No. 860,304. PATENTED JULY 16, 1907.

W. L. E. KEUFFEL.

TAPE REEL.

APPLICATION FILED JUNE 6, 1905. RENEWED MAY 16, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

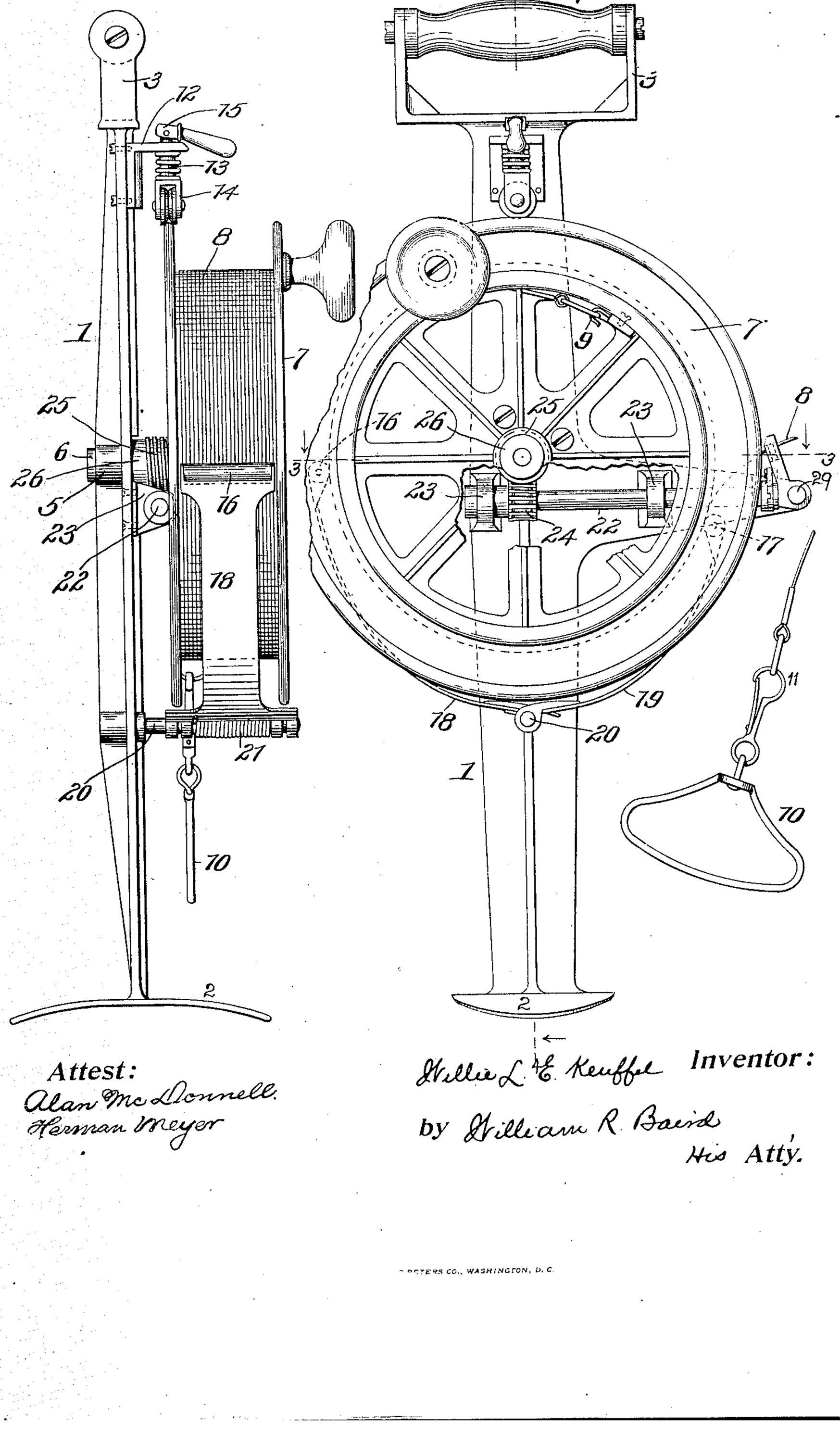

Fig. 2.

