(No Model.) 2 Sheets—Sheet 1.

G. A. STILES.

SHOE SEWING MACHINE.

No. 494,969. Patented Apr. 4, 1893.

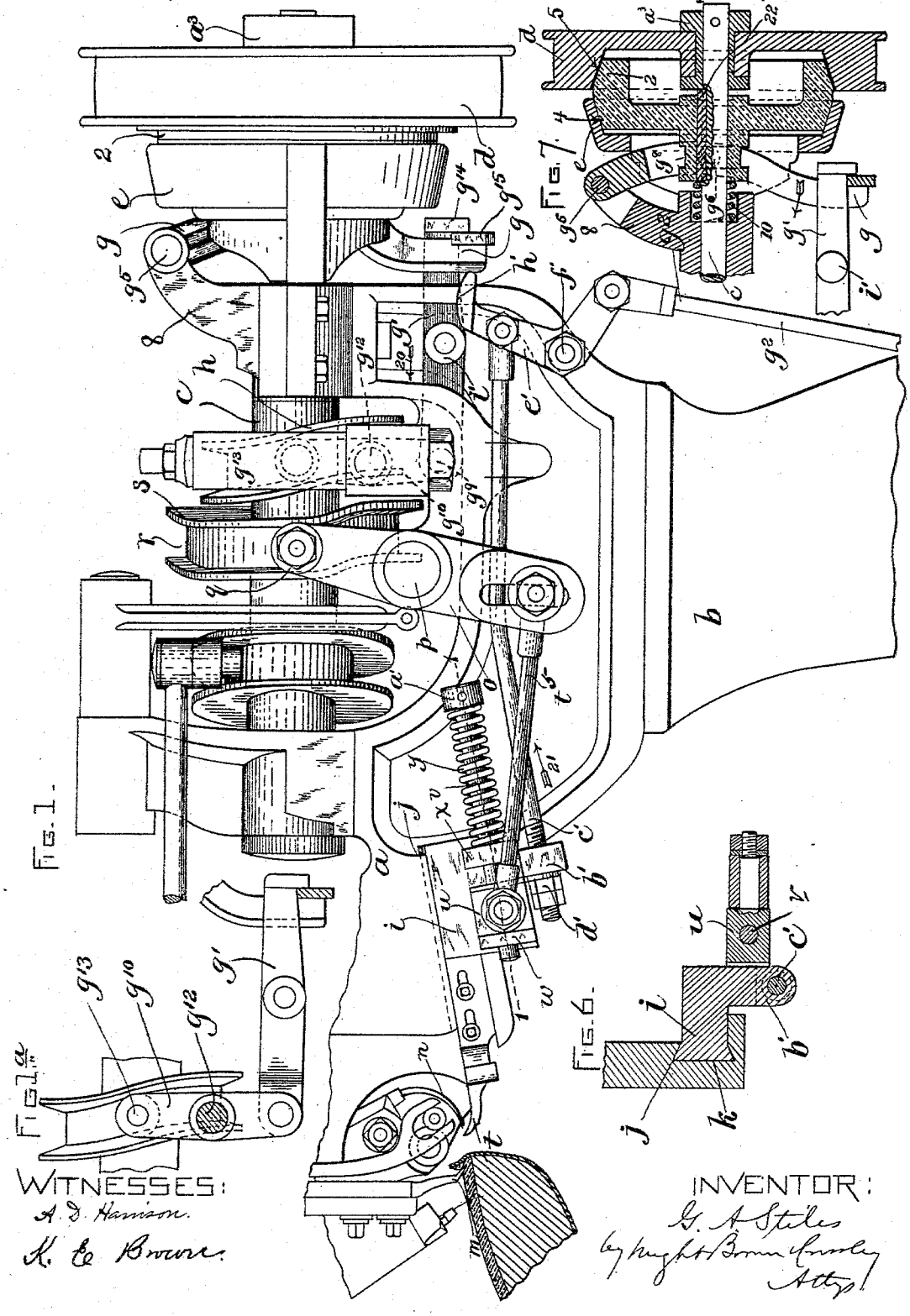

Fig. 1.

