

(No Model.)

3 Sheets—Sheet 1.

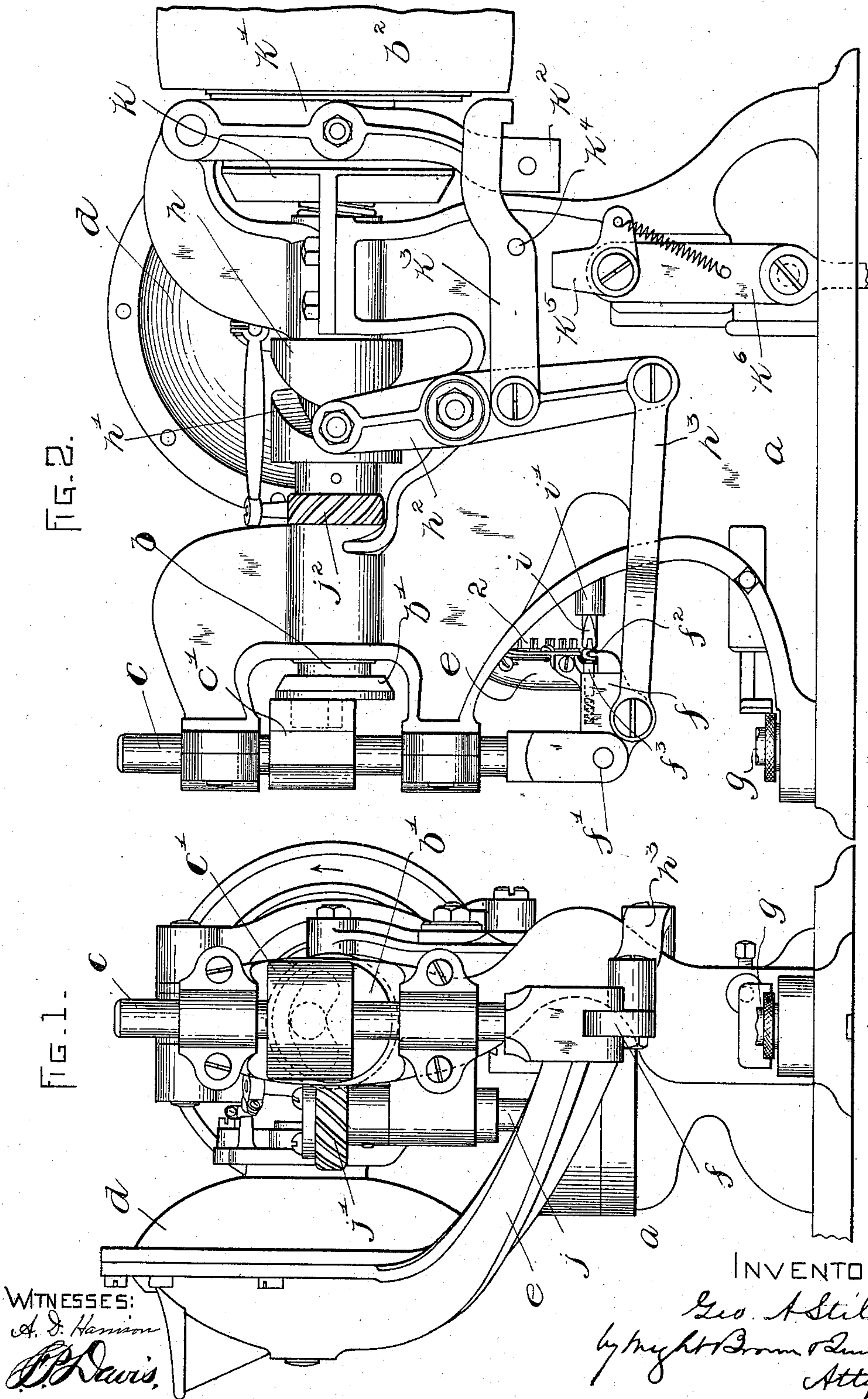
G. A. STILES.
LACING STUD SETTING MACHINE.