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2 SHEETS—SHEET 2.

Fig. 3.

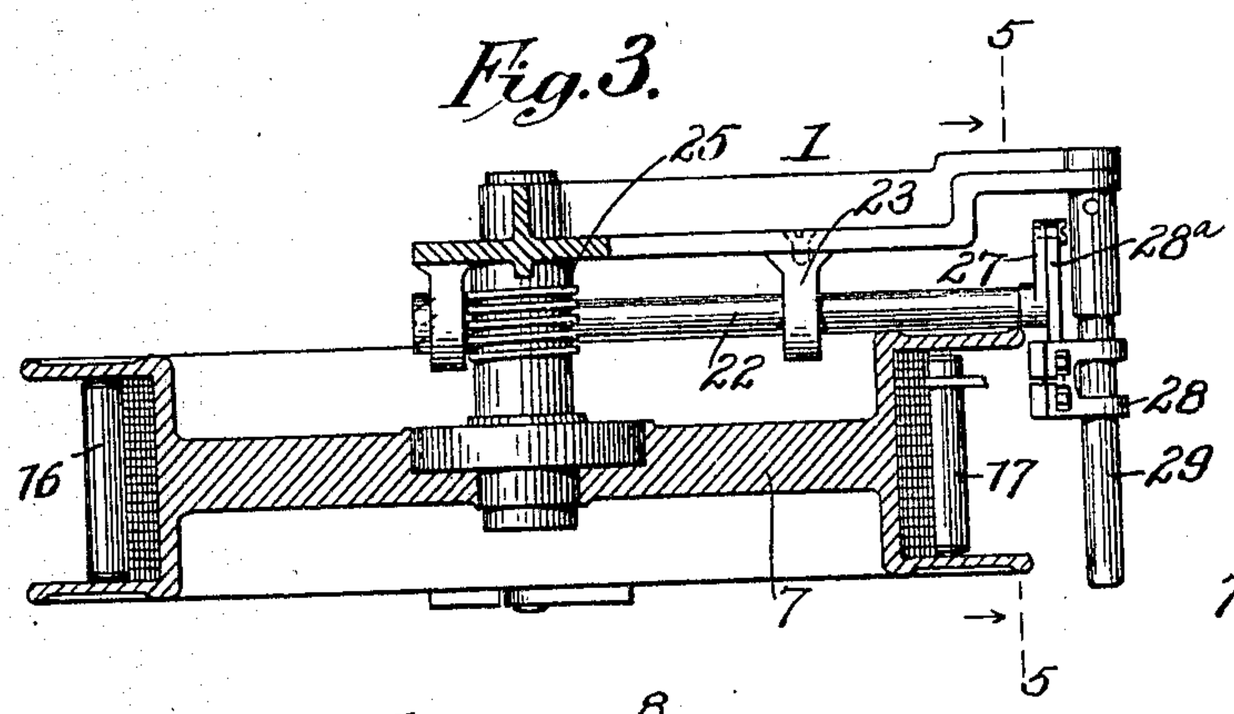


Fig. 4.

