C. L. ELMES.

TESTING MACHINE.

APPLICATION FILED OCT. 27, 1913.

1,098,102.

Patented May 26, 1914.

2 SHEETS—SHEET 1.

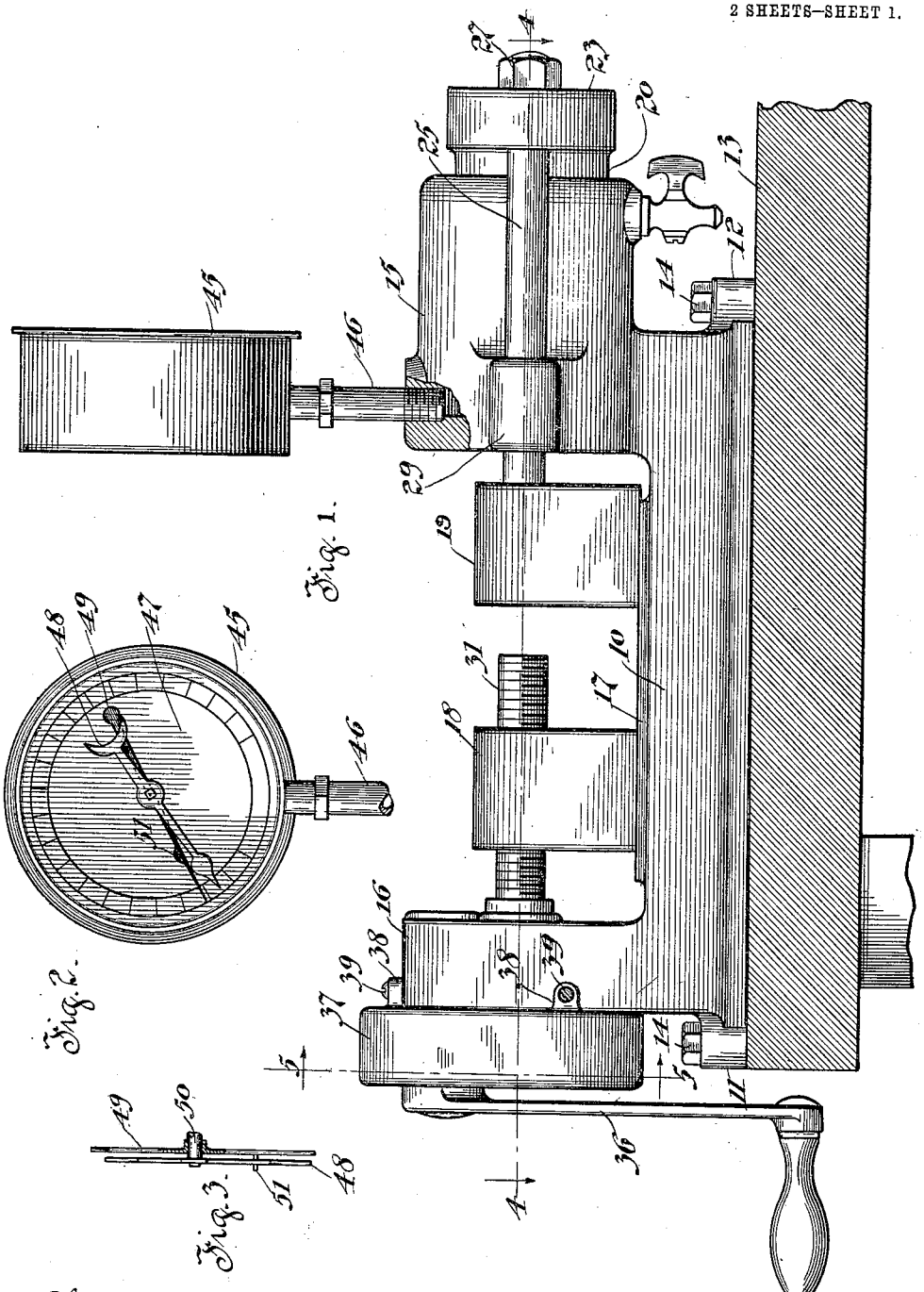


Fig. 1.

Fig. 2.

Fig. 3.

Witnesses

Robert H. Weir

A. D. Carlos

Inventor

Carleton L. Elmes

By Foster Freeman May

Attys.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

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2 SHEETS—SHEET 2.

Fig. 4.

