

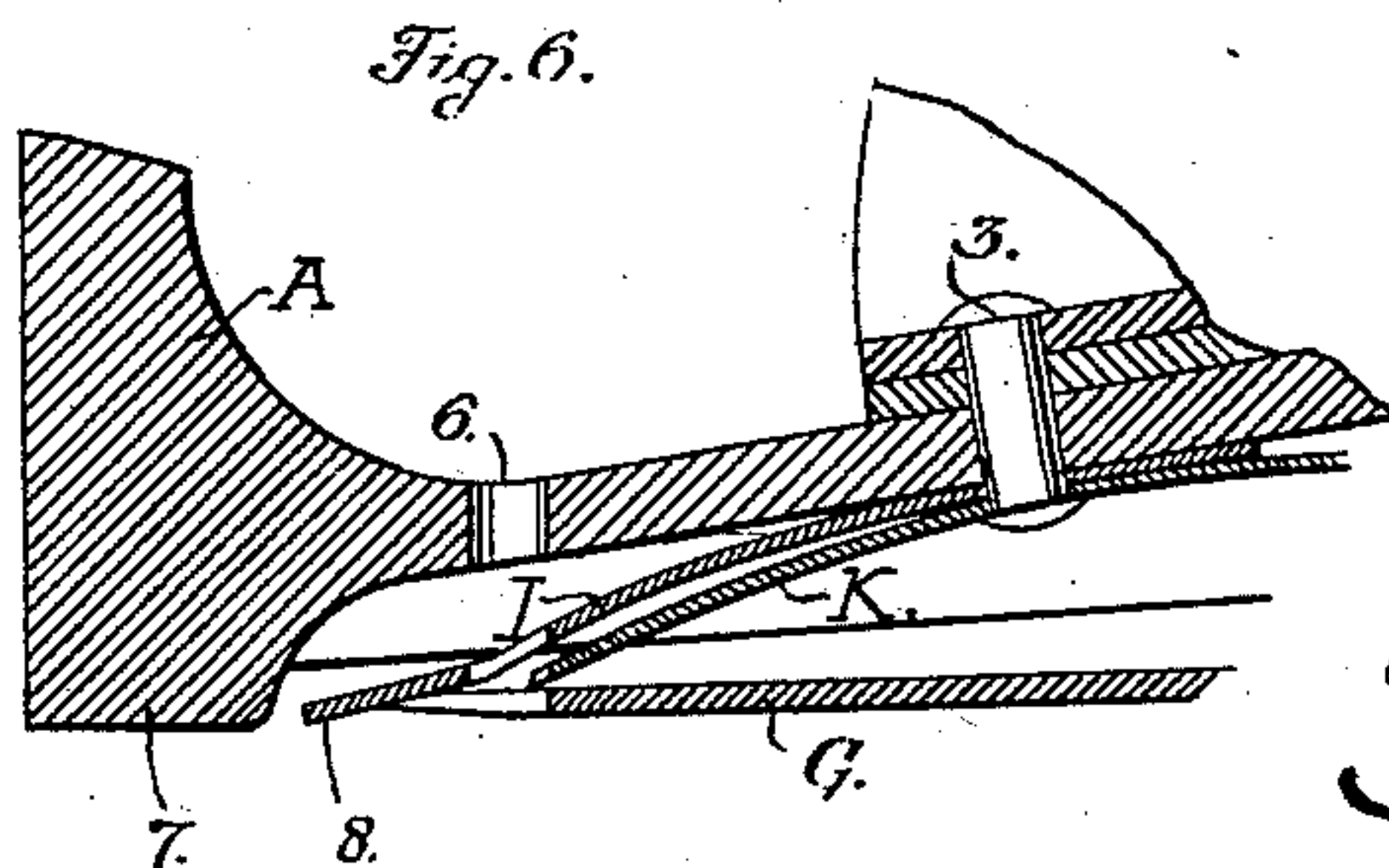
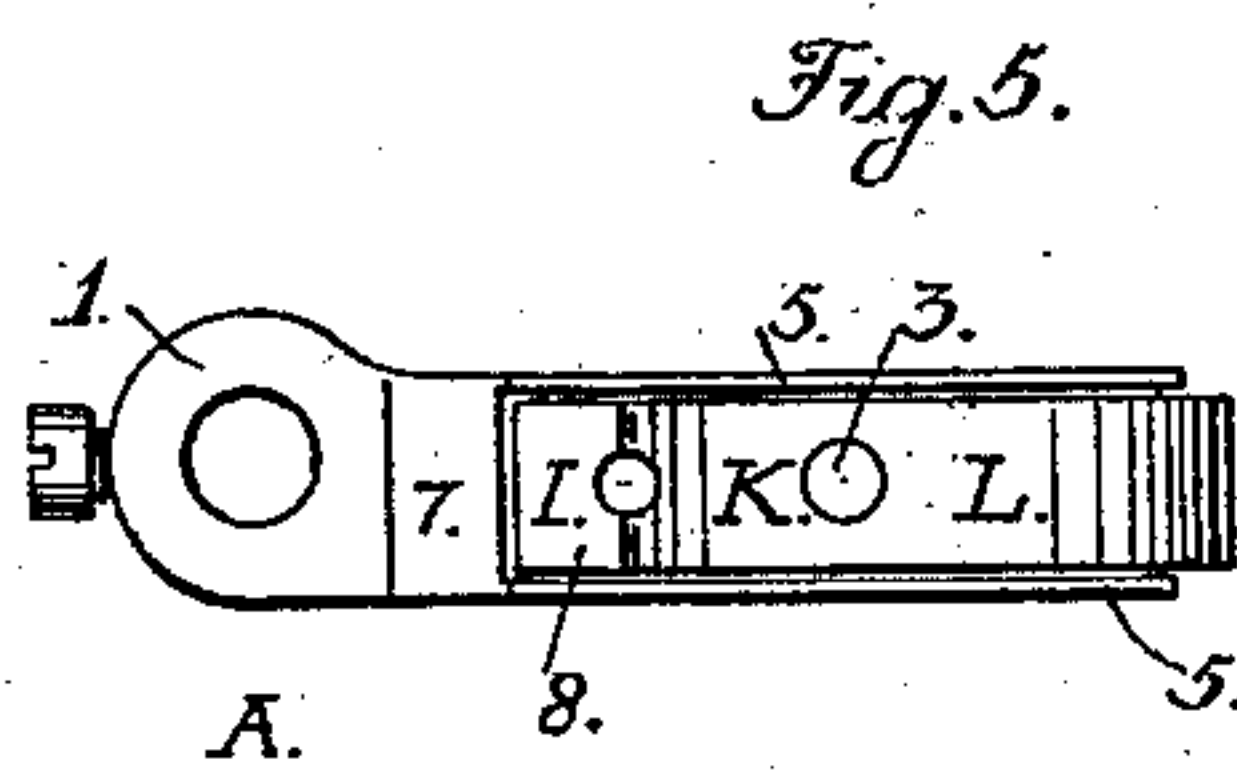
