

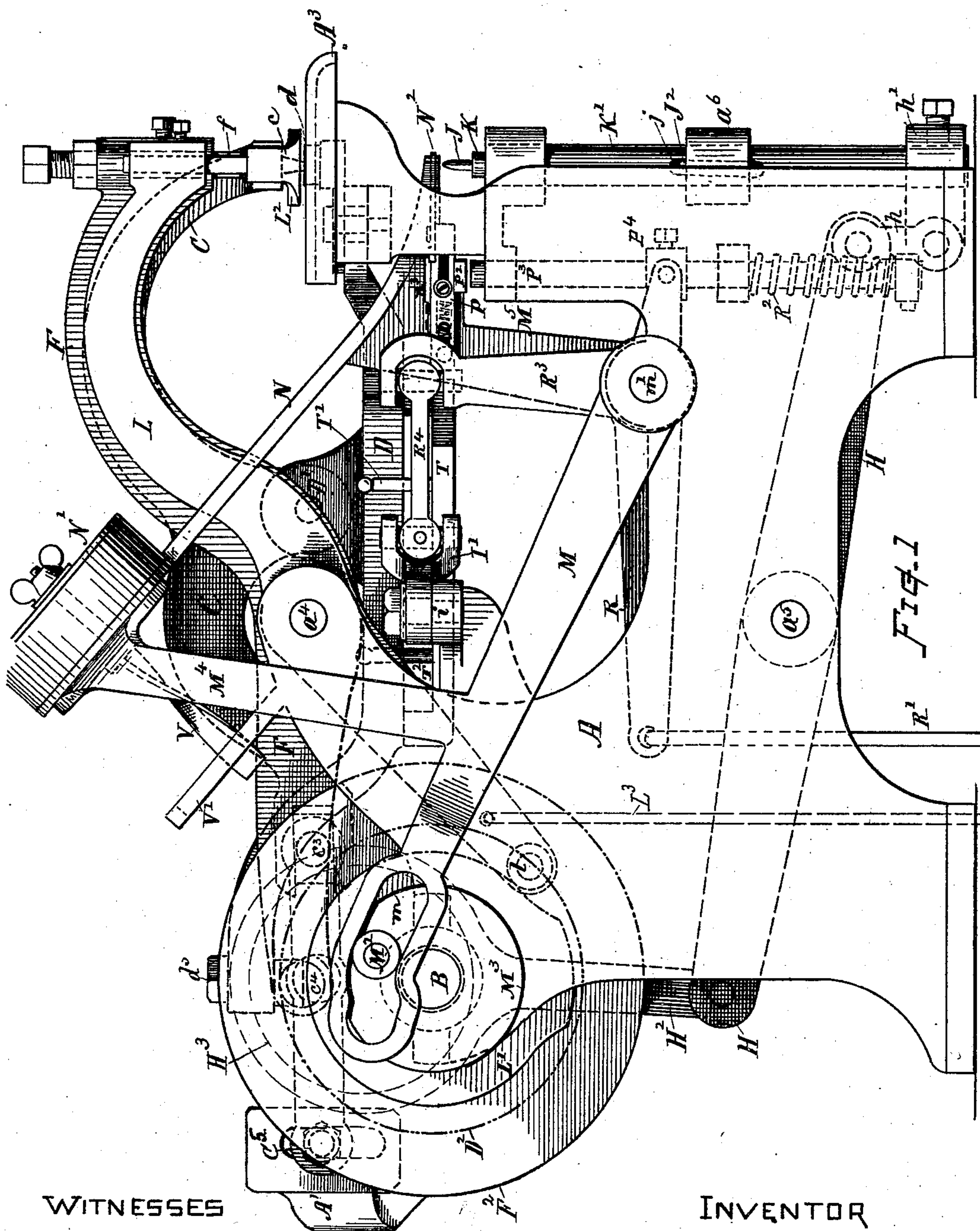
(No Model.)

4 Sheets—Sheet 1.

C. A. CORMAN.
EYELETING MACHINE.

No. 368,875.

Patented Aug. 23, 1887.



WITNESSES

INVENTOR

William B. Harding
Ella P. Blenis

Charles A. Corman
By Chas H. Burling
Attorney

(No Model.)

