

PATENTED NOV. 10, 1903.

NO. MODEL.

2 SHEETS—SHEET 1.

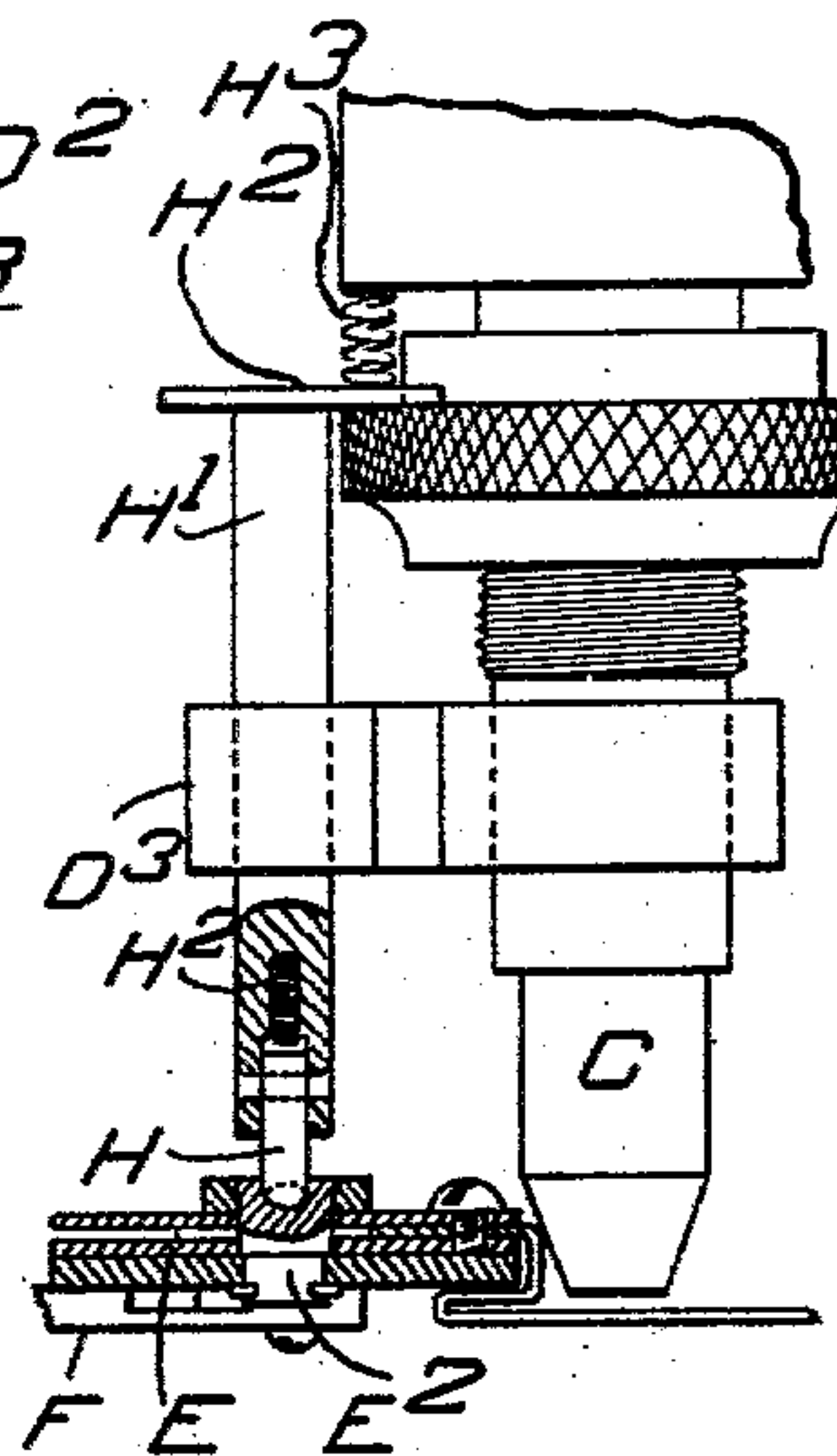


FIG. 2.

