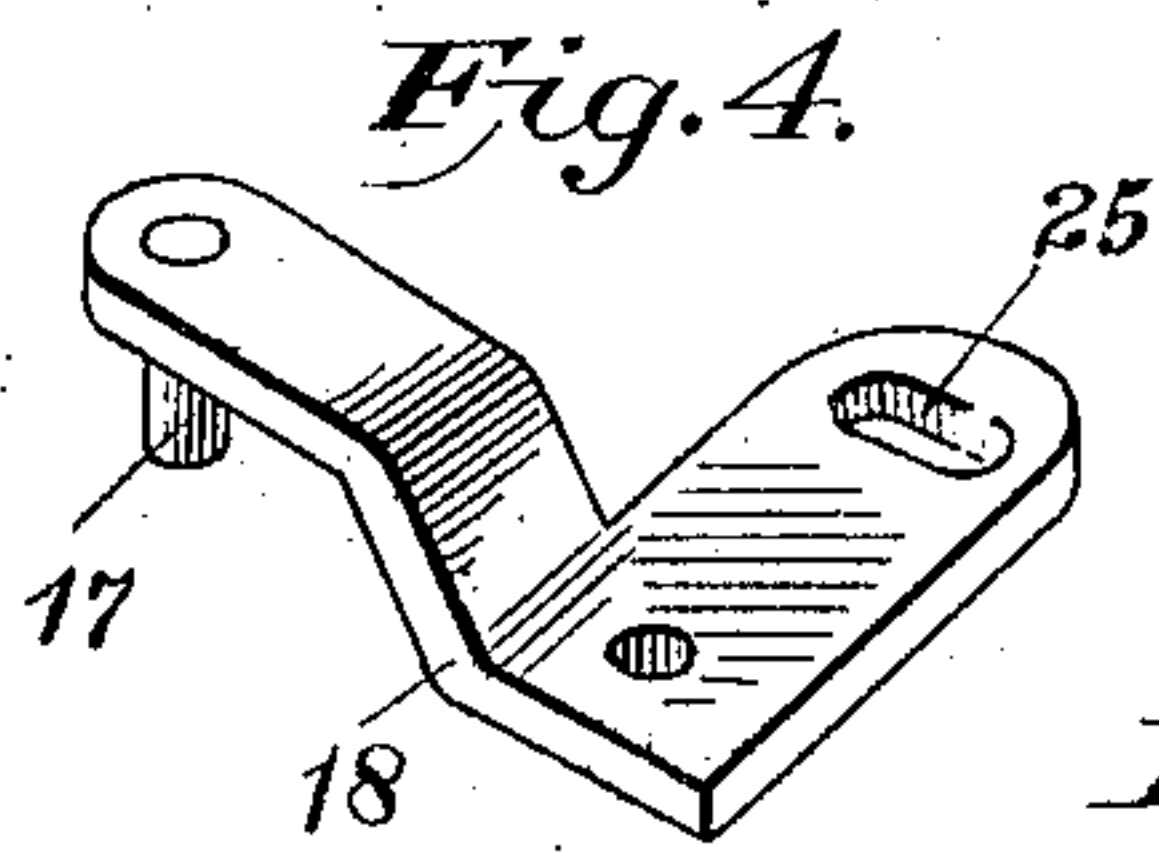