Fig. 1a.

Fig. 7.

Fig. 6.

WITNESSES:
A. D. Harrison.
K. E. Brown.

INVENTOR:
G. A. Stiles
by Wright Brown Quinby & Atty's

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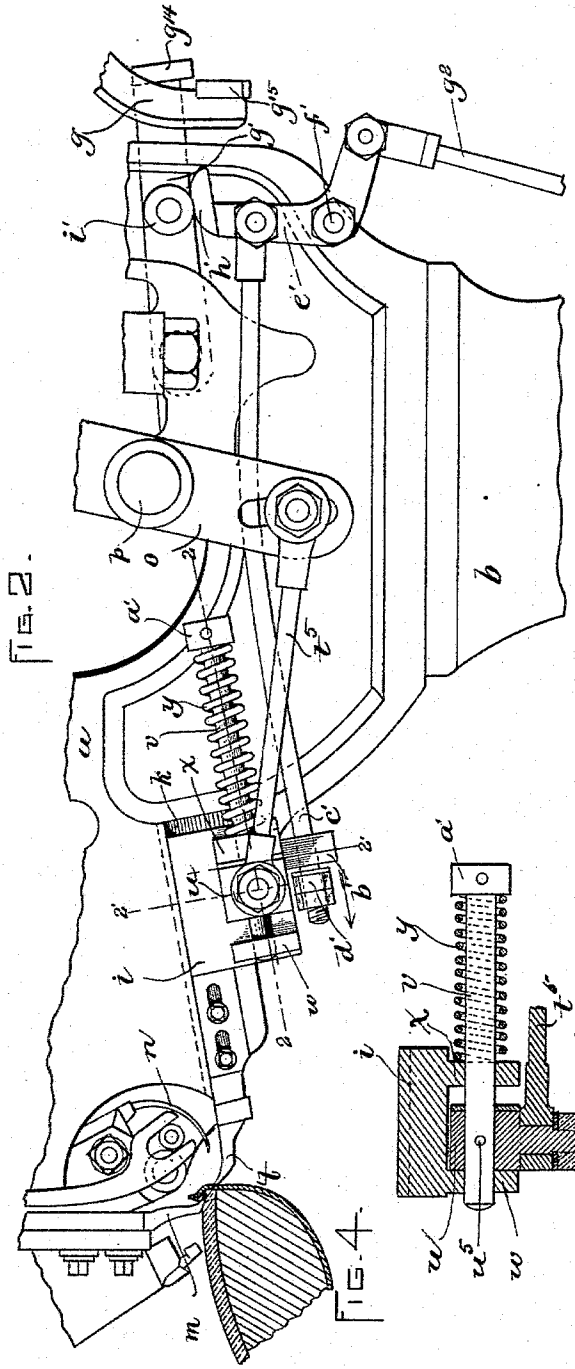

FIG. 2.