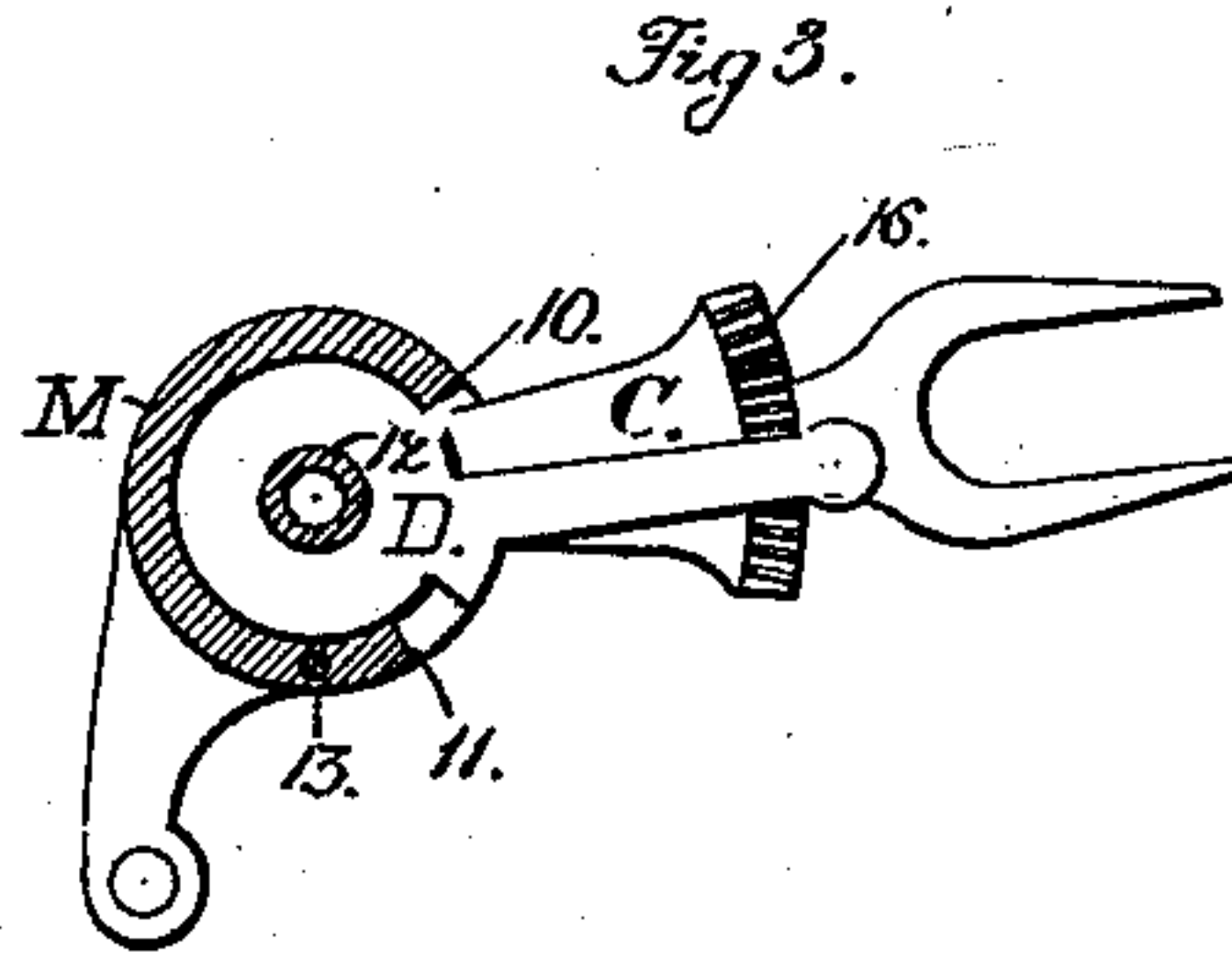