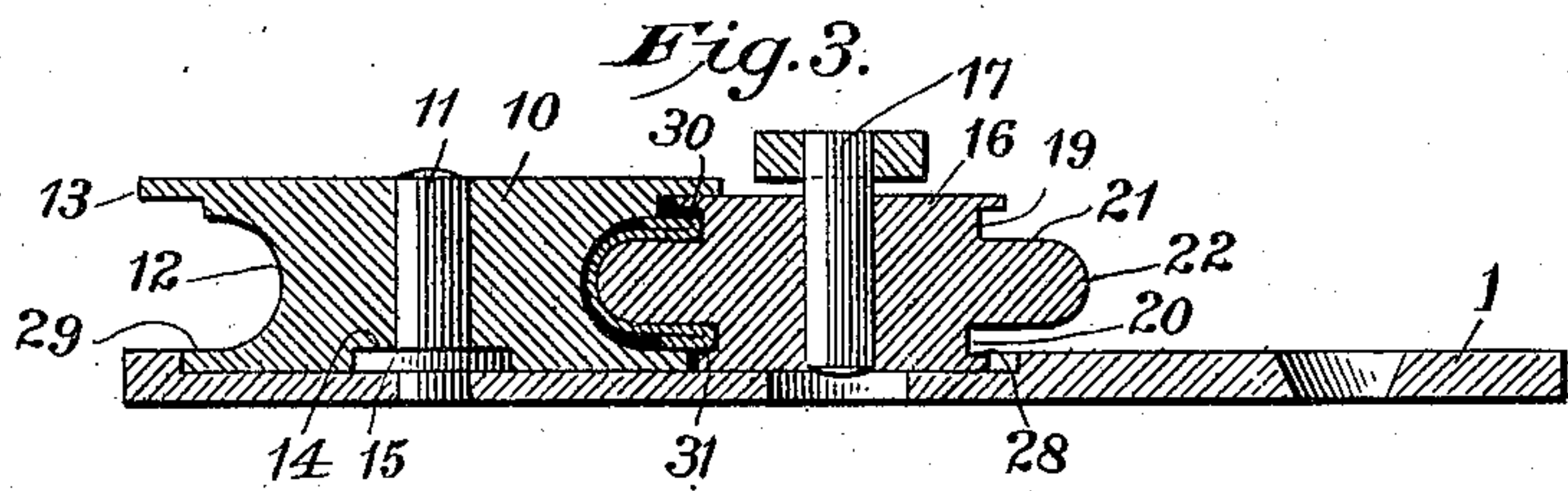
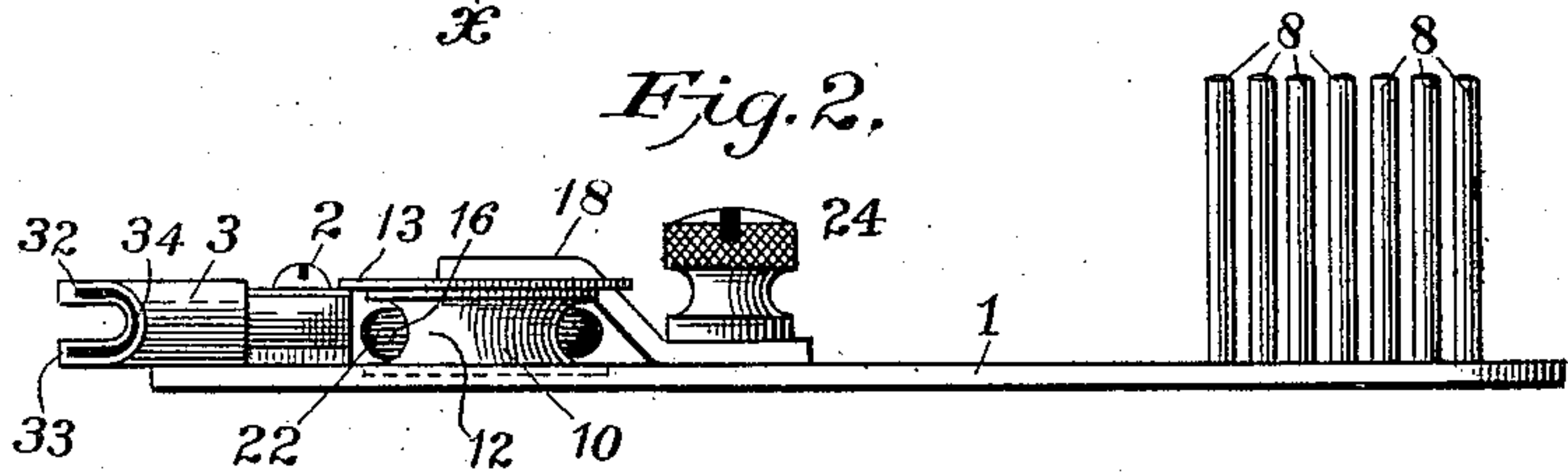