No. 565,810.

Patented Aug. 11, 1896.

FIG. 2.

FIG. 1.



WITNESSES:
A. D. Harrison
P. Davis.

INVENTOR:
Geo. A. Stiles
by Wright Brown & Quincy
Attys.

(No Model.)

3 Sheets—Sheet 2.

G. A. STILES.
LACING STUD SETTING MACHINE.

No. 565,810.

Patented Aug. 11, 1896.

FIG. 4.

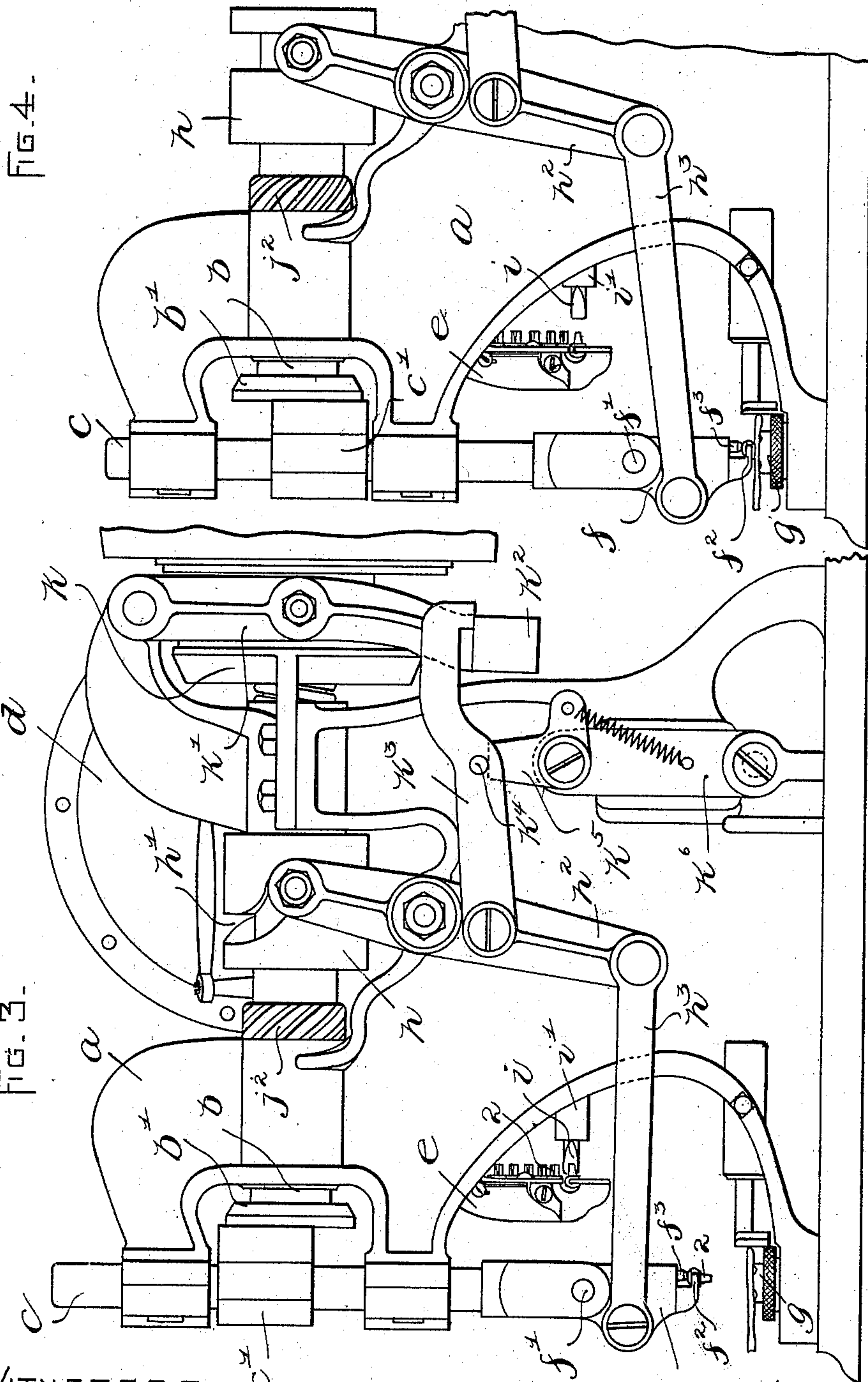
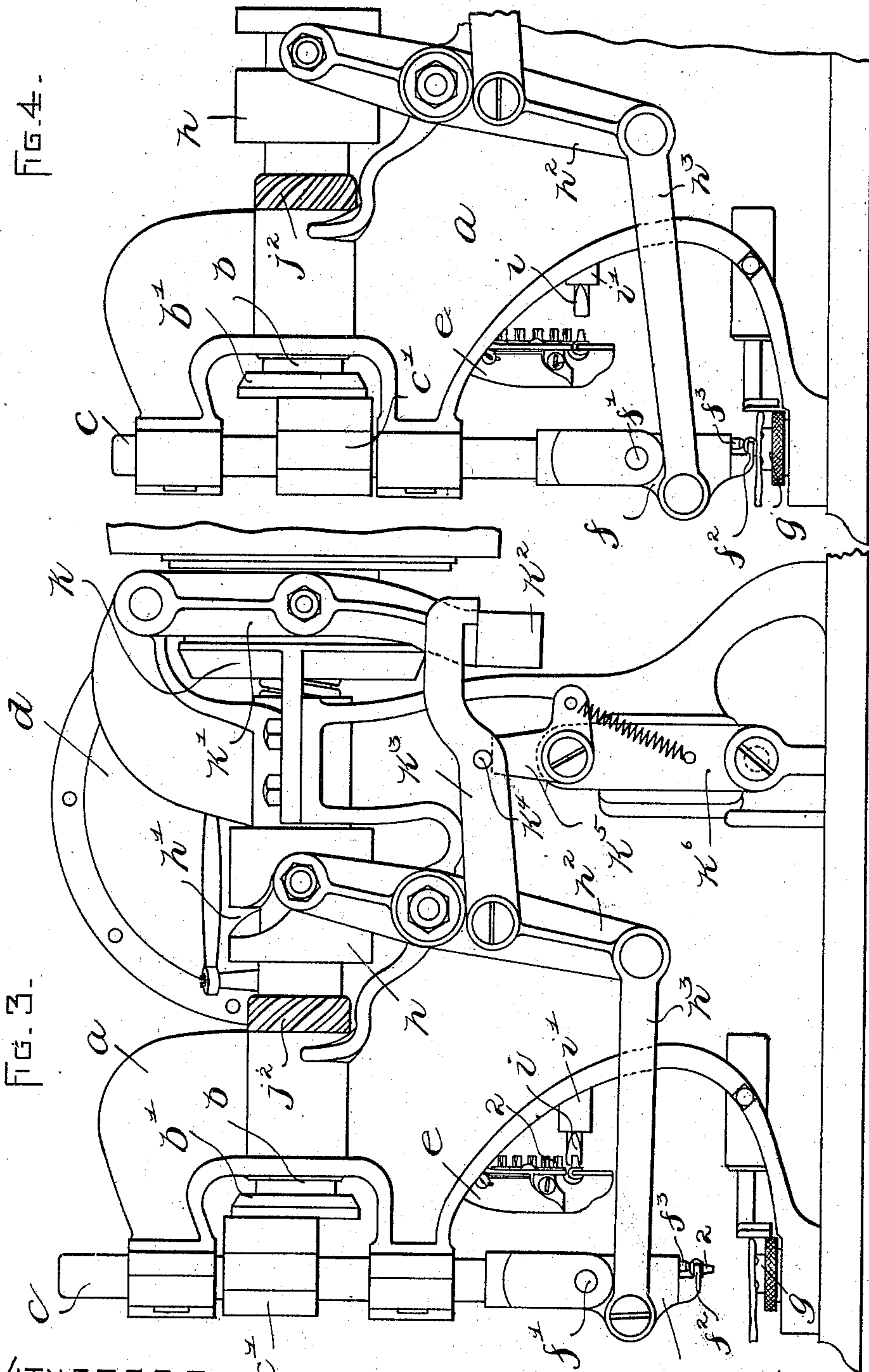


FIG. 3.