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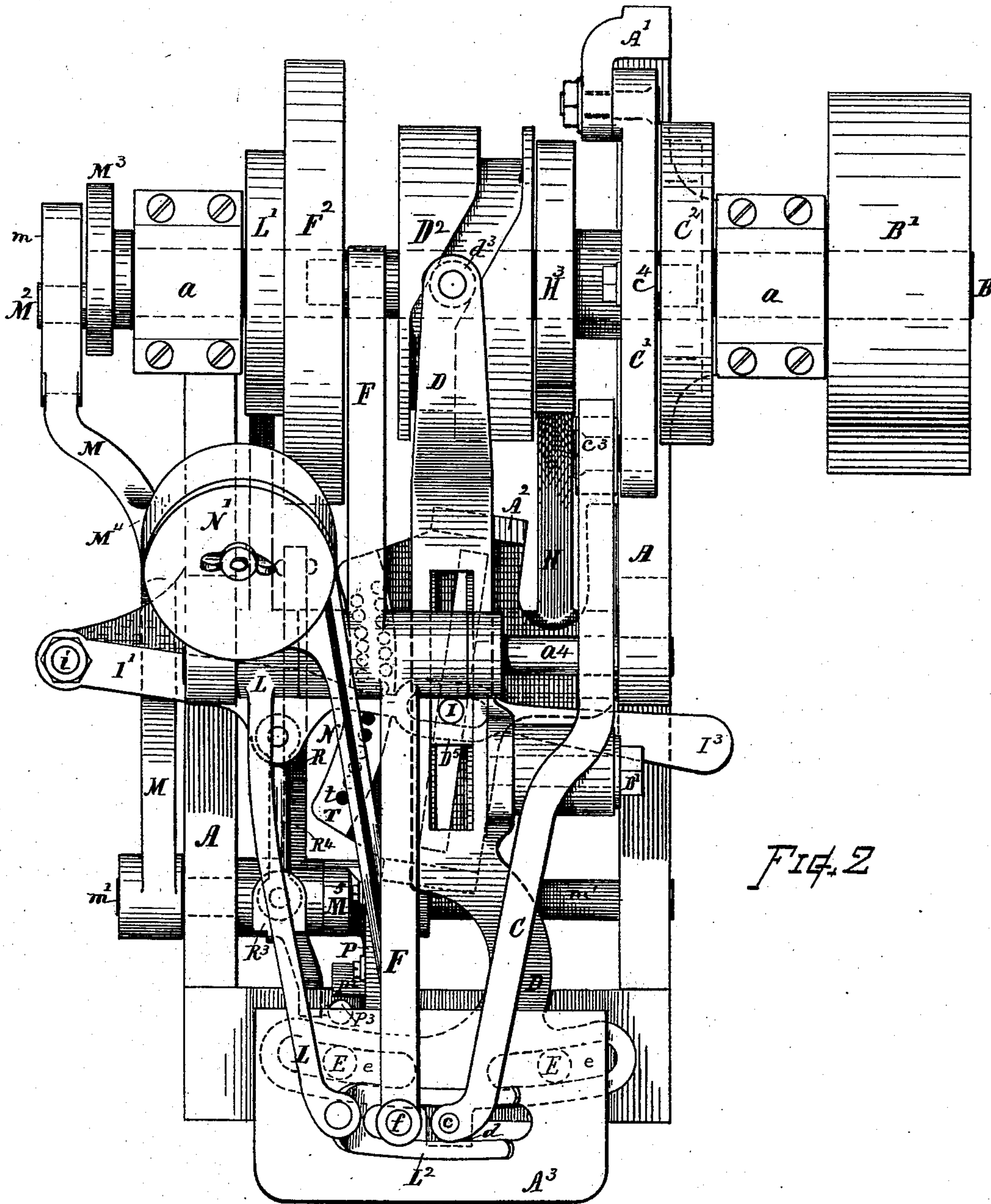


