

(No Model.)

3 Sheets—Sheet 1.

O. W. T. AM ENDE.

THICKNESS GAGE FOR PAPER MAKING MACHINES.

No. 521,976.

Fig. 1. Patented June 26, 1894.

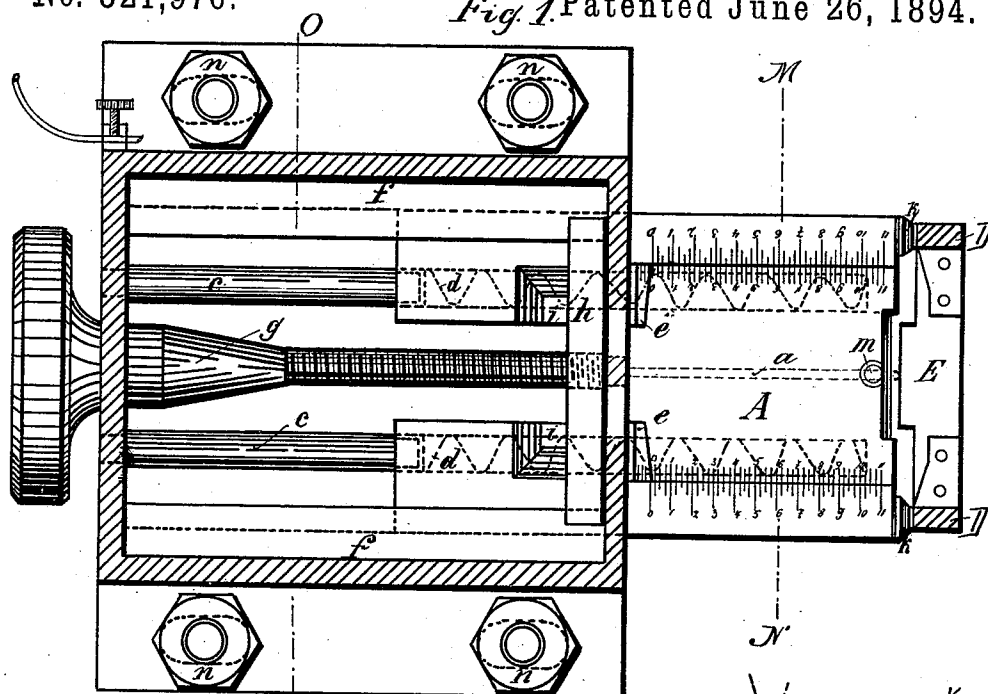
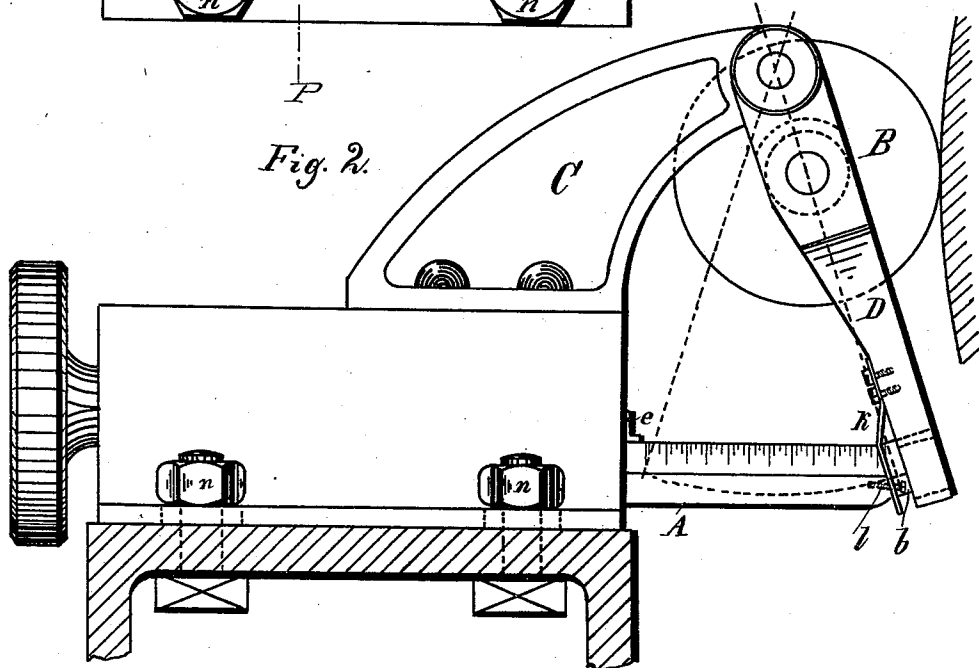