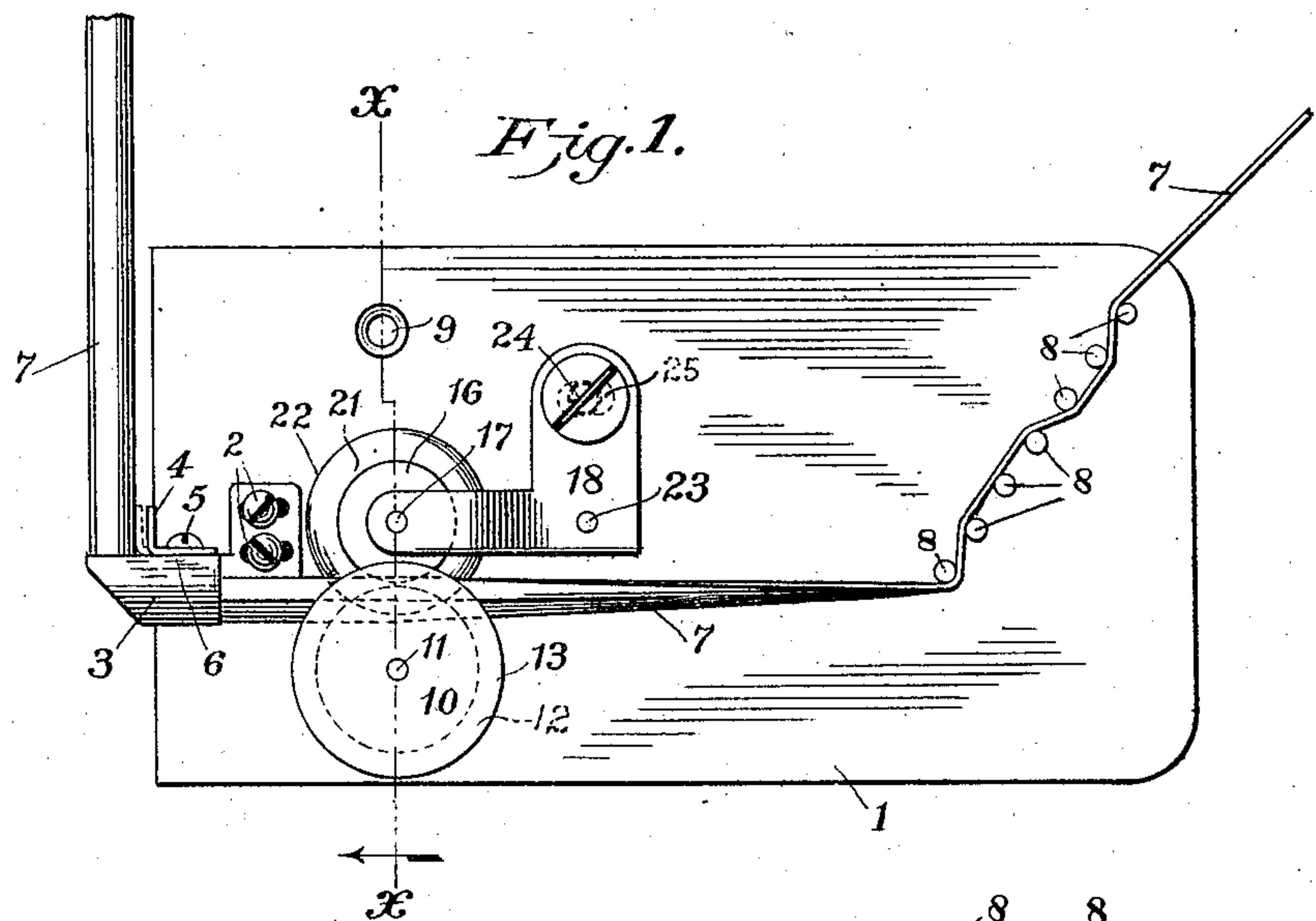