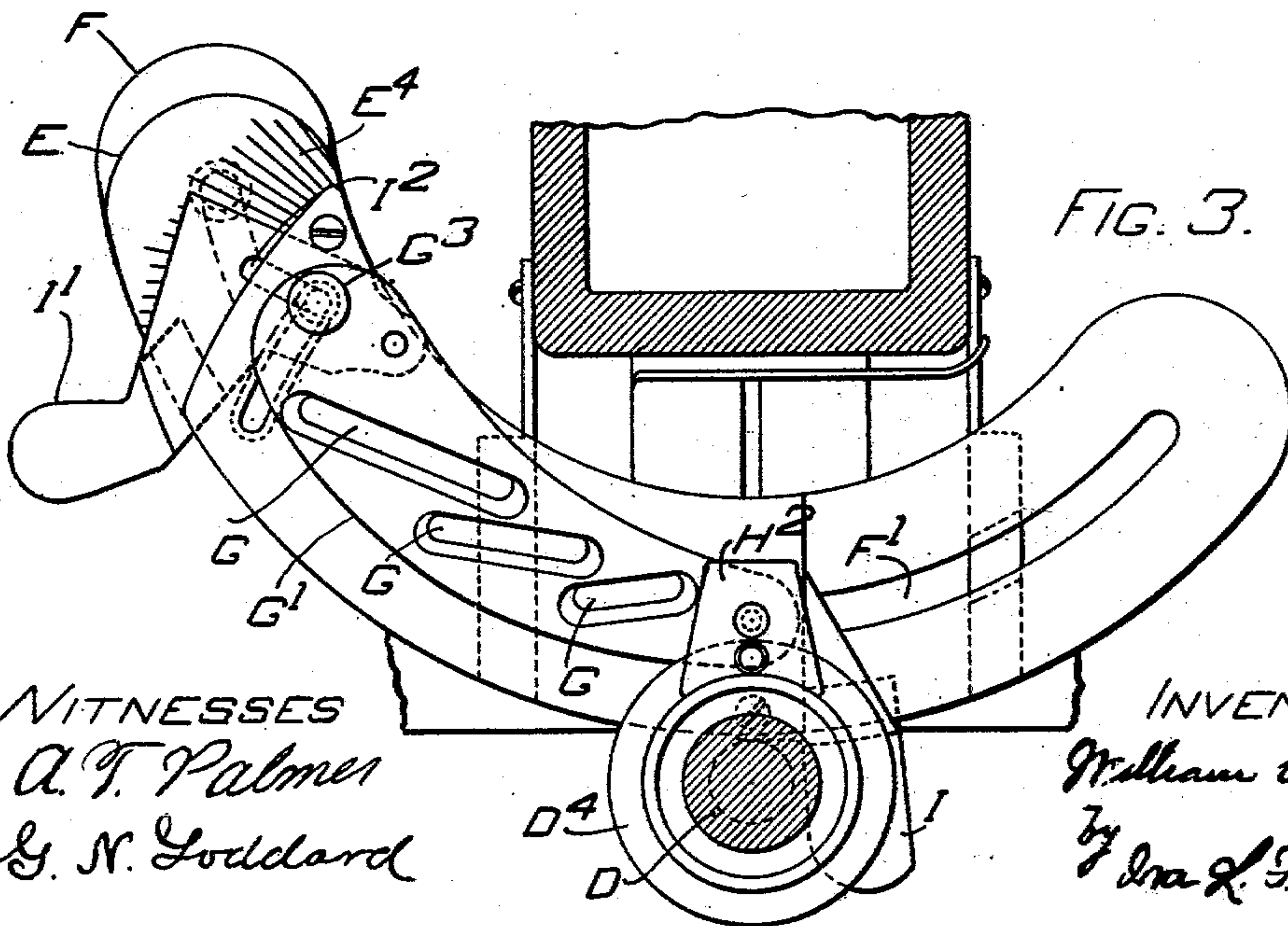


FIG. 3.

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No. 743,684.

PATENTED NOV. 10, 1903.

W. C. BRAY.  
SPACING MECHANISM.  
APPLICATION FILED AUG. 1, 1903.

NO MODEL.