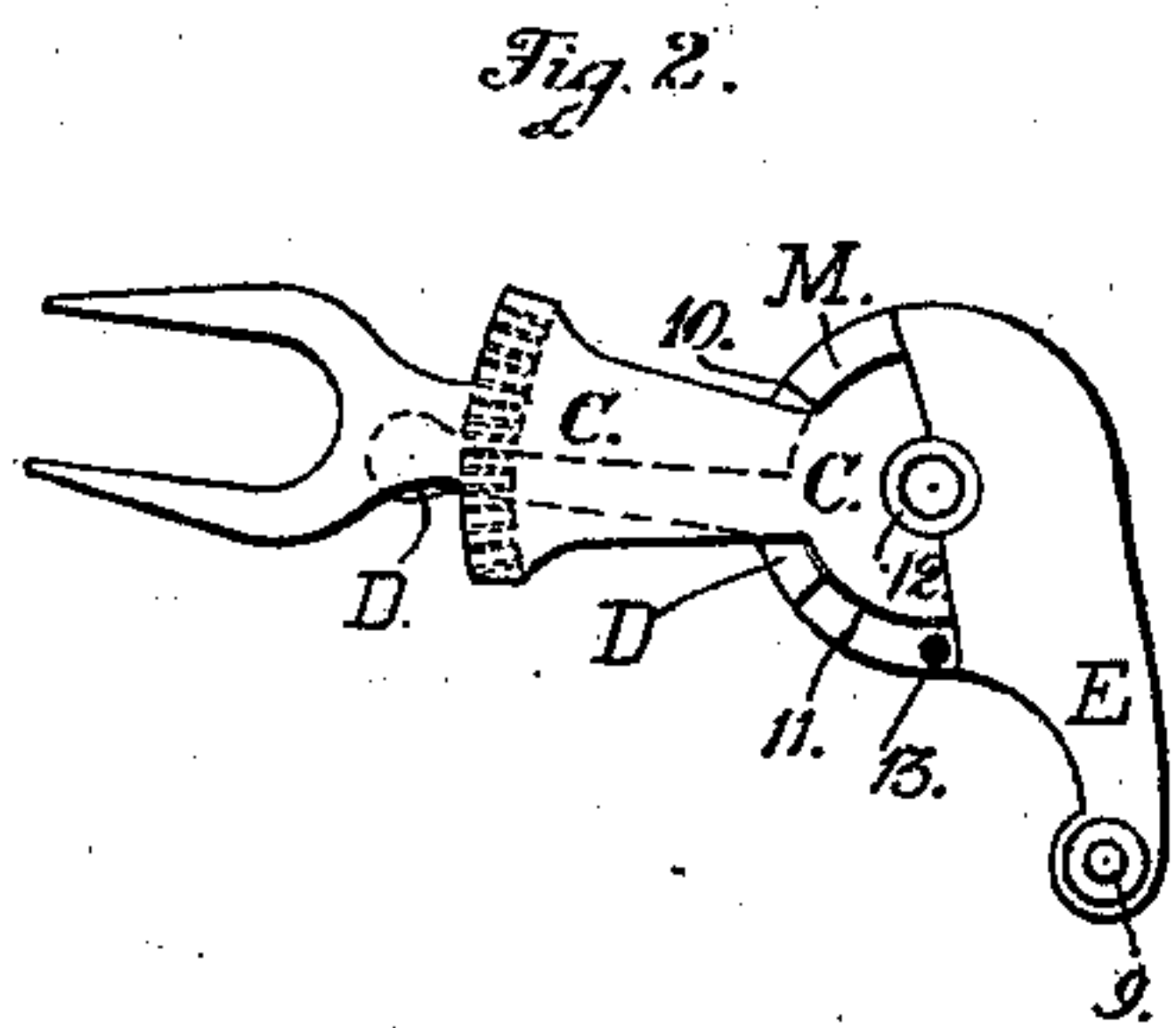
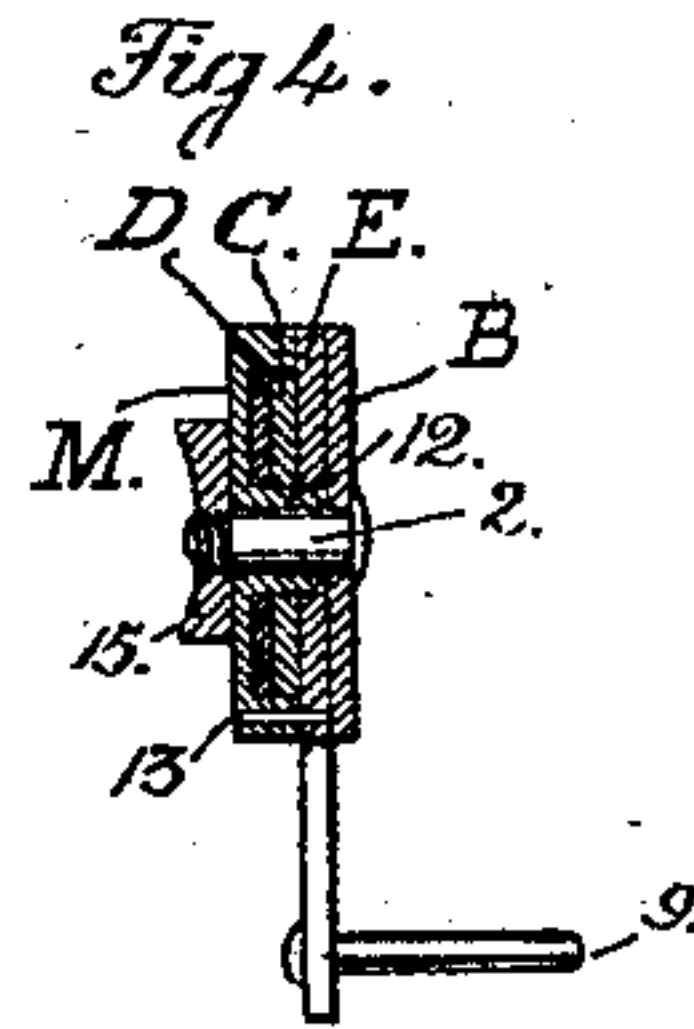