Fig. 2

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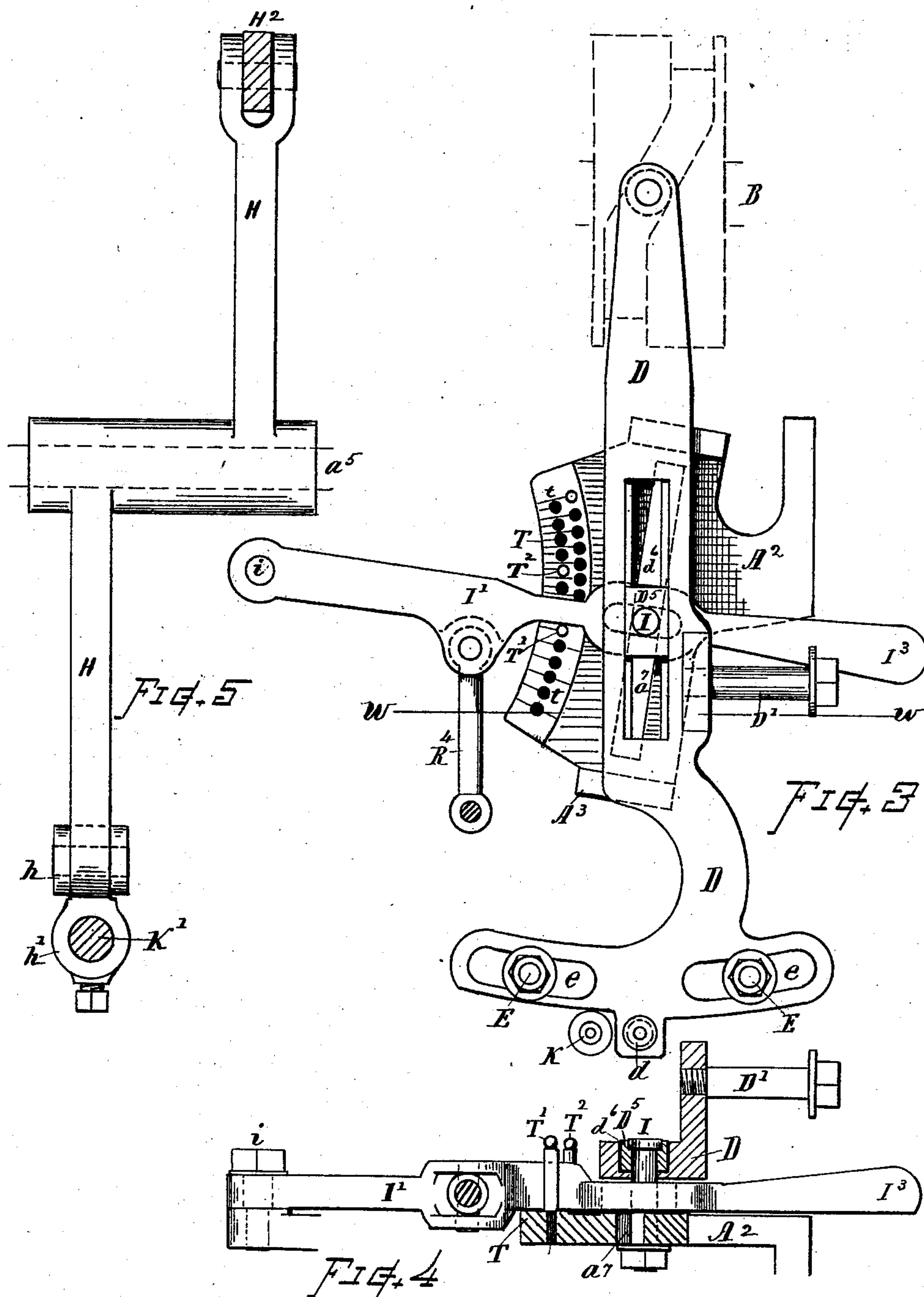
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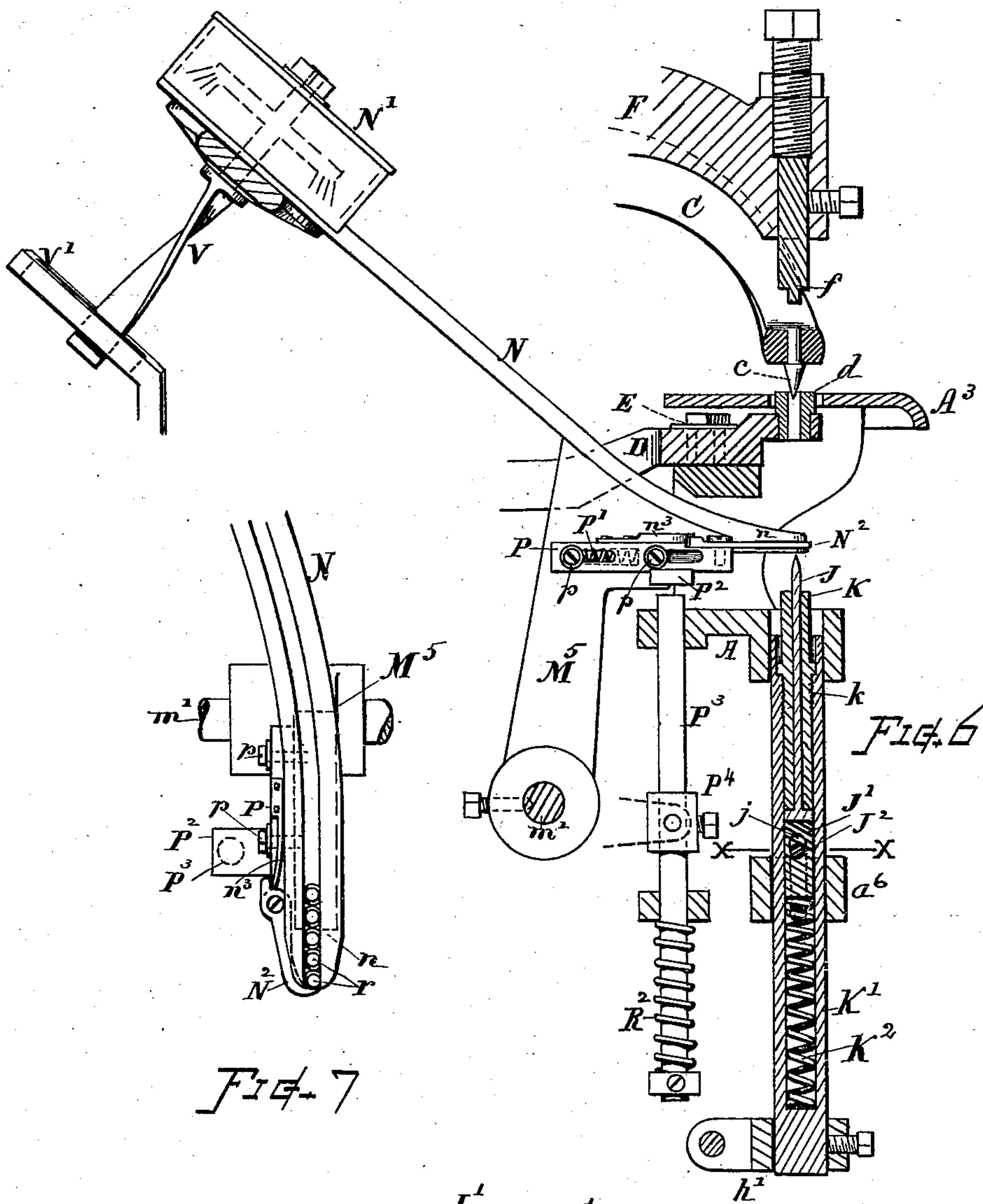
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4 Sheets—Sheet 4.

