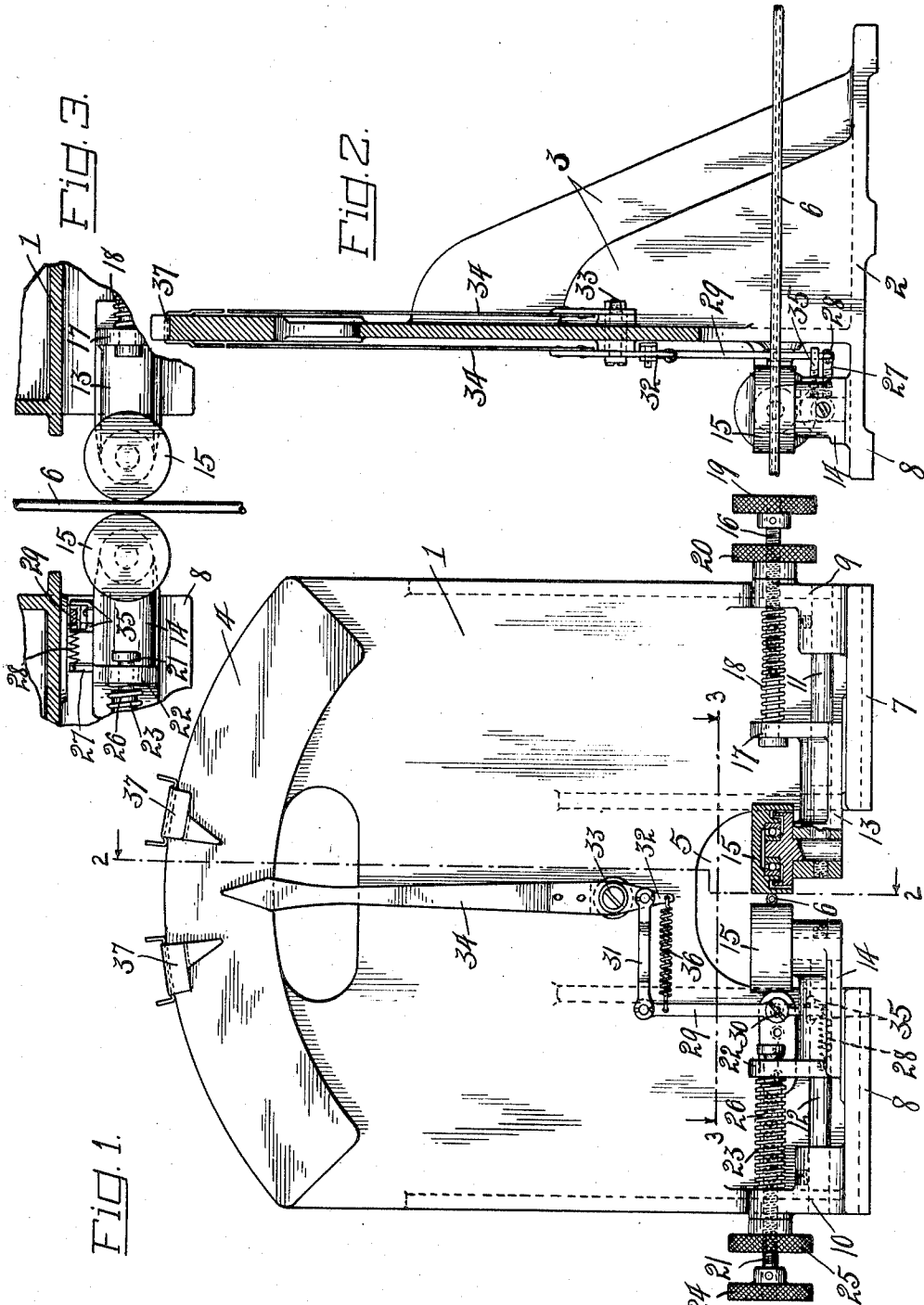


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GAGE.

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UNITED STATES PATENT OFFICE.

