March 10, 1936. O. F. FREELAND 2,033,623

ELONGATION TESTING MACHINE

Original Filed Aug. 10, 1934 3 Sheets-Sheet 1

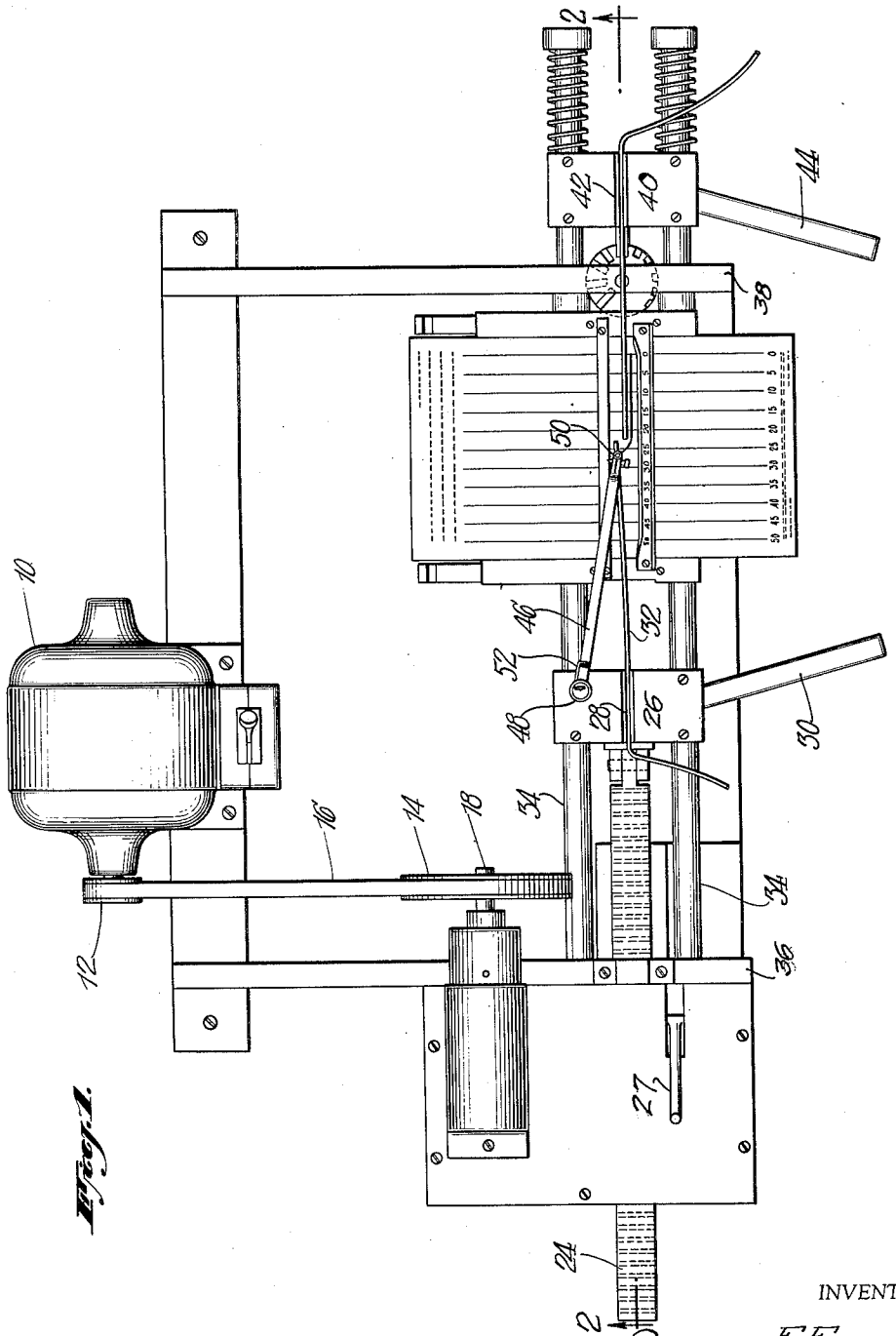


Fig. 1.

INVENTOR.

ORVILLE F. FREELAND.