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No. 368,875.

Patented Aug. 23, 1887.



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FIG. 8 *Charles A. Corman*
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UNITED STATES PATENT OFFICE.

CHARLES A. CORMAN, OF COCHITUATE, MASSACHUSETTS.

EYELETING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 368,875, dated August 23, 1887.

Application filed May 10, 1887. Serial No. 237,717. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. CORMAN, a citizen of the United States, residing at Cochituate, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Punching and Eyeletting Machines for Boots and Shoes and for other Purposes, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

My present invention relates to certain improvements in the construction of various parts of the mechanism and to the combination of the devices employed, in the manner hereinafter explained, with a view to the production of a more convenient, desirable, and practically efficient machine for punching and setting eyelets in fabrics, the particular subject-matter claimed being hereinafter definitely specified.

In the drawings, Figure 1 is a side view of a punching and eyeletting machine, illustrating the features of my invention. Fig. 2 is a plan view of the same. Fig. 3 is a plan view showing the details of the bed-lever and feed-changing mechanism. Fig. 4 is a vertical section of the same at line *ww* in Fig. 3. Fig. 5 is a plan view of the lever for working the under eyelet-setting tool. Fig. 6 is a vertical sectional view showing the details of the punch, eyelet-sets, and eyelet-delivering mechanism. Fig. 7 is a plan view of the end of the eyelet-chute and devices for controlling the delivery of eyelets, and Fig. 8 is a transverse section of the lower eyelet-set bar at line *xx* in Fig. 6.

Referring to parts, A denotes the frame.

B indicates the operating-shaft, disposed in horizontal position to rotate in bearings *aa* at the rear part of the frame, and having mounted thereon a series of cams for working the several levers that actuate the punching and eyeletting devices, and provided with a pulley, B', for the driving-belt, whereby the machine is to be operated by power transmitted from any convenient source. Pulley B' may, in practice, be connected with the shaft B by an automatic stop-clutch of any convenient form, adapted to throw off the power at each revo-

lution of the shaft B, and controlled by a treadle mechanism in the usual manner. The automatic stop-clutch mechanism I have not herein shown, as it is well known, and is not essentially a feature of my present invention.

It will be understood that the several cams are grooved or shaped so that they impart the desired quality and quantity of movement to the respective parts operated thereby, and that they are relatively disposed upon the shaft in such manner that they will bring the working devices consecutively into action in their proper order and at the required intervals of time.

C indicates the lever which carries the punching-tool *c*. It is fulcrumed by the stud D' upon the bed-lever D to move laterally in unison therewith, and is operated by an auxiliary lever, C', that works in conjunction with the cam C² on the shaft B. The auxiliary lever C' is fulcrumed on an arm, A', of the frame A, and is coupled with the lever C by a loose sliding joint at *c*³, forming a compound punching-lever, the cam-bearing roll of which is at *c*⁴. As the cam-roll is raised, the punch *c* is depressed, and vice versa. This compound lever action permits the side movement of the lever C with the bed-lever D, to accommodate itself at the connecting-joint *c*³, and thus obviate side movement of the part C', and consequent irregular wearing of the cam C².

