

M. C. & A. WELLS.
MACHINE FOR GAGING THE THICKNESS OF MATERIAL.

APPLICATION FILED JULY 17, 1906.

3 SHEETS—SHEET 1.

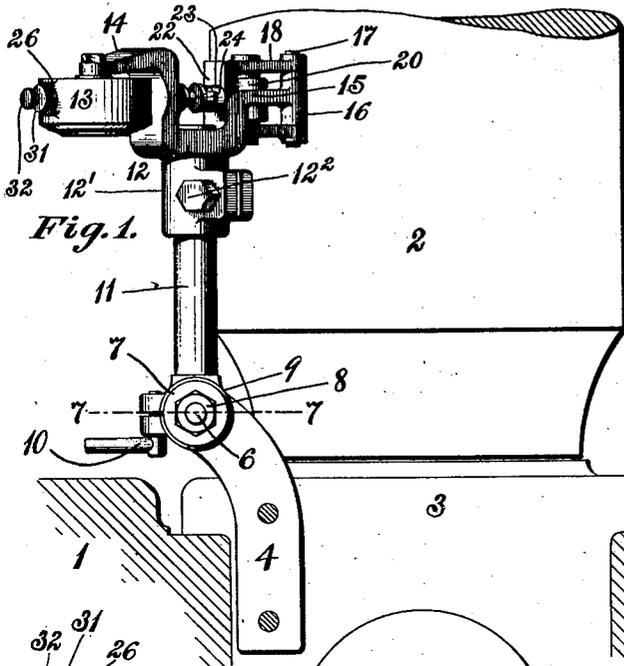


Fig. 1.

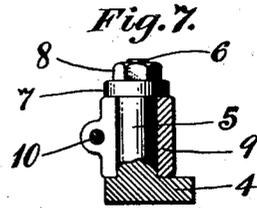


Fig. 7.

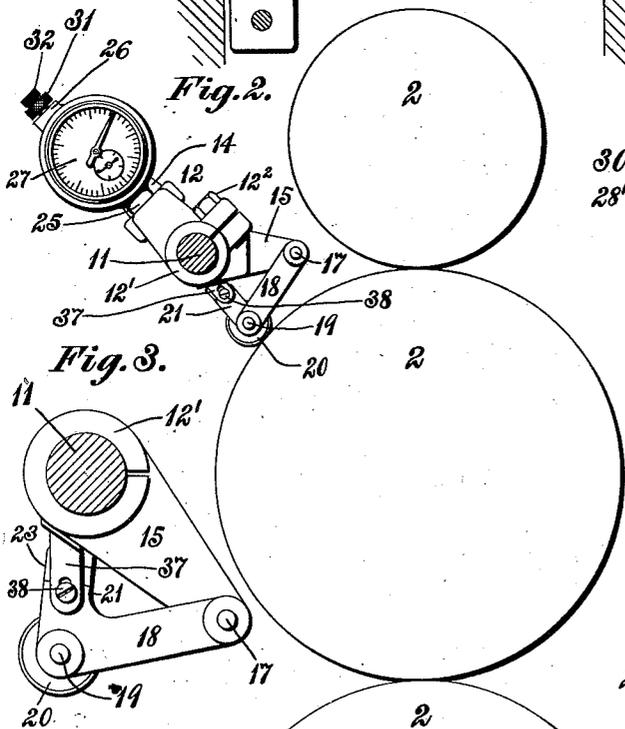


Fig. 2.

Fig. 3.

Fig. 4.

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No. 842,044.

PATENTED JAN. 22, 1907.

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3 SHEETS—SHEET 2.

Fig. 5.