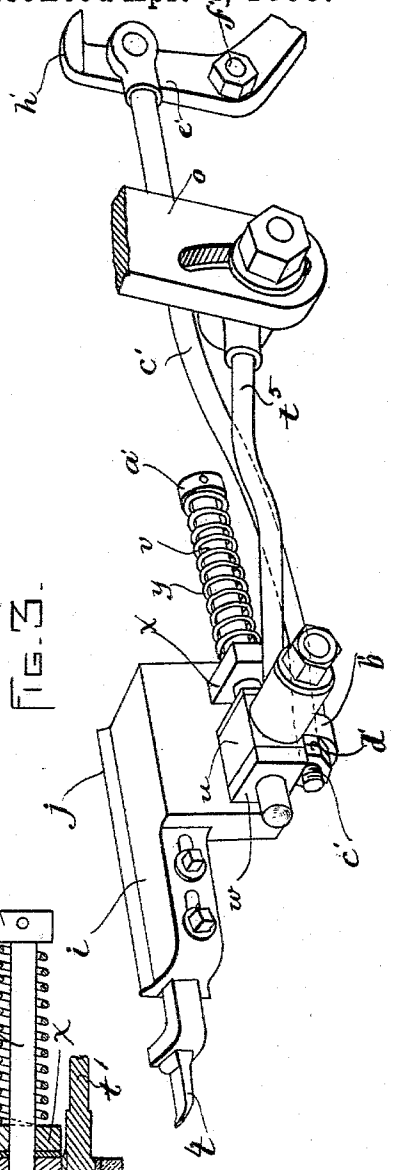

FIG. 3.

FIG. 4.

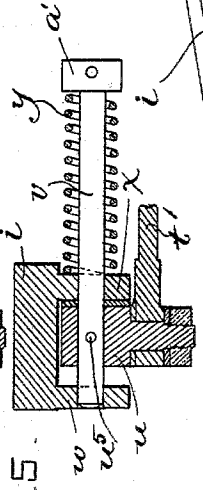

FIG. 5.

WITNESSES:
A. D. Harrison.
K. E. Bowne

INVENTOR:
G. A. Stiles
by Wright Brown Quinby & Otley
Attys.

UNITED STATES PATENT OFFICE.

GEORGE A. STILES, OF BROOKLINE, MASSACHUSETTS, ASSIGNOR TO THE LINCOLN SEWING MACHINE COMPANY, OF EXETER, NEW HAMPSHIRE, AND OF BOSTON, MASSACHUSETTS.

SHOE-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 494,969, dated April 4, 1893.

Application filed May 26, 1892. Serial No. 434,471. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. STILES, of Brookline, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Boot or Shoe Sewing Machines, of which the following is a specification.

This invention relates to boot or shoe sewing machines employing a curved needle, and a back gage or support, which is arranged to bear upon the boot or shoe upper and support the same for the action of the needle and co-operating parts of the stitch-forming mechanism.

The invention, as here shown, is adapted for sewing the soles and uppers of turned shoes, a channel gage being employed to enter the channel formed in the sole for the reception of the stitches, while the back gage is arranged to bear upon the upper at a point near the edge of the latter, and to co-operate with the channel gage in holding the lasted boot or shoe in position to enable the needle to pass through the upper and the between-substance of the sole and lay the stitches in the channel of the sole. The back gage necessarily has a reciprocating movement toward and from the channel gage, to alternately hold and release the work, the back gage being moved toward the channel gage to hold the work when the needle is projected, and retracted to release the work and permit it to be fed and then projected when the needle is retracted. It is also desirable to so organize the machine that the back gage can be displaced or thrown back from the position it occupies when the work is being fed, in order that more room may be provided between the channel gage and back gage for the insertion and removal of the work. Heretofore, in machines of this class, the means for displacing the back gage have been of such nature that a special act on the part of the operator has been required to displace the back gage to permit the convenient insertion and removal of the work, a considerable amount of time being required for this purpose.

The object of my invention is to enable the back gage to be automatically displaced by the operation of the devices which stop the operation of the machine, and automatically returned to its working position by the operation of the devices which start the machine, so that no special act on the part of the operator will be required in displacing and returning the back gage.

To these ends, the invention consists in the improvements which I will now proceed to described.

Of the accompanying drawings, forming part of this specification: Figure 1 represents a side elevation of a portion of a machine shown and described in Letters Patent of the United States, granted to me June 2, 1891, and numbered 453,568, to which machine my improvements are preferably attached. Fig. 1ª represents a view of a part of the mechanism detached. Fig. 2 represents a similar elevation of the same, showing the mechanism comprising my improvements in a different position from that shown in Fig. 1, and to be described in connection therewith. Fig. 3 represents a perspective view of the mechanism for operating the back-gage detached from the machine. Fig. 4 represents a section on line 1—1, Fig. 1. Fig. 5 is a section on line 2—2, Fig. 2. Fig. 6 is a section on line 2′—2′, Fig. 2. Fig. 7 represents a det sectional view of the friction clutch mechanism hereinafter described.