2 SHEETS—SHEET 2.

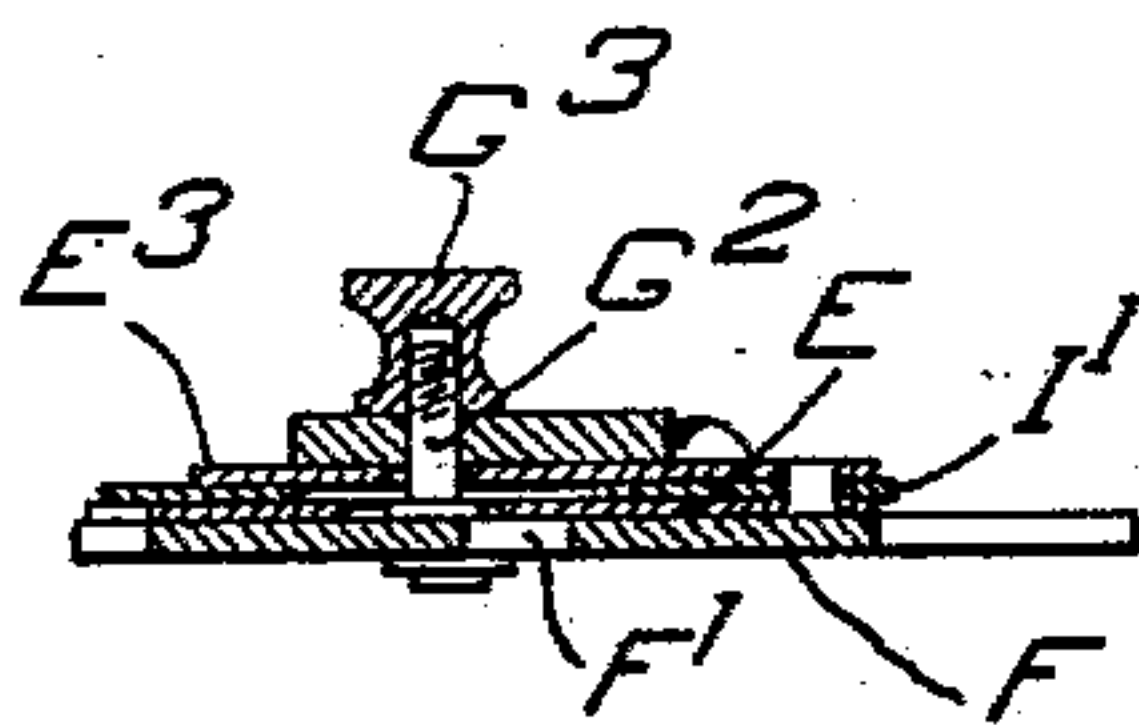
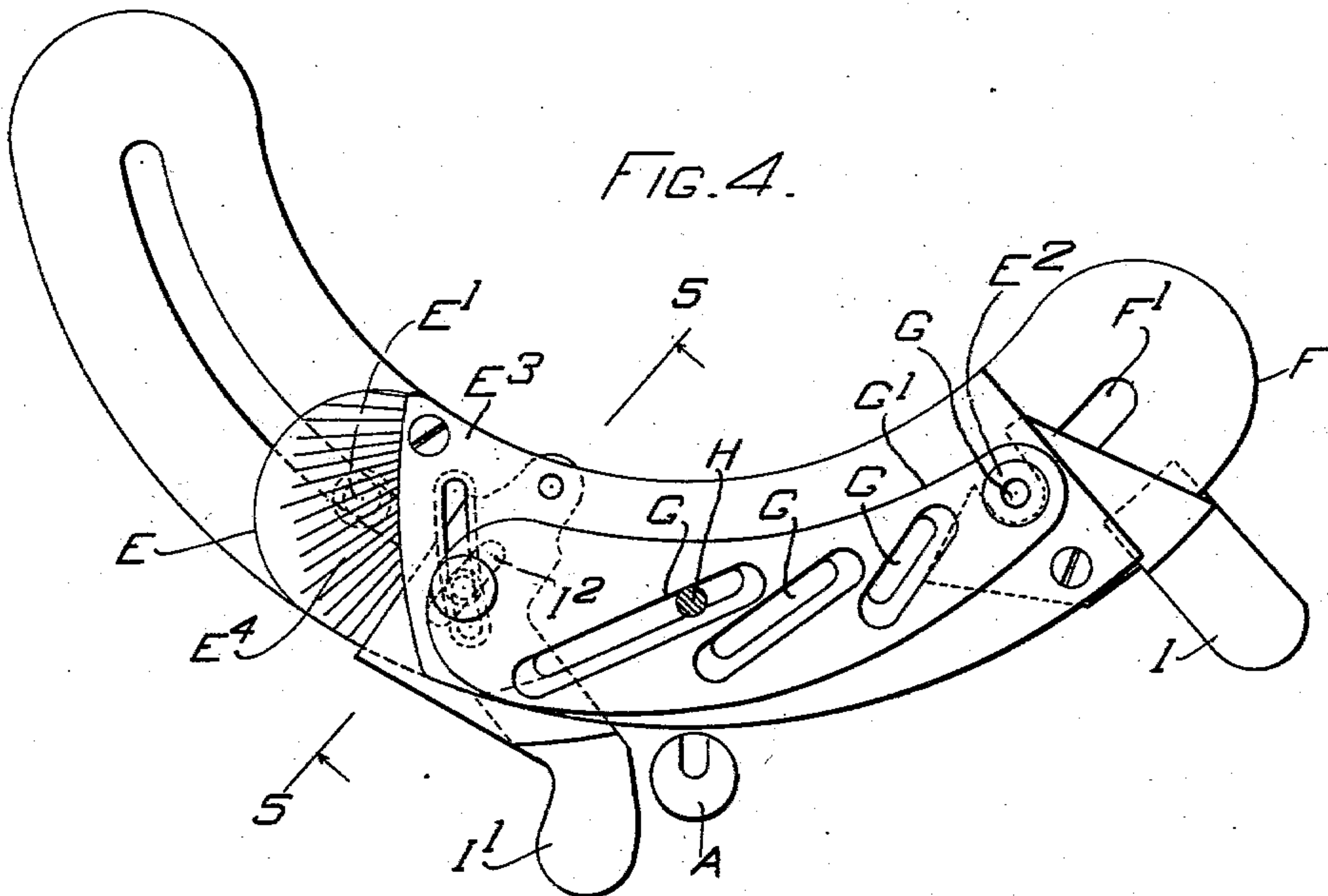