WITNESSES:
A. D. Harrison.
J. P. Davis.

INVENTOR:
G. A. Stiles
J. M. Brown & Son
Atty.

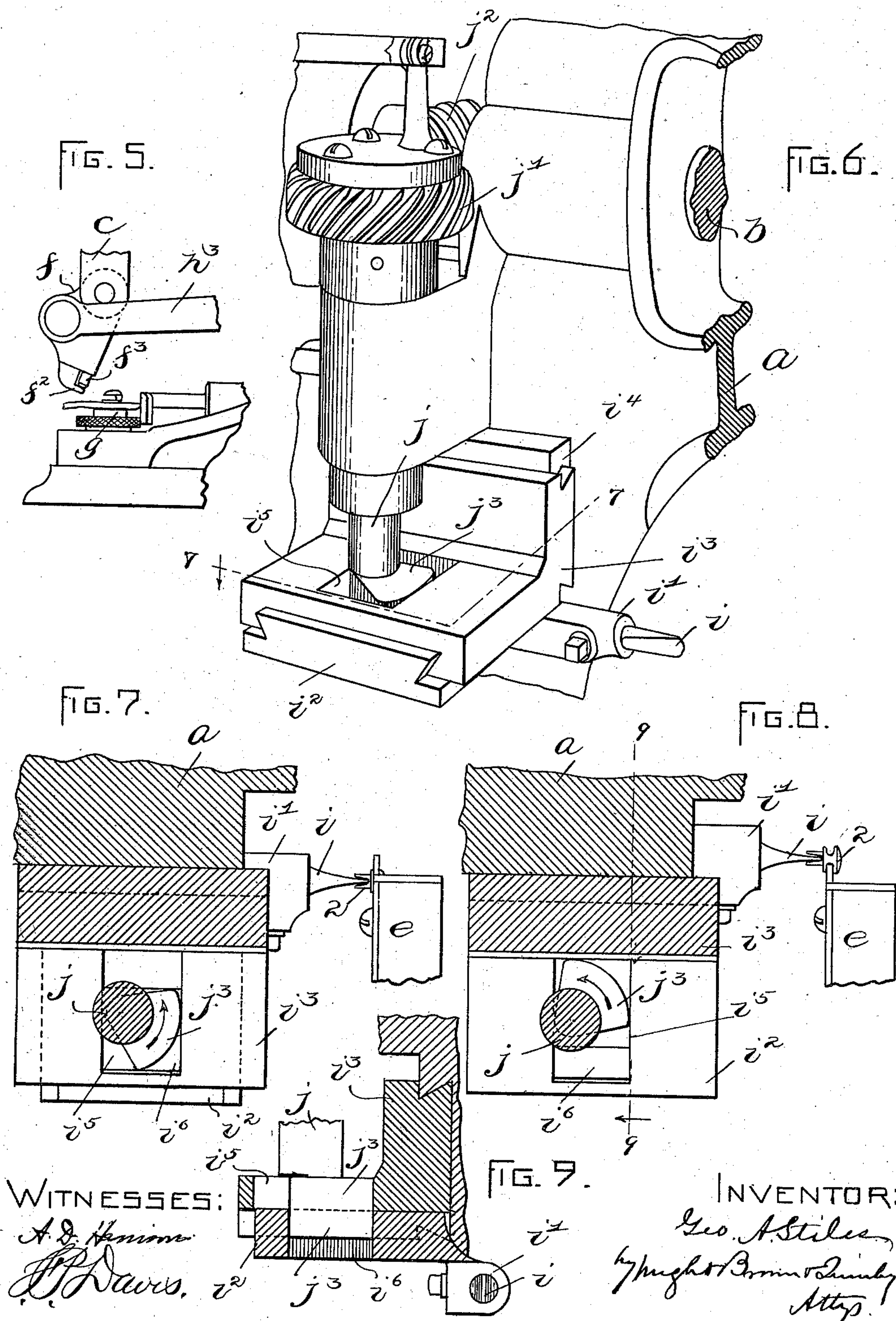
(No Model.)

