20, 1944, Serial No. 531,939

6 Claims. (Cl. 24—263)

This invention relates to grip mechanism for testing machines and more particularly to mechanism for operating wedge type grips in a tensile testing machine. With the grip mechanism formerly used, the reactions were so violent when the test specimen was broken that the specimen and grip plates were thrown from the machine and even the fastener pins and the handles of the gripping mechanism sheared off after a number of test specimens had been broken.

It is an object of this invention to provide a device for preventing the grips from being thrown from the machine.

This and other objects will be more apparent after referring to the following specification and attached drawings, in which:

Figure 1 is a front elevation of the invention;

Figure 2 is a sectional view on the line II—II of Figure 1 with one of the gear segments shown in retracted position;

Figure 3 is a sectional view on the line III—III of Figure 1; and

Figure 4 is a sectional view on the line IV—IV of Figure 3 with the grips and liners removed, the position of the removed parts being shown in broken lines for the purpose of clarity.

Referring more particularly to the drawings, the reference numeral 2 indicates the top crosshead of a tensile testing machine. The crosshead is provided with a pocket 4 for receiving the grips 6, each of which is provided with a gripping surface 8 for gripping the test specimen S. The side of each grip 6 opposite the gripping surface 8 is provided with a wedge surface 10, which, as shown, is made from a liner 12 fastened to the grip 6 by means of cap screws 14 threaded into tapped holes 16. The pocket 4 is provided with wedge surfaces 18 which engage the surfaces 10. Each of the grips 6 is provided with a slot 20 for receiving the end of a grip pin 22. Communicating with the pocket 4 is a bearing surface 24 in which is mounted meshing gear segments 26 and 28, each of which supports one of the pins 22 in holes 30. A passageway 32 leads from the bearing 24 to the outside of the cross-head 2. The gear 26 is provided with a shaft 34 which extends through the opening 32 to a point outside the cross-head 2. A shoulder 36 is provided on the shaft 34 and a screw 38, having an enlarged head 40, is received on the reduced portion of the shaft 34. The screw 38 is held against the shoulder 36 by a collar 42 which bears against the head 40 and is held in place by means of the tapered pin 44, the pin passing through a hole 46 in the shaft 34 and holes 48 in the collar 42. The shaft 34 is provided with a square portion 50 on the outboard side of the collar 42. The hub 52 of a handle 54 is pressed onto this reduced portion and held in place thereon by means of the lock screw 56, which is threaded into the hole 58 in the shaft 34. The gear 28 is provided with a shaft 60 similar to shaft 34, but without the square portion 50. A screw 62 is held in place on the reduced portion 64 of the shaft 60 between the shoulder 66 and the collar 68 which is held in place on the shaft 60 by means of tapered pin 70. The opening 32 is covered by a plate 72 which is fastened to the cross-head 2 by means of screws 74. The plate 72 is provided with two internally threaded openings 76 which act as stationary nuts to receive the screws 38 and 62. Fastened to the plate 72 by means of screws 78 is a latch housing 80 which is provided with an opening 82 in which is received two balls 84 with a spring 86 therebetween. The heads of the screws 38 and 62 are provided with notches 88 for receiving the balls 84 and a handle 90 is fastened to the head of each screw. A spring 92 surrounds the shaft 34 and has one end received in a notch 94 in the gear 26 and the other end received in a notch 96 in the plate 72. A similar spring 98 surrounds the shaft 60 and has one end received in a notch 100 in the gear 28 and the other end received in the notch 102 in the plate 72.

The operation of the device is as follows:

In operation, the handles 90 are swung down right and left rotating the screws 38 and 62 to withdraw the gear segments 26 and 28 into the retracted position with pins 22 out of the slots 20, this permitting the grips 6 to be removed or replaced in the pocket 4. In positioning the grips 6, the pins 22 engage the slots 20 when the handles 90 are swung upwardly to rotate the screws 38 and 62 in their respective threaded openings until the balls 84 spring into the notches 88 and lock the mechanism in the inner position. With the pins 22 received in the slots 20, the handle 54 is rotated, this causing the gears 26 and 28 to rotate in unison and the movement of the pins 22 in the slots 20 causes the grips 6 to move downwardly and inwardly until the specimen S is held firmly between the surfaces 8. In assembling this mechanism, spring 92 is twisted to provide enough torsion to induce the gear segment 26 to rotate counter-clockwise (Figure 4) thus causing grip pin 22 to rise to the high position and by its engagement with the slot 20 suspend the grips 6 in the open position. Spring 98 will be assembled and function exactly opposite to spring 92. With the mechanism in the open position the test

