H. I. CHEW.

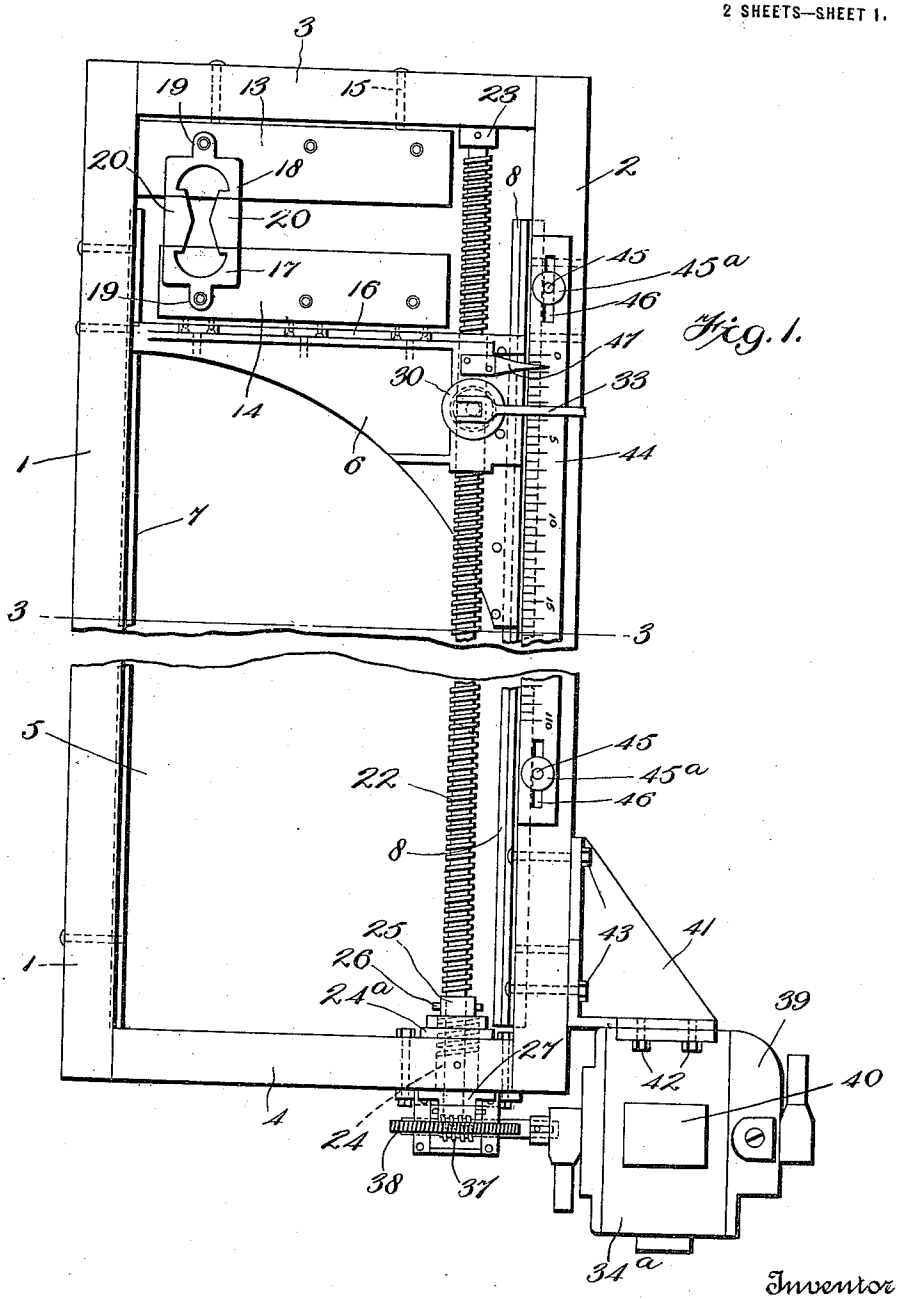
TESTING MACHINE.

APPLICATION FILED MAY 3, 1913.

1,208,748.

Patented Dec. 19, 1916.

2 SHEETS—SHEET 1.



Witnesses
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2 SHEETS—SHEET 2.

Fig. 2.

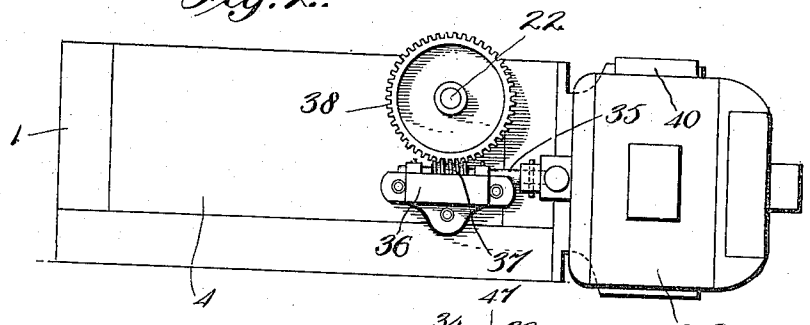
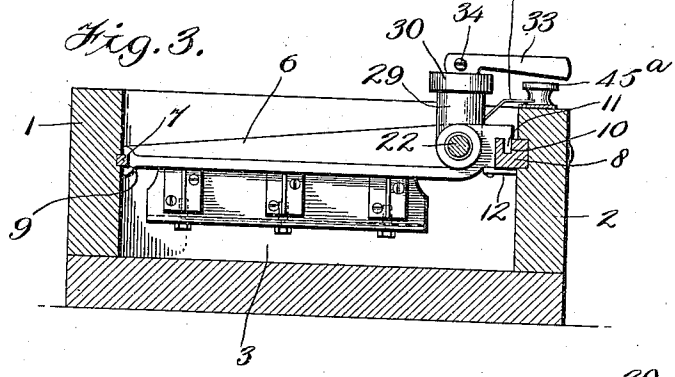


