(No Model.) 3 Sheets—Sheet 1.

C. A. CORMAN.

PUNCHING AND EYELETING MACHINE.

No. 348,190. Patented Aug. 31, 1886.

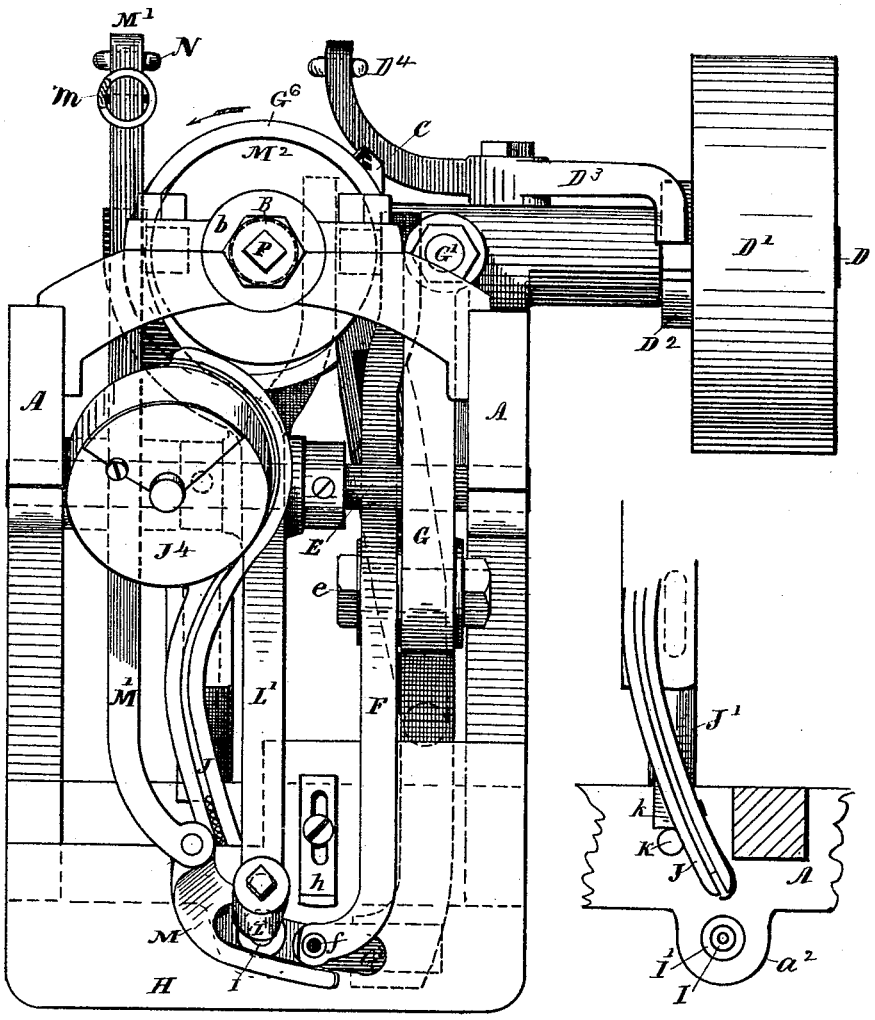

FIG. 1 FIG. 1a

WITNESSES

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