

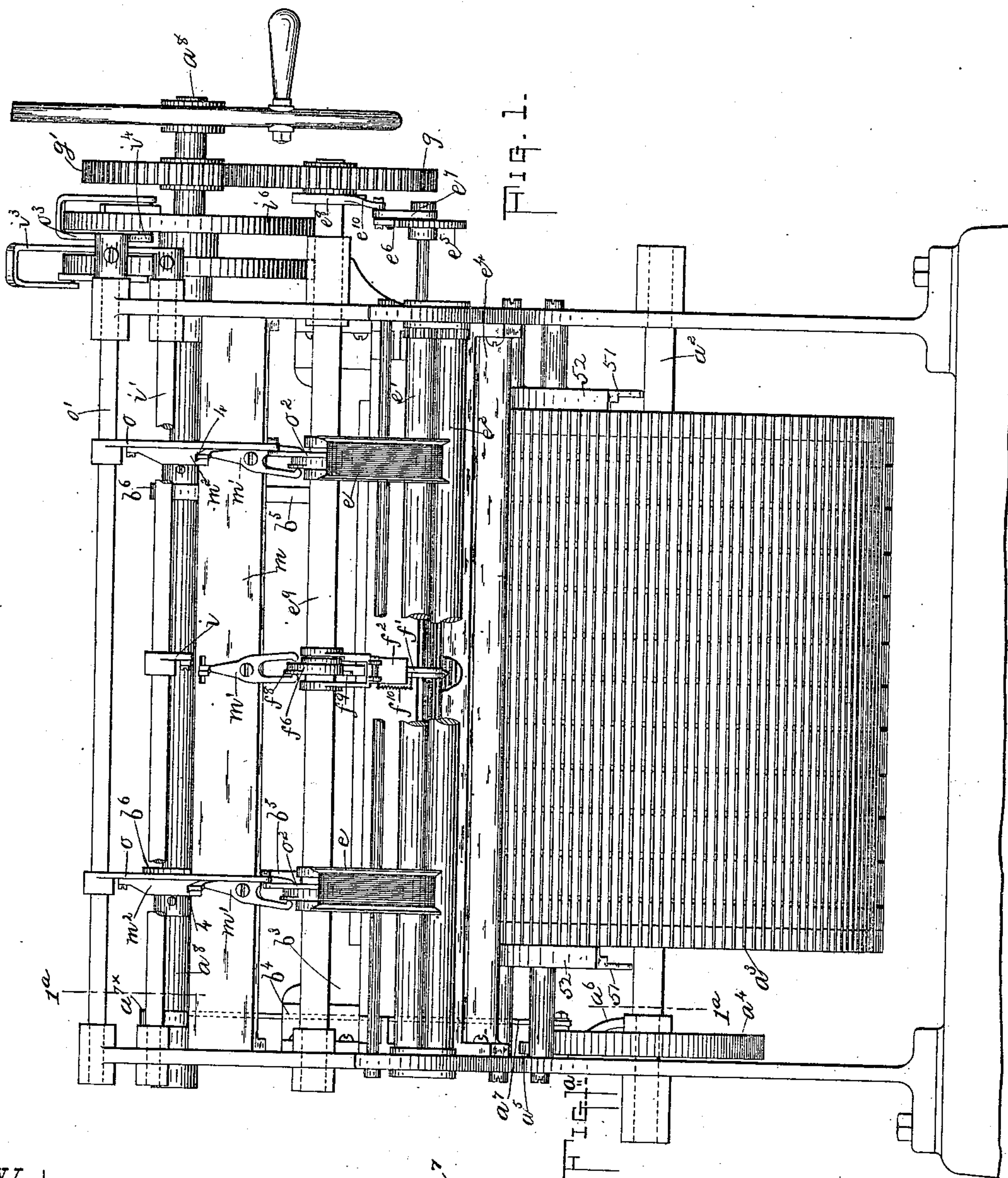
(No Model.)

3 Sheets—Sheet 1.

F. S. PINKHAM.
MACHINE FOR SMOCKING CLOTH.

No. 546,474.

Patented Sept. 17, 1895.



Witnesses

Lucy F. Graves.

Chas. Blocker.

Inventor

Frederick S. Pinkham

by A. J. Hayes,
Atty.

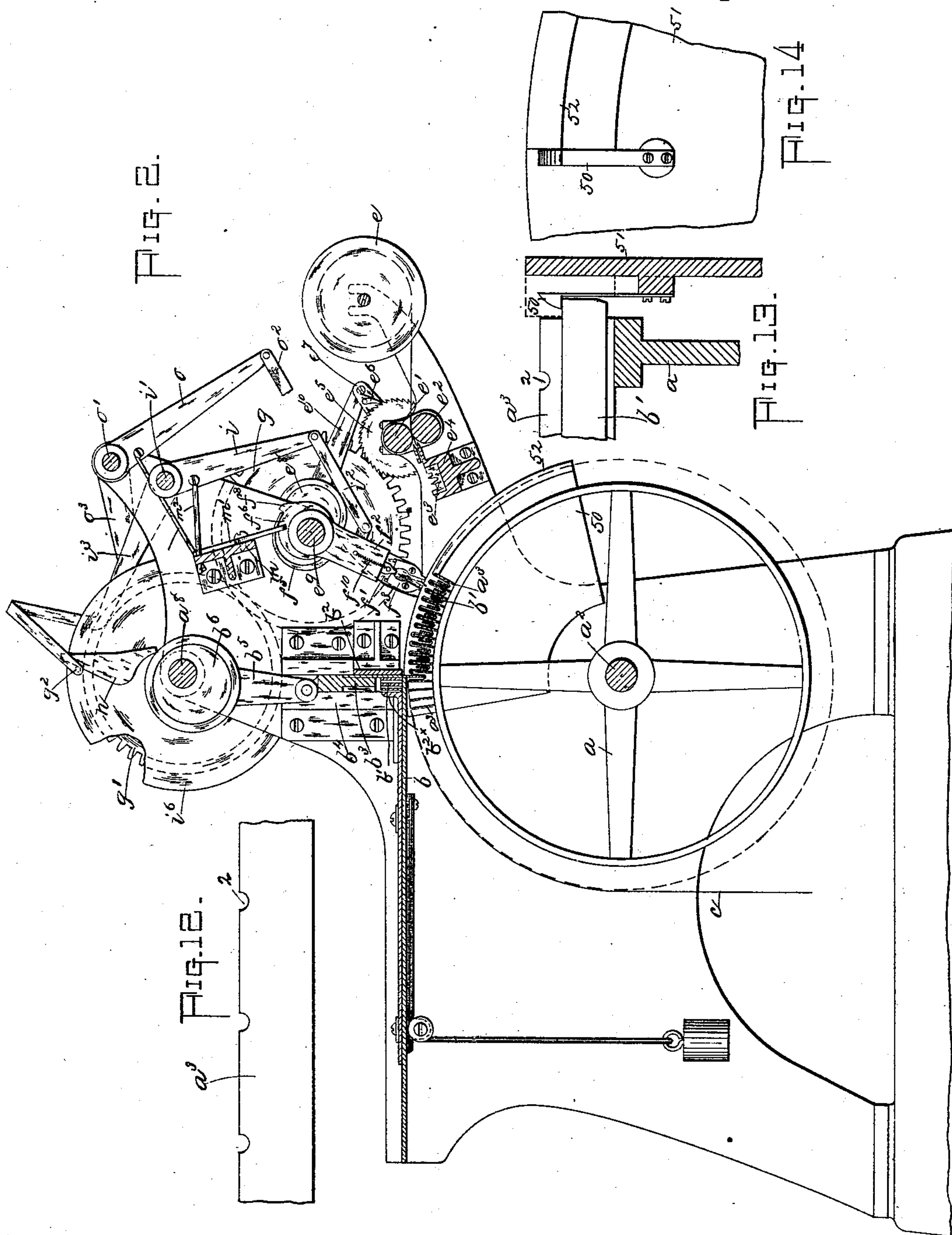
(No Model.)