The stud C⁵, which forms the fulcrum of the auxiliary lever C', is adjustable up and down in the frame A', so that the fulcrum of said lever can be raised or depressed relatively to the cam C², consequently raising or depressing the rear end of the lever C, so as to cause the punch *c* to work more or less closely to the anvil-block or lower punching-die.

The bed-lever D, which serves to carry the cutting-bed anvil or lower punching-die, is longitudinally slotted, as indicated, and is fulcrumed upon a slotted bracket, A², fixed to the main frame A by means of an adjustable stud, I, that passes through a sliding block, D⁵, disposed within the slot of the lever. Said bed-lever is operated by the cam D² upon the shaft B, the movement of the bearing-roll *d*³ in the groove of the cam being such as to impart lateral movement to said lever. The adjustment of the stud I is effected by means which will be hereinafter described.

The anvil or punching-die d is supported in or upon the forward end of the bed-lever D, and projects up through a slot in the work-supporting table A³. An ordinary cutting-punch may be used for leather-work; but for use on cloth or similar fabric the punch is best made as illustrated in Fig. 6—that is, as a sharp-pointed stiletto, the anvil d being made with an opening, into which the point of the stiletto enters, so as to force it through the fabric. The feeding is effected while the fabric is gripped between the punch c and anvil d by lateral movement of the levers C and D, the ends of which pass to a position that brings said punch and anvil axially in line with and between the upper and lower sets while they are near their extreme points of separation, and the punch and die then separate, leaving the work with the punched hole in position for receiving the eyelet and sets.

The bed-lever D is provided with guiding-slots e , which engage studs E, fixed on the frame, or with other equivalent guiding devices, whereby the said lever is confined to a line of motion that will bring the anvil and punch into a position coincident with the vertical axis of the eyelet-sets at whatever position its fulcrum I may be adjusted or whatever the sweep or distance which the punch and anvil move when feeding forward the work. The studs E are preferably provided with anti-friction rolls where they pass through the slots e in the head of the bed-lever.

F indicates the top set-lever, fulcrumed on the rod or shaft a^4 , and carrying at its forward end the eyelet-setting tool f , of ordinary any suitable construction. Said lever is operated for depressing and raising the setting-tool f by the cam F², fixed on the shaft B.

H indicates the lower set-lever, fulcrumed on the rod or shaft a^5 , and having its forward end connected by a pivoted link, h , and collar h' with the vertically-reciprocating bar K', which carries the lower eyelet-setting tool, K. The lever H is operated for raising and depressing the setting-tool K by means of a link or strap, H², that embraces an eccentric, H³, fixed on the shaft B. The bar K' is formed as shown in detail in Figs. 6 and 8. The eyelet-setting tool K is secured therein by screw-threads at k . The picker-pin J passes through the setting-tool K, and is provided with a confining-head that rests upon a slide-block, J', fitted to move up and down within the hollow of the bar K'. The bar K' is longitudinally slotted, as at j , and the slide-block is provided with a cross bar or pin, J², that extends out through said slots j sufficiently far to engage with the bearings a^6 . A spring, K², is disposed within the bar K' beneath the slide-block J', for exerting an upward yielding pressure against the picker-pin J. By the use of the slide-block J' and its projecting pin J², I attain a positive action for forcing the picker J from the setting-tool K in case said picker, when depressed, becomes clogged or wedged by small chips or other substance, so that the

spring cannot raise it. The ends of the pin J² strike the top of the bearing a^6 as the bar K' descends and prevents the picker from being carried below the given position, thus utilizing the full running force of the machine for ejecting the picker, if necessary, while in no way interfering with the normal yielding action of the spring as the parts are elevated. The position of the setting-tool K for properly effecting its work in relation to other parts may be accurately adjusted by the screw-threads k .

L indicates the presser-lever, fulcrumed on the rod or shaft a^4 and operated by the cam L' on the shaft B, which engages the follower-roll l on the rear end of the lever, (see dotted lines, Fig. 1,) and lifts the presser-foot L² from the work while it is being fed forward by the punching devices. The presser-foot L² may be of ordinary form. A rod, L³, connects the presser-lever with a suitable treadle, by means of which the presser-foot can be lifted for introducing the fabric beneath it.

M indicates the eyelet-feed lever. This is fulcrumed on the rocker-shaft m' at the outside of the frame. Its rear end is provided with a slot, m , that engages with a crank or wrist pin roll, M², on the crank-plate M³, fixed to the end of the shaft B. Said lever M is provided with an arm or arms, M¹ M⁵, for supporting the eyelet-feeding chute N and supply-hopper N'. In the present instance the arm M⁵, that supports the chute, is keyed to the rocker-shaft m' , said shaft being keyed to work with said lever M; but, if preferred, said arm might be a part of the lever M, with its top end offset to reach the chute. It will be understood that the arm M⁵ and lever M swing in unison for carrying the delivery end of the chute over and away from the picker-pin J for delivering eyelets thereto. The slot m in the lever M is curved, so as to give a stop or retardation in the action of the eyelet-feed while the eyelet is passing through to allow ample time for the other parts to perform their work. By the action of the lever M working on the crank M², the eyelet-hopper N' is given a peculiar upward and downward action, as well as forward and back movement, which throws up the eyelets within the hopper at each movement of the lever and prevents the eyelets from settling down into a compact solid mass, and thus greatly facilitates the proper feeding of the eyelets down the chute.