BY

ATTORNEYS

March 10, 1936. O. F. FREELAND 2,033,623

ELONGATION TESTING MACHINE

Original Filed Aug. 10, 1934 3 Sheets-Sheet 2

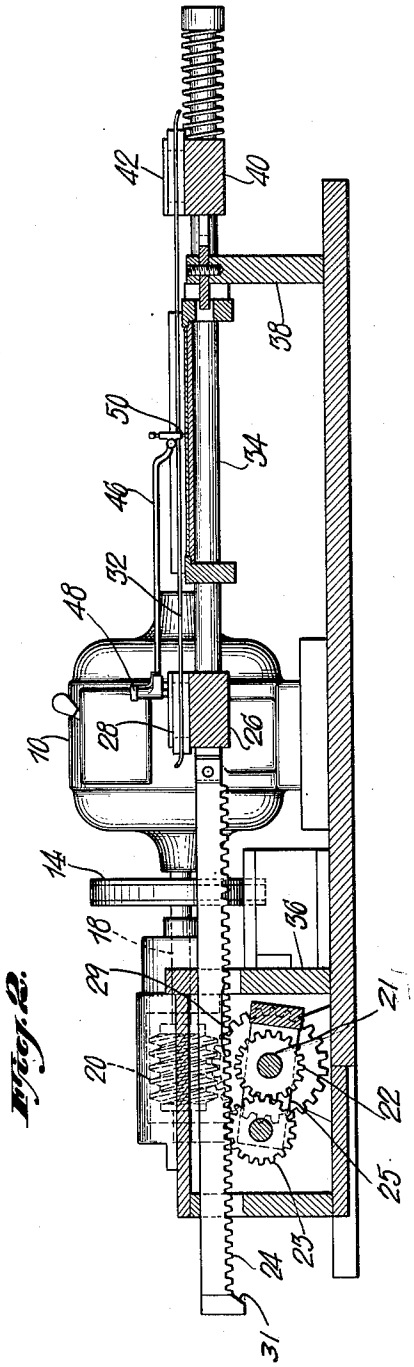


Fig. 2.

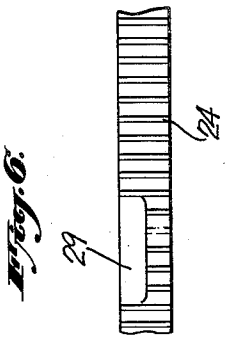


Fig. 6.

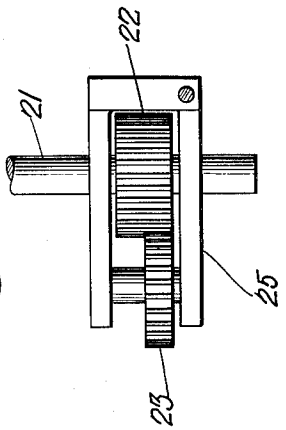


Fig. 5.

INVENTOR.

ORVILLE F. FREELAND.