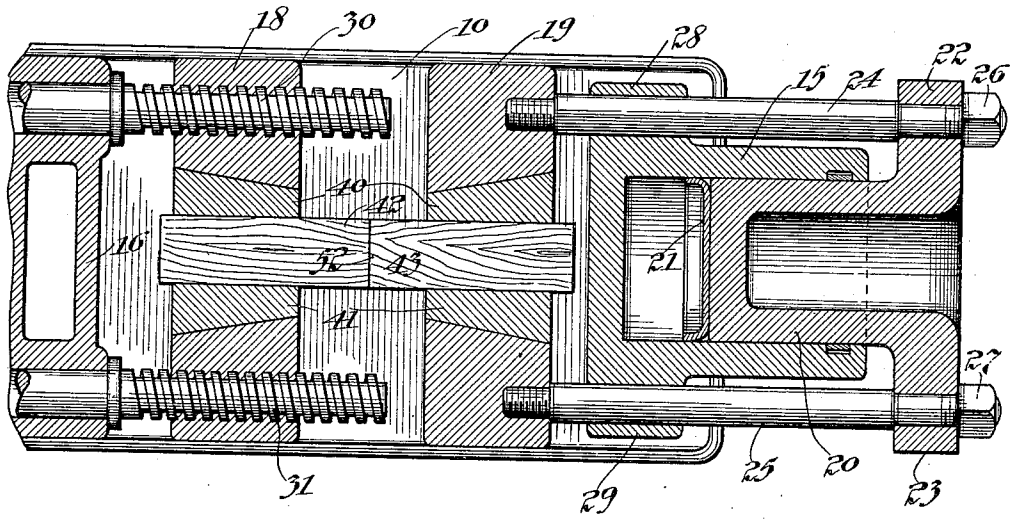
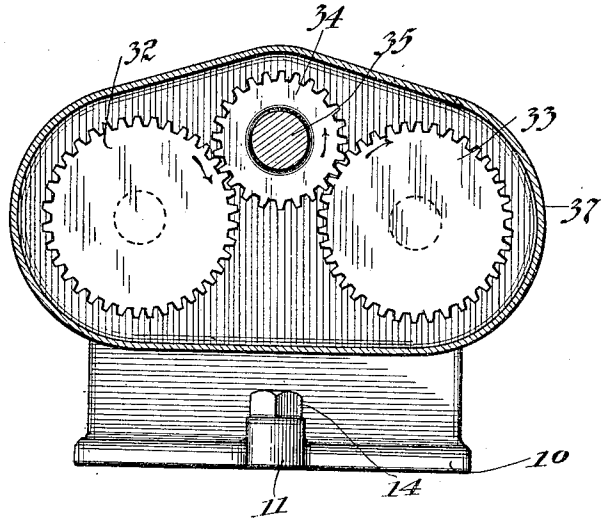


Fig. 5.



Witnesses
Robert H. Weir
A. H. Carlson

Inventor
Carleton L. Elmes
By Foster Freeman Watson Coleman
Attys.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CARLETON L. ELMES, OF WINNETKA, ILLINOIS.

TESTING-MACHINE.

1,098,102. Specification of Letters Patent. Patented May 26, 1914.

Application filed October 27, 1913. Serial No. 797,363.

To all whom it may concern:

Be it known that I, CARLETON L. ELMES, a citizen of the United States, residing at Winnetka, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Testing-Machines, of which the following is a specification.

My invention relates to improvements in testing machines.

One of the general objects of my invention is to provide a machine for testing, ascertaining and recording the tensile strength and tenacity of materials.

A more specific object of my invention is to provide a relatively small, cheap to make machine and one which is simple in structure and durable and efficient in operation.

Other and further objects of my invention will become readily apparent to persons skilled in the art from a consideration of the following description when taken in conjunction with the drawings wherein—

Figure 1 is a side elevation of the machine. Fig. 2 is a front view of the indicating and recording gage. Fig. 3 is a detail of the gage. Fig. 4 is a longitudinal section taken on line 4—4 of Fig. 1. Fig. 5 is a transverse section taken on line 5—5 of Fig. 1.

In all the views the same reference characters are employed to indicate similar parts.

In the particular embodiment herewith illustrated the base 10 is provided with laterally extending, perforate lugs 11 and 12 which are adapted to be secured to a table, or other support, 13, by means of screw bolts 14, to hold the device in position when it is being operated. The base is also provided on one end with an integral hydraulic cylinder 15 and on the other end with an integral head 16. The intermediate portion 17 of the base is planed to a smooth finish to provide bearing surfaces for the movable specimen-carrying chaps 18 and 19.

A hydraulic ram 20 fits in the cylinder 15, and is freely movable therein and on its front end is provided with a packing cup 21, as usual with devices of this character. The ram is also provided with laterally extending projections 22 and 23, which projections are perforated for reception of the guide rods 24 and 25, respectively. The guide rods are held in place in the respective projections by means of nuts 26 and 27. The guide rods pass freely through perforated projections or guides 28 and 29, as means for preserving their parallel relation and are screw threaded into the rear chap 19 so that the rear chap or jaw, moves longitudinally with the ram 20.