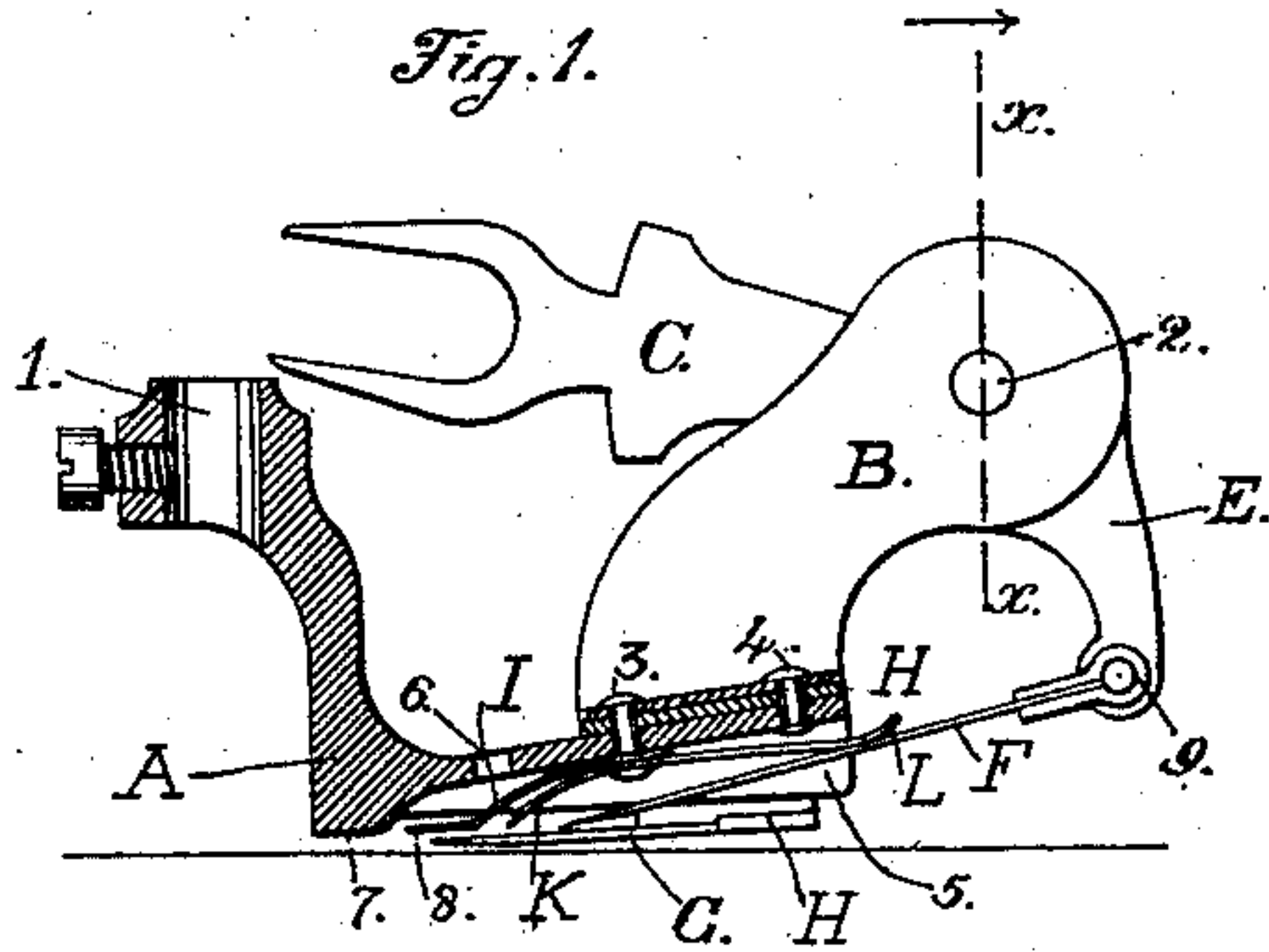
(No Model.)

