

Dec. 10, 1929.

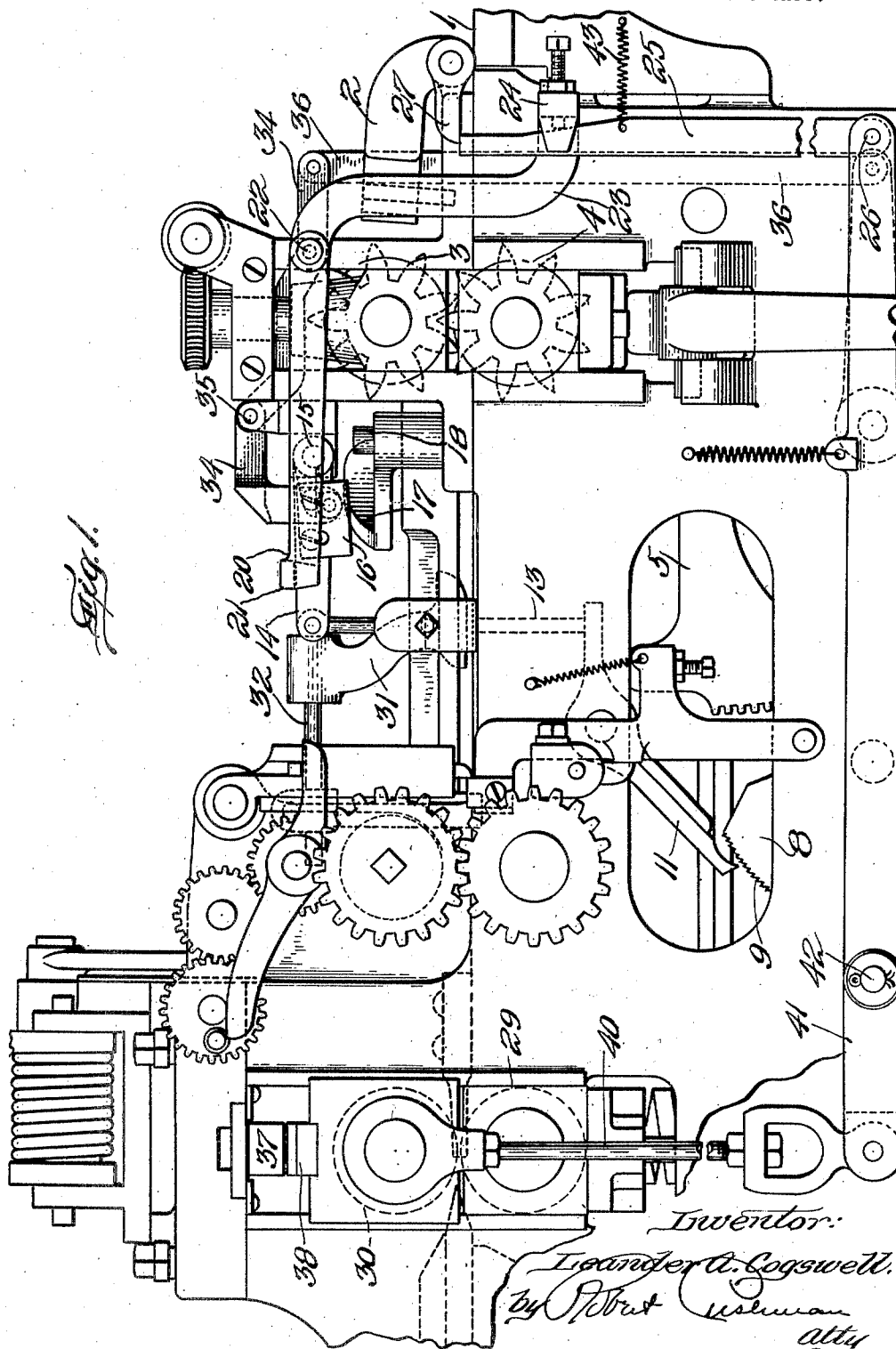
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1,738,818