3 Sheets—Sheet 2.

F. S. PINKHAM.
MACHINE FOR SMOCKING CLOTH.

No. 546,474.

Patented Sept. 17, 1895.



Witnesses
 Lmy 7 Graves.
 Chas. P. Blocker.

Inventor
Frederick S. Pinckham.
By B. J. Hayes,
att'y.

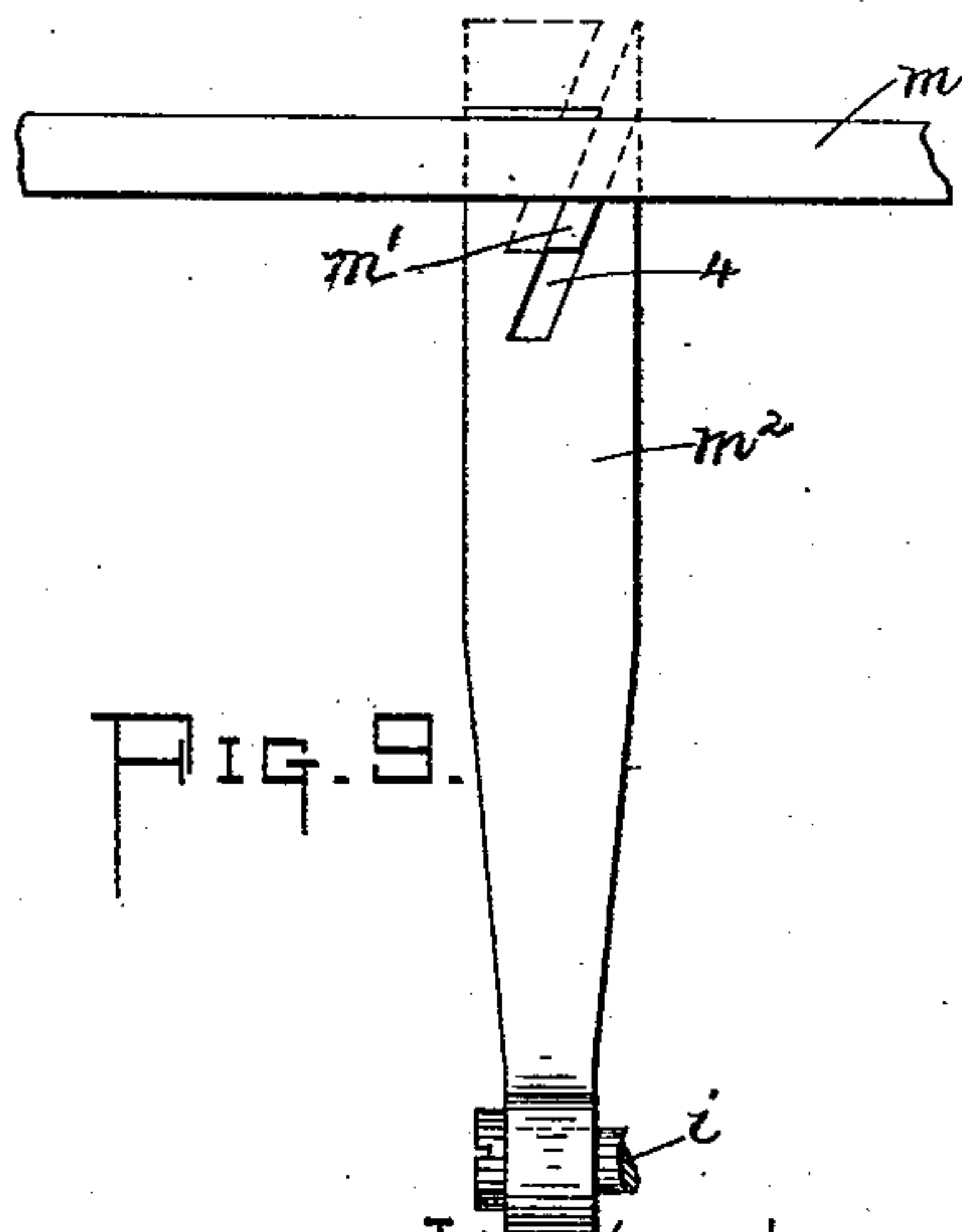
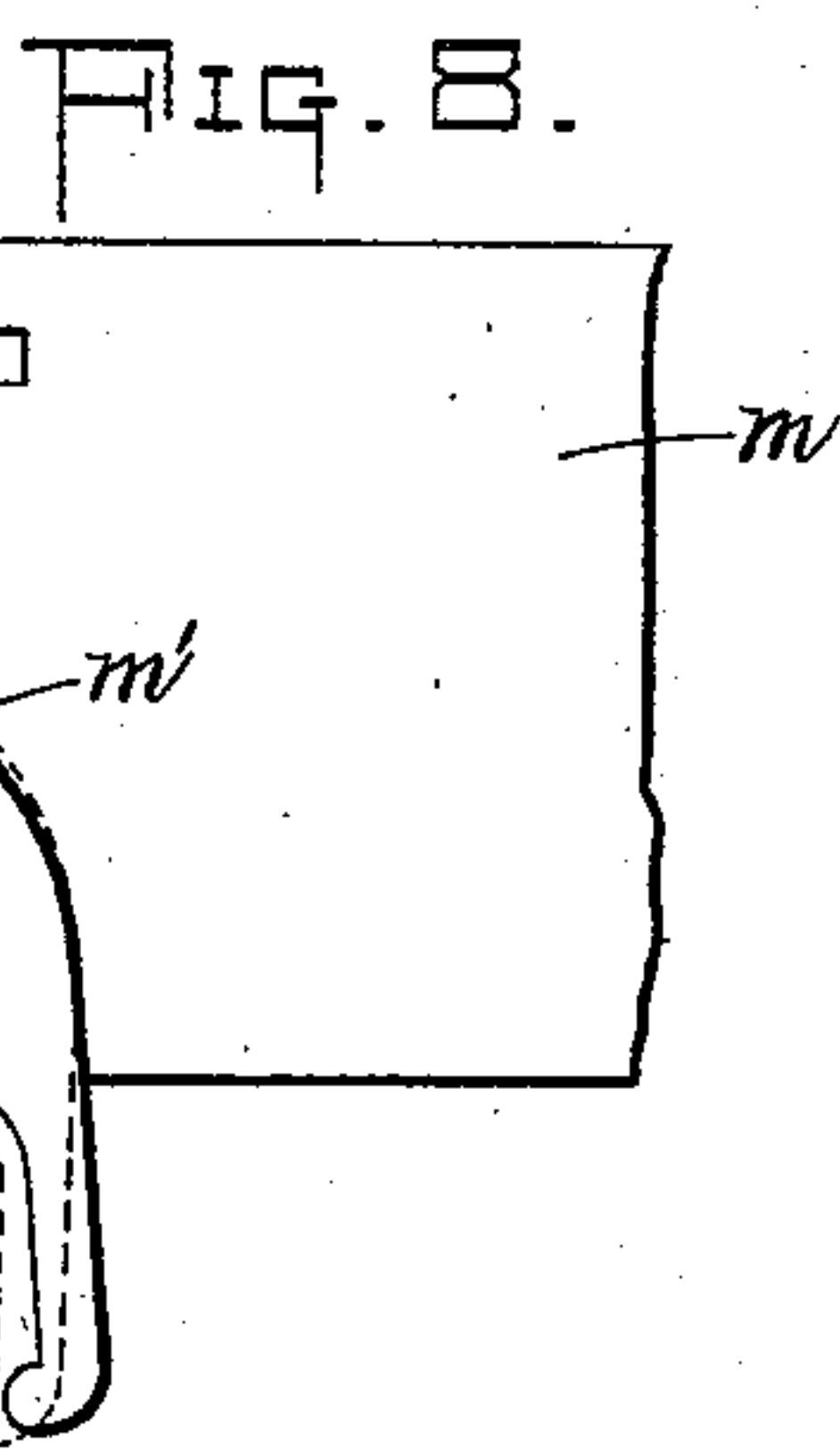