BY

Ursina & Rambo

ATTORNEYS

March 10, 1936. O. F. FREELAND 2,033,623

ELONGATION TESTING MACHINE

Original Filed Aug. 10, 1934 3 Sheets-Sheet 3

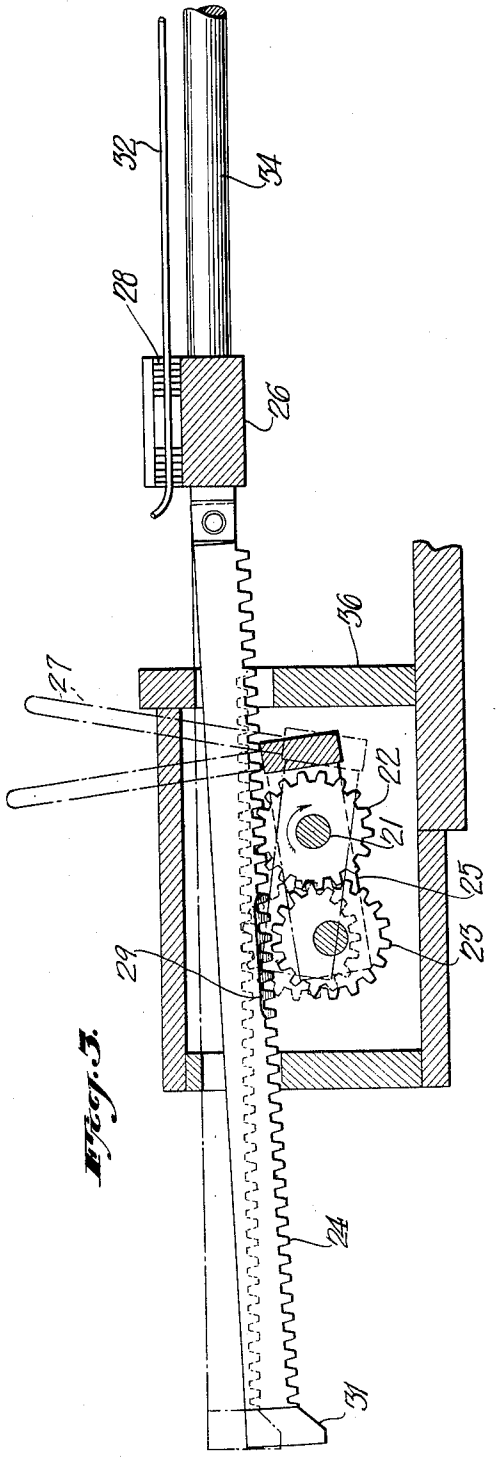


Fig. 3.

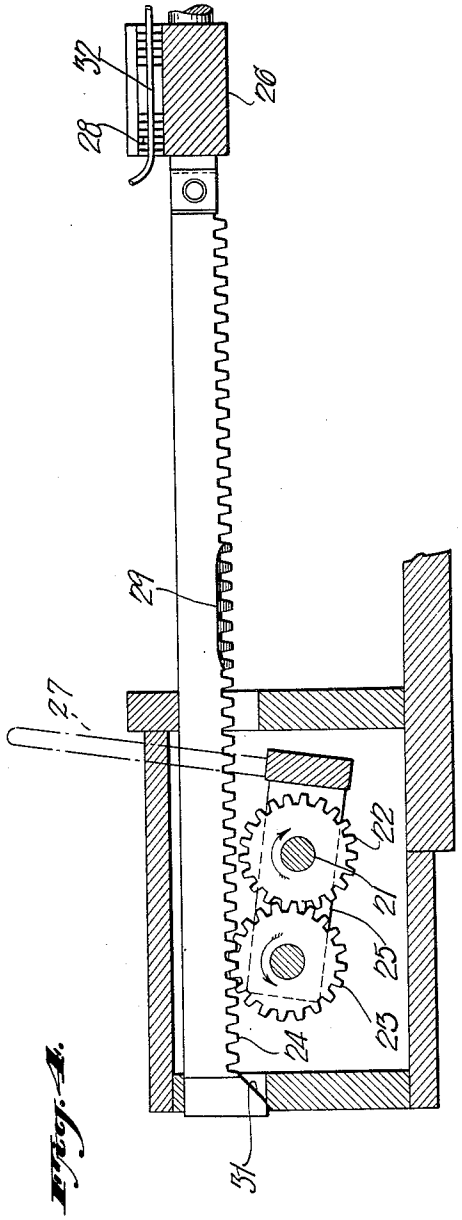


Fig. 4.

INVENTOR.
ORVILLE F. FREELAND.
BY
Fisina & Rauber
ATTORNEYS

Patented Mar. 10, 1936 2,033,623

UNITED STATES PATENT OFFICE

2,033,623

ELONGATION TESTING MACHINE

Orville F. Freeland, Muskegon, Mich., assignor to Anaconda Wire & Cable Company, New York, N. Y., a corporation of Delaware

Original application August 10, 1934, Serial No. 739,212. Divided and this application June 8, 1935, Serial No. 25,535

2 Claims. (Cl. 265—12)

The present application is a division of my application Serial No. 739,212, filed August 10, 1934.

This invention relates to improvements in an elongating testing machine and is directed particularly to a machine having clamping means engageable with the ends of the piece to be tested and the power drive for automatically moving the clamping means relatively to one another in reverse directions.

The above and various other more detailed features of the invention will be fully apparent from the following specification when read in connection with the accompanying drawings, in which—

Fig. 1 is a plan view illustrating one embodiment of the invention; Fig. 2 is a longitudinal section on line 2—2 of Fig. 1; Fig. 3 is an enlarged view in longitudinal section showing the reversible means for operating one of the clamp holding members; Fig. 4 is a similar view showing the same parts in reverse position; Fig. 5 is a detail plan view of part of the gearing shown in Fig. 3; Fig. 6 is a fragmentary inverted plan of the gear rack of Figs. 3 and 4.