GRADING MACHINE

Filed Jan. 24, 1928

3 Sheets-Sheet 1



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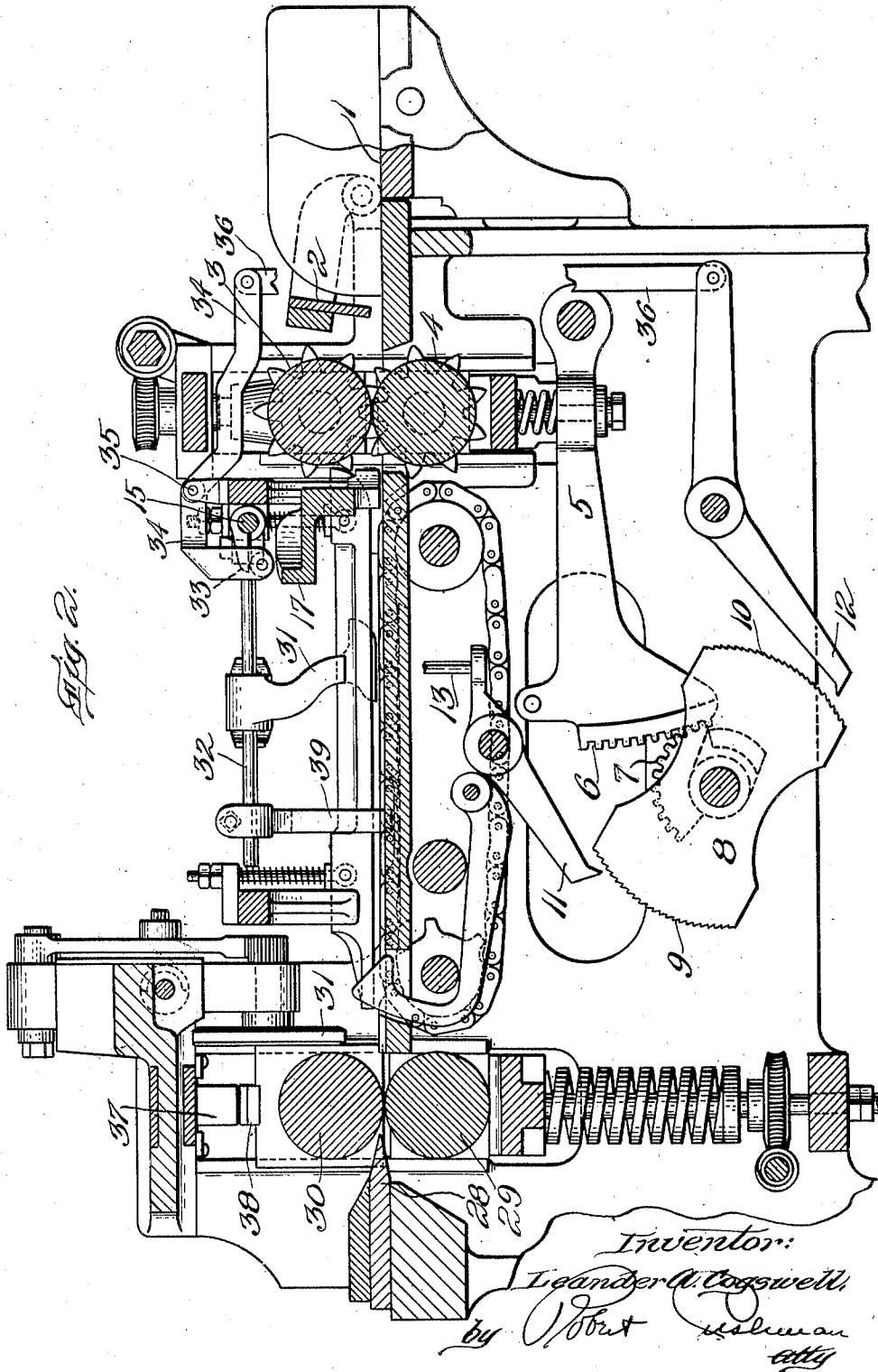
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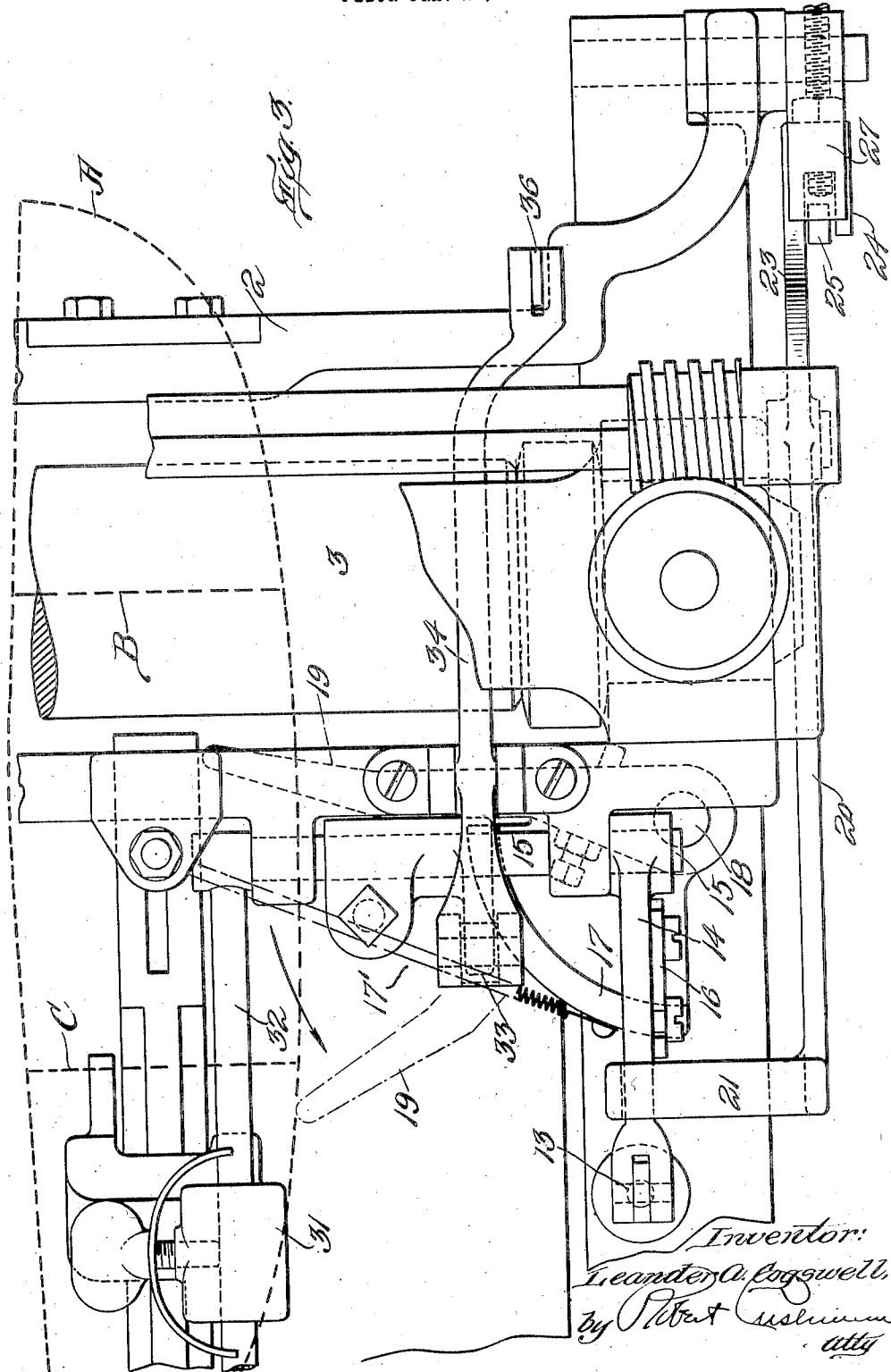
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UNITED STATES PATENT OFFICE