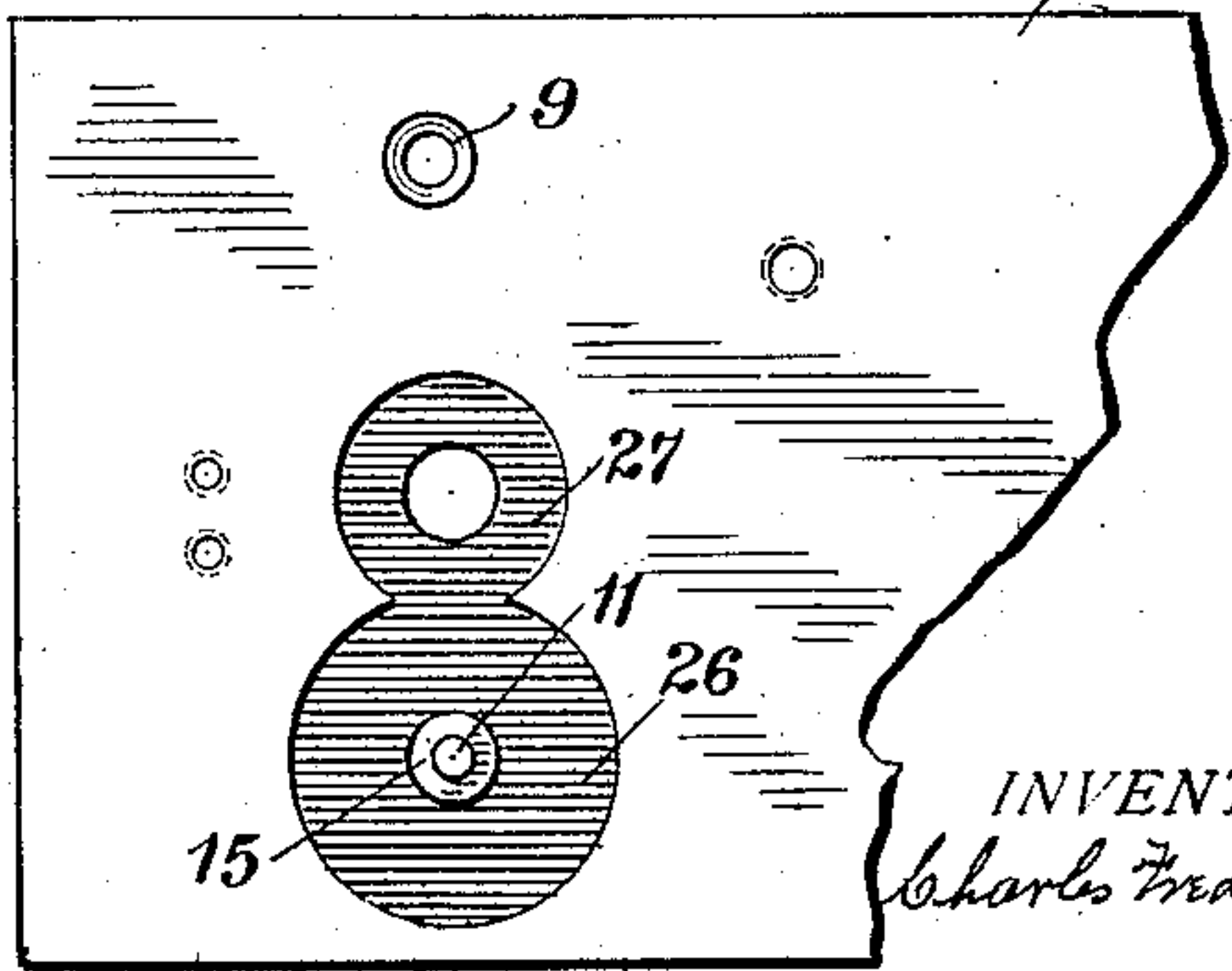
No. 859,939.