Referring in detail to the drawings, 10 represents a motor which is adapted by means of pulleys 12 and 14 and belt 16 to transmit motion to a counter shaft 18 and through gearing, indicated generally at 20 to drive pinions 22 and 23, which are arranged to alternatively mesh with a rack 24 hingedly mounted on a member 26. These pinions 22 and 23 are carried on a lever 25 which is mounted with freedom for a slight oscillating movement from the position of Fig. 3 to the position of Fig. 4 and vice versa, the lever being pivoted on the shaft 21, which carries the pinion 22. Pressure on the manually operable control arm 27 will cause the pinion 23 to engage the teeth of the rack 24 and the driving force, which is transmitted through the pinion 22 tends to keep the pinion 23 engaged with the teeth of the rack until the rack is moved a sufficient distance to bring the interrupted portion 29 thereof into register with pinion 23. At this time, the same force assisted by gravity will cause the pinion 23 to drop due to the lack of resistance by the rack and when the pinion 23 drops to the position of Fig. 3 it will automatically rock the lever 25 to a point where the pinion 23 will clear the teeth of the rack and the latter will move about its hinge support to the position of Fig. 3 into mesh with the pinion 22. Inasmuch as the pinions 22 and 23 revolve in reverse directions, as indicated by the arrows, the reverse movement will be imparted to the rack. Thus, after each test, the mechanism shown and described is effective to return the parts to starting position for the next test.

At its left extremity, the rack carries a downwardly depending member formed with a cam surface 31, which functions to lift the rack from the position of Fig. 3 to the position of Fig. 4 when the limit of the right hand movement is reached, this cam surface coacting with any suitable part of the framework.

The rack 24 is adapted to reciprocate a test piece engaging member 26 which carries suitable clamp jaws 28 adapted to be actuated by a lever 30 in a manner hereinafter described, so as to clamp one end of the wire or other test piece 32. The member 26 is slidably supported on guide rods 34 secured to the frame members 36 and 38. A normally fixed test piece engaging member 40 is provided with clamp jaws 42, which are actuated by lever 44. The movable test piece engaging member 26 has pivotally supported thereon a stylus supporting element 46 and, as shown, its pivotal support includes a stud 48. A pen, pencil, or other suitable marking member, or stylus, as indicated at 50, is secured to the end of the element 46 and a spring 52 is provided which normally tends to press the stylus laterally against the work piece under test. As thus arranged, it is clear that when the work piece being tested is fractured a transverse mark will be made by the stylus.

Suitable means, such as disclosed in my parent application, are provided for supporting a record sheet for position in coaction with the stylus. These means are not claimed in the present divisional application and, therefore, will not be further described in detail. Suffice it to say that the record sheet is detachably held in position to receive a graph transcribed by the stylus, the sheet being ruled with suitable scale divisions. And when the limit of elongation of the piece under test is reached and the wire breaks the stylus will be deflected under the influence of a spring 52 and the graph delineated on the record sheet will give a reading of the percentage of elongation of the particular wire under test. From the foregoing, it is apparent that after each test the mechanism shown and described provides power means for automatically moving the parts to starting position. It is also apparent that the machine described includes spaced members carrying means for securing a test piece, a power drive an element secured to

one of said members and automatic reversing means operatively connected with said power drive for moving said element in reverse directions.

The specific reversing means claimed herein, it will be apparent, involves the employment of a rack for propelling the means which clamp the test piece, this rack being hingedly mounted and coacting with a pair of meshing pinions driven by the power drive, there being provided a movable mounting adapted to alternately engage one of the pinions with the rack.

While I have described quite precisely the specific embodiment of the invention illustrated, it is to be understood that various modifications and substitutions of equivalents may be made by those skilled in the art without departure from the invention as set forth in the appended claims.

What I claim is:

1. An elongation testing machine of the character described comprising spaced members carrying clamping means engageable with the opposite ends of the test piece, a power drive, a rack hingedly mounted on one of said members and having an interrupted portion, a pair of meshing pinions driven by the power drive, and adapted to be alternately engaged with said rack and a mounting for one of said pinions movable about the axis of the other pinion.

2. An elongation testing machine of the character described comprising spaced members carrying clamping means engageable with the opposite ends of the test piece, a power drive, a rack hingedly mounted on one of said members, a pair of meshing pinions driven by the power drive, a mounting for tilting one of said pinions into and out of engagement with said rack, said mounting being pivoted axially of the other pinion, and said rack having an interrupted portion adapted to clear the teeth of the tilting pinion and also having a cam surface effective to rock it about its pivotal support.

ORVILLE F. FREELAND.