FIG. 5.

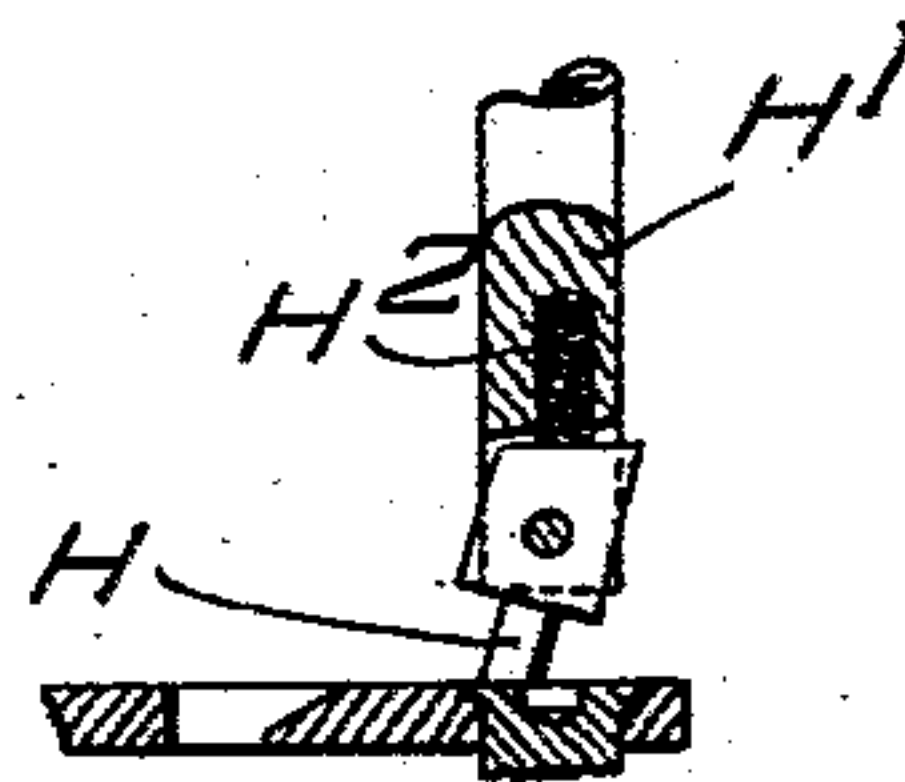


FIG. 6.

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# UNITED STATES PATENT OFFICE.

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## SPACING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 743,684, dated November 10, 1903.