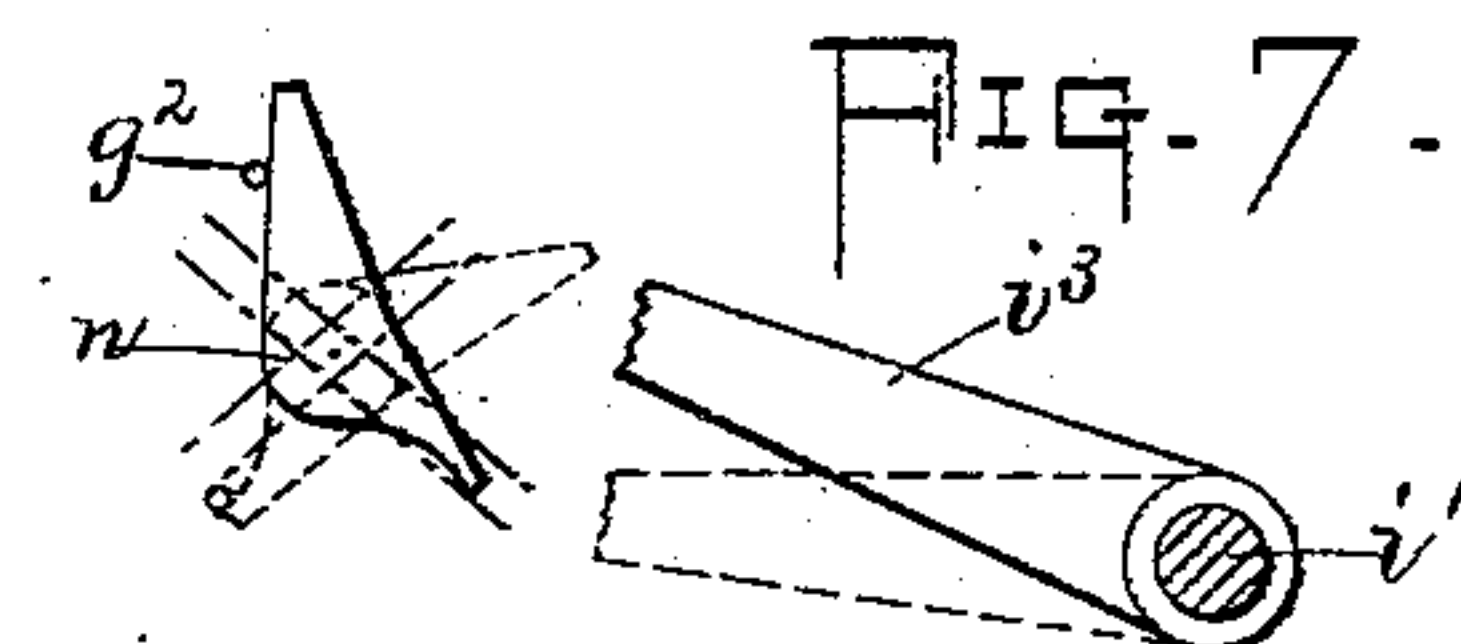
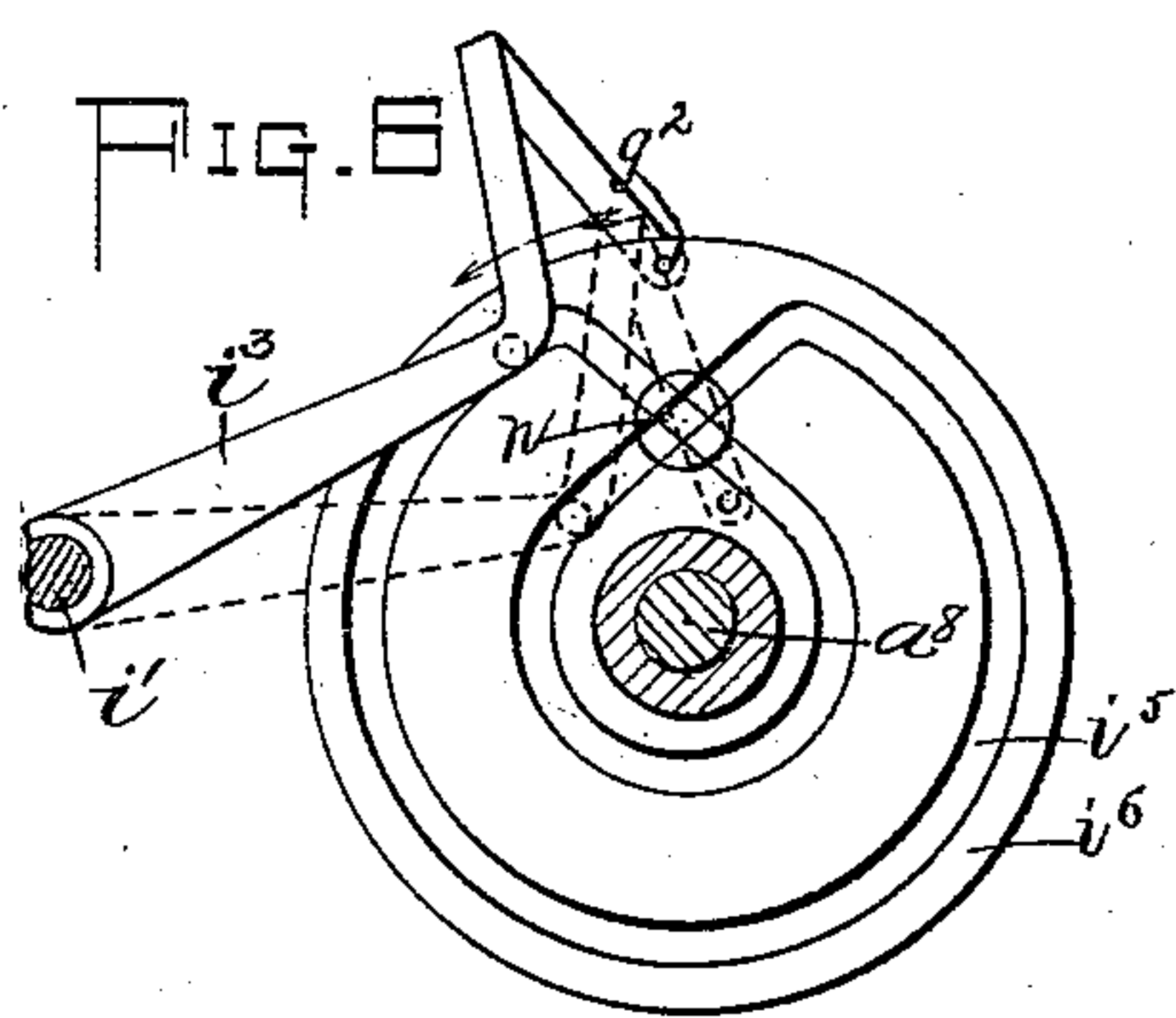
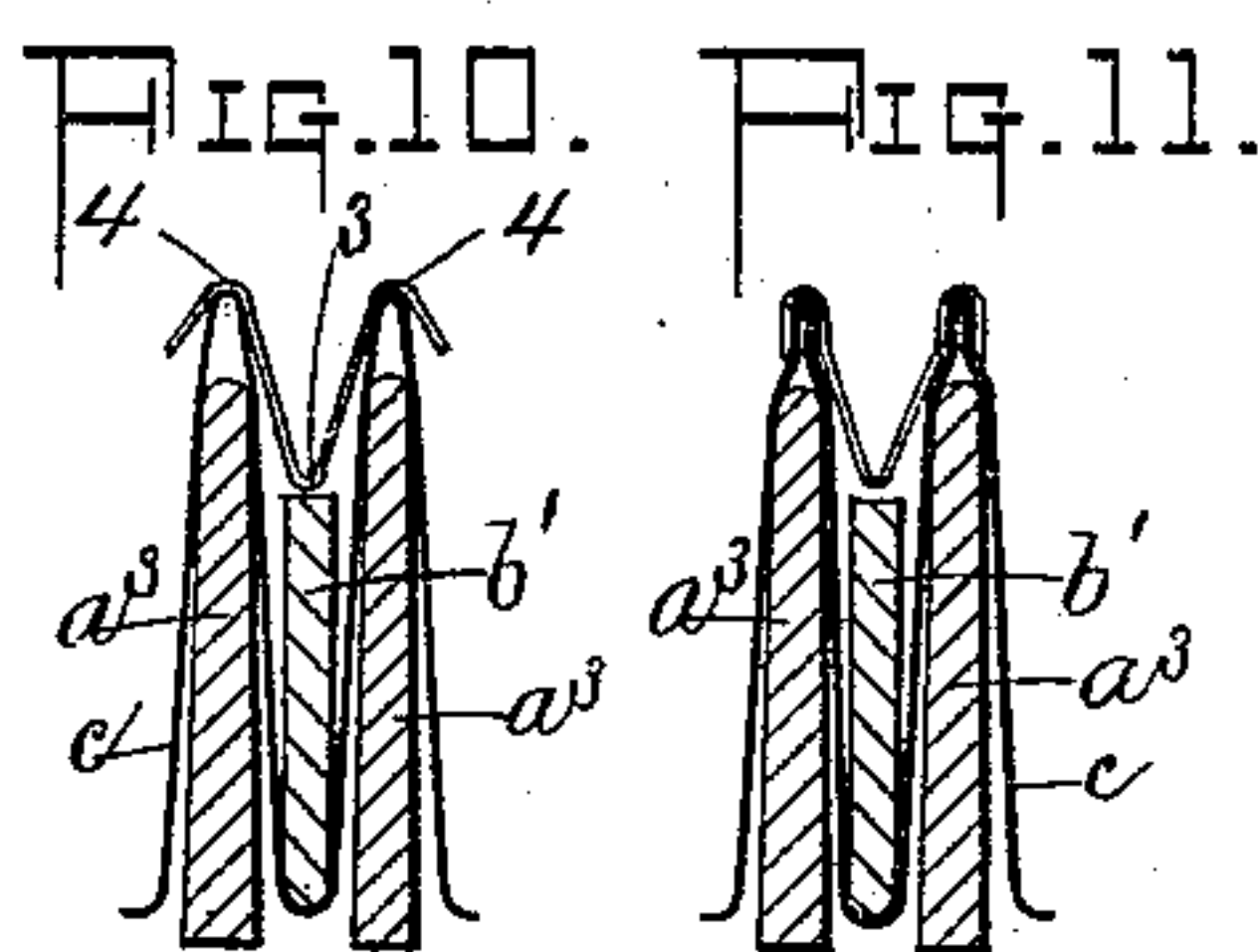
