Jan. 18, 1938. V. T. LAINGOR 2,106,053

GAUGE TAPE CASE

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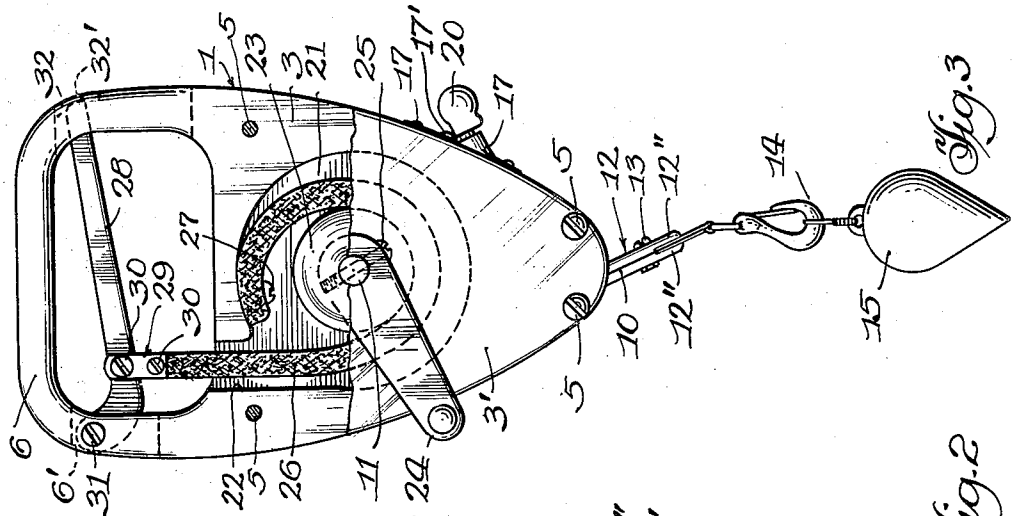