The forward end of the chute N is horizontally slitted at n , (see Figs. 6 and 7,) and a laterally-swinging spring-pressed stop hook or finger, N², is provided for retaining the eyelets r , except as they are taken off by the picker. The end of the finger N² is made of a size that will pass into the slit n , and said finger is pivoted or flexibly connected to a backwardly and forwardly movable slide, P, mounted on the arm M⁵, or other equivalent support, in connection with the chute, and a suitable spring, P', is provided for pressing forward the slide P to its forward position. A spring, n^3 , is provided for normally retaining

the finger N^2 in position for stopping the eyelets. The finger N^2 for stopping eyelets may be the same hook or finger that prevents the eyelets from falling from the end of the chute, or it may be a separate hook or finger specially adapted for drawing back the eyelets.

The screws p , which attach the slide P to its support, pass through slots. Said slide is provided with a lug or projection, P^2 , that is engaged by the bar or stopping device P^3 , which latter is arranged in connection with the frame A and operated by suitable treadle mechanism. When the chute N is moved back, if the bar P^3 is raised its end obstructs the forward movement of the slide P , so that as the chute advances the finger N^2 is drawn into the slit n , thereby forcing the eyelets r backward in their delivery-groove away from the extremity of the chute, so that while the end of the chute will come into its usual place over the eyelet-set K there will be no eyelet at its extreme end in position to be taken off by the picker-pin J . This method of stopping the feed of eyelets in a punching and eyeleting machine, by stopping or forcing back the eyelets in the groove of the delivery-chute and retaining them out of reach of the picker while the chute makes its normal action, is a feature of my invention.

R indicates the lever for lifting the stop-bar P^3 . Said lever is fulcrumed on shaft m' , and a rod, R' , connects its rear end with a suitable treadle. (Not shown.) A spring, R^2 , acting between the bearing and a collar on the bar P^3 , serves for depressing said bar and for returning and retaining the parts connected with the lever R at their normal positions.

R^3 indicates an upwardly-extended arm on the treadle-actuated lever R . Its upper end is connected by means of a universally-jointed link, R^4 , with a lever, I' , through which the fulcrum pin or stud I of the bed-lever is passed. Said lever I' is fulcrumed on a suitable bracket, or part of the frame A , as at i , and extends laterally and substantially horizontally across the machine, its free end being in the present instance provided with a handle, I^3 . The pivot-stud I passes through the bearing-block D^5 , which slides in the slot d^6 , formed in the bed-lever D , also through a slot in the shifting-lever I' , and through the slot a^7 in the supporting-bracket A^2 , the arrangement being such that when the lever I' is swung backward or forward the pivot I will be shifted, thereby changing the fulcrum-point farther from or nearer to the front end of said lever D , to increase or diminish the distance of lateral movement of the anvil and punch, thus varying the feed or spacing between the holes that are punched in the material operated upon.

The slot a^7 in the supporting-bracket is disposed in such relation to the alignment of the lever D that the variation of action incident to the shifting of the fulcrum-pivot I will be effective at one side only, or so that the punch c and anvil d will swing accurately into align-

ment with the axis of the eyelet-sets at whatever position the fulcrum-stud I may be adjusted; hence when feeding forward the work the punches will leave the fabric with the hole formed therein in proper position to receive the eyelet, whether operating by a long or a short feeding movement. Beneath the shifting-lever I' there is a segmental index-plate, T , having a series of holes, t , in which to insert pins T' and T^2 , that serve as stops for gaging the movement of the shifting-lever I' , one in front and one in rear of said lever. In the operation of this mechanism, when the lever R is depressed, its arm R^3 and link R^4 swing back the shifting-lever against the rear stop-pin, I^2 , increasing the length of feed, and at the same time the feeding of eyelets is cut off by the bar R' and slide mechanism P ; hence in the eyeleting of shoe-uppers, wherein it is desired to use lacing-studs at the top part of the uppers, the desired variation between eyelet-spacing and the stud-spacing can be effected, the eyelets set for such portion as required, and the uneyeleted holes punched for the insertion of the lacing-studs by continuous operation and without taking the work from the machine or stopping to make change of feed, as the operator can, by simply placing his foot on a treadle and depressing the lever R , effect this result while the machine is running. When the treadle-lever R is released, the parts return to normal position. This mechanism for the simultaneous stopping of the eyelets and the change of spacing or feed is a feature of my invention.