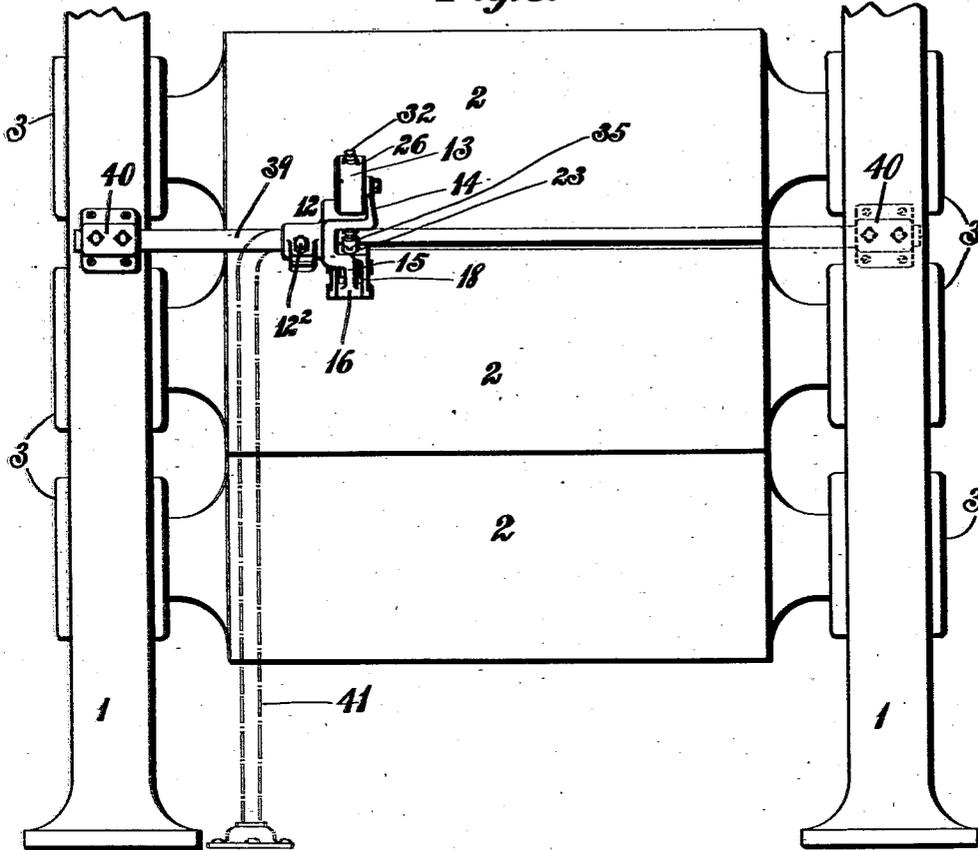
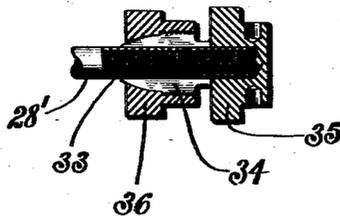


Fig. 6.



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3 SHEETS—SHEET 3.

Fig. 9.