Fig. 2.



Witnesses:

C. R. Kotton

H. van Oldenmeel

Inventor:

Otto Wilhelm Theodor am Ende

By Richardson

his Attorneys

(No Model.)

3 Sheets—Sheet 2.

O. W. T. AM ENDE.

THICKNESS GAGE FOR PAPER MAKING MACHINES.

No. 521,976.

Patented June 26, 1894.

Fig. 3.
M-----N

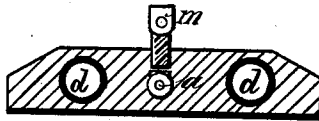
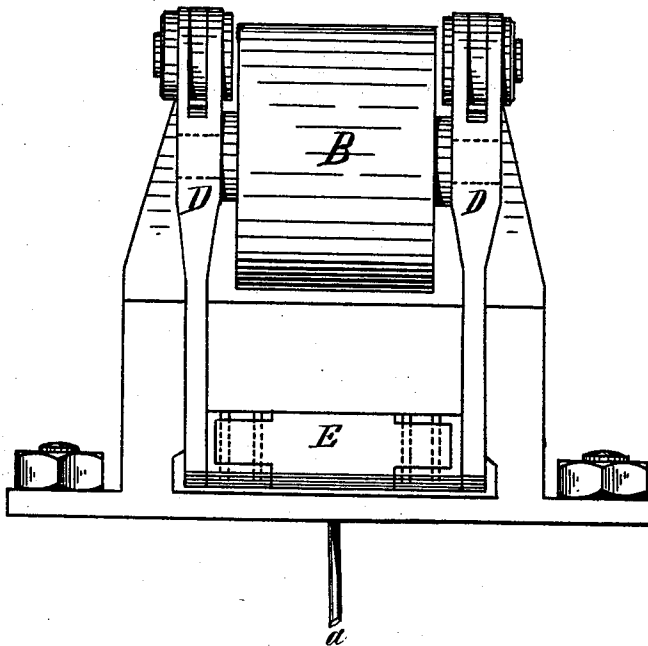


Fig. 4.



Inventor:

Witnesses:

Otto Wilhelm Theodor am Ende

E. R. Rolton

H. van Oldenmeel

By Richard A. Lee

his Attorneys.

(No Model.)

3 Sheets—Sheet 3.

O. W. T. AM ENDE.
THICKNESS GAGE FOR PAPER MAKING MACHINES.

No. 521,976.

Patented June 26, 1894.

Fig. 6.