Fig. 3

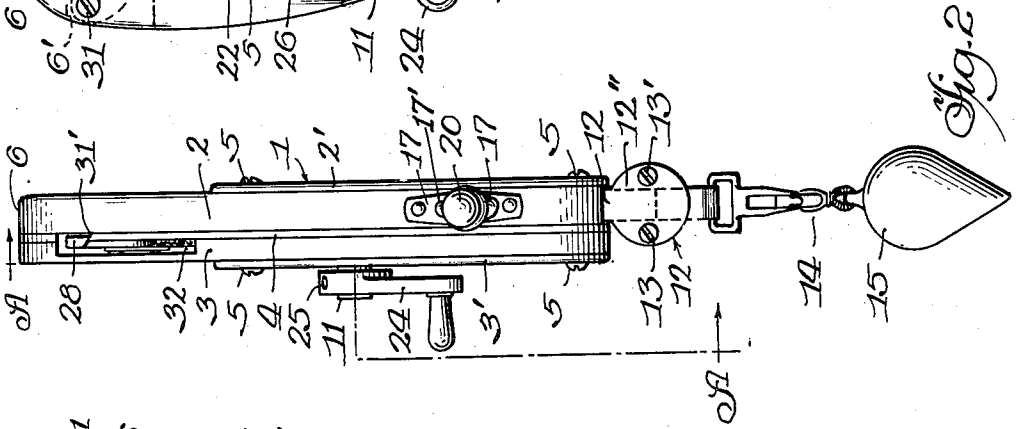

Fig. 2

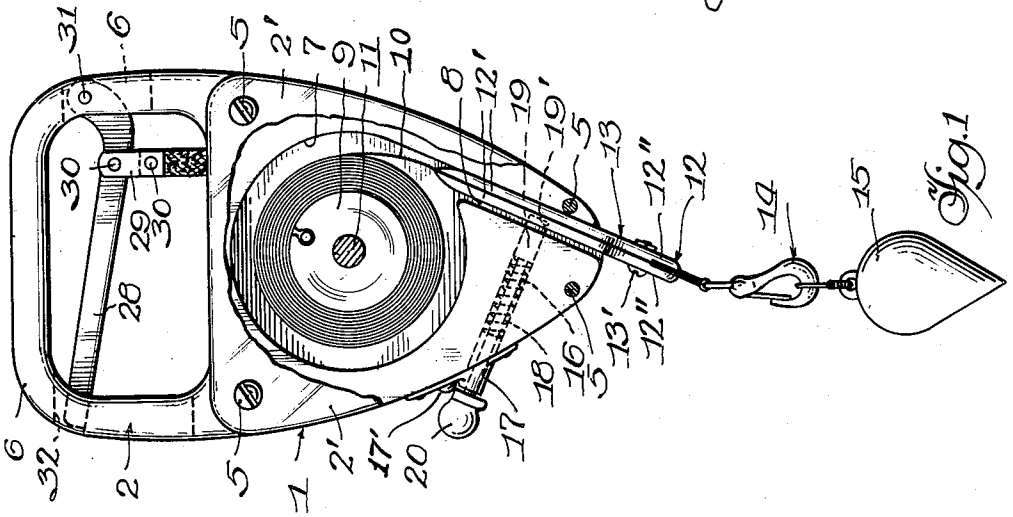

Fig. 1

Witness:
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UNITED STATES PATENT OFFICE

2,106,053

GAUGE TAPE CASE

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Application January 2, 1937, Serial No. 118,770

5 Claims. (Cl. 33—138)

My invention relates to gauge tape cases, and more particularly to a novel combination of case, measuring tape and controls designed to facilitate the art of gauging and to further provide for the protection of the tape both in and out of use.

Gauging of the liquid contents of tanks and vats is a common practice in many industries, and is frequently effected by lowering a graduated, flexible steel tape fitted with a pendent plumb-bob to the bottom of the tank to be gauged, followed by withdrawing the tape and noting the length of the immersed section. In the oil industry where large numbers of exposed tanks varying in height from ten to fifty feet have to be gauged, often several times daily, it is obvious that any device that will speed up the work and operate equally well in extremes of weather will be of decided value.

An attempt to achieve such effect resulted in the known combination of a tape and pendent bob attached to an open reel provided with a crank and hung in an inverted U-shaped frame. While such device expedited the withdrawal of the tape, it did not control the speed of descent (other than by relatively slow manual unwinding), often resulting in a snapped tape with loss of a considerable section thereof together with the pendent bob. On account of there being no provision for locking the tape, it also unwound to a greater or less extent when the reel was carried, the resultant swing of the bob frequently causing a fracture of the tape at the junction with the snap-latch commonly employed for attaching the bob.

The chief object of my invention is to provide a combination of case, reel, tape, and control means, not only obviating the above objections, but possessing several new and novel features; among others to provide for a protective case carrying an enclosed spool on which the tape is wound by an exteriorly disposed crank, such case being further fitted with a readily detachable face plate for removing the tape and provided with a relatively wide D type of handle through which the arm may be passed or easily held with a heavy glove. The latter improvement will be at once apparent over the smooth handle of the simple reel so difficult to hold when oil-smeared.

A highly important object of my invention is to provide for a brake to arrest the tape at any desired point. Controlled by a lever in the handle of the case through links attached to a readily replaceable brake band engaging a drum mounted on the same shaft as the tape spool, but separated therefrom by a median plate, arrest of the tape may be easily effected without the fingers coming in contact with the liquid being gauged, thus preventing soiling of the hands and completely removing the tendency to the dangerous practice of hand braking with its often attendant cut, burnt or frozen fingers.