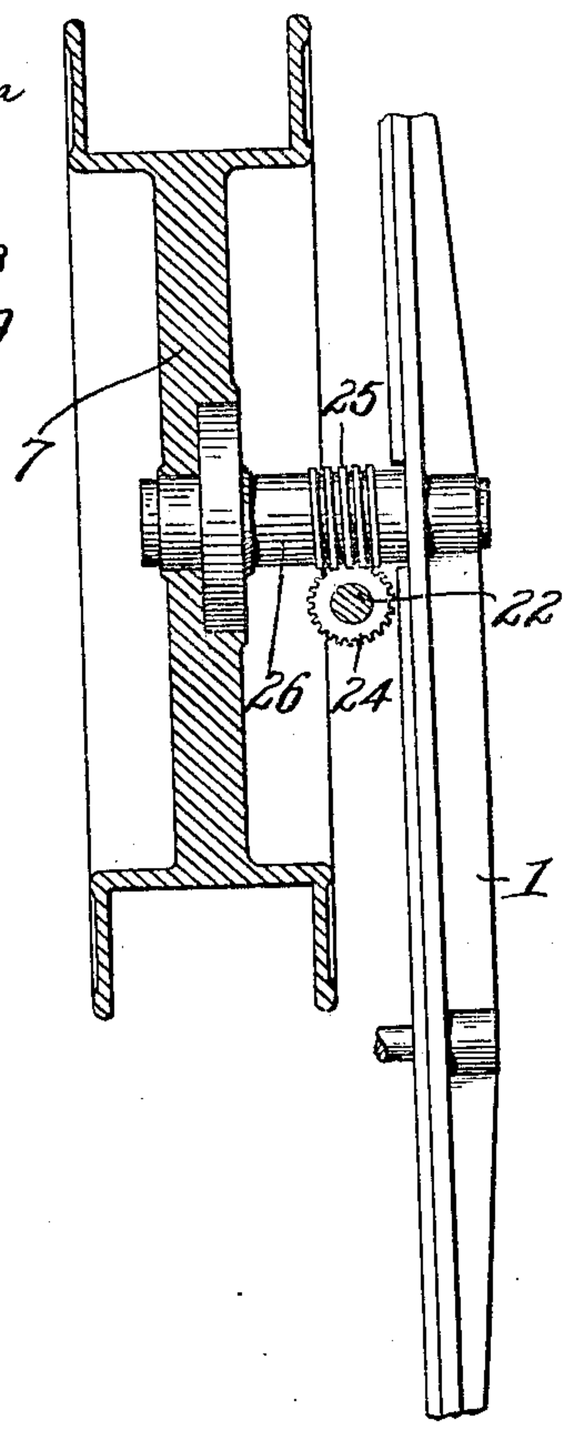


Fig. 5.