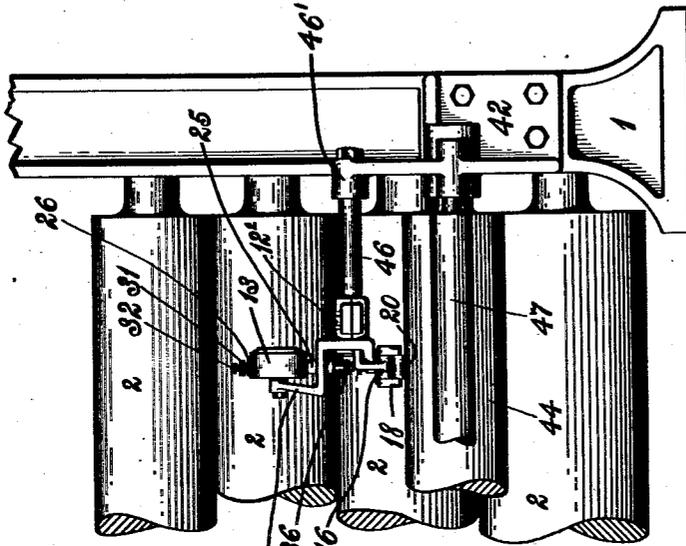
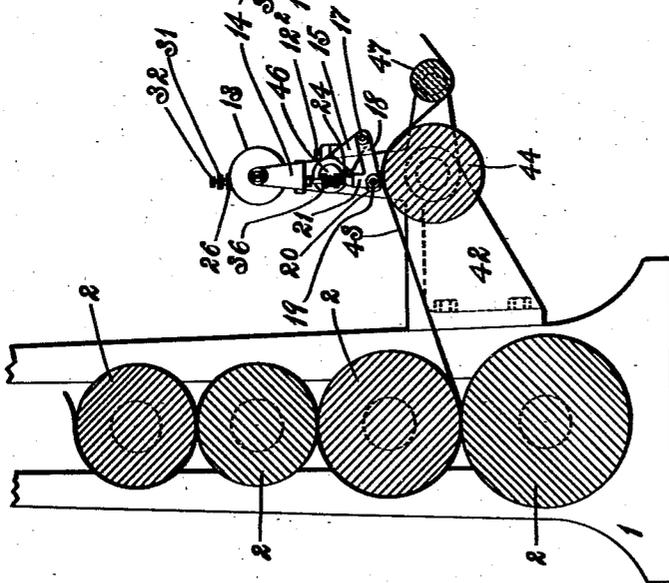


Fig. 8.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR GAGING THE THICKNESS OF MATERIAL.

No. 842,044.

Specification of Letters Patent.

Patented Jan. 22, 1907.

Application filed July 17, 1906. Serial No. 326,560.

To all whom it may concern:

Be it known that we, MINA C. WELLS and ALFRED WELLS, citizens of the United States, residing at New York, in the borough of Manhattan and State of New York, have jointly invented certain new and useful Improvements in Machines for Gaging the Thickness of Material, of which the following is a specification.

Our invention relates to means for gaging and indicating the thickness of sheet material, and has for its object the provision of improved devices for accomplishing such result.

A further object of the invention is the provision of an improved support for the gage and of improved devices whereby it may be adjusted in various ways with relation to the housings of the mill and the rollers journaled in said housings.

Other objects of the invention are the provision of improvements in the means governed by contact with one of the rolls for actuating the gage and of adjusting devices for regulating the stroke of the rod for operating said gage.

In the accompanying drawings, Figure 1 is a plan view of part of one of the rolls of the stack, showing our invention in position with relation thereto. Fig. 2 is an end view of part of the stack, showing the gage attachment in side elevation, with its support in section. Fig. 3 is a detail view illustrating the swinging lever in which the rollers hereinafter described are journaled. Fig. 4 is a rear view with the closure removed of one of the many forms of gage that may be employed and also illustrates in section the pivoted roller-carrying lever. Fig. 5 is a front view of part of the stack, showing by dot-and-dash and dotted lines different ways in which the attachment may be adjustably supported with relation to the rolls. Fig. 6 is a longitudinal section of the adjustable devices at the lower extremity of the gage-operating rod. Fig. 7 is a section on line 7 7 of Fig. 1, and Figs. 8 and 9 are views of a further modification.

Like numerals designate similar parts throughout the several views.

Referring to the drawings, the numeral 1 indicates the housings of a stack of rolls; 2, said rolls, and 3 the journal-boxes thereof.

Projecting from one of the journal-boxes is a bar 4, and at right angles to said bar is a stud 5, which although shown integral with the bar may be detachable, if desired. This stud is reduced and threaded at its outer end at 6, and upon it is sleeved between the bar and a washer 7 (held to its work by a nut 8) a split sleeve 9, clamped or released by a lever-screw 10. This sleeve is rigid with a cylindrical rod 11 carrying the support (designated in a general way by 12) of the gage or indicator 13, the support having a split hub 12' adjustable around the roll 11 and secured thereto by a bolt 12². Support 12 is of peculiar form and comprises a U-shaped body having an arm 14 rising therefrom and an arm 15 depending therefrom. Said arm 15 has a comparatively long bearing 16 to receive a shaft 17, on the end of which are pivoted the arms of a frame 18. Rotating on the shaft or rod 19 in the end of the frame opposite the pivotal point is a roller 20, and rising from the bearing of said roller are arms 21, connected by a cross-bar 22, Figs. 4 and 1, said cross-bar having a bifurcated boss 23, in which is mounted an antifriction-roller 24.