Among other objects of my invention are: to provide for a tape guard for reinforcing the tape next to the snap-latch, thus removing the danger of breakage at such junction; to provide for a slot in the gauge case so that when the tape is fully wound on its spool the tape guard will enter into such slot in a snug fit; to provide for a spring actuated lock pin, exteriorly manipulated, for locking the tape guard when drawn up into the slot, thus preventing unwinding, swinging and fracture of the tape when being carried; and to further provide for the construction of the various parts of the assembly from a light and tough substance unattacked by the liquid to be gauged; fibre, bakelite, light metals or their alloys being examples of suitable materials for fabrication.

In order that the invention may be more readily understood, reference is made to the accompanying drawing, where Figure 1 represents a front elevation and Figure 2 a side elevation of one form of my invention. Figure 3 is drawn partly in rear elevation and partly in vertical cross-section along the line AA of Figure 2; like parts being numbered the same throughout.

Referring to the drawing, the gauge tape case proper 1 comprises the slab-like, coincident frames 2, 3 and interjacent median plate 4 substantially in the form of an isosceles triangle; front and rear readily detachable face plates 2' and 3'; assembly screws 5; and carrying handle 6 integral with said frames and subtending an aperture therein freely admitting a heavily gloved hand. If the invention is to be used in the oil industry, these parts are preferably fabricated from a light tough metal, aluminum for example being very satisfactory.

Referring to Figure 1 where the face plate 2' is depicted as partly cut away, it will be noted that frame 2 has a circular recess 7 terminating in the substantially tangential slot 8. In the recess 7 is concentrically disposed the tape spool 9 carrying the tape 10 which passes outwardly through the slot 8 and is commonly of the flexible steel type graduated in feet and inches. The tape spool 9 is rigidly mounted on the shaft 11, respectively extending through the median plate

4 and face plates 2' and 3', such plates serving as shaft bearings. On the external end of the tape is attached the tape guard 12 formed of two stiffening strips 12', preferably of fibre or light metal, of the same width as the tape for approximately the length of the slot 8 and terminating in the enlarged lobes 12'' (see Figure 2) which prevent the guard being drawn too far into the slot. These enlarged lobes also permit the compression of the tape between the stiffening strips and within the bolts 13 and 13', thus obviating the necessity of perforating the tape and allowing its rapid replacement. The tape may be passed through the stirrup of the snap-latch 14 carrying the plumb-bob 15, and bent back on itself before compression; or a short separate strap of sheet metal may be employed to suspend the snap-latch which with the bob is to be considered as illustrative of one form only of known pendent devices, another being a water thief (not shown). The assembled guard is of such dimensions as to fit snugly into the slot 8 when the tape is completely wound on the tape spool 9. Disposed within the recess 16 near the bottom of the frame 2 is the lock pin assembly comprising the cylindrical, lug-equipped sleeve 17, coiled spring 18 and shouldered lock pin proper 19 terminating externally in the knob 20 and extending internally of sufficient length to engage the hole 19' in the left hand stiffening strip 12' of the tape guard 12 when the latter is seated in the slot 8; said pin being held in position by the spring 18, thus positively locking the guard and tape in its case. Release is effected by pulling the knob 20 until its base clears the lug screw 17', then giving the knob a quarter turn and allowing the circular section of the knob base to rest on the lug screw; such movement of the knob retracting the pin 19 sufficiently to clear the guard and place the device in readiness for gauging.

Referring to Figure 3, it will be observed that the frame 3 has a circular recess 21 identical with that in frame 2 terminating in the slot 22. Disposed in the recess 21 is the brake drum 23 rigidly mounted on the extension of the shaft 11 and thus in effect integral therewith and tape spool 9. The crank 24 is fitted on the extension of the shaft passing through the face plate 3' and held in position by the set screw 25. Attached to the drum is the readily detachable brake band 26 of suitable tough and flexible material, such as hydraulic packing, and fastened to the frame by the screw 27. The band extends externally through the slot 22 where it is united to the brake lever 28 by the links 29 and pins 30. The brake lever operates in the slot 6' in the handle 6 substantially parallel thereto with pin 31 its fulcrum, its free end slidably fitting in the slot 32 in the opposite side of the handle. Such slot is provided with the offset 32' into which the free end of the lever may be slid when it is desired to lock the tape at any desired point.