PATENTED JULY 16, 1907.

C. F. GRAY.  
BINDER FOR SEWING MACHINES.  
APPLICATION FILED FEB. 17, 1906.



*Fig. 5.*



WITNESSES:

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# UNITED STATES PATENT OFFICE.

CHARLES FREDERICK GRAY, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE SINGER MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

## BINDER FOR SEWING-MACHINES.

No. 859,939.

Specification of Letters Patent.

Patented July 16, 1907.

Application filed February 17, 1906. Serial No. 301,607.

*To all whom it may concern:*

Be it known that I, CHARLES FREDERICK GRAY, a citizen of the United States, and a resident of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Binders for Sewing-Machines, of which the following is a specification.

This invention relates to improvements in binding attachments for sewing machines and has for its object to provide improved means for giving to the binding the required tension.

Prior to this my invention, it has been the general practice to give to the binding the required tension by passing it in a zig-zag manner between suitably arranged tension pins or studs, and such form of tension device is practical if the sewing machine is operated at an ordinary and substantially uniform speed; but when such form of tension device is used in connection with such sewing machines as are commercially known as "high speed," such means becomes impracticable, unless the sewing machine is operated at a more uniform speed than is practical in connection with the operation of sewing machines generally.

It will be readily understood that if a braid or binding is passed between tension wires or studs, such as are commonly employed, such means will effect a uniform tension upon the binding if it is drawn through the tension wires at a uniform speed; but if a suitable tension is given the binding for, say, a speed of 1500 or 1800 stitches per minute, and a much slower speed is used, as when starting the seam, followed by a speed of from 2500 to 3000 stitches per minute, as is often the case in connection with high speed sewing machines, the variation in tension, due to the variable speed at which the binding travels between the pins, practically destroys the utility of such tension mechanism. To overcome this unevenness of tension, I provide the binding attachment with a roller tension and construct the rollers so that the binding is held in a direct line and in a form corresponding to the form of the guide slot in the binder head, thus preventing the binding from crowding or drawing in the direction of either the upper or lower vertical guide walls of the binder head. In the travel of the binding from the supply to the tension rollers, it is desirable to pass the binding around or through some form of guide that will give to the binding a slight tension and present it to the action of the rollers so that the binding will lead from said guide in a vertical plane, with respect to its width. To effect such tension and position of the binding I have, in the present instance, made use of so many of the tension studs or pins as are necessary to the practical operation of my improved mechanism when used in connection

with a sewing machine operated at, what is termed, "high speed;" but I do not limit my invention in this respect, as there are many well known means for giving to the binding, as it leaves the supply, a slight tension and at the same time guiding it in a vertical plane, with respect to its width.

In the accompanying drawings, illustrating my invention, in the several figures of which like parts are similarly designated, Figure 1 is a plan view of a binder plate equipped with the commonly employed binder head and tension studs, together with the tension and guide rollers of my improved construction; Fig. 2 a front side elevation of Fig. 1; Fig. 3 a view in section on the line X, X, Fig. 1; Fig. 4 a detail of the adjustable roller bracket; and Fig. 5 a plan view of the front end portion of the binder plate.

1 is the binder plate upon which is adjustably secured, by screws 2, the commonly employed binder head 3.

4 is a bracket adjustably secured, by screw 5, to the back wall 6 of the binder head 3, thus permitting the bracket 4 to be adjusted relatively to the outer curved surface of the binding 7, as the nature of the production may require.

8 designates the usually employed tension pins or studs between which the binding is passed to effect the desired tension upon the binding as it is drawn through the binder head in its travel to the stitch forming mechanism.

9 is the usual countersunk screw hole in the binder plate for the passage of the screw commonly employed to secure the binder plate to the bed plate of the sewing machine.