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GRADING MACHINE

Application filed January 24, 1928. Serial No. 249,090.

This invention relates to grading machines of the general type shown in the Nichols Patent No. 1,130,321 dated March 2, 1915, and its principal object is to provide a machine which will grade the blanks of stock according to the thickness detections of a restricted, intermediate area only between the ends of each blank.

In the machine of said Nichols patent provision has already been made whereby the measurements of the leading end of the blank for a substantial distance along the blank, as the blank passes through the detecting rolls, will not be preserved in the setting mechanism nor transmitted through the setting mechanism to the grading mechanism until the advance edge of the blank reaches and operates a trip which renders the setting mechanism operative. The grading thereupon begins and continues throughout the remainder of the length of the blank. The reason for this construction and operation is that certain died-out pieces of leather or other blanks used in the manufacture of shoes such, for example, as soles are classified according to the thickness measurement of certain areas only of the blank. The grade of the toe or ball part of a sole determines the grade of the sole while the thickness or grade of the heel and shank part is disregarded. The sole is fed into the machine heel end first, and the heel and shank parts are permitted to pass through the detecting rolls before the trip is operated which starts the adjustment of the grading mechanism. But, from the time the trip is operated until the toe end of the sole passes out from under the gate immediately in front of the detecting rolls, the grading continues and the sole is graded practically to the end of the toe. There has been no provision heretofore whereby the grading may be stopped and the setting mechanism locked before the blank passes out from under the gate, in order to leave an ungraded area at the rear or following end of the blank as well as at the forward end.