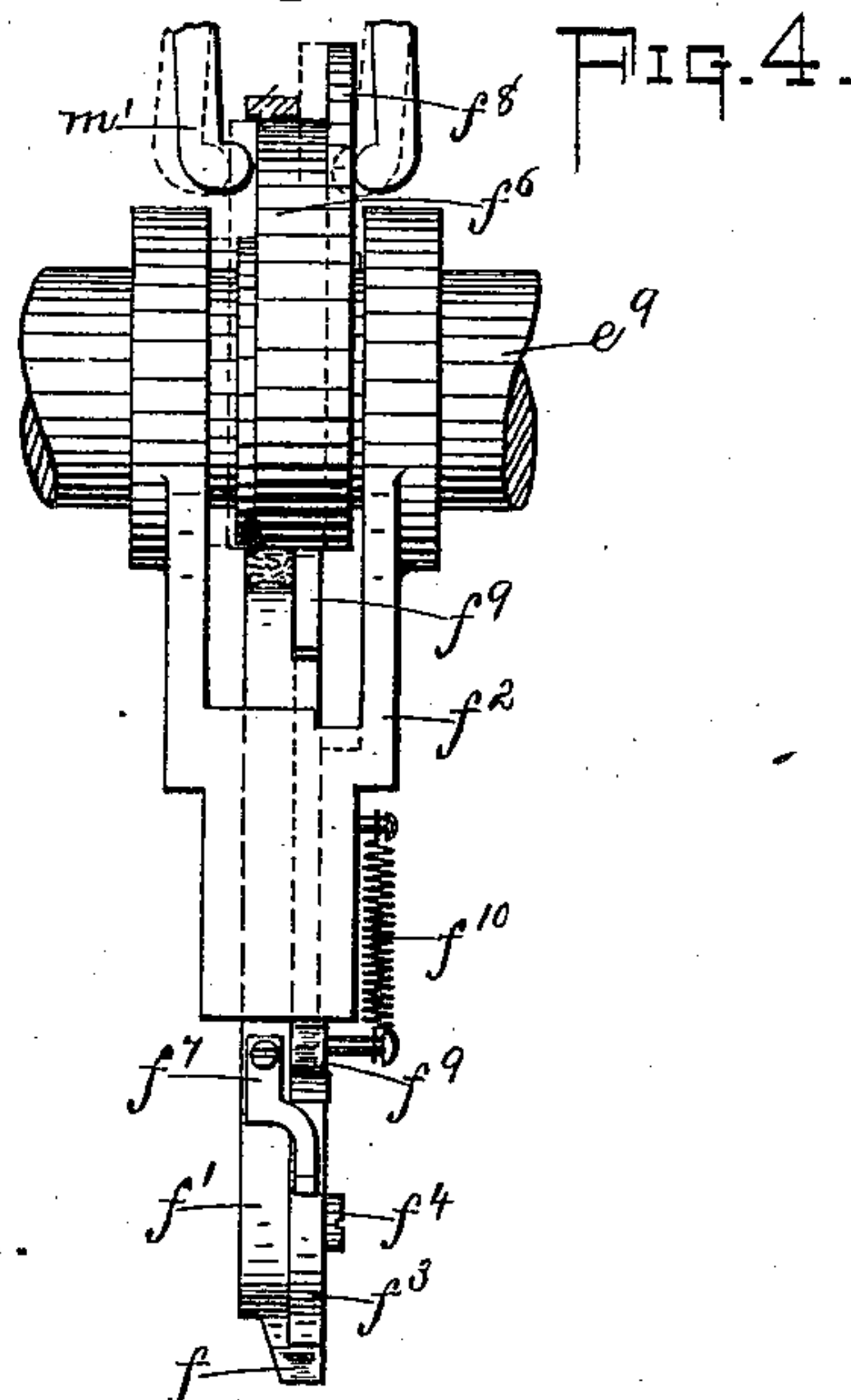
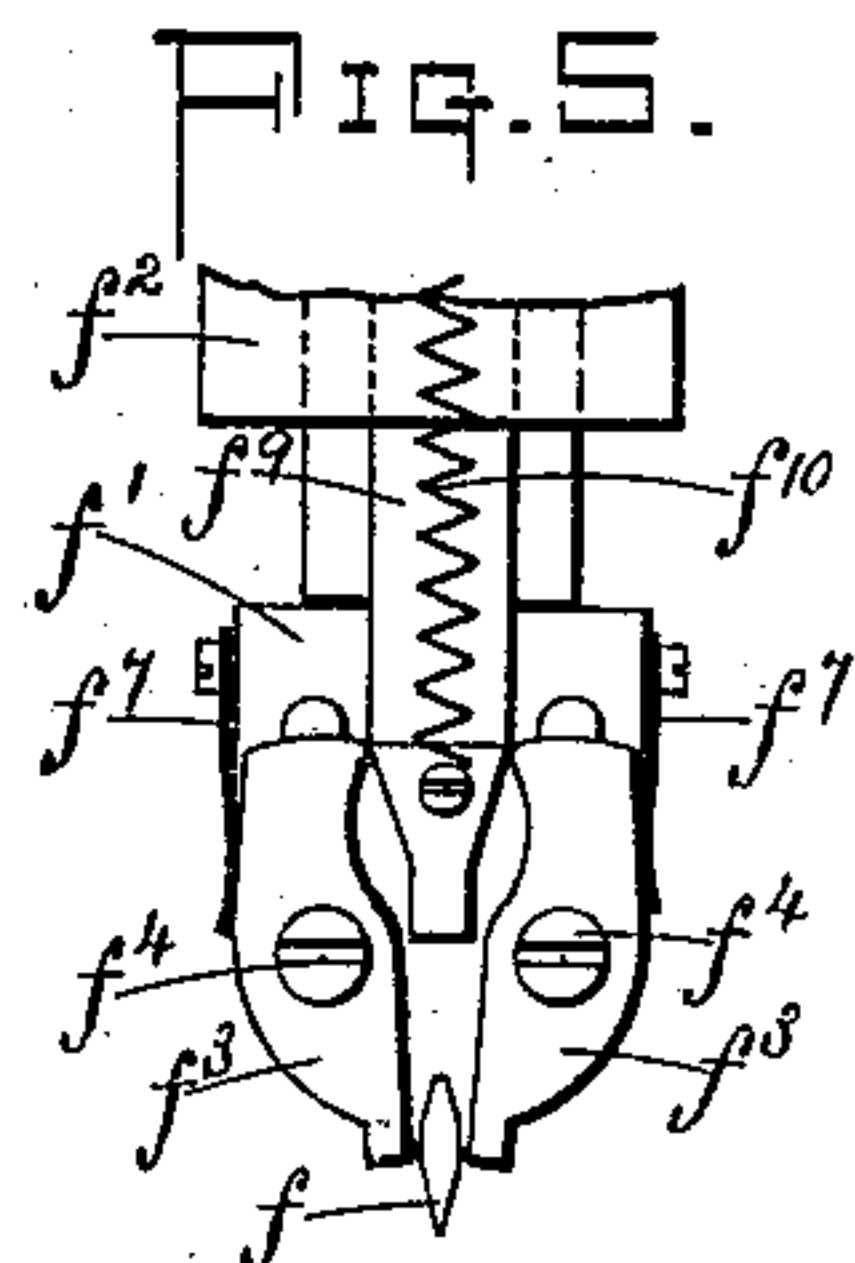
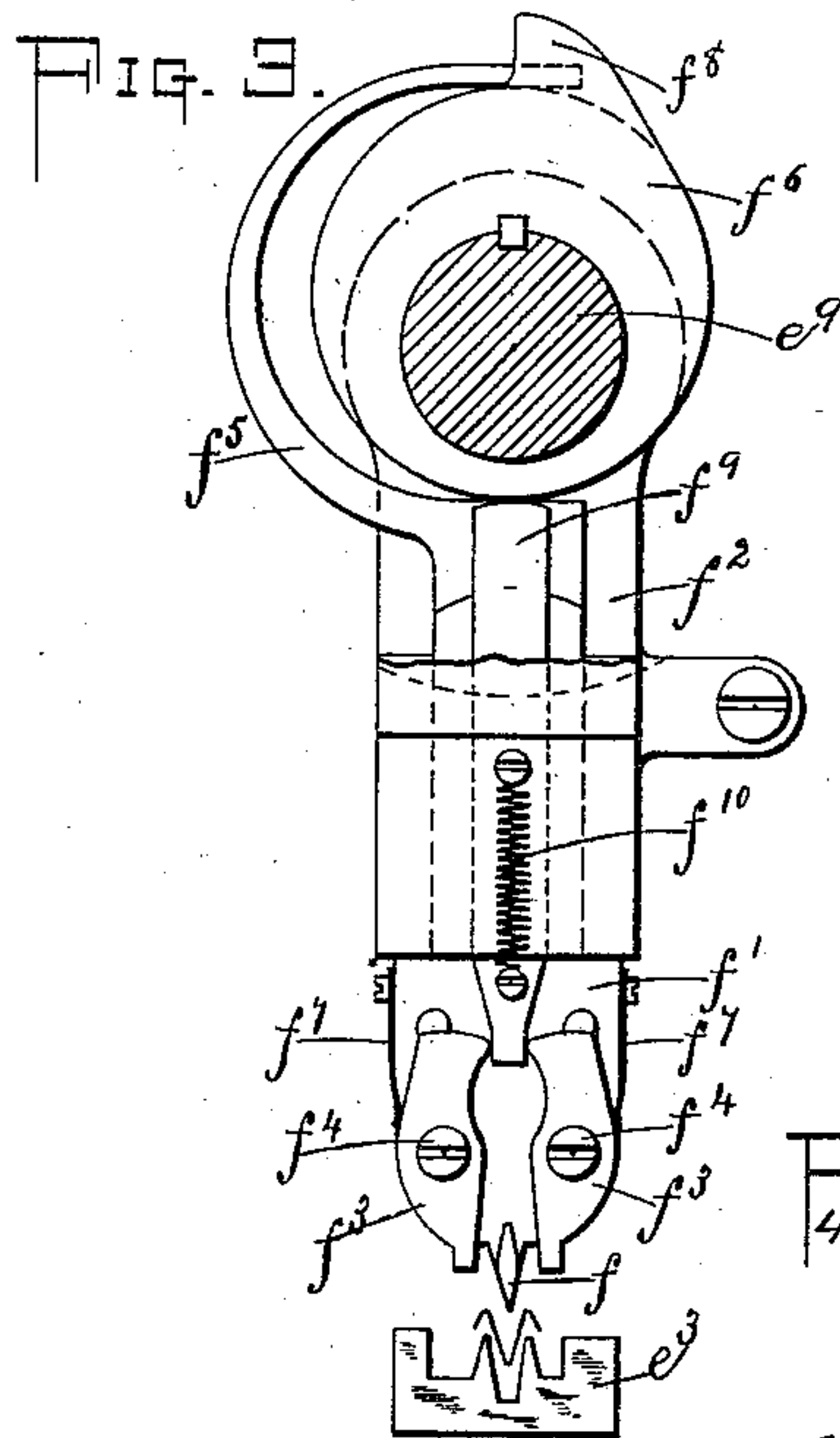
(No Model.)