specimen S is inserted between the grips **6**. Then to initiate the gripping action, the handle **54** (Figure 1) is rotated counter-clockwise which causes the pins **22** to lower the grips **6** which by their wedging action close in and grip the specimen S. After the lower part of the specimen is gripped in like manner, tension is applied to the test piece. When the test piece breaks, the reaction causes the cross-head **2** to rebound and tends to throw the grips **6** and the broken test piece from the machine. The grips **6**, however, are stopped by pins **22** in slots **20** at the top of the arc of travel of the pins **22**, this preventing them from being thrown from the pocket **4**. The screws **38** and **62** together with the engagement of latch balls **84** in slots **88** hold the pins **22** positively in the forward or inner position in engagement with the slots **20**.

While one embodiment of the invention has been shown and described, it will be apparent to one skilled in the art, that other adaptations and modifications may be made without departing from the scope of the following claims.

I claim:

1. Grip mechanism for the test piece in a tensile testing machine comprising a pair of opposed grips, a gripping surface on each grip, one of said grips having a wedge surface on the side opposite said gripping surface, a corresponding wedge surface on said machine, said last named grip having a slot therein, a reciprocating pin mounted for movement into and out of said slot, a shaft for supporting said pin, means for rotating said shaft to cause relative movement of said grips, a screw mounted on said shaft, a stationary nut in engagement with said screw and means for rotating said screw to move said pin into and out of said slot.

2. Grip mechanism for the test piece in a tensile testing machine comprising a pair of opposed grips, a gripping surface on each grip, one of said grips having a wedge surface on the side opposite said gripping surface, a corresponding wedge surface on said machine, said last named grip having a slot therein, a reciprocating pin mounted for movement into and out of said slot, a shaft for supporting said pin, means for rotating said shaft to cause relative movement of said grips, a screw mounted on said shaft, a stationary nut in engagement with said screw, means for rotating said screw to move said pin into and out of said slot, and means for locking said screw against longitudinal movement.

3. Grip mechanism for the test piece in a tensile testing machine comprising a pair of opposed wedge type grips, each of said grips having a slot therein, a gear mounted adjacent each of said grips, said gears being in engagement and movable to and from said grips, a pin projecting from each of said gears into the slot in the adjacent grip when the gear is in its inner position, a screw spaced from each of said gears, means connecting each of said screws with its associated gear, a stationary nut in engagement with each screw and means for rotating each of said screws to move the pin in its associated gear into and out of the slot in its adjacent grip.

4. Grip mechanism for the test piece in a tensile testing machine comprising a pair of opposed wedge type grips, each of said grips having a slot therein, a gear mounted adjacent each of said grips, said gears being in engagement and movable to and from said grips, a pin projecting from each of said gears into the slot in the adjacent grip when the gear is in its inner position, a shaft for each gear, a screw mounted on each shaft, a stationary nut in engagement with each screw and means for rotating each of said screws to move the pin in its associated gear into and out of the slot in its adjacent grip.

5. Grip mechanism for the test piece in a tensile testing machine comprising a pair of opposed wedge type grips, each of said grips having a slot therein, a gear mounted adjacent each of said grips, said gears being in engagement and movable to and from said grips, a pin projecting from each of said gears into the slot in the adjacent grip when the gear is in its inner position, a shaft for each gear, a screw mounted on each shaft, a stationary nut in engagement with each screw, means for rotating each of said screws to move the pin in its associated gear into and out of the slot in its adjacent grip, and resilient means for holding said screws from relative longitudinal movement.

6. Grip mechanism for the test piece in a tensile testing machine comprising a pair of opposed wedge type grips, each of said grips having a slot therein, a gear mounted adjacent each of said grips, said gears being in engagement and movable to and from said grips, a pin projecting from each of said gears into the slot in the adjacent grip when the gear is in its inner position, a shaft for each gear, a screw mounted on each shaft, a stationary cover plate having two internally threaded openings for receiving said screws, an enlarged portion on each screw located on the outboard side of said plate, each enlarged portion having a notch therein, a latch housing fastened to said plate, said housing having an opening therethrough, a pair of balls in said opening, a spring between said balls, said balls being adapted to spring into said notches to lock the screws in their inner position, and means for rotating each of said screws to move the pin its associated gear into and out of the slot in its adjacent grip.

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