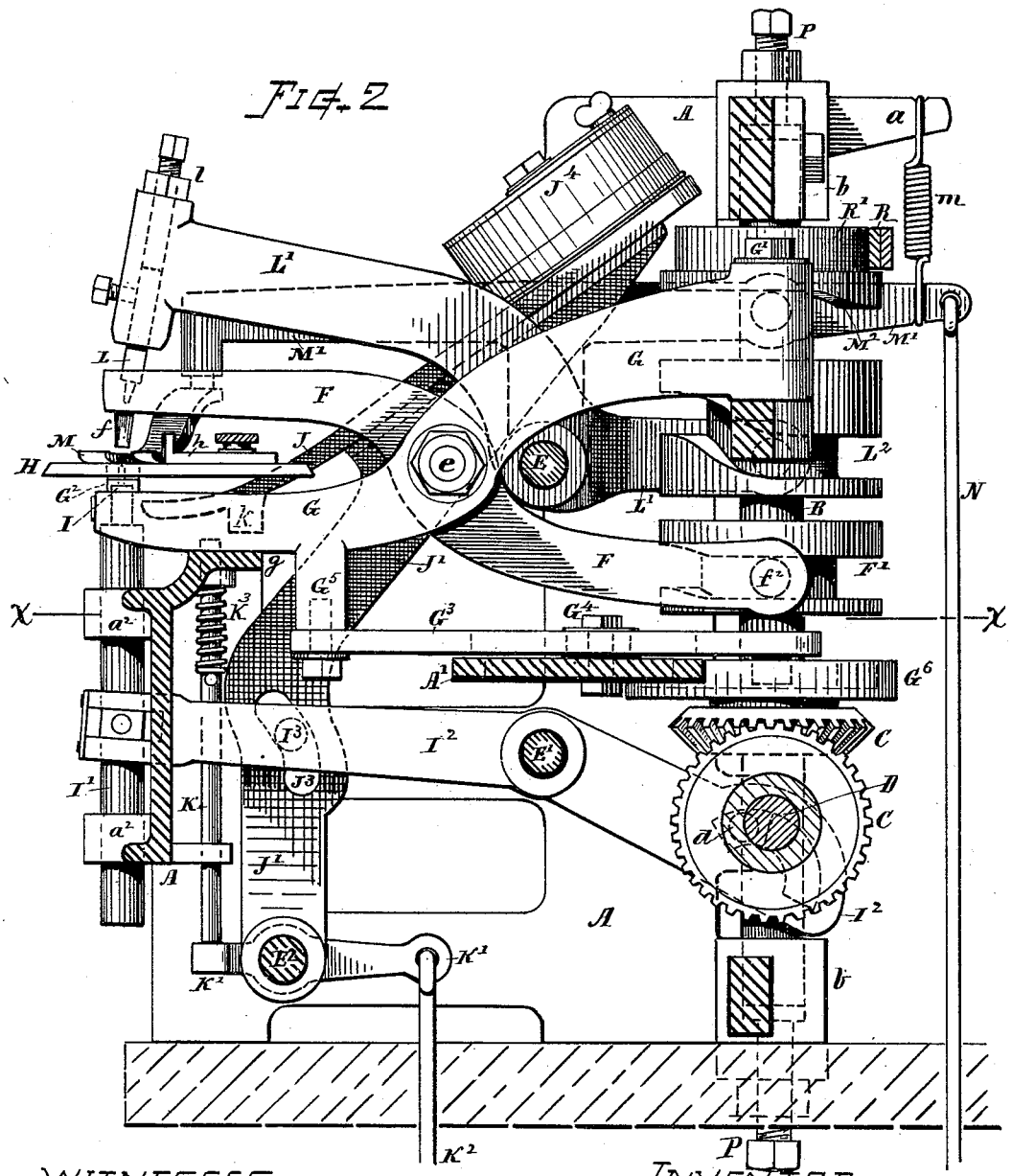
FIG. 2



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(No Model.) 3 Sheets—Sheet 3.

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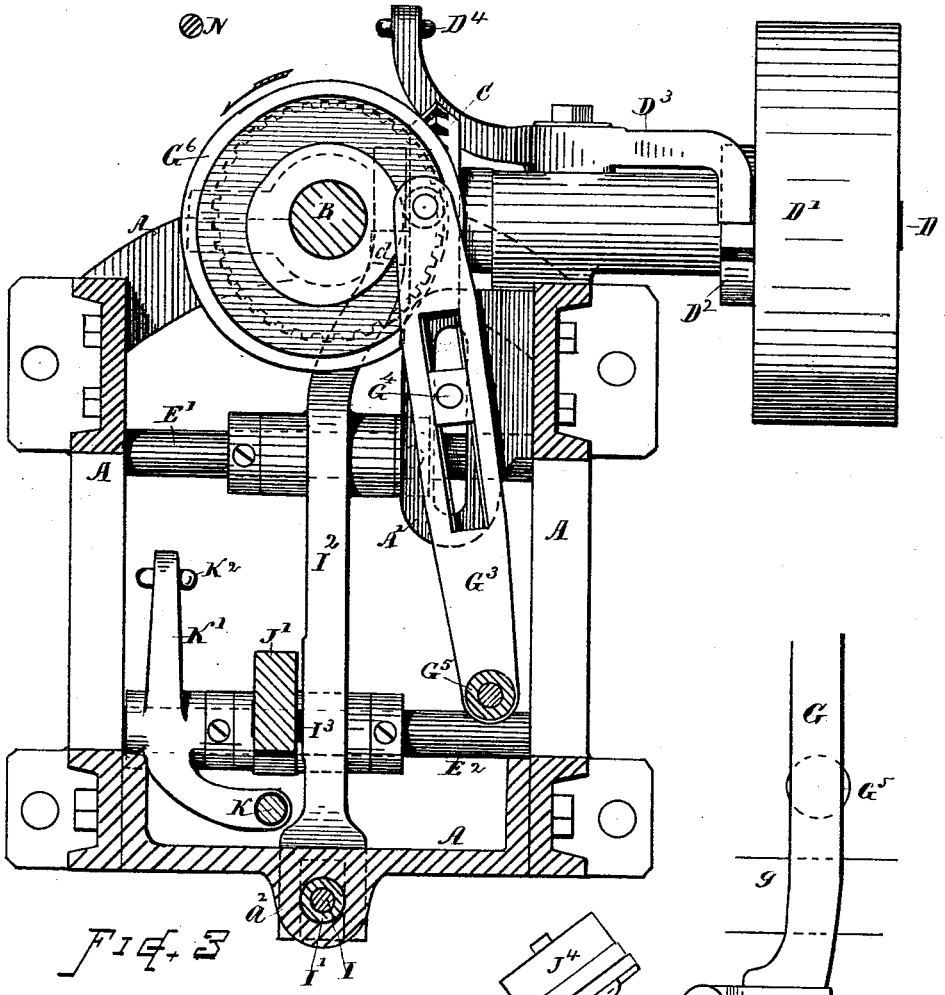