A. JOHNSTON.

RUFFLING ATTACHMENT FOR SEWING MACHINES.

No. 368,923.

Patented Aug. 23, 1887.



Witnesses.
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UNITED STATES PATENT OFFICE.

ALLEN JOHNSTON, OF OTTUMWA, IOWA.

RUFFLING ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 368,923, dated August 23, 1887.

Application filed December 19, 1884. Serial No. 150,755. (No model.)

To all whom it may concern:

Be it known that I, ALLEN JOHNSTON, of Ottumwa, in the county of Wapello and State of Iowa, have invented a new and useful Improvement in Ruffling Attachments for Sewing-Machines, which improvement is fully set forth in the following specification.

This invention relates to sewing-machine attachments for forming fabric into folds, plaits, gathers, or ruffles, to be afterward secured in that form by the sewing-machine, with or without being stitched at the same operation to a band or bands or other layers of fabric. The means commonly used for forming the ruffles or gathers consists of a reciprocatory ruffler-blade, whose end bears upon the fabric. In some ruffling attachments the ruffler-blade acts upward against the bottom of the presser-foot of the sewing-machine, (the fabric to be ruffled or gathered passing over the ruffler-blade;) but it is more common to have the ruffler-blade act downward against a plate or blade (called the "separator") above the work-plate of the sewing-machine, (the fabric to be ruffled passing under the ruffler-blade.) The separator can be, and in some of the earlier rufflers was, omitted, the ruffler-blade acting against the work-plate of the sewing-machine.

The present invention has more particular reference to ruffling attachments with downwardly-acting ruffler-blades, although it is not wholly limited thereto. It also has more particular, although not exclusive, reference to ruffling attachments adapted to be used on sewing-machines having an under feed—that is, the feed plate or device, whose upper surface is roughened or provided with teeth to take hold of the fabric, is supported and operated by devices under the work-plate, as customary in the large majority of sewing-machines.

Heretofore the feed has always acted against a surface rigid and unyielding, except by lifting the presser-foot bodily, the folded, ruffled, or gathered fabric lying between the toothed or roughened feed-plate and this rigid surface. Generally this surface is the bottom of the presser-foot; but sometimes it is the under side of a plate or supplemental presser-foot introduced under the regular presser-foot of the sewing-machine. Now in sewing-machines the points of the feed-teeth are not al-

ways in a horizontal plane, or plane parallel with the upper surface of the work-plate. Some manufacturers so construct the parts that this plane is inclined to the surface of the work-plate, the teeth on one side of the feed-plate (say the outside or side farthest removed from the goose-neck) being higher than those on the other. The angle of inclination, moreover, is different even in machines of the same make. The effect is that unless the bottom of the presser-foot or surface against which the feed-plate acts has the same inclination as or is parallel to the aforesaid plane the feed-teeth on one side of the feed-plate will press harder on the fabric than those on the other, with the result, it has been found, that the gathers, folds, plaits, or ruffles will be formed accurately on one side the line of stitching—namely, on the side of the hardest pressure—but on the other or side of least pressure they will not be regularly formed.