Fig. 3.



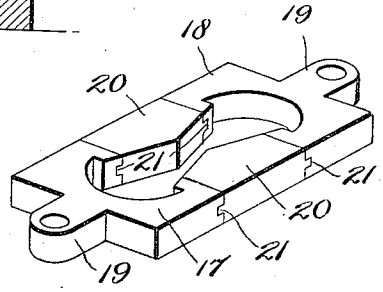
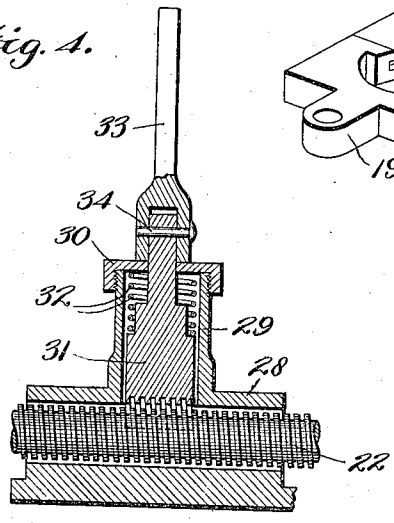


Fig. 5.

Fig. 4.



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UNITED STATES PATENT OFFICE.

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TESTING-MACHINE.

1,208,748. Specification of Letters Patent. Patented Dec. 19, 1916.

Application filed May 3, 1913. Serial No. 765,215.

To all whom it may concern:

Be it known that I, HARRY I. CHEW, a citizen of the United States of America, residing at Washington, District of Columbia, have invented certain new and useful Improvements in Testing-Machines, of which the following is a specification.

The present invention relates to machines for testing materials, and especially to machines for testing the ductility of bituminous materials and has for its purpose to provide a machine of that character which will be positive and accurate in operation, and one embodying the minimum amount of mechanism.

The invention has for its further purpose to provide a testing machine wherein the driving mechanism for the carriage is connected and so located with respect thereto that the material being acted on will be subjected to more accurate testing than has heretofore been obtained in machines for this purpose. And it is further proposed to provide a machine wherein the carriage driving mechanism will permit of the carriage being readily disconnected and returned to initial position at the will of the operator.

With these and other objects in view the invention consists in the novel details of construction and combination of parts more fully hereinafter described and particularly pointed out in the claims.

Referring to the drawings, forming a part of this specification, in which like figures designate like parts in the several views, Figure 1 is a top plan view of the testing machine. Fig. 2 is an end elevational view thereof, showing the driving motor for the carriage. Fig. 3 is a transverse sectional view of the machine and showing the carriage in elevation. Fig. 4 is a detail in section of the connection between the carriage and the driving shaft, and; Fig. 5 is a detailed perspective view of the mold for the material to be tested.

Referring to the construction in further detail the machine consists of a tank formed of side members 1 and 2, end members 3 and 4, and a bottom member 5. The tank is constructed preferably of alberine stone which has been found to be the most appropriate material. A pair of tracks 7 and 8 are mounted on the opposite inner side walls of the tank to support the carriage 6 and to which end said carriage is grooved as at 9 to engage the track 7, and has a tongue 11 fitting within a channel-way 10 formed in the track 8. A plate 12 is secured to the carriage 6 immediately beneath the track 8 and is adapted to engage therewith and prevent the carriage from becoming displaced.

A pair of plates or shelves 13 and 14 are mounted on the end member 3 of the tank and the carriage 6 through the medium of bolts 15 and a connecting plate 16 respectively. The two plates 13 and 14 have mounted thereon the end pieces 17 and 18 of the mold or frame (see Fig. 5) and said pieces are secured in position thereon by bolts or pins passing through lugs 19 and the plates as shown in Fig. 1. A pair of detachable members 20 are removably connected to the mold parts 17 and 18 through the medium of tongues 21 that engage within grooves formed in said members 17 and 18. The mold is adapted to receive the material to be tested while the same is in a liquid state, and is held therein submerged in the water contained in the tank until it has sufficiently solidified or become plastic to the degree required for the testing operation. At this time the side members 20 are removed when the carriage is ready to be driven as will be understood.

The carriage driving mechanism consists of a screw shaft 22 journaled in the bearing 23 in the end wall 3 and at its opposite end is journaled in a bushing 24 fitted in the tank wall 4. A nut 24^a is mounted on the bushing 24 and secures the same in position together with the bushing head 27. A collar 25 is fixed to the shaft by a taper pin 26 and holds the shaft against lateral displacement.