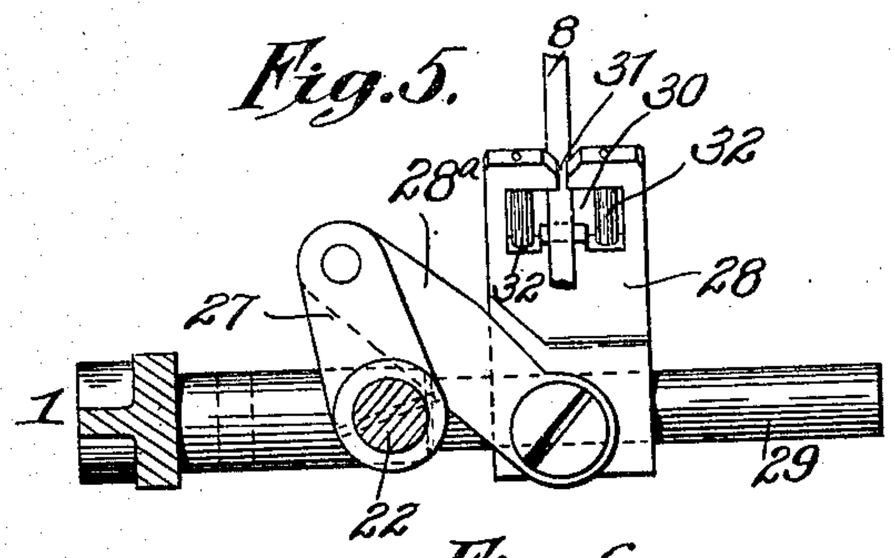
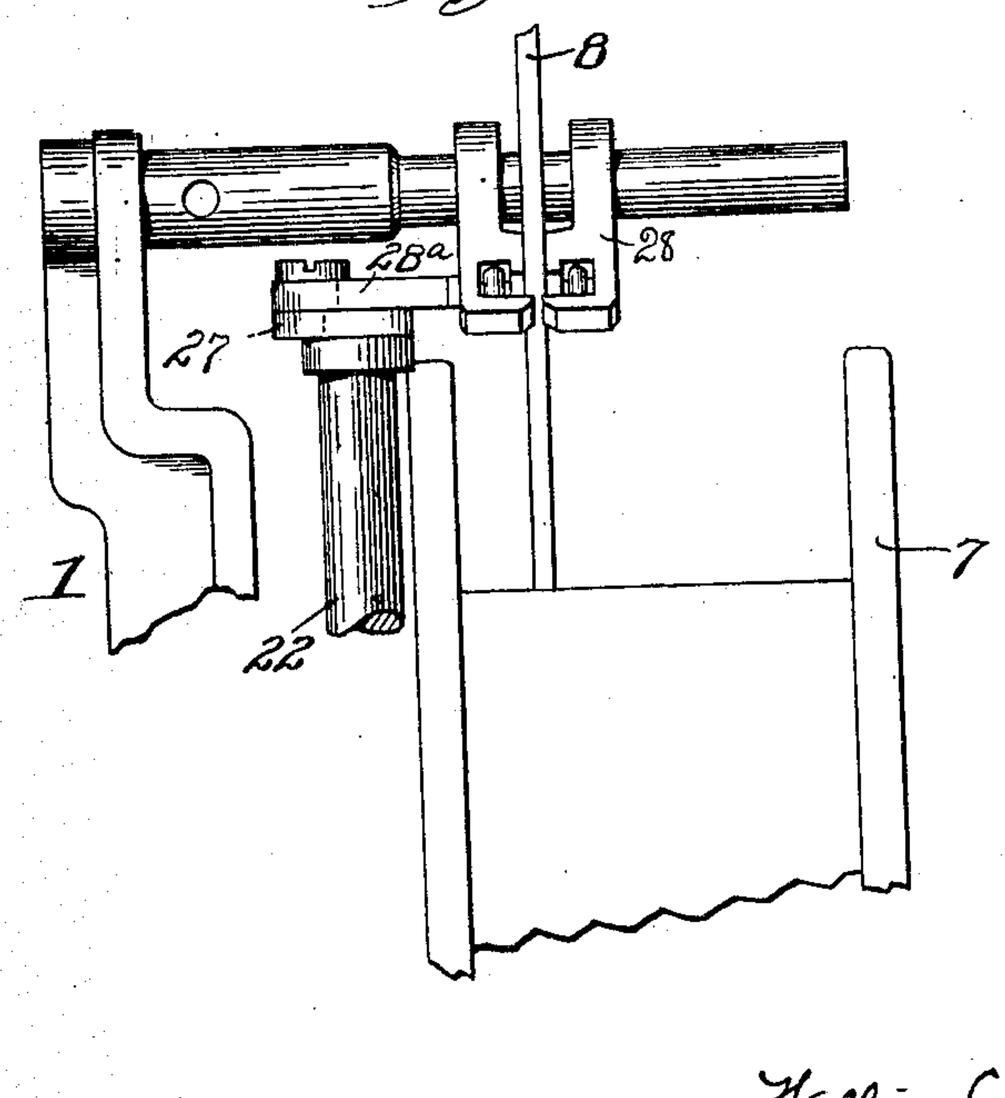


Fig. 6.



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by William R. Baird
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UNITED STATES PATENT OFFICE.

WILLIE L. E. KEUFFEL, OF HOBOKEN, NEW JERSEY, ASSIGNOR TO THE KEUFFEL & ESSER COMPANY, OF HOBOKEN, NEW JERSEY, A CORPORATION OF NEW JERSEY.

TAPE-REEL.