Two parallel strain screws 30 and 31 pass freely through the head 16 and bear on their respective ends, spur gear wheels 32 and 33 respectively. These screws pass into threaded perforations in the forward or front chap 18, and are means by which said chap is movable longitudinally of the base. An intermediate spur gear wheel 34, has meshing driving relation with the spur gear wheels 32 and 33 and is rotatably mounted on a shaft 35 which is rotated by means of a handle 36. The train of gears referred to, is contained in a casing 37 that is secured to the head 16 as by projections 38—38 and screws 39—39 and thereby the gearing is properly housed and contact therewith is prevented.

A two part tapered sleeve, comprising parts 40 and 41 are each adapted for reception in the like tapered orifices provided in the movable chaps 18 and 19 and form grippers for the specimen 42—43. When the chaps are separated each gripper receives and holds the specimen tight. Any means for gripping the specimen, instead of the two part tapered sleeve referred to, may however, be employed with equal facility.

A pressure gage 45, which may be of any suitable and acceptable form or type is connected to the hydraulic cylinder 15 by means of a pipe 46. The face 47, of the gage, is circumferentially divided into indications signifying pounds, to indicate the number of pounds pressure per square inch that may be exerted upon the specimen during the operation of the test. An indicating hand 48 is rotatably movable upon the face of the dial by the pressure responsive mechanism of the gage and a recording hand 49, is mounted upon a stationary hollow mandrel 50, having frictional engagement therewith, and is adapted to be moved by the hand 48 by its contact with the pin 51. When the hand 48 is moved forward on scale, as in response to the pressure within the hydraulic cylinder, it carries the hand 49 with it and when the hand 48 is returned to its normal position, the hand 49 remains at the highest point to which it has been carried. The

hand 48 indicates the pressure within the hydraulic cylinder and the hand 49 records the pressure so that after the parts of the apparatus have all returned to their normal positions the hand 49 will remain and thus leave a standing record of the maximum strain exerted upon the specimen.

When testing the tenacity of glue the two parts 42 and 43, of the specimen, which may be of wood, are glued together, as at 52, and the specimen is placed between the gripper 40 and 41 within the chaps 18 and 19. The handle 36 is now turned whereby the gear wheels 32 and 33, controlling strain screws 30 and 31, respectively, are rotated by the geared pinion 34, thereby drawing the chap 18 away from the chap 19 through the instrumentality of the intermediate specimen. The movement of the chap 19 is resisted, by the ram 20 within the cylinder 15, and pressure is thereby exerted upon the liquid contained within the cylinder and this pressure is imparted to the pressure-responsive gage 45, causing the hand 48 to move up on the scale, on the face of the gage, and to indicate the pressure that is being exerted upon the specimen, to separate the parts. The hand 48 will carry the hand 49 with it upon the scale to the maximum point to which it is moved and at the time of the separation of the specimen parts, 42 and 43, the ram 20 will return to its normal position releasing the liquid within the cylinder from pressure and therefore the hand 48 will resume its normal place, but the hand 49 will remain upon the scale and thereby record the pressure that was necessary to separate the parts of the specimen, or to break a single part specimen in two. To repeat the test it is only necessary to turn the handle 36 in the opposite direction to rotate the strain screws so that the chap 18 will resume the former position which it occupied with reference to the chap 19 when another specimen may be placed within the grippers and the handle turned as before.

Single blocks of cement, or the like, pieces soldered or brazed together, or other material may be tested in the same manner as the glue of the two part specimen.

This device not only shows the comparative tenacity or tensile strength of the specimen tested but it records the pressure, per square inch, necessary to be exerted to accomplish the separation.

While I have herein shown a single embodiment of my invention, for the purpose of clear disclosure, it is evident that changes may be made in the specific construction within the scope of the appended claim.

Having described my invention, what I claim is:—

In a device of the character described, a casting having on one of its ends a cylinder integral therewith and on the other end a head integral therewith to support a train of gearing and an intermediate base part having a planed surface affording a path for the specimen-holding chaps; laterally extending rod supporting and guiding projections integral with the said cylinder; two chaps having grippers; a train of gearing and screws for moving one said chap; a hydraulic ram in said cylinder; rods connected to the other chap, extending through the guiding projection and connected at their opposite ends to the ram to resist the movement of the first mentioned chap, and a gage communicating with said cylinder to indicate the extent of such resistance.

In testimony whereof I hereunto set my hand in the presence of two witnesses.

CARLETON L. ELMES.

In the presence of—

FORÉE BAIN,

MARY G. ALLEN.

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