FIG. 3

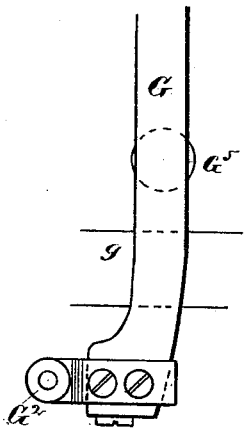

FIG. 4

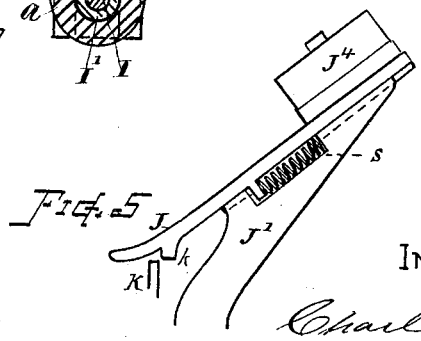

FIG. 5

WITNESSES.

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UNITED STATES PATENT OFFICE.

CHARLES A. CORMAN, OF COCHITUATE, MASSACHUSETTS.

PUNCHING AND EYELETING MACHINE.

SPECIFICATION forming part of Letters Patent No. 348,190, dated August 31, 1886.

Application filed May 11, 1886. Serial No. 201,815. (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 Eyeleting Machines, 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.

The object of my present invention is to provide a punching and eyeleting machine of improved construction, which shall be efficient and serviceable for use, not liable to get out of order in the hands of unskilled operators, and which can be manufactured with economy and at comparatively small expense; also, to provide simple and convenient means in an eyelet-machine whereby the eyelet-delivering devices can be arrested before reaching the point of delivery, to prevent the feeding of eyelets while the machine is running and punching holes, as hereinafter more fully explained; also, to provide means whereby the feed can be changed for various spacing without derangement in the adjustment of the punching or setting mechanism. These objects I attain by mechanism the nature, construction, and operation of which are illustrated in the drawings and explained in the following description, the particular subject-matter claimed being hereinafter definitely specified.

In the drawings, Figure 1 is a plan view of a punching and eyeleting machine embodying my invention. Fig. 1ª is a plan view of the lower end of the eyelet-delivering chute, the receiving-set, and the eyelet-feed stop. Fig. 2 is a side elevation showing the mechanism, the side frame being removed the better to reveal the working parts. Fig. 3 is a horizontal sectional view at the line *x x*, Fig. 2. Fig. 4 is a plan view of the end of the anvil-lever; and Fig. 5 is an outline view, on smaller scale, showing a manner of arranging a spring in connection with the eyelet-chute and its supporting-arm.

In referring to parts, A denotes the frame, formed in suitable manner to support the operating parts. B denotes the cam-shaft, arranged in upright position and rotative in bearings *b b* at the rear part of the frame. D denotes the drive-shaft, connected with said cam-shaft by bevel-gears C C, and provided with a pulley, D′, for the driving-belt, and with an automatic stop-clutch, D^2, of any suitable well-known construction, for clutching said pulley to the shaft D, under control of the tripping-lever D^3 and treadle-rod D^4, which rod, it will be understood, is to be connected with a suitable foot-treadle. These parts are so arranged that depression of the rod D^4 and lever D^3 trips the clutch D^2, and allows the pulley to rotate the shafts. Then when the treadle-rod D^4 is released the clutch automatically throws off and stops the machine at a given position, substantially as in the usual manner of working machines of this class.