No. 860,304. **Specification of Letters Patent.** **Patented July 16, 1907.**

Application filed June 6, 1905, Serial No. 263,993. Renewed May 16, 1907. Serial No. 373,979.

To all whom it may concern:

Be it known that I, WILLIE L. E. KEUFFEL, a citizen of the United States, residing at Hoboken, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Tape-Reels, of which the following is a specification.

My invention relates to reels for narrow measuring tapes such as are used by civil engineers and surveyors, and its novelty consists in the construction and adaptation of the parts, as will be more fully hereinafter pointed out. In winding up such tapes it frequently becomes tangled and forms snarls and loops, difficult to unravel. On account also, of the weight of metal employed in the long wires used, such tapes are heavy and uncomfortable to carry, because the frame work by which they are supported and on which they are reeled must be correspondingly strong.

The purpose of my invention is to overcome in part at least the disadvantages above stated, and to that end my improved tape is provided with a winding drum or reel and framework of aluminium, which I have found to be stiff enough for the purpose and yet to be light. It is provided also with means whereby a tension may be exerted at will upon the winding reel so as to steady the winding and unwinding of the tape. It is provided with a means whereby it can be securely and comfortably held by the operator, who is carrying it, and it is also provided with means for guiding the lines of the tape as it is rolled and unrolled so as to prevent the formation of snarls and loops and to cause it to be laid in even coils upon the drum of the reel.

In the drawing Figure 1 is a view in edge elevation of a tape reel constructed in accordance with my invention, Fig. 2 is a view thereof in side elevation, Fig. 3 is a view partially in top plan and partially on the plane on the broken line 3—3 of Fig. 2, Fig. 4 is a view of part of the frame partially in elevation and partially in section on the plane of the broken line 4—4 of Fig. 2, and Figs. 5 and 6 are views in detail of the mechanism for guiding the tape into even layers upon the spool.

Like reference, numerals mark the same parts in all of the figures of the drawing.

Referring specifically to the drawing, 1 indicates the body of the reel, made of any suitable material, preferably, on account of its lightness, of aluminium, and provided at one end with a body plate 2 to rest against the body while holding the reel in position for operation, and at the other or outer end with a yoke 3, in which is mounted a suitable handle 4 to be grasped by the hand to hold the reel tightly against the body.

The body 1 is further provided with a bearing 5 to receive the journal 6 of a spool 7, said spool having a suitable handle to facilitate the rotation thereof in operation.

The tape is indicated at 8, and has its inner end secured to the spool by means of a loop and hook 9, Fig. 2 so that it may be wound thereupon in the usual manner, and at the outer end of the tape is provided a suitable hand loop 10, secured removably thereto by means of suitable links and snap-hook 11.

There is mounted on the body 1 a bracket 12, in which is mounted a spring-pressed pin 13, carrying in its inner yoke-shaped end a tension roll 14, which normally presses against the periphery of the spool 7, means being provided to withdraw the pin and thus remove the tension roll from contact with the spool, such means comprising a cam-lever 15 pivoted to the outer end of the pin 13, operating in a well known manner.

To insure the proper compactness of the winding, and prevent improper unwinding of the tape, I provide rolls 16, 17, one bearing on each side of the tape on the spool, such rolls being mounted in the ends of levers 18 and 19, pivoted on a pin 20 projecting from the body 1, and actuated to normally and yieldingly press the rolls against the tape by a spring 21 wound upon the pin.

To insure the proper winding of the tape from side to side of the spool, I provide means, as follows: 22 indicates a shaft at right angles to the shaft of the spool, said shaft being journaled in bearings 23 secured to the body 1. Upon this shaft 22 is a worm-wheel 24, which engages a worm 25 on a hub projecting from the inner side of the spool so that the rotation of the spool will cause a slower rotation of the shaft 22. Secured upon said shaft 22 is a crank arm 27, Fig. 3 which is connected at its outer end by a link 28^a, with a block 28 slidably mounted on a pin 29 projecting from a side arm of the body 1 parallel with the spool shaft. This block 28 has a recess 30, through which the tape passes, being introduced therein through an open slot 31, and wear upon the tape as it passes through the recess is guarded against by providing anti-friction rollers 32 in the sides of the recess.