10 is a roller mounted to rotate upon a stud 11 secured in the binder plate 1, said roller being provided with an annular groove 12, flange 13, and counterbore 14, which latter receives the flange 15 of the stud 11.

16 is a roller mounted to rotate upon a pin 17 secured in the adjustable bracket 18, said roller being provided with grooves 19 and 20. Formed intermediate said grooves 19 and 20 is an enlarged portion 21, the periphery 22 of which is rounded to coact with the concaved wall of the groove 12 formed in the roller 10. The adjustable bracket 18 is pivotally mounted upon a pin 23 secured in the binder plate 1, and controlled, as to adjustment, by an adjusting screw 24, which latter passes through a slot 25 in the bracket 18, and is threaded into the binder plate 1. The binder plate 1 is counterbored at 26 and 27 to receive the rollers 10 and 16, so that the wall 28 of the groove 20 and the wall 29 of the groove 12 will occupy the same plane as the upper surface of the binder plate.

To insert the binding between the rollers 10 and 16,



the adjusting screw 24 is loosened and the adjustable bracket 18 swung on its pivot 23, thus carrying the roller 16 away from the roller 10. After the binding has been inserted between the rollers, the bracket is moved in the opposite direction until the extreme outer circumference of the rounded portion 21 forces the center of the rounded portion of the binding in contact with the smallest diameter of the groove 12, and with more or less force, dependent upon the tension required.

In laying the binding over the edge of the material, it is both customary and desirable to guide the binding in such manner that it will be folded slightly wider on the lower side of the material than on the upper side, so that in binding across a seam or portions of uneven thickness the variation in the width of the fold will affect only the lower or wrong side of the material. To better provide for the guiding of the binding so that the lower fold will be wider than the upper, the groove 20 in the roller 16 is of a smaller radius than the groove 19, so that the groove 20 will properly coact with the guide wall 33 of the slot 34 in the binder head, which wall is carried slightly back of or nearer the needle than the guide wall 32.

From the foregoing it will be understood that the binding is passed between such a number of the pins 8 as will slightly tension the binding before passing between the rollers 10 and 16, and that the roller 16 is adjusted relatively to the roller 10 with sufficient pressure to give to the binding, by acting upon the rollers to rotate them, the required tension before entering the binder head, and that such rollers not only act as a tension device but also act to properly present the binding to the binder head, the wall 30 of the groove

19, and the wall 31 of the groove 20, preventing the binding from drawing or crowding toward the wall 32 or 33 of the binder head guide slot 34.

#### Claims:—

1. In a binding attachment for sewing machines, the combination of a binder head and multiple tension devices, one of said tension devices comprising rollers adjustable relatively to each other and provided with coacting convex and concave walls between which the binding is gripped in its travel to the binder-head, substantially as described.

2. In a binding attachment for sewing machines, the combination of a binder head and means for applying tension to the binding, said means including rollers provided with concave and convex walls between which the binding is gripped in its travel to the binder-head, one of said rolls being provided with grooves against the inner walls of which the edges of the binding abut, to prevent the binding from drawing or crowding toward one or the other of the vertical walls of the guide slot in the binder head.

3. In a binding attachment for sewing machines, the combination of a binder head and means for applying tension to the binding, said means including rollers provided with concave and convex walls between which the binding is gripped in its travel to the binder-head, one of which is adjustably mounted, its coacting roller arranged to remain in the same center of rotation.

4. In a binding attachment for sewing machines, the combination of a binder head and means for applying tension to the binding, said means including rollers, one of which is provided with an upper and an under annular groove of unlike radii for guiding one edge of the binding slightly out of vertical alinement with its opposite edge.

Signed at Bridgeport in the county of Fairfield and State of Connecticut this 16th day of February A. D. 1906.

CHARLES FREDERICK GRAY.

#### Witnesses:

WILLIAM R. ABERCROMBIE,  
ABBIE M. DONIHU.