The same letters and numerals of reference indicate the same parts in all the figures.

In the drawings: *a* indicates the supporting frame or head of the machine, which is mounted upon a column or support *b*, preferably of a height to enable the operator to maintain a standing position when presenting the work to the machine.

The machine is provided with a driving-shaft *c*, suitably journaled in bearings in the frame or head. Upon the outer end of said shaft is secured a sleeve or bushing a^3, upon which is mounted the driving-pulley *d*, adapted to rotate loosely.

Means are provided for starting and stopping the machine, by connecting the driving-pulley *d* with and disconnecting it from the driving-shaft *c*. Said means, as here shown, comprise a clutch-pulley 2, mounted upon the driving-shaft *c*, and engaged therewith by a

spline or key 22 (Fig. 7), which permits the pulley 2 to move endwise upon the shaft, and causes it to rotate therewith. The pulley 2 has two clutch surfaces or members, 4 and 5, the former of which is adapted to engage a corresponding clutch surface or member *e*, which is affixed to the supporting-frame of the machine, the other clutch member 5 being adapted to engage a clutch surface or member within the driving-pulley *d*, the arrangement being such that a slight sliding movement of the pulley 2 upon the shaft *c* will remove it from engagement with the fixed member *e* and into engagement with the pulley *d*, and vice versa. The pulley 2 is normally forced into engagement with the pulley *d* by means of a spring 10 (Fig. 7), bearing at one end upon a fixed support, and at the other end upon an extension of the hub of the pulley 2, so that, when said spring is permitted to act, the pulley 2 is engaged with the driving-pulley *d*, and the driving-shaft *c* is operated.

Means are provided for withdrawing the pulley 2 from engagement with the driving-pulley and into engagement with the fixed member *e*, when it is desired to stop the machine, the engagement of the pulley 2 with the fixed member *e* causing an instantaneous stoppage of the driving-shaft, as will be readily seen. Said means, as here shown, comprise a lever *g*, which is pivoted at g^5 to a fixed arm 8, and is provided with a stud or pin g^6 (shown in dotted lines in Fig. 7), engaged with a peripheral groove g^8 in the hub of the clutch-pulley 2. When the lever *g* is moved in the direction indicated by the arrow in Fig. 7, it separates the clutch-pulley from the driving-pulley, and engages the clutch-pulley with the fixed member *e*, thereby stopping the machine.

g' represents a latch lever, which is pivoted at g^9 to one end of a lever g^{10}, which in turn is pivoted at g^{12} to a fixed support, and is provided at its upper end with a trundle-roll g^{13}, engaged with a cam *h*, affixed to the driving-shaft. The rotation of the cam *h* causes an oscillating movement of the lever g^{10}, and an endwise reciprocating movement of the latch lever *g'*. When the latch lever *g'* is in its normal position, a lug g^{14}, on one of its ends, engages a lug or ear g^{15} on the lever *g*; and, when the latch lever is moving in the direction indicated by the arrow 20 in Fig. 1, the lug g^{14}, bearing on the lug g^{15}, moves the lever *g* in the same direction, and in the direction indicated by the arrow in Fig. 7, thus causing the disengagement of the clutch-pulley from the driving-pulley, and its engagement with the fixed clutch member, and stopping the rotation of the driving-shaft.