The tape being wound upon the spool and it being desired to unwind, or reel it out, the reel is held tightly against the body in the manner hereinbefore described and the tape pulled outward by the hand-loop 10, the tape being slipped out of the recess 30 if desired, and the tension of roll 14 being also removed, if desired, by operating the cam lever 15. This will leave the tape free to be unwound, tangling, or the formation of snarls or loops being prevented by the spring-pressed rolls 16 and 17, the pressure of which can also be relieved, if desired, by throwing their supporting levers 18 and 19 back or outward.

In order to wind up the tape, the reel is tightly held against the body as before, when, by rotating the spool by means of its handle, the tape, passing through the recess 30 of block 28, is regularly and evenly wound

upon the spool, being packed by the spring-pressed rolls 16 and 17, and being guided from side to side of the spool and laid in regular layers thereon by the sliding of the block 28 on the pin 29, caused by the action of the worm 25, the worm-wheel 24, the shaft 22, the crank-arm 27 and the link 28[a].

By the construction described, the objects of my invention are accomplished and the tendency to tangles, loops and snarls obviated. The weight of the implement is reduced, means are provided to tightly hold the reel in position against the body; a regular, easy and free unwinding of the tape is insured, and a regular, easy and compact winding of the tape made possible.

What I claim as new is:

1. A reel of the character described comprising a frame, or body, a body-plate on one end thereof, a rigid transverse handle on the opposite end, and a revoluble spool journaled in the body.

2. A reel of the character described, comprising a frame or body, having one side clear of projections, a revoluble spool, journaled on the opposite side, a crank handle on the outside of the spool, a body-plate at one end of the body and a rigid transverse handle at the opposite end thereof.

3. A reel of the character described, comprising a frame or body, a revoluble spool journaled thereon, a bracket mounted at substantially a right angle to the body, a spring-pressed slidable pin mounted in the bracket, a roll carried by the pin, and bearing upon the spool, and means for withdrawing the roll from contact with the spool.

4. A reel of the character described, comprising a frame or body, a revoluble spool journaled thereon, a bracket mounted at substantially a right angle to the body, a spring-pressed slidable pin mounted in the bracket, a roll carried by the pin, and bearing upon the spool, and a cam lever pivoted to the pin for withdrawing the roll from contact with the spool.

5. A reel of the character described, comprising a frame or body, a bracket at right angles to the body, a spool journaled on the body, a spring pressed roller carried by the bracket and bearing upon the periphery of one of the flanges of the spool, and two spring pressed rolls fitting between the flanges of the spool and exerting opposite pressures upon the contents of the spool in planes substantially at right angles to the line of pressure of the bracket-supported spool.

6. A reel of the character described, comprising a frame or body, a revoluble spool journaled thereon and adapted to receive a steel tape, a pin projecting from the body near the edge of the spool, two arms pivoted on said pin, rolls journaled in the outer ends of said arms and adapted to bear upon the opposite sides of the tape wound on the spool, and a spring wound upon the pin and pressing both of said rolls upon the tape.

7. A reel of the character described, comprising a frame or body, a revoluble spool journaled thereon and adapted to receive a steel tape, a bracket at a right angle to the body, a spring-pressed grooved roller supported upon the bracket and bearing upon one of the flanges of the spool, a pin projecting from the body near the edge of the spool, two arms pivoted on said pin, rolls journaled in the outer ends of said arms and adapted to bear upon the opposite sides of the tape wound on the spool, and a spring wound upon the pin and pressing both of said rolls upon the tape in directions substantially at right angles to the direction of pressure of the bracket-supported spool.

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

WILLIE L. E. KEUFFEL.

Witnesses:
ALAN MCDONNELL,
HERMAN MEYER.