3 Sheets—Sheet 3.

G. A. STILES.
LACING STUD SETTING MACHINE.

No. 565,810.

Patented Aug. 11, 1896.



WITNESSES:

A. D. Hanson
J. P. Davis.

INVENTOR:

Geo. A. Stiles
by Hugh B. Brown & Company
Attys.

UNITED STATES PATENT OFFICE.

GEORGE A. STILES, OF BROOKLINE, MASSACHUSETTS, ASSIGNOR TO THE
JUDSON L. THOMSON MANUFACTURING COMPANY, OF WALTHAM,
MASSACHUSETTS.

LACING-STUD-SETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 565,810, dated August 11, 1896.

Application filed July 21, 1894. Renewed November 4, 1895. Serial No. 567,955. (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 Lacing-Stud-Setting Machines, of which the following is a specification.

This invention relates to machines for setting lacing-studs in fabric, and is particularly directed toward providing improved means, carried by the plunger, for receiving the studs from the raceway and holding them while they are set in the fabric; improved means for transferring the studs from the raceway to this receiving and holding device, and, incidentally, a start-and-stop mechanism in combination with the means for actuating the said stud receiver and holder.

To the above ends the invention may be said to consist in the novel features of construction and combinations of parts recited in the appended claims and described in detail hereinafter.

The accompanying drawings, which form part of this specification, illustrate an embodiment of the invention.

Figure 1 represents a front elevation of the machine. Fig. 2 represents a side elevation of the machine. In both these views the stud receiver and holder is shown in position to receive a stud from the raceway. Fig. 3 represents a side elevation with the stud receiver and holder in position over the anvil and ready to descend with the stud. Fig. 4 represents a side elevation of part of the machine, showing the plunger as having descended. Fig. 5 illustrates the movement of the stud-holder which disengages it from the stud after the same has been set in the fabric. Fig. 6 represents a perspective view of the stud-transferring devices. Fig. 7 represents a section on line 7 7 of Fig. 6. Fig. 8 represents a similar view with the parts under a different adjustment. Fig. 9 represents a section taken substantially on line 9 9 of Fig. 8.

In the drawings the letter *a* designates the supporting-frame of the machine; *b*, the main driving-shaft; *c*, the vertically-reciprocating plunger carrying a head *c'*, grooved to

receive a crank-pin on a disk *b'*, affixed to or formed on the driving-shaft, the form of said groove being such as to permit a dwell in the plunger's operation at different points to allow for the stud-receiver's movements hereinafter described. (See dotted-line representation in Fig. 1).

The letter *d* designates the hopper, which contains the supply of studs 2, and *e* the raceway or chute, which extends from said hopper to a point back of the plunger, the said chute being slotted in the rear side, so that the bifurcated shank of the studs may protrude therethrough, as shown, and also being provided with a flange for the neck-openings of the studs to embrace. The studs arrive at the lower open end of the raceway with the bifurcation of their shanks disposed vertically, as shown. A stud receiver and holder *f* is pivoted to the lower end of the plunger *c*, as shown at *f'*, and is designed to swing on its pivot between the raceway and the anvil *g*. Said receiver is formed or provided with a flange *f²* at its outer end, designed to register with the flange of the raceway and occupy the neck-opening of the stud, which it receives from said raceway. A pin *f³* is fitted to a bore in the receiver opposite the flange *f²* and is impelled toward said flange by a spring. (Indicated in dotted lines in Fig. 2.) This pin bears against the head of the stud on the flange *f²*, and its end is slightly beveled or rounded, so as to permit of the stud displacing it when transferred from the raceway.