There are some blanks which are preferably graded according to the thickness of an intermediate area only between the ends of the blank leaving a substantial area at each

end ungraded. For instance, in counters and particularly in long counters for turned shoes the only part which needs to be or should be graded is a restricted area about midway between the ends of the blank. It is only at this intermediate area or zone that great stiffness and reinforcement is desired in the heel part of the shoe. The two ends of the counter which extend into or toward the shank of the shoe are usually thinned and bevelled down before being built into the shoe. Consequently the grade of the two end regions of the blank should be disregarded, not only because it is unnecessary to grade them, but because if the counter blank being graded should happen to have a thin part in one of these end regions, the blank as a whole would receive a lower rating than required by the grade of the middle part or intermediate area which is the only area that matters.

The principal object of this invention is to provide means whereby the grading of a blank can be stopped short of the end to confine the grading to the intermediate area of the blank, or at least to prevent the latter or following end of the blank from being graded as it passes through the machine.

In the accompanying drawings which illustrate an embodiment of the invention,

Fig. 1 is a partial side elevation of a grading machine containing the invention;

Fig. 2 is a partial longitudinal section; and

Fig. 3 is a detail plan view on an enlarged scale of the front left hand corner of the machine.

For an understanding of the present invention it is not necessary to disclose and describe herein the entire grading machine. The construction and operation of the machine in general will be understood by reference to said Nichols patent, but I will describe enough of the machine to show the application of my present improvements thereto.

The blanks to be graded are fed into the machine from the work table 1 under the usual gate 2 to the feed rolls 3, 4, the latter roll constituting the usual feeler or detector roll. The movement of the detector roll 4, in response to variations in thickness of the blank, are transmitted as usual to the set-

ting mechanism which includes the lever 5 having a gear segment 6 on its end meshing with a gear segment 7. The gear segment 7 actuates the ratchet 8 provided with the usual thinness measuring teeth 9, and ratchet teeth 10 by which the mechanism is locked against responding to thicker measurements of the blanks. Pawl 11 cooperates with the ratchet teeth 9 and pawl 12 cooperates with the ratchet teeth 10. Pawl 11, which may be termed the thinness-measuring pawl, is normally held disengaged from ratchet teeth 9 by a weighted rod 13. Pawl 12, which may be termed the final locking pawl, is also normally disengaged from its ratchet. The construction and operation of the parts thus far described may be substantially the same as in said Nichols patent and the grading mechanisms, which may be any one or more of the types known in this art, may also be substantially similar to those shown in said Nichols patent, such as the skiving and evening devices indicated by the knife 28 and rolls 29, 30 or the marking or stamping devices indicated by the type wheel 31. It will, therefore, not be necessary to describe these mechanisms more in detail, nor their actuating mechanisms, since the same will be understood by reference to said Nichols patent. It will be understood that the blanks are graded according to the thinnest part as determined by the detecting mechanism.

The top end of rod 13 is pivotally connected to an arm 14 loosely journaled on cross shaft 15. The arm 14 has an adjustable cam follower block or plate 16, immediately below which is a cam 17 formed on a segmental piece pivoted on a vertical axis 18 mounted on the frame of the machine. The cam segment is provided with a trip arm 19 which extends laterally into the path of the blanks close to the nip of the rolls 3 and 4.

A blank A representing a counter is illustrated in broken lines in Fig. 3. When the blank is fed through the rolls 3, 4 its leading edge upon emerging from the bite of the rolls engages arm 19 and swings it to the right (Fig. 3) to the position shown in broken lines thereby swinging cam 17 in the same direction. Cam 17 acting on cam follower 16 lifts arm 14 and rod 13 and thereby allows pawl 11 to engage the ratchet teeth 9. The measurement of the blank for the thinnest spot as determined by the detecting rolls will now be preserved and will be transmitted to the grading devices in the manner well known in machines of this type. The cam device just described is similar to that shown in Figs. 8 and 9 of the Nichols Patent No. 1,058,623 dated April 8, 1913 except that in the present device the adjustable cam follower 16 makes it possible to time the setting of the pawl 11 to occur

at the desired interval after the leading end of the blank emerges from the rolls 3, 4 and engages arm 19.