Depending from the frame of the gage is a tubular extension 25, and integral with the top thereof is a tubular boss 26. This gage is shown of the usual "Waltham" kind and a dial 27 and usual gearing 28 for actuating the pointers of said gage. These matters constitute no part of the invention and are fully disclosed in the patent granted H. H. Burton and J. L. Burton June 20, 1905, No. 793,027, to which reference may be had.

A rod 28' passes through the frame of the gage and carries a rack 29, by which the pointer-actuating gearing is operated, and springs 30 and 30' surround said rod and serve to return the same to normal position, while the downward movement thereof is limited by an adjustable thimble 31, threaded into the boss 26 and coacting with the knurled stop 32 of the rod. At its lower extremity the rod 28' is threaded at 33, Fig. 6, to receive an externally-threaded split nut 34, said nut having a head 35, provided with a knurled periphery and being clamped in place by a nut 36, engaging its split portion, as shown in Fig. 6.

A slotted guide-bracket 37 depends from the arm 15 of support 12, and to the head 21

of frame 18 is secured a screw or pin 38, which prevents the frame 18 and its rollers 20 and 24 from dropping beyond a certain point when the attachment is swung away from the stack and the roller 20 is removed from the roll with which it was in contact. This swinging movement of the carrier for the indicator and its connected parts may be accomplished by releasing the bolt 12², Fig. 1, then turning the carrier or support 12 around the rod 11, and, finally, clamping the carrier in place again upon said rod or by loosening the lever-screw 10 and turning the rod, sleeve 9, &c., to an angular position with relation to the roll 2. Provision is also made for a slight adjustment longitudinally of the rolls of the stack of the carrier 12 upon the rod 11 when bolt 12² is released.

From what has been stated it will be seen that the movement of the rack-carrying rod 28' can be regulated with nicety and precision by the devices described and located at the upper and lower extremities of said rod and the head 35 of the nut 34 serving as adjustable abutment to receive the bearing thrust of the roller 24, carried by the swinging frame 18.

In Fig. 5 part of the stack is shown, and two different ways of supporting the carrier 12 are delineated. In one of these ways a rod 39 is clamped in boxes 40, secured to the housings of the stack, said rod being illustrated partially in full and partially in dotted lines and the carrier being adjustable either longitudinally of or around the rod. In the same figure a stand 41 is shown by dot-and-dash lines, and the carrier 12 may be adjusted thereon as desired.

In Figs. 8 and 9 brackets 42 (one of which is shown) are bolted to the bushings, and indicating mechanism of the character before described will be carried by each bracket, while instead of gaging from one of the working rolls of the mill a measurement of the finished product 43 is made, said product passing from the stack to and between the roll 20 and a roll 44, journaled in bearings 45 of each bracket 42. A rod 46, on which to secure the indicating mechanism, is fastened in tubular bosses 46' of said brackets 42. After leaving the rolls 20 and 44 the sheet material passes beneath a roller 47 to a reel or other device in the usual manner.

In operation all the forms of the attachment operate in a similar way, and one or any number of said attachments may be employed. If employed with a stack of paper-calendering rolls, the roller 20 in engagement with a stack-roll will rise and fall in accordance with the thickness of the paper and through the connections described will cause the gage to indicate any variations in the sheet differing from standard, while in Fig. 8 the same result will be obtained in connection with the finished product.