When it is desired to set the eyelets at uniform distances apart without changing the feed and without stopping off the eyelets at any portion of the work, the shifting-lever I' may be confined at any desired position by placing the pins T' and T^2 close against it at either side.

In case it is desired to change the spacing or feed without cutting off the delivery of eyelets at the same time, the set-screw in the collar P^4 may be loosened, so that the stop-bar P^3 will not be worked by the action of the lever R when said lever is moved for operating the shifting-lever I' .

The stops for the lever I' may be pins, as T' T^2 , or any other device for limiting the movement of the fulcrum-block. The bed lever acts positively in both directions, and no spring is required.

V indicates a spiral rotator for imparting movement to the stirrer, brush, or fingers within the eyelet-hopper. Said rotator consists of a flat spirally-twisted projection connected to the spindle of the hopper and passing through a slot formed in the stationary bracket V' , fixed to the frame. The sides of the slot embrace the sides of the rotator, and as the hopper rises and falls oscillative rotation is imparted to the spindle by the spiral surfaces sliding up and down in the slotted bracket in the manner of a screw.

I am aware that punching and eyeleting machines have been heretofore constructed having

means for changing the feed or spacing between the holes, and, also, that it is common practice in machines of this class to employ means for stopping the delivery of eyelets; but, so far as I am aware, the mechanism employed for effecting such results is essentially different in construction and operation from that herein shown and described.

I am aware that in a previous patent a punching and eyeleting machine has been described wherein facilities are afforded for changing the extent of feed movement and stopping the delivery of eyelets, so that holes for lacing-studs may be formed at different spacing from those for the eyelets. The means for attaining such results are, however, essentially different in construction and method of operation from those herein described.

What I claim as of my invention, and desire to secure by Letters Patent, is—

1. In a punching and eyeleting machine, the punch-lever C and its auxiliary lever C', fulcrumed substantially as shown, and arranged to operate as a compound lever, with the two parts connected by the sliding joint-block C¹, in combination with the operating-cam and anvil-carrying mechanism, substantially as and for the purposes set forth.

2. In a punching and eyeleting machine, the combination, with the punch-lever C and the operating-cam C², of the auxiliary lever C', actuated by said cam and connected for working the lever C, and having an adjustable fulcrum-stud, C⁵, substantially as set forth, whereby the fulcrum of said auxiliary lever C' can be raised or depressed, relatively to the cam, for regulating the closing of the punching-dies.

3. In a punching and eyeleting machine, the bed-lever D, having an adjustable fulcrum and provided with guideways or slots e, in combination with stationary studs or guide-rolls, as E, substantially as set forth, whereby said lever is confined to an established line of movement irrespective of the position of the fulcrum, for the purpose set forth.

4. The combination, as set forth, of the bed-lever D, carrying the anvil or punch-die d, mounted on a central fulcrum and confined by guiding devices E, the punch-lever C, fulcrumed on said bed-lever, as at D', carrying the punch c, the auxiliary lever C', connected thereto by a loose joint at c', to work in compound order with said punch-lever, the operating-shaft B, and the cams C² and D², substantially as and for the purposes described.

5. In a punching and eyeleting machine, the pointed punch c and recessed anvil or die d, respectively formed as described, in combination with the laterally-swinging levers C and D, whereon said punch and die are carried, and the vertically-acting eyelet-setting tools, substantially as and for the purpose set forth.

6. The combination, in a punching and eyeleting machine, of the punch-lever and bed-lever carrying tools whereby the punching and feeding of the work is effected, a movable fulcrum for the lateral swing of said levers,

adjustable to give greater or less throw or feed-spacing, a fulcrum-shifting mechanism, and means, substantially as described, for effecting the shifting of said fulcrum while the machine is in operation, for the purpose set forth.

7. The combination, with eyelet-setting tools working at a fixed axial line, of the vertically-swinging punch-lever carrying the upper punching-tool, the laterally-swinging bed-lever carrying the lower punching-tool and having a longitudinal slot, d⁵, the support-bracket A², having the slot a', the sliding fulcrum-block D⁵, and the adjustable fulcrum-stud I, arranged therein, said slots in the bed-lever and bracket being relatively disposed as described, whereby movement of said levers will advance the punches into axial line with the eyelet-setting tools, whether said fulcrum-stud is adjusted toward the front or rear end of the slots, for giving long or short intervals of feed.

8. In a punching and eyeleting machine, the combination, with the bed-lever, which controls the feeding action, of an adjustable fulcrum-stud, a shifting-lever, or means whereby said stud can be shifted to increase or diminish the throw of said bed-lever while the machine is in operation, and guide devices, as described, that confine the forearm of said lever to a given line of movement, whatever the relative adjustment of said fulcrum, substantially as set forth.