To overcome this difficulty the present invention consists in providing a yielding or elastic device for the feed to act against, said device, in virtue of its yielding nature or elasticity, automatically adjusting itself to the different angles of the feed-surface. It is not necessary that the whole of the surface against which the feed acts should be that of the yielding or elastic device. It may also act against a rigid device—a part of the usual presser-foot, for example. Such an arrangement or combination is in fact embodied in the attachment to be hereinafter described, and forms a part of the present invention, the rigid or unyielding surface enabling the feed more securely to take hold of the goods and feed it through the machine. After the ruffle has been formed and stitched it is less important that the feed should act evenly on the work, as the folds cannot then be disarranged. Independently, however, of the variations in the feed-surface, it is desirable to produce upon the fabric that is folded over the end of the ruffler-blade a lighter pressure than that of the usual spring which holds down the presser-foot of the sewing-machine.

To this end the invention consists in the combination, with the reciprocatory ruffler-blade adapted to bear at its end upon the fabric and form the same into folds or ruffles, and the presser-foot adapted to bear upon the fab-

ric after it has been folded or ruffled, of one or more spring blades or pressers arranged on the opposite side of said ruffler-blade from that on which said fabric passes, said blades 5 or pressers bearing upon the folds as they are formed on the end of said ruffler-blade with a lighter pressure than that of the presser-foot.

The invention also consists in a holding-blade whose flat point or edge at the free end 10 bears upon the fabric to be ruffled. By taking hold of said fabric it prevents the fold or gather formed by the forward movement of the ruffler-blade being drawn back with said ruffler-blade when the latter returns.

15 The holding-blade is or may be the spring blade or presser before referred to, or one of them when more than one are employed, but not necessarily. The spring blade or presser, even when it is so constructed that a flat surface bears upon the fabric, tends to prevent withdrawal of the folds or gathers; but the holding-blade, since it has an edge (more or less sharp) to bear upon the fabric, takes a more secure hold, and its use is valuable for 20 ruffling certain kinds of goods where this drawing back of the fold or gather is very apt to occur. The best construction is to have two of the spring blades or pressers—one with a flat bearing-surface to rest on the fabric and 25 the other with an edge, the latter constituting the holding-blade. This construction is embodied in the attachment to be hereinafter described, and constitutes a special improvement or part of the invention.

35 Another part of the invention consists in the mechanism for operating the ruffler-blade. For this purpose there are three levers pivoted at a common point to the ruffler-frame, one lever being connected with the ruffler-blade 40 and imparting the reciprocatory motion thereto, a second lever receiving motion from the sewing-machine and communicating motion to the former lever and through it to the ruffler-blade, and the third being adjustable to vary 45 the extent of the motion conveyed or stroke of the ruffler-blade.

Heretofore various arrangements of the levers have been used, but none of them, so far as I am aware, embodying the three levers pivoted at a common point, as stated. The new 50 arrangement or combination possesses practical advantages in the manufacture of the rufflers.

In addition to the foregoing improvements 55 or parts of the invention, there are certain special constructions, combinations, and arrangements of parts which will be readily understood without particularizing them in this part of the specification.

60 The following is a description of what is considered the best mode of applying the principle of the invention.

In the accompanying drawings, which form a part of this specification, Figure 1 is a view 65 in longitudinal section of a ruffling attachment constructed in accordance with the invention; Fig. 2, a view in elevation of the op-

erating-levers detached, (part of the front lever being broken away to show the devices 70 behind;) Fig. 3, a view in elevation on the opposite side from that shown in Fig. 2, the view being partly in section; Fig. 4, a view in sectional elevation on line *x x*, Fig. 1, looking in the direction of the arrow; Fig. 5, a bottom 75 view, the separator and ruffler-blade being removed; and Fig. 6, a view in section on an enlarged scale.

The ruffler-frame is composed of the presser-foot A, provided with a socket, 1, for attaching the same to the presser-bar of the sewing- 80 machine, and an upright plate, B. The levers C D E, for operating the ruffler-blade F, are pivoted at 2 to the upright plate. The separator G is attached to the bowed arm H. The spring-presser I and holding-blade K and 85 elastic finger L are fastened to the bottom of the presser-foot A. The bowed arm H and the upright plate B are fastened to the presser-foot A by rivets 3 and 4, (of course other ordinary or suitable fastening means could be used,) 90 and the devices I K L, of elastic and yielding or spring metal, are secured by the rivet 3. The elastic finger L is, as shown, a continuation of the holding-blade K. This, however, is simply a matter of convenience. It could 95 be made of a separate piece of spring metal. The devices I K L are set between depending flanges 5 at the sides of the presser-foot, which flanges prevent their turning upon the rivet 3 as a pivot. 100

