Feb. 27, 1923. 1,446,620

T. A. HALL

SCLEROSCOPE

Filed Feb. 26, 1921 2 sheets-sheet 1

FIG. 1.

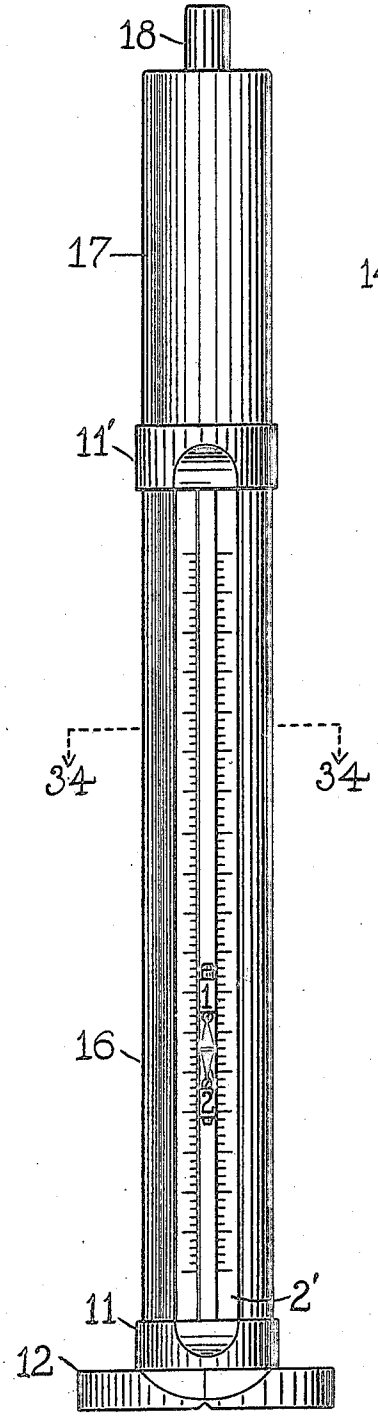


FIG. 2.

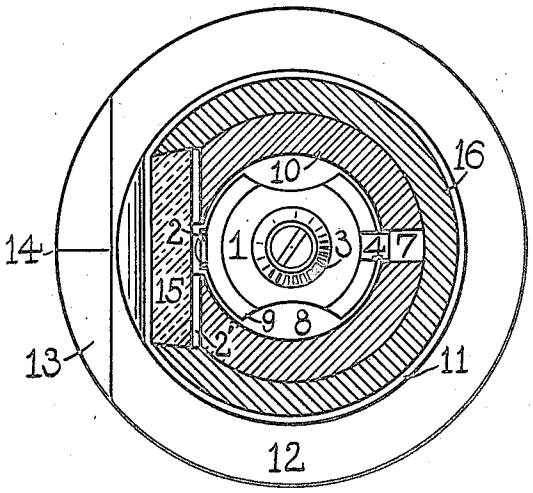
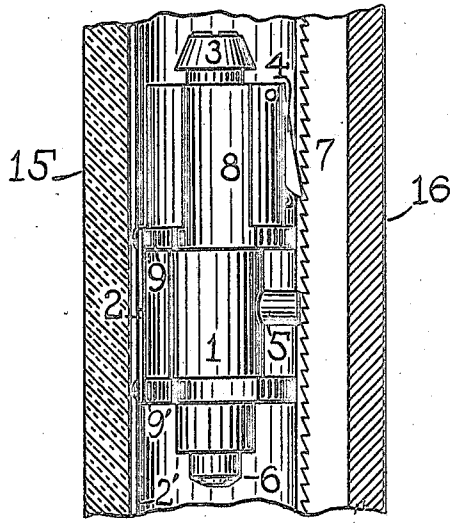


FIG. 3.



Trygve A. Hall,
Inventor,
By Frank Carlson
His Attorney.

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FIG. 4.