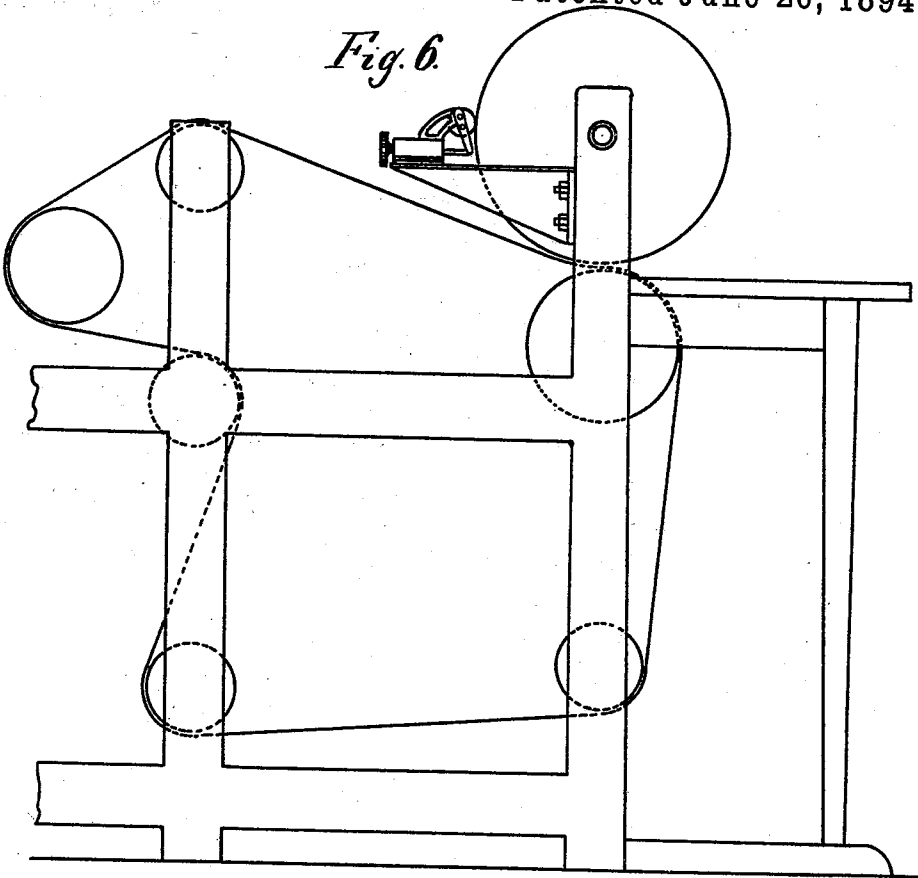
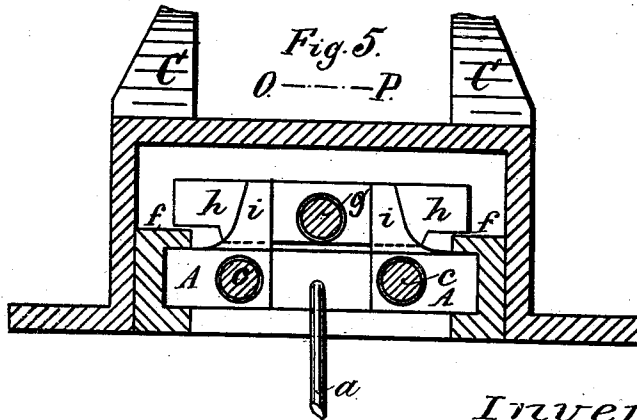


Fig. 5.
O---P



Witnesses:

E. R. Kallan

H. van Densen

Inventor:

Otto Wilhelm Theodor am Ende

By *Richard A. Lee*
his Attorneys.

UNITED STATES PATENT OFFICE.

OTTO WILHELM THEODOR AM ENDE, OF BAD HARZBURG, GERMANY.

THICKNESS-GAGE FOR PAPER-MAKING MACHINES.

SPECIFICATION forming part of Letters Patent No. 521,976, dated June 26, 1894.

Application filed November 10, 1893. Serial No. 490,591. (No model.) Patented in Belgium May 24, 1893, No. 104,801.

To all whom it may concern:

Be it known that I, OTTO WILHELM THEODOR AM ENDE, a subject of the King of Prussia, residing at Bad Harzburg, in the Duchy of Brunswick, German Empire, have invented new and useful Improvements in Thickness-Gages for Paper-Making Machines, (for which I have obtained Letters Patent in Belgium, No. 104,801, dated May 24, 1893,) of which the following is a specification.

My invention relates to apparatus for measuring the thickness of paper or pulp in a paper making machine, as I shall describe referring to the accompanying drawings.

Figure 1 represents a plan partly in section. Fig. 2 is a side view. Fig. 3 is a section on the line M N of Fig. 1. Fig. 4 is a part end elevation. Fig. 5 is a section on the line O P of Fig. 1. Fig. 6 shows the arrangement of the whole apparatus on a paper making machine, and its position relatively to the measurement cylinder.