3 Sheets—Sheet 3.

F. S. PINKHAM.
MACHINE FOR SMOCKING CLOTH.

No. 546,474.

Patented Sept. 17, 1895.



Witnesses

Ernest F. Graves.
Chas. B. Crocker.

Inventor

Fredrick S. Pinkham
by O. J. Hayes,
att'y.

UNITED STATES PATENT OFFICE.

FREDERICK S. PINKHAM, OF EVERETT, ASSIGNOR, BY MESNE ASSIGNMENTS,
TO ANDREW J. ROBINSON, OF BOSTON, MASSACHUSETTS.

MACHINE FOR SMOCKING CLOTH.

SPECIFICATION forming part of Letters Patent No. 546,474, dated September 17, 1895.

Application filed July 26, 1892. Serial No. 441,248. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK S. PINKHAM, of Everett, county of Middlesex, State of Massachusetts, have invented an Improvement in Machines for Smocking Cloth, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

10 This invention has for its object to construct a machine for smocking cloth. The machine is designed to successively fold the cloth upon itself or plait it and to connect two of the adjacent folded edges at one side of the cloth at
15 intervals, then to connect one of said connected folded edges to the folded edge next to it at intervals, the connections being made opposite the spaces between the previous row of connections. As a preferable way of folding or plaiting the cloth it is forced down into
20 slots made in a cylindrical or other movable bed and held therein by slats or otherwise, so as to present the folded edges which are to be connected. The connections are herein shown
25 as made by metallic fastenings, and the form of fastenings which I prefer to employ are made of wire bent at or about the middle to present a central depressed portion adapted to enter between the folded edges to be con-
30 nected, and also bent near each end to form hooks or clamps adapted to engage the said folded edges. These metallic fastenings are herein represented as formed by suitable mechanism provided for the purpose, after
35 which they are properly positioned and set by suitable setting mechanism likewise provided for the purpose, although said fastenings may be previously formed and delivered to the said setting mechanism.

40 Figure 1 shows in front elevation a machine for smocking cloth embodying this invention. Fig. 1^a is a sectional detail taken substantially on line 1^a 1^a of Fig. 1; Fig. 2, a vertical section of the smocking-machine shown in Fig. 1, taken on the dotted line *x x*, looking toward
45 the right; Figs 3 and 4, side and edge views, respectively, of the forming and setting devices for the fastenings; Fig. 5, a detail of a portion of the setting device, showing the clinching jaws or nippers in the position they
50 will occupy when the fastening is clinched;

Fig. 6, a detail of one of the cams employed for moving the parts to place the fastening in position to be clinched; Fig. 7, a detail showing a switch on said cam; Figs. 8 and 9, details showing the means employed for moving
55 the cam longitudinally on the shaft; Fig. 10, a detail showing the fastening placed in proper position to be clinched; Fig. 11, a similar detail showing the fastening clinched; Fig. 60
12, a detail showing a portion of one of the side walls of the slots of the cylindrical bed, and Figs. 13 and 14 details showing the locking device for the removable slats.