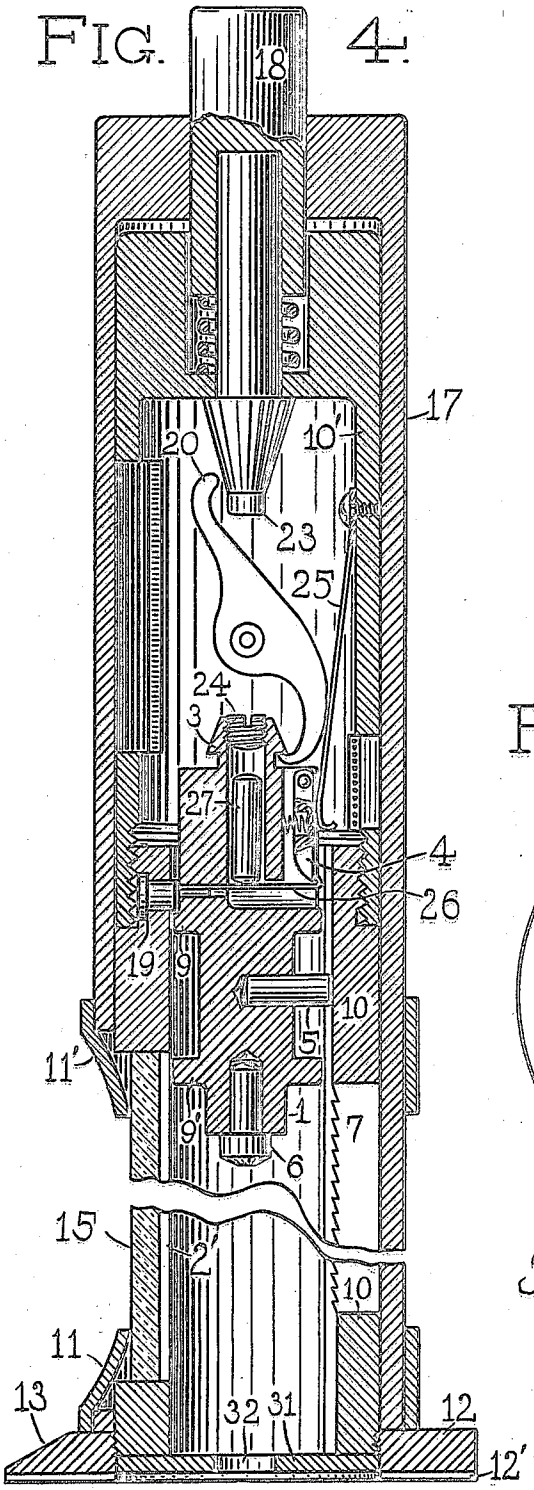


FIG. 5.

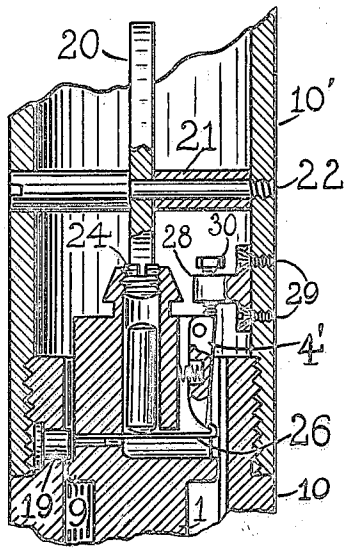
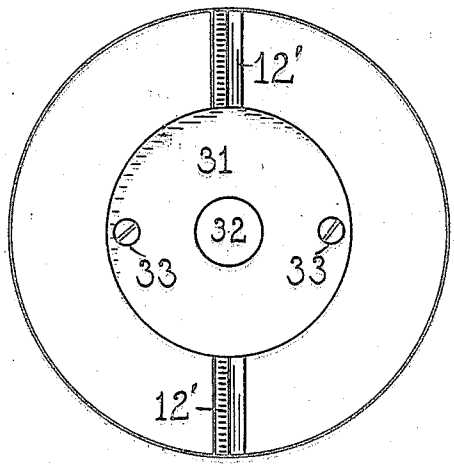


FIG. 6.



Trygve A. Hall,
Inventor,
By Frank Carlson
His Attorney.

Patented Feb. 27, 1923. 1,446,620

UNITED STATES PATENT OFFICE.

TRYGVE A. HALL, OF POUGHKEEPSIE, NEW YORK.

SCLEROSCOPE.

Application filed February 26, 1921. Serial No. 448,026.

To all whom it may concern:

Be it known that I, TRYGVE A. HALL, a subject of the King of Sweden, and a resident of 25 South Clinton Street, Poughkeepsie, county of Dutchess, State of New York, have invented certain new and useful Improvements in Scleroscopes, of which the following is a specification.

This invention relates to scleroscopes or hardness testers, and especially to that class wherein a free striker is adapted to fall vertically in a tube provided with a friction surface to engage the striker upon rebounding from a test surface.

The main object of my invention is to provide a scleroscope which is simple and rapid in action, perfectly accurate and cheap as well as portable. In order to arrive at this result, certain novel features are embodied in this invention as will hereinafter be more fully described in the specification and illustrated in the accompanying drawings.

Referring to the drawings:—

Fig. 1 is a view of an apparatus embodying the present invention.

Fig. 2 is an enlarged cross section of Fig. 1 on line 34—34.

Fig. 3 is a side section of part of Fig. 2.

Fig. 4 is an enlarged vertical side section of Fig. 1 with a portion cut out to reduce the height of the view.