It will be obvious from the above description that any compression of the brake lever 28, easily effected by the fingers while holding the gauge case by the handle 6, will be transmitted to the tape 10, whose descent can be arrested temporarily or locked at any desired point without danger to the tape or injury to the operator.

Where shallow depths of liquid are to be gauged, or where cheapness in construction is essential, the case handle 6 may be made integral with frame 2; frame 3 (including the brake drum) dispensed with and a suitable rear face plate installed in place of the median plate 4; such assembly retaining the enclosed tape spool, tape guard and lock pin features together with the easily held handle, but not the braking device disclosed in my preferred form of the invention. The invention is not limited to the dimensional relations or to the precise form or assembly shown in the drawing, nor to the materials mentioned as suitable for fabrication. Other advantages will doubtless occur to those skilled in the art and what I claim as new and desire to protect by Letters Patent is:

1. In combination with a flexible measuring tape, a case having a handle, a tape spool and a brake drum rigidly disposed on a common shaft thus forming an integral member, said member being rotatably mounted in said case and said tape being attached to said spool, a brake band frictionally engaging said drum, and a brake lever pivotally linked to said band, said lever being hung within and co-planar to said handle.

2. In combination with a flexible measuring tape, a slab-like case having a D-shaped handle co-planar therewith, a tape spool and a brake drum rigidly disposed on a common shaft thus forming an integral member, said member being rotatably mounted in said case and said tape being attached to said spool, there being an extension of said shaft through said case terminating in a winding crank, a brake band frictionally engaging said drum, and a brake lever pivotally linked to said band, said lever being hung within and co-planar to said handle, there being a lock slot in said handle adapted to receive and retain the free end of said lever in a position preventing the movement of said tape.

3. In combination with a flexible measuring tape, a slab-like case having an extended D-shaped handle co-planar therewith and enclosing a relatively large aperture, a tape spool and a brake drum rigidly disposed on a common shaft thus forming an integral member, said member being rotatably mounted in co-axially disposed chambers in said case and said tape being detachably attached to said spool, there being an extension of said shaft through said case terminating in a winding crank, a brake band frictionally engaging said drum, and a brake lever pivotally linked to said band, said lever being pivotally hung in one side of said handle and situate within and co-planar to said handle, there being a lock slot in the opposite side of said handle adapted to slidably receive and retain the free end of said lever in a position preventing the movement of said tape through sufficient frictional engagement of said band with said drum.

4. In combination with a flexible measuring tape, a slab-like case in which said tape is rotatably mounted, a tape guard comprising two straight stiffening strips terminating in enlarged lobes between which the external end of said tape is rigidly compressed, there being a slot in said case adapted to slidably receive the straight portion of said guard, a rotatable spring-actuated lock pin in said case engaging said guard when the guard is inserted in said slot, said pin being retractile through an external knob rigidly connected to said pin, and an elevated projection on said case on which said knob may be seated after retraction and partial rotation, thus preventing engagement of said pin with said guard.

5. In combination with a flexible measuring tape, a slab-like case having a D-shaped handle

co-planar therewith, a tape spool rigidly disposed on a shaft thus forming an integral member, said member being rotatably mounted in said case and said tape being detachably attached to said spool, there being an extension of said shaft through said case terminating in a winding crank, a tape guard comprising two straight stiffening strips terminating in enlarged lobes, between which the external end of said tape is rigidly compressed, there being a slot in said case adapted to slidably receive the straight portion of said guard, a rotatable spring-actuated lock pin in said case engaging said guard when the guard is inserted in said slot, said pin being retractile through an external knob rigidly connected to said pin, and an elevated projection on said case on which said knob may be seated after retraction and partial rotation, thus preventing engagement of said pin with said guard.

VERGIL T. LAINGOR.