E. W. DENNISON.

Metal, or Paper Gage.

No. 165,158. Patented July 6, 1875.

Fig. 4. Enlarged.

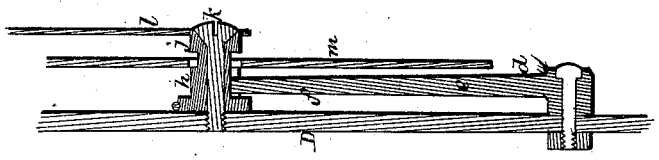


Fig. 2.

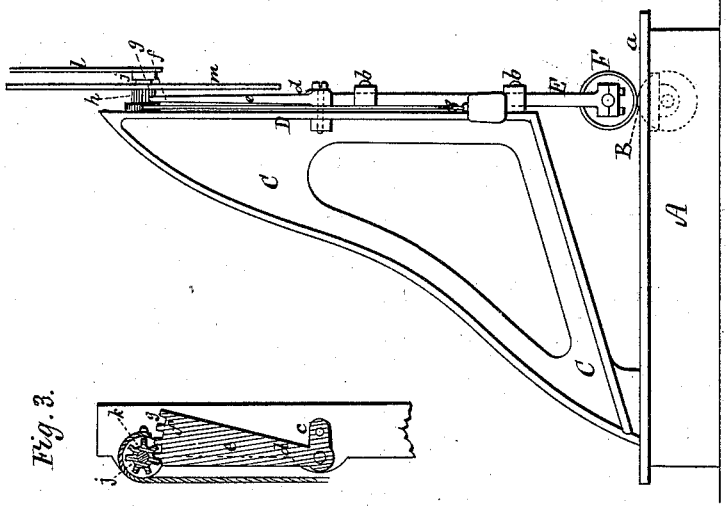
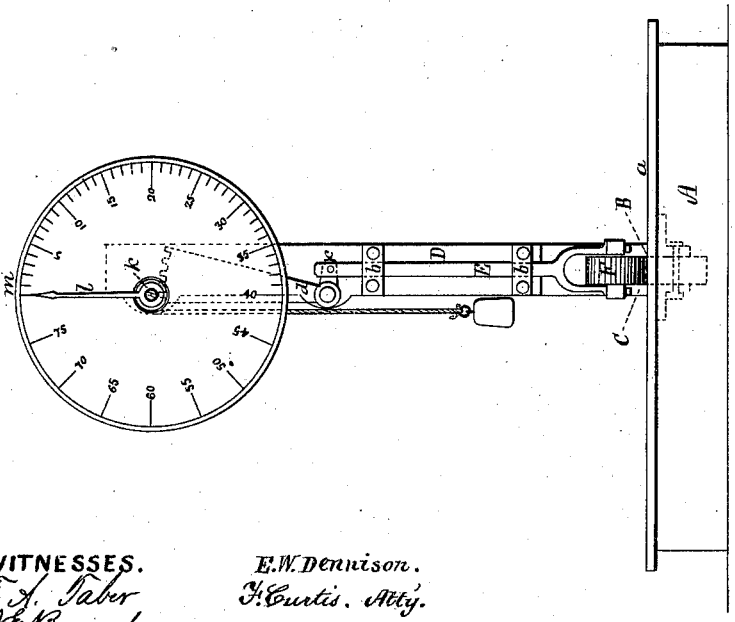


Fig. 3.

Fig. 1.



WITNESSES.
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UNITED STATES PATENT OFFICE.

ELIPHALET W. DENNISON, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN METAL OR PAPER GAGES.

Specification forming part of Letters Patent No. **165,158**, dated July 6, 1875; application filed April 26, 1875.

To all whom it may concern:

Be it known that I, ELIPHALET W. DENNISON, of Boston, Suffolk county, Massachusetts, have invented certain Improvements in Paper or Metal Gages, of which the following is a specification:

The purpose of this invention is to provide an accurate and convenient instrument for determining the thicknesses of papers, sheet metals, card-boards, or other substances in which the extremes of thickness are comparatively slight; and the invention consists in the main, first, of a roller, mounted upon a horizontal axis, and preferably disposed with its greater part below a table or platform, with its upper part or highest point protruding slightly above the top of such table; second, of a second roller, pivoted horizontally to the lower end of an upright bar, sliding in suitable guides applied to a frame or standard, which surmounts the table before named, the last-named roller being disposed immediately over and coinciding with the lower, and in fact resting upon it, and the slide-bar being combined with and actuating a proper indicating mechanism, and a dial to show the thickness of the substance introduced between the rollers, the whole being substantially in manner, and operating as hereinafter described.