The presser-foot A is cut away on the bottom in front of the needle-hole 6, and also from some distance behind it, leaving only the heel 7 to bear upon the work. The spring-presser 105 I is bent near the end, the flat under surface of the part 8 bearing upon the folds. This spring-presser, as shown, projects beyond the needle-hole 6, and also beyond the separator G. The part 8 thus constitutes a surface against which the feed acts. It is capable not 110 only of being lifted by the work or the feed, or yielding vertically, but also on account of the thinness of the spring metal admits of a slight twist or torsional movement if the feed is higher on one side than the other, and thus 115 adjusts itself to the varying angles of the feed-surface in different machines. This torsional movement need be and is very little; but it suffices practically to overcome the difficulty of the feed pressing harder upon the work on 120 one side of the line of stitching than on the other.

The presser I is lifted by the folds as they are laid over the end of the ruffler-blade easier than the presser A itself would be, because 125 the tension of the spring I is less than that of the spring which is employed in sewing-machines to hold down the presser-foot. The holding-blade K is so constructed and arranged that the edge at the end or flat point of the 130 blade bears upon the fabric, and thus takes a better hold of it than the nearly horizontal part 8 of the spring-presser I. The holding-blade K, being made of spring metal, acts as a

spring-presser in laying the fabric over the end of the ruffler-blade.

The ruffler-blade F acts downward upon the separator G to ruffle or gather the fabric, which passes under the ruffler-blade between it and the separator. Said blade F is fastened to the lower end of the lever E by means of the pin 9, fixed in said lever. It passes for a short distance between the depending flanges 5 of the presser-foot. The elastic finger L, under which the ruffler-blade is reciprocated, bears upon said blade and holds the free end against the fabric on the separator. At the upper end of the lever E is a cap, M, having at the circumference a rim which is cut away on one side to form the two stops or contacts 10 and 11, and at the center a small hub, 12. The enlarged ends of the levers C and D fit inside the rim and project between the stop or contacts 10 and 11. They turn on said hub independently of the cap M until they strike one or the other of said stops or contacts. The hub 12 passes through a hole in the centers of said enlarged ends. The hub also passes through the enlarged or upper end of the lever E. The cap M is further connected with the lever E by the pin 13, fixed in the rim of the cap and projecting into a hole in the lever. The lever E thus turns with the cap M, which forms in effect a part of said lever. The pin 2, fixed in the upright plate B, passes through the hub 12, and a nut, 15, on the outer end confines the three levers in place.

The adjusting-lever D is elastic, so that its outer end can be bent sidewise, the same as the adjusting-lever in the ordinary Johnston ruffler, for many years in use, and it is similarly provided with a lip or projection for engaging a ratchet or toothed surface to retain it in the position to which it may be adjusted.

In the ruffler embodying the present improvement the ratchet 16 is formed on the lever C, which receives motion from the sewing-machine. It is provided with a fork to fit over the needle-screw or similar projection on the needle-bar, so as to be vibrated in both directions by said needle-bar. Of course other usual modes of imparting movement from the sewing-machine to the lever of a ruffler could be employed.

The operation will be readily understood. When the needle-bar of the sewing-machine rises, it lifts the levers C and D independently of lever E until the lever C strikes the contact 10. After that the lever E is carried along and the ruffler-blade F is advanced, the elastic finger K pressing it down. The fabric to be ruffled is folded over the end of the ruffler-blade, and the fold is pushed under the holding-blade K and spring-presser I. While the needle-bar is up, the feed of the sewing-machine comes into action and advances the work. If one side should be higher than the other, the device I or spring-presser yields, so as to maintain a uniform pressure over the fold beneath. The heel 7 of the presser-foot constitutes a rigid device which bears firmly

on the work, so as to prevent its disarrangement and to insure that the feed-teeth beneath take a firm hold of the same. The ruffler-blade is preferably arranged to carry the fold nearly but not quite to the end of the separator. On the descent of the needle-bar the levers C D are carried down independently of the lever E until the lever D strikes the stop 11, whereupon the lever E is also vibrated and the ruffler-blade F is drawn back. The distance to which the ruffler-blade is withdrawn, and consequently the stroke of the same, is determined by the position of lever D, and is regulated by shifting it up or down, as it may be required to increase or diminish the fullness of the gathers. The holding-blade K prevents the fold being drawn back with the ruffler-blade. The reciprocation of the latter is repeated until the desired length of fabric has been ruffled.

The holding-blade K can be omitted; but its use is advantageous not only in preventing the fold being drawn back, but also to press upon the fold in formation before the fold reaches the spring-presser I. It thus prevents the fold becoming disarranged in its formation. The spring-presser I can also be omitted; but its omission would be disadvantageous. Also, it is evident that various other modifications could be made in details without departing from the spirit of the invention, and that parts of the invention can be used separately.