The slotted bed, herein shown as cylindrical, is composed of two like wheels or disks *a*,
65 secured to a shaft *a*² at a desired distance apart, and slats or bars *a*³, rigidly secured to the peripheries of said wheels or disks at short distances apart. The shaft *a*² has its bearings in the main framework of the machine.
70 To one end of the shaft *a*² a ratchet-wheel *a*⁴ is secured, which is engaged and rotated by the pawl *a*⁵, connected to and operated by a pawl-carrying arm *a*⁶, turning loosely on shaft
75 *a*², and connected at the outer end by a rod *a*⁷ to an eccentric *a*^{7x} on the main shaft *a*⁸. (See Fig 1^a.) As said shaft *a*⁸ is rotated continuously the said slotted cylinder will be rotated intermittently. Upon the table *b* just
80 above the slotted cylinder, a series of independent slats *b*¹ are placed, of suitable length and width to enter the slots in the cylinder, they being held in place against a cross-bar *b*² by a suitably-weighted presser *b*^{2x}, and said table *b* terminates just short of said cross-bar
85 *b*², so that a narrow slit is left down through which the said slats *b*¹ are forced one by one by means of a plunger *b*³, moving vertically in guides *b*⁴ on the framework. The said
90 plunger *b*³ is connected by short arms *b*⁵ to eccentrics *b*⁶ on the shaft *a*⁸, so that at each revolution of said shaft the plunger will make one complete operation and force one slat
95 into a slot in the cylinder. The cloth *c* to be smocked is fed to the cylinder beneath the table *b* and slit down, through which the slats are forced, so that as the slats enter the slots in the cylinder they carry the cloth with them.
100 To hold the slats in place when once forced into the slots in the cylinder, I have provided at each end of said cylinder a latch 50, se-

cured to a plate 51, rigidly connected to the framework. The latches 50 are so positioned that when the cylinder is at rest they will stand opposite the spaces which receive the
 5 slats, so as to engage the ends of said slats as they are forced down into the spaces and thereby hold them. Besides these locking devices or latches curved flanges 52 extend for a short distance, in continuation of the
 10 latched ends, and the slats are made longer than the cylinder, so as to project a short distance at each end thereof, as shown in Fig. 13, to be engaged by the latches 50, and thereafter by the flanges 52 as the cylinder is ro-
 15 tated. At the termination of the flange 52 the slats b' are released. The cloth c thus folded over the rigid bars a^3 of the cylinder is held taut by the removable slats b' , as shown in Figs. 10 and 11, and the parallel
 20 folded edges, it will be seen, are accessible to be connected together. The slats b' are made considerably narrower than the bars a^3 , and the outer edge of said bars a^3 are provided with a series of notches 2, eleven being herein
 25 represented. To connect the said folded edges of the cloth I employ a metallic fastening, (best shown in Figs. 10 and 11,) which is composed of a piece of wire bent at or about the middle, at 3, to form a central depressed V-
 30 shaped portion adapted to enter the spaces between the folded edges of the cloth drawn over the bars a^3 and bent in an opposite direction at or near each end, as at 4 4, to form
 35 hooks or clamps to embrace the said folded edges of the cloth upon which they are clinched. This metallic fastening, as herein represented, is formed in the machine; yet it may be previously formed, if desired. The
 40 wire taken from the reel e , held in suitable bearings provided for it, is carried forward by two feed-rolls e' e^2 over a die e^3 set in a holder e^4 . A ratchet-wheel e^5 is secured to one end of the roll e' , which is engaged by a pawl e^6
 45 on a pawl-carrying arm e^7 , connected to an eccentric e^8 on a shaft e^9 by a rod e^{10} .

Referring to Figs. 3 and 4, the former for the fastening consists of a nose-piece f on the lower end of the slide-bar f' , mounted in the frame f^2 on the shaft e^9 , and two like plates
 50 f^3 f^3 , pivoted to the face of said slide-bar f' at f^4 , one at each side of the nose-piece f . This former, when co-operating with the die e^4 , forms the wire into the desired shape, and as the nose of one of the plates f^3 is squared,
 55 and so also one of the side walls of the die e^3 , the wire, when taken from the reel, is cut off by said squared portions co-operating just previous to the formation of the fastening. The slide-bar f' has at its upper end a strap
 60 or loop f^5 , which embraces the eccentric f^6 , splined on the shaft e^9 , so that at each revolution of said shaft said slide-bar will be depressed and returned to its normal position. The plates f^3 f^3 are held in their normal po-
 65 sition to cut off and form the fastening by springs f^7 , secured to the slide-bar. The fastening, having been formed, clings to the

former as the latter rises, thereby removing it from the die. The former, carrying the fastening with it, is then swung on the shaft e^9 70 as a pivot a little toward the left, (see Fig. 2,) into a position just over the folded edges of the cloth on the cylinder, by means to be described, and the eccentric f^6 is moved longitudinally on the shaft e^9 for a short distance, 75 by means to be described, and then, as the shaft e^9 again revolves, the former will approach the cloth and deliver the fastening into its proper position, with the central depressed or V-shaped portion between the 80 folded edges and the hooks or clamps embracing said folded edges, as represented in Fig. 10, and when so positioned a cam f^8 on said eccentric f^6 strikes the upper end of a wedge-block f^9 , depressing it against the ten- 85 sion of the spring f^{10} , so that its lower wedge-shaped end, which lies between the upper ends of the plates f^3 f^3 , acts to turn said plates on their pivots f^4 f^4 , causing the lower ends of said plates to each approach the nose-piece f , 90 thereby compressing the hooks or clamps of the fastening on the cloth. As said cam f^8 passes by the end of said wedge-block f^9 , the latter is returned to its normal position by the spring f^{10} and said plates permitted to 95 separate and return to their normal position, and as the shaft continues to rotate the former retreats and thereafter returns to its normal position, by means to be described, to form or obtain the next fastening. While 100 this forming and setting or clinching device for the fastening is herein represented as a single instrument, it is obvious that if the fastenings were previously formed and delivered to the machine said instrument would possess 105 the functions of simply setting or clinching the fastening, and hence the operating mechanism would be simplified.

The means herein shown for moving the forming and setting device from one to its 110 other position consists of an arm i , secured to a rod i' , held in suitable bearings in the framework, and a link i^2 , connecting said arm i with the frame f^2 , which supports the oper- 115 ating parts of the forming and setting device, and an arm i^3 is secured to said rod i' , which carries a pin i^4 , which follows in a cam-groove i^5 , formed in the face of the disk i^6 , secured to the main operating-shaft a^8 . As herein de- 120 signed the fastening is formed by one complete revolution of the shaft e^9 and then set or clinched by the next revolution thereof, and during each operation of forming and setting the fastening the former makes a com- 125 plete go-and-return motion, so I have secured to the shaft e^9 a toothed gear g , which is engaged by a like toothed gear g' on the main operating-shaft, so that said shafts may turn in unison, and I have arranged the cam- 130 groove i^5 so that the arm i^3 will be held in one position during one revolution of the main shaft and in its other position during the next revolution of said shaft, and to effectually carry out this result the said cam-groove

crosses itself, and at such point I have provided a switch n , which has a single groove or pathway through it, and said switch is turned first in one and then in the opposite direction by a projection on the switch-plug at the opposite side of the disk i^6 striking a pin g^2 on the outer end of the arm i^3 as said disk revolves, said outer end of the arm i^3 being bent to embrace the disk, as represented in Fig. 7.