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GAGE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDWARD DANNER, a citizen of the United States, and a resident of Toledo, in the county of Lucas and State of Ohio, have invented a certain new and useful Gage; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to means for indicating the size of a bar or tube being drawn, and is particularly intended for use in connection with the continuous drawing of molten glass in bar or tube form.

The object of my invention is the provision of a simple and efficient means of this character, which is adjustable to accommodate stock of different diameters and is extremely sensitive in its nature to adapt it to indicate a very slight variance in the diameter of the stock being drawn. Other objects and advantages of the invention will be apparent from the following detailed description thereof.

While the invention, in its broader aspect, is capable of embodiment in numerous forms, a preferred embodiment thereof is illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of an apparatus embodying the invention. Fig. 2 is a section on the line 2—2 thereof, and Fig. 3 is a fragmentary section on the line 3—3 in Fig. 1.

Referring to the drawings, 1 designates a plate, which rises from a base or pedestal 2, being braced and strengthened with respect thereto by webs 3, and having its upper edge terminating in a double-faced segment

4. The plate 1 is provided centrally of its lower edge portion with an opening 5, through which the stock 6 may feed, and at opposite sides of such opening with forward extensions 7 and 8 forming parts of the base 2 and having webs 9 and 10 at the respective outer ends thereof.

Guide-rods 11 and 12 project inward from the respective webs 9 and 10 and have brackets 13 and 14 respectively mounted thereon for movements toward and away

from each other, said brackets having their bottoms in sliding engagement with the respective extensions 7 and 8. Each of said brackets carries a horizontally disposed roll 15 of any suitable type on its inner end in peripherally spaced relation to the other roll to permit the passage of the stock 6 therebetween.

An adjusting screw 16 is threaded through the web 9 and projects loosely at its inner end through an apertured ear 17 on the outer end of the bracket 13, the inner end of said screw being shouldered to limit the inward movement of the bracket 13 with respect thereto, and a coiled compression spring 18 is mounted on said rod between said ear and web to resist an outward movement of the bracket. The inward movement of the bracket is limited by the coaction of the ear 17 with the shouldered end of the rod. A hand-wheel 19 is carried by the screw 16 at its outer end and a lock-nut 20 is threaded on the screw for engagement with the web 9.

An adjustment of the bracket 14 and its pressure against the stock 6 is controlled by a screw 21, which is threaded through the web 10 and loosely projected at its inner end through an apertured ear 22 on the outer end of said bracket, being shouldered at the inner side of said ear to limit the inward movements of the bracket. A coiled compression spring 23 of less tension than the spring 18 is mounted on the screw 21 in opposed end thrust contact with the web 10 and ear 22 to urge an inward movement of the bracket. A hand-wheel 24 is provided on the outer end of the screw 21, and a lock-nut 25 is threaded on the screw in engagement with the web 10. A sleeve 26 is preferably mounted on the screw 21 within the spring 23 and coöperates with the shoulder at the inner end of the screw to limit the permissible reciprocatory movements of the bracket 14.

The normal space between the gage rolls 15, 15 is less than the thickness of the stock 6 so that the bracket 14 is moved outward thereby from normal position and relative to the screw 21, due to the spring 23 being of less tension than the spring 18. The difference in the tension of the two springs also permits the bracket 14 to have reciprocatory movements in accordance with any irregularities encountered in the stock

by the rolls 15, 15 or any variation in the thickness of the stock as it passes between the rolls.