Fig. 5 is a view of part of Fig. 4 including a modification.

Fig. 6 is a bottom view of Fig. 4.

Throughout the several views, like reference numerals refer to the same parts.

In the mechanical trades generally, it is often useful and frequently necessary to determine the exact hardness of various parts being made for different purposes, and it is therefore proposed to use the present invention to make such tests where it would be impossible to use larger existing apparatus for the same purpose.

The striker 1 of the herein described scleroscope is provided in its lower extremity with an extremely hard hammer 6, and has a pair of spaced flanges 9 and 9′ upon its body portion to guide the striker in tube 10. The upper portion of striker 1 is formed into a head 3 adapted to engage the lower end of hook 20 to retain the striker in raised position. Said hook is pivoted on a pin 22 which carries a bushing 21 upon its reduced portion, thus retaining the hook between its shoulder and the inner end of the bushing. The mentioned pin is screwed into the wall of a tube 10′ which is really a continuation of tube 10, being screwed down on the same. At their junction, a stop 19 is inserted to engage the striker to serve as an upper limit for the striker, so that hook 20 will catch head 3 properly to retain the same.

The plunger 18 is provided with a spring in the upper part of tube 10′, and below the same with a tapered head 23. When said plunger is depressed, head 23 will force hook 20 to rotate slightly upon its axis 22, the lower portion of 20 then releasing the head of the striker so that the latter immediately descends by force of gravity.

In order to prevent the striker from turning, a pin 5 has been secured in the same and projects into the slot in tube 10 wherein is located a vertical rack 7, but without contact with said rack.

When the striker rebounds from a test surface, it is desirable to catch the same in its highest position for a scale reading, and for this purpose, a pendant pawl 4 is provided in the side of the striker, having a spring between the striker wall and itself, while the hooked leaf spring 26 serves to retain the lower extremity of the pawl in inactive position. Within the striker body is a short steel bullet 27, which rests on spring 26, the screw 24 serving to retain the bullet in its chamber.

When the striker is caused to drop, it will rebound and rise in the tube. Owing to the momentum gained by the part 27 when the striker descends, the bullet will temporarily force down leaf spring 26, releasing pawl 4. As at this moment the striker will be upon its upward journey, it is evident that the pawl will engage the rack as in Fig. 3 the instant the striker comes to rest, and will prevent its descent.

As the location of the striker in such a position is a direct index of the hardness of an object to be tested, an indicator 2 has been secured to the striker, and a pair of marked scales 2′ secured beneath a glass 15 in the open side of tube 10, the reading being taken in degrees upon the scale at the point of location of the indicator.

In order to give the apparatus a finished appearance, and provide accuracy in placing the same in proper positions for testing, a base 12 is screwed to the lower end

of tube 10, and an overall sleeve 16—17 is drawn down over the whole to the base. The appearance is further enhanced by the retainer rings 11—11′, whose indented portions serve to retain and protect the glass 15.

When it is desired to test the hardness of a flat piece of steel or any other material, it is only necessary to stand the apparatus upon the same, and then to depress plunger 18 for a moment. The striker instantly descends and rebounds, coming to rest immediately. A reading may then be taken.

In order to take another reading, which is but the work of a moment or two, it is only necessary to invert the apparatus and stand it again upon the test piece, when depressing the plunger will afford a second reading.

When the apparatus is temporarily inverted, the striker falls till it meets limit 19, where hook 20 will immediately engage head 3 of the striker owing to the pressure of spring 25, the latter also extending far enough to engage the surface of pawl 4, depressing said pawl so that the hook spring 26 catches the point of the pawl. The apparatus is then ready for a new reading when righted.

As the air resistance in the tubes would impede free movement of the striker, a pair of air clearance channels similar to 8 have been cut along the body of the striker, eliminating this trouble completely. Also, within the base 12, a retainer 31 for the striker has been secured to the bottom of tube 10 by screws 33, 33, the aperture 32 providing ample clearance for hammer 6 of the striker, yet preventing the striker as a whole from dropping out of the apparatus.

This invention is likewise adapted for measuring the hardness of round bars or shafts, the base 12 being provided with grooves 12′, 12′ to center the apparatus on such objects. In order to facilitate the use of the grooves in this class of work, the base has been beveled at 13, and a center line 14 provided, pointing down to one end of the grooves 12′.

It has been thought possible that the leaf spring 25 might not last a useful length of time in case it be required to serve two distinct purposes as described, and a modification has suggested itself, as seen in Fig. 5. Here a part 28 has been secured to tube 10′ by screws 29, a set screw meeting the upper shoulder of pawl 4′, causing the latter to swing in so that hook spring 26 catches the lower end of the pawl. This is the preferred form of my invention.