The drawings accompanying this specification represent, in Figure 1, a front elevation, in Fig. 2 a side elevation, and in Figs. 3 and 4 vertical and longitudinal sections, of an instrument embodying my invention.

In these drawings, A represents a flat horizontal table or bench, below the top *a* of which I dispose a roller, B, which I mount upon a pin or pivot placed parallel to the said top and to the front edge of the table, said roller protruding slightly above the top, through a slot created in the latter. Upon the rear side of the table A I erect a curved standard, C, which leans forward toward the front of such table, its outer face or plate D being upright, and at such a height above the table as to readily admit the introduction, below it, of a sheet of paper or other material. To the front face of the standard C, and sliding in suitable boxes *b b* applied thereto, I dispose an upright bar, E, to the lower end of which I pivot a second roller, F, which is preferably a counterpart of the first, the pivot or axis of this roller F being parallel to that of the first, and the peripheries of the two rollers being in contact. The upper extremity of the bar E is pivoted to the inner end of the horizontal arm *c* of a bent or bell-crank lever, *d*, which is pivoted at its corner to the standard C, the upright arm *e* of this lever being much longer than the first, and terminating in a sectoral plate, *f*, the upper edge of which is converted into a toothed rack *g*, which engages and drives a pinion, *h*, which pinion in turn constitutes part of a horizontal rock-shaft, *j*, which shaft in turn is supported upon a stud, *k*, projecting laterally from the upper part of the said standard C. The outer end of the tubular shaft or sleeve *i* carries a hand or pointer, *l*, while in rear of this pointer, and between it and the bar E, I place a dial-plate, *m*, upon the front of which I engross a scale of divisions, the nature of which is to correspond to the gage of the material to be tested by the instrument. In the present instance this scale of divisions, as an example, consists in dividing the circumference of the dial-plate into fifteen equal divisions, and subdividing each or all these divisions into five equal parts, thus producing eighty divisions upon the dial. The hand or pointer *l*, while in a normal position, coincides with the first or upper central mark upon the dial, which thus becomes zero, consequently any departure from this zero-mark is instantly detected and registered, and such pointer is held up to this zero-mark by a spring or weight applied to the sleeve *j*.

The above description embraces the elementary features of an instrument which I have devised as one practical method of putting my invention into practice, and its operation is briefly as follows: The sheet of paper, card, piece of sheet metal, or other object whose thickness is to be gaged, is pushed between the two rollers, the effect of which is to elevate the upper roller F and its slide-bar E, while this elevation of such bar E effects a vibratory movement of the upright portion of the sectoral lever *d*, while such movement of the lever, acting through the pinion *h*, effects a partial rotation of the sleeve *j* upon its axis, and consequently of a corresponding movement of the index-pointer away from the zero-

mark, and over the scale of divisions upon the dial-plate. Owing to the compounding or multiplication of the lever *d*, as between its fulcrum and sectoral rack, and the pivot which connects it to the actuator-bar E, the slightest variation of the thickness of the material introduced between the rollers is instantly detected.

The principle of my invention is susceptible of wide application, and I do not restrict myself to the details of mechanism herein shown and explained, as these details are not arbitrary, but matter of convenience in many instances. In fact, one or both the rollers may be dispensed with, and a polished block take their places, but the wear upon the unyielding surfaces of such blocks would of necessity be much more rapid than upon the constantly yielding and changing periphery of the rollers.

I claim—

1. In an instrument for gaging paper and other materials, a stationary roller or bed as a base upon which the material to be gaged passes, in combination with a yielding or sliding roller or block, disposed over and touching the first, and connected in a suitable manner with an index and pointer, to register the extent to which the two rollers or bearings are separated by the introduction of an object between them, the whole being substantially as and for the purposes stated.

2. The mechanism consisting of the lower or base roller B, the upper roller F, and bar E, pivoted together as explained, the bent lever *d*, pivoted at one end to the bar E, and with its opposite end engaging the tubular rock-shaft *j* or a pinion affixed to the latter; and, lastly, the pointer *l* and dial-plate *m*, with its index engrossed upon it, the whole being substantially as and for purposes stated.

E. W. DENNISON.

Witnesses:

JAMES A. SHEPARD,

F. CURTIS.