9. In a punching and eyeleting machine, the combination of the slotted bed-lever, its movable fulcrum-block, the slotted supporting-bracket, the shifting-lever I', and the fulcrum-stud I, passing through said parts, substantially as and for the purposes set forth.

10. In a punching and eyeleting machine, the combination, with the feeding-lever and eyelet-setting devices, of a movable feed-lever fulcrum, a fulcrum-shifting lever, and a graduated index and adjustable pins for limiting the action of said shifting-lever, as set forth.

11. The combination of bed-lever D, the adjustable fulcrum-stud I, the slotted support-bracket A², the shifting-lever I', actuating-lever R R³, link R⁴, and treadle-connection R', substantially as and for the purpose set forth.

12. The combination of the slotted bed-lever D, its adjustable fulcrum-block D⁵, the slotted support-bracket, the shifting-lever I', the fulcrum-stud I, arranged through said levers and bracket, the index-plate T, having a series of holes, t, the stop pins or devices T' T², adjustable to different positions in said plate, the link R⁴, actuating-levers R R³, and operating-connection R', substantially as and for the purposes set forth.

13. The combination, as set forth, of the upper and lower eyelet-setting devices, their operating-levers F and H, the compound punch-lever C C', carrying punch c, the bed-lever D, carrying the punch-die d, the adjustable fulcrum-stud I, the support-bracket provided with a slot for guiding the adjustment

of said fulcrum-stud, as set forth, the operating-shaft B, the cams C², D², and F², eccentric H³, and strap H², substantially as and for the purpose set forth.

5 14. In a punching and eyeleting machine, the combination, with the laterally-movable punch-carrying levers C and D and eyelet-setting tools, of the adjustable fulcrum I, fulcrum-shifting lever I', lever R R³, link R⁴, slide
10 P, carrying the stop-finger N², and the stop device P³, actuated on the lever R and engaging said slide simultaneously with the backward movement of the shifting-lever, substantially as and for the purpose set forth.

15 15. In a punching and eyeleting machine, the combination, with the eyelet-setting tools, of an eyelet-delivery chute having a laterally-slitted end, an adjustable stop-finger retractible into said slitted end, and means, substan-
20 tially as described, for retracting said finger longitudinally in relation to the end of the chute for moving back the row of eyelets within the chute to escape the picker or receiving pin, substantially as set forth.

25 16. In an eyeleting-machine, the combination, with the eyelet-setting tools and a reciprocating chute for feeding eyelets, of a stop finger or hook supported on a reciprocating slide and engaging the eyelets at the end of the
30 chute, and means, substantially as described, for arresting the forward movement of said slide while the chute is advanced, thereby cutting off the delivery of eyelets to the setting-tools while said chute continues its nor-
35 mal action, substantially as set forth.

17. In an eyelet-setting mechanism, the combination, with the delivery-chute N, having the slot n, and its support M⁵, of the finger N², slide P, spring P' and n³, lug P², and stop-bar
40 P³, substantially as and for the purpose set forth.

18. The combination, with the lower eyelet-set bar K', of the detachable setting-tool K,

carrying the picker-pin J, the movable slide-block J', for sustaining said picker-pin, pro- 45
vided with side projections or pins, J², extending through slots j in the eyelet-set bar, the spring K² beneath said block, and a stationary stop, onto which said side projections or pins strike when the eyelet-set bar is depressed, 50
substantially as set forth.

19. In an eyelet-setting machine, the combination, with the lower eyelet-setting tool and its reciprocating support-bar K', and the operating-shaft B, of the lever H, fulcrumed, 55
as at a⁵, and connected with said reciprocating bar by a link and collar, h h', and to the shaft B by an eccentric, H³, and by a strap or connecting-bar, H², substantially as set forth.

20. In an eyelet-setting machine, the com- 60
bination, with the eyelet-setting tools, the eyelet-hopper N', and chute N, of the lever M, arm M⁵, moving with said lever, the fulcrum-shaft m', operating-shaft B, and crank M², en-
gaging the slot m in said lever, substantially 65
as set forth.

21. In an eyeleting-machine, the eyelet-chute arm M, constructed with the hopper-supporting arm M⁴, and arranged in the man-
ner illustrated and described, in combination 70
with the crank M², operating-shaft B, and fulcrum-shaft m' and arm M⁵, substantially as set forth.

22. In an eyelet setting machine, the combination, with the eyelet-hopper brush, of the 75
spiral shaft or rotator V and stationary bracket V', having a slot through which said spiral shaft extends, substantially as and for the purpose set forth.

Witness my hand this 3d day of May, A. D. 80
1887.

CHARLES A. CORMAN.

Witnesses:

CHAS. H. BURLEIGH,
ELLA P. BLENUS.