As a means of moving the eccentric f^6 longitudinally on the shaft e^9 , so that the cam f^8 thereon will strike the wedge-bar f^9 at only every other rotation of the shaft, I have pivoted to the cross-bar m (see Figs. 8 and 9) a shipper-lever m' , which astrides said eccentric f^6 , and the end of said lever enters a diagonal slot 4 in a rod or bar m^2 , connected to the arm i and moving in a slot in the cross-bar m , so that as said rod or bar is moved longitudinally by the vibrations of the arm i the said shipper-lever m' will be turned back and forth. On said shaft e^9 , I will arrange quite a number of forming and setting devices, and while I have herein shown only three, I will preferably employ many more, and hence the slats of the cylinder are herein shown as notched at eleven different points, as at 2; yet I do not desire to confine myself to the particular number that I may employ, and as two of the folded edges of the cloth are first to be connected together, and then one of said connected folded edges is to be connected to the folded edge next to it at a point opposite the spaces between the previous row of fastenings, I have divided the forming and setting devices into two gangs, so that every other one of the row will operate to set a fastening, and then the remainder will do the same; and for convenience I have so arranged and timed the parts that while one gang is forming the fastenings the other is setting the fastenings, and vice versa. In order to accomplish this result an independent mechanism is provided for moving the forming and setting devices of the two gangs from one position to the other. As herein represented, substantially the same mechanism as above described is employed in connection with the second group, consisting, namely, of an arm o , secured to the rod o' and connected by the link o^2 with the arm of one of the forming and setting devices, and an arm o^3 , also secured to said rod or shaft, which engages a cam-grooved disk p , substantially like the cam-grooved disk i^6 and constructed to carry out the same result.

In Fig. 2 I have omitted one gang of the forming and setting devices for clearness, although the operating mechanism therefor is shown.

The die-holder e^4 supports as many dies as there are forming devices, and on the rods i' o' separate arms i o are provided for each forming and setting device, and also a separate shipper-lever for the eccentric thereof, although but one arm, as i^3 and o^3 , and one

cam-groove disk is necessary to rock each rod or bar.

It will be observed that so far as the forming and setting devices of the fastenings are concerned, any other form of folding mechanism may be employed for folding or plaiting the cloth preparatory to connecting the folded edges at one side thereof, and, furthermore, I do not desire to confine my invention to any particular construction of forming and setting devices. If the fastenings are placed in said setting device, they do not need to be constructed to perform the additional functions of forming the fastenings.

When different designs are to be made, those forming and setting devices which are not to be used for setting the fastenings are incapacitated from performing their work—such, for instance, as removing the wire from the feeding device therefor—and by so doing many different designs may be made.

I claim—

1. In a machine of the character described, the combination of a grated bed over which the material lies, means for entering the material into the channels or slots of the bed so that it lies in folds over the bars thereof, and means for applying fastenings to the adjacent folded edges of the material.

2. In a machine of the character described, the combination of a grated bed over which the material lies, detached bars to enter the channels or slots of the bed and hold the material in folds, means for inserting said bars and means for applying fastenings to the adjacent folded edges of the material.

3. In a machine of the character described, the combination of a movable grated bed over which the material lies, means for intermittently moving said bed, detached bars stacked one against another on a fixed support and designed to be introduced one by one into the channels of said bed to fold the material over the bars thereof, means for moving the stack of bars on its support to bring the bars one by one into position for engagement with the channels of the bed, and means for engaging the bars with the bed when brought to such position.

4. In a machine of the character described, the combination of a rotary cylindrical grated bed over which the material lies, means for turning the same step by step, means for introducing the material into the channels or slats of the bed so that it lies in folds over the bars of the bed, and means for applying fastenings to the adjacent folded edges of the material.

5. In a machine of the character described, the combination of a support for the plaited material, a plurality of gangs of devices for applying fastenings to adjacent folded edges of the material, the members of said gangs being arranged alternately so that those of one gang apply fastenings to a pair of folded edges opposite spaces between fastenings ap-

plied by the other gang to a preceding pair of folded edges, and means for actuating the fastening appliers.

6. In a machine of the character described, 5 the combination of a movable support for the plaited material, means for intermittently moving said support, a plurality of gangs of devices for applying fastenings to adjacent folded edges of the material, the members of 10 one gang alternating in position with those of the other gang, and means for alternately actuating the gangs, for the purpose described.

7. In a machine of the character described, 15 the combination of a support for the plaited material; a fixed die out beyond said support; and a fastener-applier movable back and forth between the die and the material support and having fastener-forming means co- 20 acting with the die.

8. In a machine of the character described, the combination of a support for the plaited material, a fixed die, a fastening applier pivotally suspended between the die and the material support and having fastening-forming 25 means to co-act with the die, and means for vibrating the said fastening applier and for operating its forming devices.

9. In a machine of the character described, 30 the combination of a support for the plaited material; a fixed die-bed; a fastening applier movable between the die-bed and the material and having fastening-forming means to co-act with the die-bed, said means including clinch- 35 ing-jaws; means for vibrating the fastening applier; means for independently actuating its clinching jaws; and means for rendering said jaw-actuating means operative or inoperative, according as the fastening applier is 40 over the material or over the die-bed.

10. In a machine of the character described, the combination of a support for the plaited material, a fixed die-bed, a fastening applier movable between the die-bed and the material 45 and having fastening forming means to co-act with the die-bed, said means including clinching jaws, means for vibrating the fastening applier, a shiftable cam for actuating its clinching jaws, and means for shifting said 50 cam into and out of operative position, for the purpose described.

11. In a machine of the character described, the combination of a grated bed with notched

bars over which the material lies in folds, and a fastener applying device comprising a 55 plunger to take a substantially V-shaped fastener between the bars of the grated bed, clinching jaws to act through the notches of the bar and close bent ends of said fastener on the folded edges of the cloth, means for 60 actuating said plunger, and means for independently actuating the clinching jaws.

12. In a machine of the character described, the combination of a support for the plaited material, a fixed die-bed, a swinging fastener- 65 forming and setting device, and means for vibrating the same, including a compound cam with an automatic switch for the purpose described.

13. In a machine of the character described, 70 the combination of a suitable support for the plaited material, a fixed die-bed, gangs of swinging fastener-forming and setting devices, and sets of actuating means applied to said gangs respectively and including oppo- 75 sitely set cam-disks each having a compound cross over groove with an automatic switch.

14. In a machine of the character described, the combination of a grated bed over which the material lies, detached bars to enter the 80 slots of said bed carrying the material with them, means for engaging said bars with the bed, and means for holding the bars in engagement with the bed.

15. In a machine of the character described, 85 the combination of a grated bed over which the material lies, detached bars to enter the slots of said bed carrying the material with them, a plunger to force said pieces into the slots, and spring catches to hold the pieces in 90 place.

16. In a machine of the character described, the combination of a movable grated bed over which the material lies, detached bars for in- 95 sertion in the slots of the bed, a plunger for inserting said pieces, spring catches for holding the pieces in the slots, and flanges forming extensions of said catches.

In testimony whereof I have signed my name to this specification in the presence of 100 two subscribing witnesses.

FREDERICK S. PINKHAM.

Witnesses:

BERNICE J. NOYES,
LUCY F. GRAVES.