In old forms of construction there is more or less chattering of the gage-operating rod 28', thereby somewhat affecting the accuracy of the gage; but by pivoting the frame 18 in the manner described and employing the roller 24, bearing against the abutment 35, this trouble will be entirely overcome.

While primarily designed for use with paper-calendering rolls, the invention is not restricted to any special machine nor to any specific art.

Changes may be made in the constructional details of the invention, which is not limited to the precise devices shown and described.

Having thus described our invention, what we claim is—

1. The combination, with a pivoted frame having an angular extension, of a roller journaled in said frame; an antifriction device carried by the angular extension of the frame at a point opposite the roller; an indicator; and means actuated by said antifriction device for operating said indicator.

2. The combination, with a support having means, whereby said support may be turned in an arcuate path, and then secured in position, of an indicator carried by the support; mechanism for actuating the pointers of the indicator; a rod for operating said mechanism; a swinging frame; a roller journaled in said frame; and an antifriction device carried by the swinging frame and adapted to actuate the rod.

3. The combination, with a support, and with an indicator carried by said support, of gearing for actuating the pointers of the indicator; a movable rod; a rack carried by said rod, and engaging with an element of said gearing; a frame pivoted to the support; a roller journaled in said frame, and adapted to bear against the material to be gaged; and means carried by said frame, and engaging the rod to actuate the same when variations in the thickness of the material undergoing operation occur.

4. The combination, with a support, of means whereby it may have an arcuate movement; means for securing said support in position when arcuately adjusted; an indicator carried by the support; a rod also carried by the support, and serving to actuate the indicator; a frame pivoted to the support; a roller carried by said frame; and means also carried by the frame for operating the rod.

5. The combination, with a swinging support, and with an indicator secured thereto, of mechanism for actuating the pointers of the indicator; a slide; a rod for operating said mechanism; a frame pivoted to the support, and having an angular extension; a roller journaled in said frame; and an antifriction-roller journaled in the angular extension of the frame, and bearing against the rod.

6. The combination, with a support, and

with means whereby it may be swung into and out of operative position and then secured in place, of a swinging frame; a roller journaled in said frame; an indicator; means actuated by the swinging frame for operating the indicator; and means for preventing the dropping action of the swinging frame when the support is removed from its operative position.

7. The combination, with a U-shaped support having a pair of arms, one arm projecting from each end of said support, of an indicator carried by one of the arms; a swinging frame carried by the other arm; a roller journaled in said swinging frame; and means operated by the swinging frame for actuating the indicator.

8. The combination, with a support having a pair of arms, one arm projecting from each end, of a bracket secured to one of the arms; a swinging frame pivoted to one of the arms; a device carried by said frame, and engaging the bracket; a roller journaled in the swinging frame; an antifriction-roller journaled in an extension of said swinging frame; an indicator; and means operated by said antifriction-roller for operating the indicator.

9. The combination, with a swinging frame, and with a roller journaled therein, of a rod; an adjustable abutment on the end of said rod; an antifriction device carried by the swinging frame, and bearing against said adjustable abutment; an indicator; and

means operated by the rod for actuating the indicator.

10. The combination, with a swinging two-armed frame, having an extension at one end, of a roller journaled in the frame below the extension; an antifriction-roller journaled in the extension; a rod having an abutment for receiving the thrust of said antifriction-roller; and an indicator operated by the rod.

11. The combination, with a roll over which material passes, of a support; an indicator carried by said support; a frame pivoted to the support; a roller journaled in the frame; and means actuated by the frame as it rises and falls for operating the indicator.

12. The combination, with a roll over which material passes, of a support; a swinging frame pivoted to the support; a roller journaled in the support; an indicator carried by the support; means operated by the roller for actuating the indicator; means whereby the support may be swung into or out of position; and means for preventing the dropping of the swinging frame and its roller when the swinging support is out of its operative position.

In testimony whereof we affix our signatures in presence of two witnesses.

MINA C. WELLS.
ALFRED WELLS.

Witnesses:

LIDA MELHURSH,
C. F. WAINRIGHT.