The carriage is connected to be driven by the shaft 22 through the medium of the form of device shown in Fig. 4. A tubular part 28 is formed on the carriage and has connected thereto a cylinder 29 closed by a cap 30. A half-nut 31 is movably mounted in the cylinder 29 and moves to engage the

shaft 22 normally under the action of a spring 32. A lever 33 is pivotally connected with the member 31 at the point 34 and is adapted for withdrawing said member 31 from engagement with the screw shaft 22. The carriage is connected with the shaft for stretching the material and at any time may be readily disconnected and returned to its initial position without requiring the driving motor to be stopped. The member 28 serves as a support for the screw shaft 22 and prevents sagging thereof, and avoids relative displacement between the shaft and supporting member; and the part 28 also acts as a bearing for the screw shaft.

The shaft 22 is adapted to be rotated by the motor 34[a] having a shaft 35 on which is mounted a screw 37 engaging with the worm wheel or pinion 38. The journal box or casing 36 is secured to the tank wall 4 and has mounted therein to rotate said shaft 35. The motor is provided with a rheostat 39 having the usual controlling handle 40 for regulating the speed of the motor after the usual manner. The casing of the motor 34[a] is mounted on the tank through the medium of the angle plate 41 which is secured to said motor casing and the tank through the medium of bolts 42 and 43 respectively. A gage 44 is mounted on the tank and adapted to be adjustably positioned thereon through the medium of screws 45 fixedly mounted on the tank and passing through slots 46 (as shown in Fig. 1) and jam nuts 45[a] on said screws 45. A pointer 47 is mounted on the carriage and coöperates with the scale of the gage as will be readily understood.

It is proposed that all metal parts of the machine which are exposed to water be made of brass, and that the same be accurately machined and fitted. The machine when constructed in accordance with the foregoing will run with practically no vibration, and thus avoid the possibility of snapping the fine thread of bituminous material before the test is properly completed. The carriage may be readily thrown out of driving engagement with the screw and instantly shifted or returned by hand to position for making a new test, thus effecting greater convenience and considerable saving of time. There is furthermore provision made for from one to three tests at the same time to which end the shelves or plates for holding the mold or form are adapted as shown clearly in Fig. 1.

The material in the molds or forms under test is at all times held true or in equilibrium as regards the fixed and moving mold sections, since the carriage 6 has a relatively long bearing on the track 8, which is the essential supporting or foundation track for the moving carriage.

It is obvious that those skilled in the art may vary the details of construction and arrangement of parts, without departing from the spirit of my invention, and therefore I do not wish to be limited to such features except as may be required by the claims.

What I claim as new is:

1. In a testing machine the combination of a tank; a carriage mounted to travel on the tank; a screw shaft journaled in the tank; a member carried by said carriage and movable into and out of engagement with the threaded shaft whereby to drive the carriage and permit of shifting thereof; mold sections mounted on said carriage and tank respectively; and means for operating the screw shaft, substantially as described.

2. In a testing machine the combination of a tank; a pair of guides mounted on the tank; a carriage mounted to travel on said guides; a screw shaft journaled in the tank; a threaded member carried by said carriage and movable into and out of engagement with the threaded shaft whereby to drive the carriage and permit of shifting thereof; members mounted on said tank and carriage for holding the respective ends of the material being tested; and means for operating the screw shaft.

3. In a testing machine the combination of a tank; a pair of guides mounted in the tank; a carriage mounted to travel on said guides; a screw shaft journaled in the tank and having driving connection with said carriage; members mounted on said tank and carriage for holding the respective ends of the material being tested; a screw and worm gear connected to the screw shaft; and a motor connected to drive said gear.

4. In a testing machine the combination of a tank; guides mounted in the tank; a carriage mounted to travel on said guides; a screw shaft journaled in the tank and adapted to drive said carriage; means for throwing said carriage into and out of driving engagement; a scale mounted on the tank; a pointer carried by the carriage and coöperable with said scale; members mounted on said tank and carriage for holding the respective ends of the material being tested; and a motor for operating said screw shaft.

5. In a testing machine the combination of a tank; guides mounted in the tank; a carriage mounted to travel on said guides; a screw shaft journaled in the tank and adapted to drive the carriage; a plate mounted on the tank; a plate mounted on the carriage; members carried by said plates for holding the respective ends of the material being tested; a scale mounted on the tank; a pointer carried by the carriage and coöperable with the scale; and a motor for operating said screw shaft.

6. In a testing machine the combination of

a supporting structure; guide rails mounted on said structure; a carriage mounted to travel on said guide rails; a screw shaft journaled on said structure and having driving connection with said carriage; members mounted on said structure and carriage for holding the respective ends of the material being tested; a screw and worm gear connected to the screw shaft; and means for operating said screw shaft.

In testimony whereof I affix my signature in presence of two witnesses.

HARRY I. CHEW.

Witnesses:

LESLIE W. TELLER,

THOMAS H. MCKEE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D C."