Having thus fully described my invention, I claim,

1. A portable and invertible scleroscope comprising a tube containing a movable rebounding striker provided below with a contact hammer and above with an engagement head, a hook having an upper projection and pivoted at its central portion mounted in the upper portion of said tube, a spring mounted against said hook tending to rotate the same and adapting its lower free extremity to catch and retain the head of said striker in raised position, a plunger upon said tube having an interior projection adapted to engage the upper extremity of said hook and release said striker by withdrawing the lower extremity from the striker head by reverse rotation of said hook about its axis.

2. A scleroscope including a tube provided interiorly with a groove in the wall thereof, a rack located in said groove, a striker adapted to travel in said tube and provided with a pendant pawl to engage said rack, and a pin projecting from said striker into the rack groove to guide said striker.

3. A scleroscope including a tube, a striker adapted to travel in said tube, a bottom grooved base upon said tube having an interior retaining means for said striker and upon the side a bevelled portion with an index line upon said portion to locate the groove beneath said base.

4. A scleroscope including a tubing provided interiorly with a friction wall, a movable striker in said tube provided with a pawl to engage said friction wall, a spring beneath said pawl to project the same, a hook upon said striker adapted to engage said pawl in withdrawn position against said spring to prevent engagement of said pawl with said friction wall, and means upon said striker to release said hook.

5. A scleroscope including a tube provided with an interior rack, a striker body adapted to travel through said tube, a pawl in said body adapted to engage said rack, a spring in said body to project said pawl, a hooked spring in said body adapted to engage the end of said pawl in inoperative position, a weight upon said hooked spring on said body, an upper limit for said striker in said tube, and a projection in said tube adapted to throw said pawl into engagement with said hooked spring upon inversion of said tube.

6. A scleroscope including in a tube a striker provided with a head, a hook pivoted in the upper portion of said tube adapted to engage and retain said striker head, a plunger surmounting said tube and provided within the tube with a tapered head adapted to engage a projection upon said hook to move the latter upon depressing said plunger, thereby disengaging said hook from said striker head.

7. A scleroscope including a tube provided with a longitudinal slotted portion, a scale and a glass cover in said slotted portion, a flat base secured to said tube, a striker body in said tube provided upon its lower ex-

tremity with a contact hammer, and a retaining washer in said base permitting said hammer to pass but preventing loss of said striker body.

8. A scleroscope including in a tube a striker body provided with a pair of spaced flanges, a head upon its upper portion, a contact hammer upon its lower extremity and a pair of longitudinal grooves in the sides of said striker body cutting through said flanges to provide air clearance channels about said striker.

9. A scleroscope including a tube provided upon a slotted portion with scale strips and a glass cover, a sleeve fitting outside said tube and clamping the edges of said glass, a pair of retaining rings upon said sleeve to secure the extremities of said glass, and a bottom grooved base secured to said tube and provided with a bevelled portion with an index line to facilitate location of the groove under said base.

10. A portable scleroscope comprising a tube provided upon its lower extremity with a flat bottomed base bisected by a straight groove, upon its side with a graduated slot, upon its upper portion with a depressible plunger, within said tube a pendant hook and a movable rebounding striker having a head engageable by said hook, and an inner projection upon said plunger adapted to displace said hook to release said striker upon depressing said plunger.

11. A scleroscope including a tube provided with a movable striker, and a base adapted to retain said striker having a groove upon the bottom thereof.

12. A scleroscope including in a suitable tube a rebound striker comprising a longitudinal body having a pair of parallel spaced flanges, a contact hammer upon its lower extremity and a head upon its upper portion, a pendant pawl mounted in one side of said striker body having a spring beneath the same and adapted thereby to project beyond the outline of said striker, and in said body a weighted transverse member adapted to normally retain the free extremity of said pawl within the outline of said striker and upon the striker contacting with a test surface adapted to react by momentum to release said pawl.

13. A scleroscope including a tube provided with a movable striker, a base adapted to retain said striker, a bisecting groove on the underside of said base and a face upon the side of said base having an indicator line connected to said groove to optically locate the same.

14. A scleroscope including in a tube a rigid rack, a movable striker comprising a hollow body portion containing a free floating member, a head upon the upper portion of said body and a contact hammer upon the lower portion, a hook pivoted in said striker body and adapted to engage said tube rack, and a transverse hooked spring in said body supporting said contained free floating member and with its hooked portion engaging said striker hook to prevent contact of the latter with said tube rack.

Signed at the city of Poughkeepsie, county of Dutchess, this 21st day of February, 1921.

TRYGVE A. HALL.

Witnesses:
HULDA JOHNSON,
JOHN HENDERSON.