A lever 20, which has a yoke 21 engaging the top of arm 14, is pivoted to the frame of the machine at 22 and is provided with a rearwardly and downwardly extending arm 23 terminating in a hook-like end 24 which engages behind a latch bar 25. The latch bar 25 normally holds the gate 2 lifted, as shown in Fig. 1, by means of a short arm 27, which is fixed to the same shaft on which gate 2 is carried and rests on top of latch bar 25.

When arm 14 which sets pawl 11 is lifted by the entering blank it will at the same time lift lever 20 upward and cause lever 23 to swing downward and to the left thereby swinging latch bar 25 to the left out from under arm 27. The gate thereupon drops on top of the blank.

From the time when the forward end of the blank acting through cam 17 sets pawl 11 until locking pawl 12 engages ratchet 10 the thinness measurements of the blank as determined by the rolls 3, 4 will be received and preserved by the setting mechanism and transmitted to the grading devices in the manner described in said Nichols patent. Heretofore, however, as illustrated in said Nichols patent, the pawl 12 was caused to be set into the ratchet to lock the mechanism in its final adjustment by the dropping of the gate 2 from the rear end of the blank as the blank is about to pass out between rolls 3, 4. In the present invention the pawl 12 is not controlled by the gate but is wholly independent of the gate and is controlled by a separate trip mechanism which acts before the blank passes out from underneath the gate and while a considerable area of the following end of the blank remains still to pass through rolls 3, 4. This trip is shown at 31, adjustably mounted on rod 32, which is fixed to shaft 15. The shaft 15 also has fixed on it a short arm 33 engaging a roller in the bifurcated end of lever 34, which is pivoted to the machine frame at 35. The other end of lever 34 is connected by link 36 to the tail piece of pawl 12. Consequently, when a blank enters under the foot of trip 31, which is in the path of the blanks between the trip arm 19 and the grading mechanisms, the trip 31 and rod 32 are lifted by the blanks, thus causing pawl 12 to engage ratchet teeth 10. The setting wheel 8 is now locked against movement in both directions and no further motions of the detecting roll 4 will be transmitted to the setting mechanism or the grading mechanisms as the following or latter part of the blank passes between the rolls 3 and 4, but the grading mechanisms will remain set and locked in accordance with the measurements of the middle or intermediate area only of the blank. The trip 31 is adjustable on arm 32 so that the time of actuating

pawl 12 may be regulated to occur sooner or later, as desired, thus leaving a greater or less area at the latter end of the blank ungraded.

As the blank passes on through the machine, as soon as the rear end of the blank passes clear of the gate 2, the gate will drop to the work table 1 and prevent the insertion of another blank until the gate is again raised in the manner hereinafter described. As soon as the rear or following end of the blank passes clear of the cam actuating arm 19, said arm and the cam 17 will swing back to normal position under the influence of spring 17', thus allowing the arm 14 and rod 13 to drop. This will cause pawl 11 to disengage from ratchet 9, but the upward movement of roll 4 following the exit of the blank from between the rollers 3 and 4, will not rotate the ratchet wheel 8 to the left, because the ratchet is still locked by pawl 12 against movement in that direction; hence there is no tendency to change the adjustment of the grading devices. Moreover, so long as the blank is between rolls 29 and 30, the pressure exerted thereby between the usual stepped wedges or inclines 37 and 38 will also hold the grading devices locked against disarrangement.

In case it is desired to hold the rod 32 lifted and the pawl 12 locked longer than would be the case if trip 31 alone were used, one or more additional trips 39 may be mounted on rod 32 with the result that the rod 32 will be held up and pawl 12 locked after the rear end of the blank passes out from underneath the trip 31. The use of such additional trip or trips is especially advantageous in the handling of short blanks.

When the blank passes out from underneath trip 31, if that alone is used, or trip 39 if more than one trip is used, rod 32 will drop and pawl 12 will be unlocked. The setting ratchet 8 is now freed from both pawls and is in condition to respond to the measurement of the next following blank. The gate 2, however, is still closed down on to the feed table 1 and consequently another blank can not be fed into the machine until the gate is raised in response to the outgoing blank by the mechanism which will now be described.