When it is desired to start the machine, the latch lever *g'* is raised from its normal position, as shown in Fig. 2, thus moving the lug g^{14} from engagement with the lug g^{15}, and permitting the spring 10 to engage the clutch-pulley with the driving-pulley. The displacement of the latch lever *g'* is effected by means of a bell-crank lever *e'*, which is pivoted at *f'* to the supporting-frame, and has on one of its arms a curved shoe *h'*, arranged to bear upon a roll or projection *i'* on the latch lever *g'* when the bell-crank lever *e'* is moved to the position shown in Fig. 2, thus raising the latch lever. The other arm of the bell-crank lever *e'* is connected, by means of a rod g^2, with a treadle (not shown), by which the operator can move the bell-crank lever from the position shown in Fig. 1 to that shown in Fig. 2, the treadle being suitably weighted or provided with a spring, so that it normally acts through the connecting-rod to hold the bell-crank lever in the position shown in Fig. 1. Hence, upon release of the treadle by the operator, the bell-crank lever *e'* releases the latch lever, and the latter falls to its normal position, causing the stoppage of the machine, as above described, while upon the movement of the treadle by the operator, the latch lever *g'* is raised, as shown in Fig. 2, and the operation of the machine is started.

t represents the back gage, which is suitably affixed to a slide *i*, adapted to move in a dove-tail way or guide *k* on the supporting-frame, said slide having dove-tail ears or ribs *j*, engaged with the dove-tail sides of the guide, as shown in Figs. 1 and 6. To the slide *i* are affixed ears or lugs *w x*, which are perforated to receive and permit the endwise movement of a rod *v*, which passes through both of said ears, and is provided at one end with a head *a'*, between which and the ear *x* is interposed a helical spring *y*.

u represents a block, located between the ears *w x*, and affixed to the rod *v* by means of a pin w^5 (Figs. 4 and 5). Said block has a limited sliding movement between the ears *w x*, and is reciprocated when the machine is in operation, by means of a lever *o*, pivoted at *p* to the supporting-frame, and engaged at one end with the block *u*, by means of a connecting-rod t^5, and at its other end with a cam *r* on the driving-shaft, by means of a trundle-roll *q*, said cam being formed to impart an oscillating movement to the lever *o*, and through said lever and the rod t^5, a reciprocating movement to the block *u*. The office of the spring *y* and headed rod *v* is to keep the block *u* normally in engagement with the ear *x* of the slide *i*, and thus not only cause the ear *x* and slide *i* to reciprocate with the block *u*, but also hold the slide and the back gage *t* in such position that the back gage will bear upon the boot or shoe upper, and co-operate with the channel gage *m* in holding the work in place while the needle *n* is entering and leaving the material, the movements of the slide and back gage, caused by the reciprocation of the block *u*, being such as to retract the back gage sufficiently to permit the feeding of the work when the needle is out of the material.

The yielding connection between the ear *x* and the block *u*, afforded by the spring *y* and

rod v, and the independent motion which is permitted by the excess in width of the space between the ears $w\,x$ over the length of the block u, enables me to move back the slide i and back gage t farther than the backward limit of the ordinary reciprocating movement of the slide and back gage, thus displacing the back gage, to such an extent as to permit the unobstructed removal and application of the work, as shown in Fig. 1. I accomplish this displacement of the back gage automatically by connecting the slide i with the bell-crank lever e', by means of a connecting-rod c', pivotally connected at one end to one arm of said bell-crank lever, and fitted at its other end to slide in an ear or lug b', which is affixed to the slide i, as best shown in Fig. 6. The rod c' is provided at one side of the ear b' with a nut or stop d', which, while permitting the rod c' to move independently of the ear b' and slide i in the direction indicated by the arrow in Fig. 2, causes the said connecting-rod to retract the ear b', slide i and back gage t, when said rod is moved in the opposite direction.

It will be seen from the foregoing that, when the operator moves the treadle to displace the latch lever g' and cause the operation of the machine, the connecting-rod c' is moved so as to separate its nut or stop d' from the ear b', and thus permit the pressure of the spring y to force the slide i and back gage t forward and keep the ear x of the slide i yieldingly engaged with the block u, so that the back gage will continue to operate in the manner described so long as the operation of the machine continues, the nut or stop d' on the connecting-rod c being thrown so far forward as to be out of contact with the ear b'. When the treadle is released and the bell-crank lever e' assumes its normal position, releasing the latch lever and causing the stoppage of the machine, said movement of the bell-crank lever e' moves the connecting-rod c' in the direction indicated by the arrow 21 in Fig. 1, thus retracting the slide i and back gage t at the same moment that the operation of the machine is stopped. The back gage is therefore made operative and inoperative automatically, or by the operation of the devices that make the machine operative and inoperative. Hence the operator is relieved of the necessity of performing a special act to displace and replace the back gage, much time being thus saved, as will be readily seen.