The receiver *f* is moved on its pivot through the following means: A block *h* is affixed on the driving-shaft *b* and is formed with a cam-groove *h'*, which receives a roller on a lever *h²*, pivoted intermediate of its ends to the frame of the machine and having its lower end connected by a rod *h³* with the receiver *f*. The form of the cam-groove *h'* is such as to swing the stud-receiver from its position shown in Fig. 2, where it receives the stud from the raceway, to its position shown in Fig. 3, where it holds the stud over the anvil; also to cause it to remain in this latter position while the plunger descends and sets the stud in the fabric; also to swing the stud-

holder outward, as shown in Fig. 5, in order to disengage it from the stud and to swing the holder back to its receiving position.

The means here shown for transferring the studs from the raceway to the receiver are of the following construction and operation: A transfer-finger i is provided to engage the bifurcation of the stud, said finger being flattened, as shown, to facilitate such engagement, and this finger is caused to traverse a path of movement calculated to engage it with and disengage it from the studs and to move them laterally out of the raceway into the receiver. The finger i is fastened in a holder i' on a transversely-sliding carriage i^2 , fitted to a slideway in the under side of another carriage i^3 , movable forward and back in a slideway i^4 on the machine-frame. Rectangular openings i^5 and i^6 are made in the two carriages, respectively, and extend transversely to each other, partially registering, as shown. A vertical shaft j , connected with the driving-shaft by spiral gears j' and j^2 , carries at its lower end a segmental cam j^3 , occupying the openings i^5 and i^6 and broad enough to engage sides of both. It will be understood that by successive engagements of this cam with sides of the two openings a movement of the finger i in a rectangular path will be produced. By the action of this segmental cam against the front side of the opening i^5 , Fig. 7, the finger is projected into the bifurcation of the stud's shank. Then the cam acts against the inner side of the opening i^6 , Fig. 8, and moves the finger laterally to take the stud out of the raceway and into the receiver. The cam next acts against the rear side of the opening i^5 and retracts the finger, disengaging it from the stud, and, continuing, moves the finger laterally back to its original position by action against the outer side of the opening i^6 .

A friction-clutch k connects the shaft b with a driving-pulley b^2 , and a shipper-lever k' , connected with said clutch, has a block k^2 at its lower end for engagement of a latch k^3 , pivotally connected with the lever h^2 and having an inwardly-projecting pin k^4 for engagement of a pivoted and spring-held trigger k^5 on the upper end of a slide k^6 , which is connected with a treadle. (Not shown.)

When the slide k^6 is lowered, as in Fig. 1, the latch k^3 rests on the block k^2 , and the forward swing of the lower arm of the lever h^2 carries the lug at the end of the latch against the block k^2 , and consequent movement of the shipper-lever k' releases the clutch and throws the machine out of operation. When this takes place, the pin k^4 is over the trigger k^5 , and the operator starts the machine by depressing a treadle, which raises the slide k^6 and causes the square end of the trigger to act against the pin k^4 and raise the latch out of engagement with the shipper-lever, whereupon the clutch is closed by a suitable spring, and the machine starts. The slide k^6 having been lowered again, the machine will be au-

tomatically stopped at the completion of a cycle of its operation. If it is desired to have the machine work continuously, the slide k^6 is held up with the trigger in the path of the pin k^4 , and the latter's action thereagainst will raise the latch as its lug approaches the block k^2 , the spring-held trigger yielding, so that the engagement of the pin with its side edge will raise the latch.

A brief recitation of a cycle of the machine's operation will suffice, when taken in connection with the foregoing description.

With the stud-receiver in the position shown in Fig. 2, the transfer-finger enters into engagement with a stud and then moves laterally, carrying the stud into the receiver. The receiver now swings down to a vertical position over the anvil, as shown in Fig. 3, and dwells in that adjustment while the plunger descends and sets the stud. (See Fig. 4.) After the stud has been set, the holder f swings outwardly, as shown in Fig. 5, to disengage it from the stud, and then swings back to its first position to receive the next stud. In the meantime the transfer-finger has receded and moved laterally, and advances into engagement with the next stud. This completes a cycle of the machine's operation.