When the blank which is being graded enters between the skiving rolls 29 and 30, the upper skiving roll 30 will be lifted by the blank. The journal of the upper skiving roll 30 is connected by link 40 to a lever arm 41 pivoted to the frame of the machine at 42 and extending rearwardly to the lower end of latch bar 25 to which it is pivoted at 26. The raising of the upper roll 30 by the blank being graded pulls the latch bar 25 downward so that its upper end is below the level of arm 27 which actuates the gate. As soon as the top end of latch bar 25 moves down below the level of arm 27, a spring 43 swings the end of latch bar 25 to the right underneath arm 27. Thereafter, when the outgoing blank be-

ing graded, leaves rolls 29 and 30, roll 30 will again move downward thus lifting latch bar 25 and opening gate 2 ready to receive a succeeding blank the moment the preceding blank has left rolls 29 and 30.

The operation of the machine, which is already indicated in the foregoing description, may be briefly summarized as follows: Assume that a counter A (Fig. 3) is to be graded according to the thinnest spot of the intermediate area only between the broken lines B and C, but is to be left ungraded as to its two end regions beyond the lines B and C. The blank is fed to the machine underneath the gate 2 into the nip of the detecting and feeding rolls 3, 4. As the forward end of the blank emerges from the rolls 3, 4 it encounters arm 19 and actuates the cam 17 which lifts the arm 14 and rod 13 and thereby sets the pawl 11 into ratchet 9, thus preserving the thinness measurements of the blank and correspondingly adjusting the grading devices in the known manner. The time when such grading will start may be regulated by the adjustment of the cam follower 16 so as to actuate the pawl 11 after the desired length of the blank has passed through without grading, say up to the line C (Fig. 3). The trip 31 is so adjusted on rod 32 that it will not be actuated by the leading end of the blank until the middle or intermediate region of the blank, which it is desired to grade, has passed through rolls 3, 4 whereupon the leading end of the blank will lift trip 31 causing pawl 12 to engage ratchet 10 thus locking the setting mechanism and terminating the effective grading of the blank. As the remainder of the blank, say from line B (Fig. 3) to the end of the blank, passes between rolls 3 and 4, no grading will take place. When the forward end of the blank enters between rolls 29 and 30, roll 30 will be lifted by the blank thereby pulling latch bar 25 downward to operative position under the gate arm 27. When the following or rear end of the blank passes clear of trip arm 19, the cam 17 will swing back to normal position. Thereafter when the following or rear end of the blank passes out from under trip 31 or 39, as the case may be, the trip will fall to the bed plate and unlock pawl 12; and when the entire blank passes clear of rolls 29, 30 latch bar 25 will again lift the gate 2 and the machine is ready to receive another blank and to repeat the same cycle of operations.

I claim:

1. A grading machine comprising detecting mechanism for gauging successive blanks of stock according to thickness, and grading mechanism responsive to the thickness detections by the detecting mechanism of an intermediate area only between the ends of each blank, and means to vary the length of the

ungraded area of the following end of the blank.

2. A grading machine comprising detecting mechanism for gauging successive blanks of stock according to thickness, and grading mechanism responsive to the thickness detections by the detecting mechanism of part of each blank but irresponsive to the thickness detections of the latter part of each blank, and means to vary the length of the ungraded area at the latter part of the blank.

3. A grading machine comprising detecting mechanism for gauging successive blanks of stock according to thickness, adjustable grading mechanism controlled by the detecting mechanism, and means whereby the detecting mechanism is rendered inoperative to adjust the grading mechanism in response to the action of the detecting mechanism upon the latter part of each passing blank, and means to vary the length of the ungraded area at the latter part of the blank.

4. A grading machine comprising detecting mechanism for gauging successive blanks of stock according to thickness, adjustable grading mechanism controlled by the detecting mechanism, and means whereby the detecting mechanism is rendered inoperative to adjust the grading mechanism in response to the action of the detecting mechanism upon the forward part and the latter part of each passing blank, but permits such adjustment in response to the action of the detecting mechanism upon the intermediate part of each blank, and means to vary the length of the ungraded area at the latter part of the blank.

5. A grading machine comprising detecting mechanism for gauging successive blanks of stock according to thickness, adjustable grading mechanism controlled by the detecting mechanism, setting mechanism actuated by the detecting mechanism and determining the adjustment of the grading mechanism, and means whereby the setting mechanism is rendered inoperative to adjust the grading mechanism in response to the action of the detecting mechanism upon the latter part of each passing blank, and means to vary the length of the ungraded area at the latter part of the blank.