Application filed August 1, 1903. Serial No. 167,848. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM C. BRAY, of Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Spacing Mechanism, of which the following is a specification.

The invention relates to spacing mechanism for machines for setting lacing studs or hooks or other machines in which the work is moved by the operator after each operation of the machine to bring it into position for the succeeding operation.

One object of the invention is to provide a simple and efficient spacing mechanism for determining the movement given to the work by the operator after each operation of the machine, which will enable the operator to rapidly and accurately position the work for the successive operations. This is accomplished by providing a gage-plate adapted to be moved with the work by the operator and devices for gaging or determining the movement of the plate after each operation of the setting devices or other devices which act upon the work.

In setting lacing-hooks upon the uppers of shoes the hooks should be set at equal distances apart and a like distance from the top eyelet-hole. In shoes of different styles and sizes the spacing of the lacing-hooks varies according to the distance from the top eyelet-hole to the upper edge of the upper, and in order to adapt the spacing mechanism for use in applying hooks or studs to various sizes and styles of shoes the mechanism embodying the various features of the invention is so constructed that by proper adjustments the spacing may be varied as desired.

In a spacing mechanism embodying all the various features of the invention the movements of the work by the operator are gaged or determined by means of a movable gage-plate provided with a series of adjustable spacing-shoulders which coöperate with a fixed stop which is moved out of the path of the spacing-shoulders at each operation of the machine. These spacing-shoulders are formed on a plate pivoted on the gage-plate

and are arranged at varying inclinations to the direction of movement of the gage-plate, so that by varying the position of the pivoted plate the distance between the parts of the shoulders which engage the fixed stop and determine the movement of the gage-plate may be varied.

The various features of the invention will be best understood from a detailed description of the spacing mechanism embodying said features in their preferred forms, which is shown in the accompanying drawings applied to a machine for setting lacing studs or hooks.

In the drawings, Figure 1 is a front elevation of so much of a stud-setting machine as is necessary to show the application of the spacing mechanism thereto. Fig. 2 is a partial side elevation, certain parts being shown in section. Fig. 3 is a sectional plan view on the line 3 3, Fig. 1. Fig. 4 is a similar plan view of the spacing mechanism, showing different adjustments and position of the parts. Fig. 5 is a sectional view on line 5 5, Fig. 4. Fig. 6 is a detail showing the construction of the fixed stop.

In the construction shown in the drawings the stud-setting machine is provided with a vertically-operating plunger A, which is provided at its upper end with a setting-plate and pocket for carrying the head of the lacing-hook, and the lacing-hooks are delivered in succession to the plunger A through the guideway B in the manner more fully disclosed in the patent to W.C. Bray, No. 277,985, May 22, 1883. The studs or hooks are set in the work by being forced against a setting-anvil C in the usual manner. The anvil C is carried in the lower end of a rod D, mounted in a suitable bearing D' in the frame of the machine and having a slight vertical play in its bearing. The upward movement of the anvil C and rod D is limited by the engagement of the nut D<sup>2</sup> with the lower end of the bearing D', and their downward movement is limited by a smaller nut engaging the upper end of the bearing. (Not shown.)

The setting devices are intermittently operated, as in the machine of the patent re-



ferred to, and the work is presented in position to receive the lacing stud or hook by the operator and is moved between each operation of the setting device to properly space the studs.