I do not limit myself to the details of mechanism here shown for displacing and replacing the back gage by the operation of the mechanism which stops and starts the machine. Neither do I limit myself to the starting and stopping mechanism here shown. I believe it to be new to connect the back gage with the starting and stopping mechanism under such an arrangement that the back gage will be displaced when the machine is stopped, and restored to its operative position when the machine is started. Hence I do not limit myself as to the particular mechanism shown for accomplishing said results.

It will be seen that the yielding connection between the back gage carrying slide i and the block u, permitting the displacement of the back gage from its operative relation to the stitch-forming mechanism by an act of the operator, and automatically returning the back gage to its operative position, may be used in connection with any suitable means through which the operator may act to displace the back gage.

I claim—

1. In a boot and shoe sewing machine, the combination of a starting and stopping mechanism, a reciprocating back gage, and connections between the said mechanism and back gage whereby the back gage is automatically displaced when the machine is stopped, as set forth.

2. In a boot and shoe sewing machine, the combination of a starting and stopping mechanism, a back gage, operating mechanism for reciprocating the back gage, connections between the starting and stopping mechanism and the back gage, whereby the back gage is automatically displaced when the machine is stopped, and a yielding connection between said back gage operating mechanism and the back gage, whereby the back gage is automatically restored to its operative position when the machine is started, as set forth.

3. In a boot and shoe sewing machine, the combination with stitch-forming mechanism of a back gage, a slide supporting the same, a block movable between ears or stops on the slide, means for reciprocating said block, a headed rod affixed to the block and fitted to move in guides on the slide, a spring having a bearing at one end on the rod and at the other end on the slide, whereby the slide is normally and yieldingly held in operative relation to the stitch-forming mechanism, and means for moving said slide against the pressure of the spring to displace the back gage, as set forth.

4. In a boot and shoe sewing machine, the combination with a stitch-forming mechanism of a back gage, a slide supporting the same, a block movable between ears or stops on the slide, means for reciprocating said block, a headed rod affixed to the block and fitted to move in guides on the slide, a spring having a bearing at one end on the rod and at the other end on the slide, whereby the slide is normally and yieldingly held in operative relation to the stitch-forming mechanism, a rod fitted to move in an ear on the slide and having a head or enlargement adapted to impart movement to the slide when the rod is moved in one direction, and means, substantially as described, for moving said rod to alternately displace the back gage and permit its restoration to its operative position, as set forth.

5. In a boot and shoe sewing machine, the combination of stitch-forming mechanism, a

driving-shaft to give motion to the parts of said mechanism, a loose driving pulley on said shaft, a clutch pulley engaged with said shaft and yieldingly held in engagement with the driving pulley, a fixed clutch member arranged to engage the clutch pulley when the latter is disengaged from the driving pulley, a latch lever and connections between it and the driving-shaft whereby said latch lever is reciprocated when the machine is in operation, a clutch lever engaged with the clutch pulley and arranged to be engaged by the latch lever, a bell-crank lever, one arm of which is arranged to act on the latch lever, means for controlling the position of said bell-crank lever, a back gage and mechanism for reciprocating it, and a rod connecting the bell-crank lever with the carrier of the back gage, all arranged and operating substantially as set forth.

In testimony whereof I have signed my name to this specification, in presence of two subscribing witnesses, this 23d day of May, A. D. 1892.

GEORGE A. STILES.

Witnesses:
C. F. BROWN,
A. D. HARRISON.