The bracket 14 has a pin 27 projecting 5 from its rear side adjacent to its outer end, and this pin is connected by a coiled contractile spring 28 to the lower short arm of a vertically disposed lever 29, which is fulcrumed, as at 30, to the plate 1 and has 10 its upper end connected by a link 31 to a short rocker arm 32, which extends down from a rock-shaft 33 mounted in the plate 1 in concentric relation to the segment 4 thereof. A pair of indicator fingers 34, 34 rise 15 in parallel relation from the shaft 33, one at each side of the plate 1, and are adapted to indicate the movement of the bracket 14 in a materially multiplied form on the respective sides of the segment 4, as is apparent. A pair of pins 35 project from the rear 20 side of the bracket 14 in spaced relation longitudinally thereof, and the lower arm of the lever 29 projects down between these pins in normally slightly spaced relation to 25 the inner pin and being held in yielding contact with the outer pin by the spring 28. The outer pin causes the lower end of the lever to have inward swinging movements when the bracket 14 moves inward. It is 30 preferable to connect the upper end of the lever 29 and the lower end of the rocker arm 32 with a coiled contractile spring 36 in parallel relation to the link 31 to take up any play or wear occurring in the joints at 35 the ends of said link.

In order to indicate to the operator the range within which the size of the bar or tube being drawn should be kept under ordinary conditions, two limit clips 37, 37 40 are slidably mounted on the upper edge of the segment 4 and spaced equally from the normal center position of the indicator fingers 34. If the indicator fingers 34 assume a substantially permanent position without 45 the range indicated by the space between the limit clips 37, the operator knows that the bar or tube being drawn is either running too thin or too thick in diameter, depending on the direction in which the indicator fingers are moved from central position and the operator then adjusts the drawing apparatus accordingly. 50

It is evident in the use of my indicator that the brackets 13 and 14 are set to suit 55 the size of bar or tube being acted on, the bracket 13 being permanently retained at the limit of its inward movement except when sudden or abnormal shocks are imparted to the rolls 15 by encountering enlargements in the stock when rapidly feeding 60 therebetween. Under such abnormal conditions the spring 18 yields to permit an outward movement of the bracket 13. Ordinarily, however, said bracket remains stationary and all of the relative to and fro 65

movements imparted to the rolls 15, 15 by the stock are communicated to the bracket 14 and thence transferred in a multiplied form to the indicator fingers 34, due to the motion multiplying connection between the 70 bracket 14 and said indicator fingers.

I wish it understood that my invention is not limited to any specific construction, arrangement or form of the parts, as it is capable of numerous modifications without 75 departing from the spirit of the claims.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a gage of the class described, a pair 80 of work coacting gage members mounted for relative to and fro movements, means for adjusting the limit of inward movement of one of said members, means yieldingly resisting an outward movement of said adjustable member, and indicator means connected 85 to said yieldingly movable member and operable by movements thereof to indicate in a multiplied manner variations in the size of the work passing between said members. 90

2. In a gage of the class described, a pair of work coacting gage members mounted for relative to and fro movements, separate means for adjusting the limit of inward 95 movements of each of said members, separate means, one stronger than the other, for yieldingly resisting a relative outward movement of said members, and indicator means connected to the more easily movable one of 100 said members and operable by movements thereof to indicate variations in the size of the work passing between said members.

3. In a gage of the class described, a pair of relatively movable members, a roll carried by each member for engagement with 105 opposite sides of a work bar or tube passing therebetween, means yieldingly resisting an outward movement of one of said members and its roll, an indicator finger, and means yieldingly connecting said finger and yieldingly movable member to communicate 110 movements from one to the other.

4. In a gage of the class described, a pair of relatively movable members, a roll carried by each member for engagement with 115 opposite sides of a work bar or tube, separate means, one stronger than the other, yieldingly resisting an outward movement of each of said members and its roll, an indicator finger, and means yieldingly connecting said finger and the weaker of said 120 yieldingly movable members to communicate movements from one to the other.

5. In a gage of the class described, a frame, a pair of brackets mounted for opposed reciprocatory movements on said 125 frame, rolls carried by said brackets for opposed engagement with a work bar or tube passing therebetween, separate means adjustable to limit the inward movements of 130

each of said brackets and to resist an outward movement thereof, one of said means being weaker than the other in its resistance to an outward movement of its bracket, an
5 indicator finger, and means connecting said finger and the weaker of said brackets to

communicate movements from one to the other.

In testimony whereof, I have hereunto signed my name to this specification.

EDWARD DANNER.