Having now fully described my said invention and the manner of carrying the same into effect, what I claim is—

1. In a ruffling attachment, and in combination with a movable ruffling device or ruffler-blade and a presser-foot bearing solidly upon the work, a yielding or elastic device for the feed of the sewing-machine to act against, said device, in virtue of its yielding nature or elasticity, adjusting itself automatically to variations in the feed-surface, so as to press evenly on the work on both sides of the line of stitching, substantially as described.

2. In a ruffling attachment, the combination, with the ruffler-blade and presser-foot bearing upon the work, of an elastic or yielding device free to rise and fall independently of said foot and arranged to bear upon the work above the feed, substantially as described.

3. In a ruffling attachment, and in combination with the downwardly-acting movable ruffling device or ruffler-blade, the presser-foot arranged to bear at the heel solidly upon the work, and provided with an elastic or yielding device arranged to bear upon the work in advance of said heel, substantially as described.

4. The combination of a presser-foot arranged to bear at the heel upon the work, a separator, an elastic or yielding device arranged to bear upon the work between the end of the said separator and the said heel, and a reciprocatory ruffler-blade, substantially as described.

5. The combination, with a presser-foot provided with a socket for attaching the same to the presser bar of the sewing-machine and constructed to bear solidly upon the work at the heel, and a reciprocatory ruffler-blade and its operating mechanism, carried by said presser-foot, of a yielding or elastic device, also carried by said presser-foot, substantially as described.
6. The combination, with the presser-foot bearing solidly on the work and the reciprocatory ruffler-blade, of one or more spring blades or pressers for bearing lightly on the fabric as it is folded over the end of said ruffler-blade, substantially as described.
7. The combination, with a reciprocatory ruffler-blade and a presser-foot, of a spring blade or presser for bearing upon the fabric folded over the end of said ruffler-blade, said presser being yielding or elastic, so as by automatically adjusting itself to press evenly upon the work on both sides of the line of stitching, substantially as described.
8. The combination, with a reciprocatory ruffler-blade and a presser-foot, of a spring blade or presser arranged on the opposite side of the ruffler-blade from that on which the fabric passes, and extending beyond the ruffler-blade when farthest advanced, substantially as described.
9. The combination, with a reciprocatory ruffler-blade and a presser-foot, of a separator and a spring blade or presser arranged on the opposite side of said ruffler-blade from said separator, the pressing-surface of said spring-presser lying partly over and partly beyond the end of said separator, substantially as described.
10. The combination, with the reciprocating ruffler-blade, of a holding-blade arranged on the opposite side of said ruffler-blade from that on which the fabric to be ruffled passes, said holding-blade bearing at the edge upon the fabric, substantially as described.
11. The combination, with the reciprocating ruffler-blade and the presser-foot, of the holding-blade, of spring metal, arranged on the opposite side of the ruffler-blade from that on which the fabric to be ruffled passes, and bearing at its edge upon said fabric, substantially as described.
12. The combination of the presser-foot, the reciprocatory ruffler-blade, the separator below said blade, and the holding-blade, for bearing on the fabric, of spring metal, above the same, substantially as described.
13. The combination of the presser-foot, the reciprocatory ruffler-blade, the holding-blade, of spring metal, and the spring-presser, substantially as described.
14. The combination of the presser-foot, the ruffler-blade, the separator, the holding-blade, and the spring-presser, substantially as described.
15. The combination, with the presser-foot having depending flanges at the sides, of the reciprocatory ruffler-blade passing between said flanges, substantially as described.
16. The combination, with the ruffler-frame and the ruffler-blade, of the operating mechanism comprising the three levers pivoted to said frame at a common point—namely, the lever receiving motion from the sewing-machine and having a ratchet, the adjusting lever provided with a lip or projection for engaging said ratchet, and the lever through which the motion is conveyed from the former levers to the ruffler-blade, substantially as described.
17. The combination, with the ruffler-frame and ruffling-blade, of the operating mechanism comprising the lever pivoted to the ruffler-frame, and having two stops or contacts, and the two levers, one adjustable with reference to the other, and both of them pivoted to the ruffler-frame and projecting between the aforesaid stops or contacts, a common pivot-pin passing through the three levers, substantially as described.
18. The herein-described ruffling attachment, comprising, in combination, the following elements, namely: the ruffler-frame comprising the presser-foot and upright plate, the ruffler-blade, the lever mechanism for operating and regulating the stroke of said ruffler-blade, the separator below the ruffler-blade, and one or more spring-pressers fastened on the under side of said ruffler-frame, as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

ALLEN JOHNSTON.

Witnesses:

W. T. MAJOR,
J. T. HACKWORTH.