It is evident that the invention is not limited to the form of means here shown, which may be variously modified.

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

1. In a machine of the character described, the combination with a raceway for the studs, a plunger, and a stationary anvil in line with the plunger; of a stud-holder pivoted to the plunger and movable on its pivot from a receiving position at an angle to the plunger and in register with the raceway, to a stud-setting position in line with the plunger and anvil, and means for vibrating said stud-holder.

2. In a machine of the character described, the combination of a plunger; a stud-holder pivoted thereto and movable from a work-receiving position at an angle to the plunger to a position in line with the latter and beyond said position of alinement with the plunger; means for vibrating the work-holder; and a stationary anvil in line with the plunger.

3. In a machine for setting lacing-studs, the combination of a raceway, a reciprocating plunger, a stud-holder pivoted to the plunger and having a lip or flange for engagement with the throat-opening in a stud, said holder being movable from a stud-receiving position at an angle to the plunger where its lip or flange is in alinement with a corresponding part of the raceway, to a stud-setting position in line with the plunger; means for vibrating the stud-holder; and a stationary anvil in line with the plunger.

4. In a machine for setting lacing-studs, the combination of a raceway, a reciprocating plunger, a stud-holder pivoted to the plunger and having a lip or flange for engagement

with the throat-opening in a stud, and a yielding presser-piece to bear on the top of the stud, said holder being movable from a stud-receiving position at an angle to the plunger where its lip or flange is in alinement with a corresponding part of the raceway, to a stud-setting position in line with the plunger; means for transferring the studs from the raceway to the holder; means for vibrating the holder; and a stationary anvil in line with the plunger.

5. In a machine for setting lacing-studs, the combination of a raceway, a plunger, an anvil, a stud-holder movable from a position of alinement with the raceway to a position of alinement with the plunger and anvil, a transferring-finger movable to engage it with and disengage it from the bifurcated shanks of the studs and also movable to transfer the studs from the raceway to the holder; means for positively imparting distinct movements to the finger in each way; and means for vibrating the stud-holder.

6. In a machine for setting lacing-studs, a stud receiver and holder pivoted to the plunger and arranged to swing from the raceway to a position over the anvil, a transfer-finger movable in a rectangular path and designed to engage the bifurcated shanks of the studs and take them from the raceway into the pivoted holder, and means for positively moving said finger in such manner, substantially as described.

7. In a machine for setting lacing-studs, a stud receiver and holder pivoted to the plunger and arranged to swing from the raceway to a position over the anvil, a transfer-finger for taking the studs from the raceway to the holder, two transversely-movable slides, one carried by the other and one supporting the

said transfer-finger and a segmental cam for actuating said slides, substantially as and for the purpose described.

8. In a machine of the character described, the combination of a work receiver and holder pivoted to the plunger and movable between the raceway and anvil, a lever pivoted to a stationary support, a rod connecting said lever with the pivoted holder, a cam for actuating said lever, and a start-and-stop mechanism coacting with said lever.

9. In a machine of the character described, the combination of a work receiver and holder pivoted to the plunger and movable between the raceway and anvil, a lever pivoted to a stationary support, a rod connecting said lever with the pivoted holder, a cam for actuating said lever, a clutch, and a latch connected with the said lever and coacting with the clutch.

10. In a machine of the character described, the combination of a work receiver and holder pivoted to the plunger and movable between the raceway and anvil, a lever pivoted to a stationary support, a rod connecting said lever with the pivoted holder, a cam for actuating said lever, a clutch, a shipper-lever, a latch for engaging said shipper-lever and connected with the first-named lever, and means for disengaging the latch from the shipper-lever.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 15th day of March, A. D. 1894.

GEO. A. STILES.

Witnesses:

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