The apparatus consists chiefly of a rectangular box, fitted, first, with a slide A, which by means of a micrometer screw can be moved outward or inward; second, with the divisions on the slide made to an enlarged scale for reading the thickness of the article to be measured; third, with one insulated metal wire *a* in the slide; fourth, with a roller B suspended from arms C to the box by two lever arms D, the lower parts of which are connected by the plate E.

The apparatus, which is to be made of metal, is connected by the insulated metal wire *a* with an electric battery and bell, in any suitable position, while a second wire leading to the electric bell is fastened directly to the apparatus; the bell is actuated at any desired moment determined by the apparatus, apprising the workmen, that the prescribed thickness of the pulp or the paper has been reached.

The apparatus is so constructed as to measure thickness down to eleven millimeters and that it admits of being set to a degree of accuracy equal to one-eighth of a millimeter. If finer measurements should be required, the length of the lever arm to the axis of the roller B is lessened, or a longer lever arm D may be used. The scale on the slide will in such case be proportionally increased. The

slide A by means of its springs bearing against the ends of the bolts *c* is so far pushed out, that the points of both the indicators *e* stand at zero on both scales. The slide A can be drawn horizontally into the box by means of the micrometer screw *g* working in the bar *h*, which bears against stops *i* on both sides of the slide, the apparatus being thus set to any desired measurement. The true movement of the slide is insured by the angle iron guides *f*. Both the lever arms D and along with them the lower connecting plate E are connected with the slide A by springs *k* and pins *l* passing through a vertical slot of the springs, the arrangement being such, that the front face of the connecting plate E is kept away from contact with the point of the insulated wire *a* a distance of two to three millimeters by means of the springs *k*, but on a slight pressure against the roller B the plate E is brought in contact with the point of the wire *a* thus closing a circuit and causing the bell to ring. The roller B will be acted on only when the pulp or the paper approximately reaches the desired thickness. The insulated wire *a* is held fast in its position by the screw *m*. The elasticity of the springs *k* is such, that they will yield on the slightest pressure against the roller B allowing of contact of the connecting plate E with the wire *a*, without the slide A being itself pushed back into the box.

In graduating the slide A regard is to be had to the movement of the roller B in a circular path and to the variation of leverage at which the connecting plate E touches the point of the wire *a*. In the apparatus shown a movement of the roller through ten millimeters corresponds to a length of thirty-nine millimeters on the slide A. The apparatus has to be mounted upon a firm stand, and if in a pulp machine, against the pulp cylinder as shown in Fig. 6, being bolted on to the framing by four bolts *n*, which pass through slotted holes, it being so adjusted, that the roller touches the pulp cylinder in the horizontal line passing through the center of the cylinder, the connecting plate E also touching the wire *a*, with the slide set to zero. In this position the electric signal would be heard, but then the slide is to be moved back by the micrometer screw, until the indicator

e points to the required thickness for the pulp or paper.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. A gage for paper making machine comprising the frame, the graduated slide A movable therein, the springs for forcing the slide forward, the adjusting screw for retracting the slide against the spring pressure, the arms D pivoted to the frame and depending from their pivotal points and having the cross bar E at their lower ends opposite the front end of the slide, the roller carried by the said arms to bear on the pulp cylinder to move the depending arms pivotally, the electric contact carried by the graduated slide and the springs k interposed between the lower ends of the pivoted frame and the graduated slide, substantially as described.

2. A gage for paper making machines comprising the adjustable graduated slide carrying a contact point, the means for adjusting the slide, the frame in which the slide is movable, the arms D pivoted in said frame and depending from their pivotal points, the cross bar E at the lower ends of said arms opposite the end of the graduated slide and the contact carried thereby and the roller carried by the depending arms to bear on the pulp cylinder to move the pivoted depending arms toward the graduated slide, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

OTTO WILHELM THEODOR AM ENDE.

Witnesses:

OTTO FRANK,
G. HÜLSMANN.