6. A grading machine comprising detecting mechanism for gauging successive blanks of stock according to thickness, adjustable grading mechanism controlled by the detecting mechanism, setting mechanism actuated by the detecting mechanism and determining the adjustment of the grading mechanism, and means whereby the setting mechanism will transmit to the grading mechanism the thickness detection of an intermediate area only between the ends of each blank, and means to vary the length of the ungraded area at the following end of the blank.

7. A grading machine comprising detect-

ing mechanism for gauging successive blanks of stock according to thickness, adjustable grading mechanism controlled by the detecting mechanism, setting mechanism actuated by the detecting mechanism and determining the adjustment of the grading mechanism, and means whereby the setting mechanism is rendered inoperative to adjust the grading mechanism in response to the action of the detecting mechanism upon the forward part and the latter part of each passing blank but is rendered operative to adjust the grading mechanism in response to the action of the detecting mechanism upon the intermediate part of each blank, and means to vary the length of the ungraded area at the latter part of the blank.

8. A grading machine comprising detecting mechanism for gauging successive blanks of stock according to thickness, adjustable grading mechanism responsive to the detecting mechanism, and means in the path of the blank and actuated by the leading end of the blank after passing the detecting mechanism to render the detecting mechanism inoperative to adjust the grading mechanism in response to the action of the detecting mechanism while a substantial area of the blank remains still to pass through the detecting mechanism.

9. A grading machine comprising detecting mechanism for gauging successive blanks of stock according to thickness, adjustable grading mechanism responsive to the detecting mechanism, and means in the path of the blank and actuated by the leading end of the blank after passing the detecting mechanism to render the detecting mechanism operative to adjust the grading mechanism in response to the action of the detecting mechanism, and separate means actuated by the leading end of the blank, after passing the first means, to render the detecting mechanism inoperative to adjust the grading mechanism in response to the action of the detecting mechanism while a substantial area of the blank remains still to pass through the detecting mechanism.

10. A grading machine of the kind described comprising detecting mechanism, grading mechanism, setting mechanism including a ratchet member and a normally disengaged final locking pawl, and a trip in the path of the blank between the grading mechanism and the detecting mechanism adapted to be actuated by the leading end of the blank to set the locking pawl before the rear part of the blank has passed through the detecting mechanism.

11. A grading machine of the kind described comprising detecting mechanism, grading mechanism, setting mechanism including a ratchet member having two opposed sets of ratchet teeth, a thinness-measuring pawl to engage one set of ratchet teeth

and a final locking pawl to engage the other set of ratchet teeth, a trip in the path of the blank adapted to be actuated by the leading end of the blank after emerging from the detecting mechanism to set the thinness-measuring pawl, and a second trip in the path of the blank between the first trip and the grading mechanism adapted to be actuated by the leading end of the blank to set the locking pawl.

12. A grading machine of the kind described comprising detecting mechanism, grading mechanism, setting mechanism, and means actuated by the blank for controlling the setting mechanism including a cam and cam-follower, one of which is adjustable with relation to the other, to vary the time when the setting mechanism is brought into operation.

13. A grading machine of the kind described comprising detecting mechanism, grading mechanism, settling mechanism, and means actuated by the blank for controlling the setting mechanism including a cam and cam-follower, the cam-follower being adjustable to vary the time when the setting mechanism is brought into operation.

14. A grading machine comprising detecting mechanism for gauging successive blanks of stock according to thickness, adjustable grading mechanism responsive to the detecting mechanism, a gate in advance of the detecting mechanism to control the admission of the blanks, and means independent of the gate actuated by a blank before the blank has passed out from under the gate to render the detecting mechanism inoperative to adjust the grading mechanism in response to the action of the detecting mechanism.

15. A grading machine comprising detecting mechanism for gauging successive blanks of stock according to thickness, adjustable grading mechanism responsive to the detecting mechanism, a gate in advance of the detecting mechanism to control the admission of the blanks, means actuated by a blank after its leading end has passed the detecting mechanism to render the detecting mechanism operative to adjust the grading mechanism in response to the action of the detecting mechanism, and separate means actuated by the blank before the blank has passed out from under the gate to render the detecting mechanism again inoperative to adjust the grading mechanism.

Signed by me at Manchester, New Hampshire this 18th day of January 1928.

LEANDER A. COGSWELL.