The mechanism for enabling the operator to rapidly and accurately space the work comprises a gage-plate E, supported upon a plate F, secured to the frame of the machine and provided with a guiding-slot F', which is engaged by studs E' E<sup>2</sup>, projecting from the gage-plate. The shape of the guiding-slot will depend upon what arrangement of the studs upon the work is desired, the slot being curved if the studs are to be set in a curved line or being straight if the studs are to be set in a straight line. In setting studs upon the uppers of shoes the studs are usually arranged in a curved line, and in the construction shown the guiding-slot F' is a curved slot corresponding to the curve in the top of the shoe-upper along which the studs are set. The gage-plate is provided with a series of spacing-shoulders G, formed on a plate G' and arranged to be brought in succession against a fixed stop H, and thus determine the successive movements of the gage-plate. The fixed stop H is in the form of a finger pivoted in the end of a vertically-movable rod H' and acted on by a spring H<sup>2</sup>, which tends to move the finger laterally, as indicated in Fig. 6. The rod H' is guided in an arm D<sup>3</sup>, secured to the rod D, and is provided with a laterally-projecting plate H<sup>2</sup>, which engages a flange D<sup>4</sup> on the nut D<sup>2</sup> and is held yieldingly in engagement therewith by a spring H<sup>3</sup>. By reason of these connections between the rod H' and the rod D, which carries the setting-anvil C, the fixed stop H is moved upward with the anvil C when the setting devices operate and is thus carried upward out of engagement with the spacing-shoulders G. When this occurs, the spring H<sup>2</sup> moves the stop-finger H laterally, as indicated in Fig. 6, so that upon the return of the setting devices to their normal position after the setting of the stud is completed the stop H is out of register with the shoulder G, from which it was disengaged on its upward movement, and engages the top of plate G' as the rod H' descends and arrests the descent of said rod. The stop-finger H now rests upon the plate G', as indicated in Fig. 6, so that said plate is free to be moved until its movement is arrested by the engagement of the succeeding spacing-shoulder G with the stop-finger H. By such engagement of the spacing-shoulder with the stop-finger the finger is moved into its vertical position, as indicated in Fig. 1, where it arrests the movement of the gage-plate ready for the next operation of the setting devices.

The work is properly positioned with relation to the spacing-shoulders on the gage-plate by means of one of two gages I I', carried by the gage-plate, against which the

work is held by the operator and by which the gage-plate is moved with the work. These gages are in the form of thin metal plates secured to the gage-plate and bent backward under the plate and then forward, so that the shoe-upper may be properly positioned with relation to the setting devices when held against the upper surfaces of the plates.

In applying the studs to one side of the upper the plate I acts as a gage for determining the relation between the upper edge of the upper and the setting devices when the stop-finger H is in engagement with the first of the series of spacing-shoulders, the plate I' at this time acting merely as a support for the upper. In setting the studs upon the other side of the upper the plate I' acts as a gage for properly positioning the upper edge of the upper with relation to the setting devices when the stop-finger H is in engagement with the first of the series of spacing-shoulders, and the plate I acts merely as a support.

In order that the spacing mechanism may be adjusted for various styles and sizes of shoes, the plate G', upon which the spacing-shoulders G are formed, is pivoted upon the plate E, and the shoulders, with the exception of the first of the series, are arranged at varying inclinations, as indicated in Fig. 4. The shoulders are formed by the sides of a series of slots formed in the plate G', and these slots are so inclined with relation to the movement of the gage-plate that the movements of the gage-plate necessary to bring the succeeding spacing-shoulders against the stop-finger H are equal for each adjustment of the plate G', although these movements vary with different adjustments. The first of the series of shoulders G is formed by a circular hole at the axis of the plate G', so that the relation between this shoulder and the gage I is not affected by the adjustment of the plate G', and consequently the upper lacing hook or stud may be set at the same distance from the upper edge of the upper for all styles and sizes of shoes without any adjustment in the gage I.

When the plate I' is used as a gage for positioning the upper edge of the upper with relation to the setting devices, the upper will be in position to receive the stud next above the top lacing-eyelet when the first of the series of spacing-shoulders is in engagement with the stop-finger H, and the gage I' should therefore be adjusted to correspond with the adjustment of the spacing-shoulders in order that the studs may be set in the proper places upon the upper. For convenience in effecting the adjustments of the plate G' and gage I' for different spacings and also for insuring the proper relative adjustments between these parts the plate G' and gage I are connected together, so that an adjustment of one produces a corresponding adjustment of the other. In



the construction shown the gage I is pivoted between the plate E and a plate E<sup>3</sup>, secured thereto. The gage I' is connected with the plate G' by means of a stud G<sup>2</sup>, extending through the plate G' and through a slot I<sup>2</sup> in the plate I' and provided with a head working in a slot in the plate E. The upper end of the stud G<sup>2</sup> is provided with a nut G<sup>3</sup>, by which the parts may be clamped in their adjusted position. When this nut is loosened, the adjustment of the plate G' and the gage I may be changed by turning the plate I about its pivot, and the parts may be then clamped in their adjusted position by tightening the nut G<sup>3</sup>. The adjustments for giving the proper spacing for various styles of shoes may be indicated by a scale E<sup>4</sup> on the plate E, if desired.

In Fig. 3 the adjustment of the parts for the greatest spacing is indicated, while in Fig. 4 the adjustment for a smaller spacing is indicated.

Supposing the parts to be in the position shown in Fig. 3 and that the studs are to be applied to the right side of a shoe-upper, the operation will be as follows: The operator will place the shoe-upper upon the upper surface of the plates I I', with the upper edge flush with the edge of the plate I or with a line made upon the plate. This will bring the upper edge of the upper at the proper distance from the setting devices for positioning the top stud. In placing the upper upon the plates I I' the operator will bring the curved edge of the upper parallel to the edge of the curved plate F, so that the successive studs will lie at the same distance from the curved edge of the upper. When the upper has been properly positioned on the gage-plates, the operator grasps the gage-plates and the superposed upper between his thumbs and fingers and holds the upper in this position while he moves the gage-plate, so that the same movements will be imparted to both the gage-plate and the work. The machine will then be thrown into operation. When the stud is forced against the anvil C, the anvil will be raised until its movement is arrested by the nut D<sup>2</sup>, when the plunger A and anvil will operate to set the stud in the work. The upward movement of the nut D<sup>2</sup> lifts the rod H' and disengages the finger H from the hole G. The setting devices immediately return to their normal position, and the rod H' descends with the nut D<sup>4</sup> until the finger H rests upon the plate G', when the downward movement of the rod H' is arrested. The work and gage-plate are now moved to the right, the finger H riding on the plate G' until the first spacing-slot is reached, when the rod H' descends, bringing the finger H into the path of the stop-shoulder G. The movement of the gage-plate to the right is continued by the operator until this movement is arrested by the stop-finger H, when the parts are in position for the next operation of the setting devices. In setting the studs upon the left

side of the upper the operation is the same, except that the upper edge of the upper is placed upon the gage I' instead of upon the gage I.

What I claim, and desire to secure by Letters Patent, is—

1. The combination with setting devices of a spacing mechanism comprising a gage-plate adapted to be moved by the operator with the work and devices for gaging the movement of the plate after each operation of the setting devices.

2. The combination with the setting devices of a spacing mechanism comprising a movable gage-plate provided with a series of spacing-stops, and a fixed stop cooperating therewith to gage the successive movements of the gage-plate.

3. The combination with setting devices of a spacing mechanism comprising a movable gage-plate provided with a series of adjustable stops and a fixed stop cooperating therewith to gage the successive movements of the gage-plate.

4. The combination with the setting devices of a spacing mechanism comprising a movable gage-plate, a plate adjustably pivoted thereon and provided with a series of spacing-shoulders of varying inclination, a cooperating stop, and means for moving said stop out of the path of the spacing-shoulders at each operation of the setting devices.

5. A spacing mechanism having in combination a gage-plate for gaging the movements of the work, a plate adjustably pivoted thereto and provided with a series of spacing-shoulders of varying inclination, and a fixed stop cooperating with said shoulders to gage the movements of the gage-plate.

6. A spacing mechanism having in combination, a movable gage-plate, a series of spacing-shoulders thereon, a stop for cooperating with said shoulders to gage the movements of the plate, and means for disengaging said stop and moving it out of register with said shoulders.

7. A spacing mechanism having in combination, a gage-plate, a series of spacing-shoulders thereon, a stop, means for moving said stop toward and away from said plate, and means for moving said stop laterally out of register with said shoulders when moved away from said plate.

8. A spacing mechanism having in combination a movable gage-plate, an adjustable gage thereon, a series of adjustable spacing-shoulders, and a connection between the gage and shoulders for insuring corresponding adjustments of the gage and spacing-shoulders.

9. A spacing mechanism having in combination a movable gage-plate for gaging the movements of the work, provided with a series of spacing-shoulders and a fixed stop cooperating therewith to gage the successive movements of the gage-plate.

10. A spacing mechanism having in combi-



- nation a movable gage-plate, a series of inclined adjustable shoulders thereon, and a stop coöperating with said shoulders to gage the movements of said plate.
- 5 11. A spacing mechanism having in combination a movable gage-plate, a plate pivoted thereon and having a series of shoulders of varying inclination, a gage pivoted on the gage-plate, connections between said gage and pivoted plate, and means for securing to the gage and pivoted plate in adjusted position.

In testimony whereof I have affixed my signature in presence of two witnesses.

WILLIAM C. BRAY.

Witnesses:

GEO. E. STROUT,

MATTHIAS E. CROCKER.