E E′ E^2 indicate cross bars or shafts, that serve as fulcrums for the various levers, which are confined laterally on said bars by suitable collars or otherwise.

F indicates the punching-lever, carrying the punching-tool *f* at its forward end, and centrally fulcrumed upon the anvil-lever G by the stud *e*, while its rear end works in conjunction with the cam F′ on the upright shaft B, a suitable anti-friction roll or stud, f^2, being employed for engaging the groove of the cam. Said cam-groove is formed to give the lever an up-and-down action.

The anvil-lever G is hinged or fulcrumed at its rear end on a vertical stud or axis, G′, corresponding with or adjacent to the operating-shaft B, in a manner to permit lateral swinging action of the front end of said lever, together with the punch-lever supported thereon, and without interfering with the simultaneous upward and downward operation of said punch-lever by its cam F′. At its front end the lever G rests and slides upon the frame, as at *g*, thus giving a firm support for the anvil G^2, which is secured to the front end of said lever G. The two levers F and G cross each other in the manner illustrated in Fig. 2, and the work-supporting table H, which is fixed on the frame A, is arranged between their front ends, as indicated, a suitable slot being formed in the table for the accommodation of the punching and eyeleting tools.

G^3 indicates a laterally-swinging lever for effecting sidewise movement of the anvil and punch. Said lever G^3 is fulcrumed by an

adjustable stud, G^4, upon a slotted bracket or ear-piece, A′, fixed to the side frame A. Its front end is pivoted to a dependent lug, G^5, on the anvil-lever, and its rear end works in conjunction with the cam G^6 on shaft B. The lever G^3 is slotted and provided with a sliding fulcrum-block for the stud G^4. By changing the position of the stud backward or forward in the slot the lateral throw of the punch and anvil can be varied, and the feeding or spacing of the holes in the work regulated as desired.

I indicates the lower eyelet-setting tool, made in ordinary form, with a central pin to receive the eyelet, and mounted in a vertically-reciprocating rod, I′, that is supported in bearings a^2 on the front of the frame. Said rod and set are moved up and down by a lever, I^2, fulcrumed on bar E′, and operated by means of a crank, *d*, connected with shaft D and working in a curved slot in the end of said lever, as indicated by dotted lines, Fig. 2.

J indicates the eyelet-delivering chute, mounted upon an upright lever, J′, which lever is fulcrumed on the bar E^2, and is arranged to swing forward and back for the delivery of the eyelets onto the center pin of the setting-tool I as it rises and falls by the action of a stud or roll, I^3, which is fixed on lever I^2, and which works in an inclined slot, J^3, formed in the lever J′, as indicated in Figs. 2 and 3.

The hopper J^4 and means for distributing the eyelets into the chute J may be of ordinary construction.

The hopper and chute are connected with their support in a manner to be capable of sliding back and forward thereon, and are retained normally at forward position by a suitable spring, *s*, or equivalent means. A cut-off or stop device, having suitable means for operating it, is employed adjacent to the chute J, said device being arranged so that it can at any time be conveniently brought into position during the operation of the machine, for arresting the forward movement of the eyelet-chute, or preventing the end thereof from approaching the picker or eyelet-receiving set for the delivery of an eyelet thereto, thus allowing holes to be punched without setting eyelets therein. This stop device preferably consists of a reciprocating pin, K, that can be raised in front of the chute, or to engage a lug, *k*, on the chute J, as indicated in Figs. 1ª and 2, and thus hold the chute from advancing to the position of the set. The elevation of said pin is in the present instance effected by a lever, K′, and rod K^2, designed to be attached to a suitable treadle. (Not shown.) The pin is depressed by a spring, K^3.

L indicates the upper eyelet set or tool, which is fixed in the head of a lever, L′, that has its fulcrum on bar E, and its rear end working in conjunction with cam L^2 on shaft B, the lever being provided with a suitable stud or anti-friction roll for following the groove of the cam, whereby the lever L′ is worked up and down. A set-screw and check-nut are provided for adjusting the eyelet-set for different thicknesses of stock, as at *l*.

M indicates the presser-foot for holding the work on the table. Said foot is attached to the end of a lever, M′, fulcrumed on bar E, and operated by cam M^2 for lifting said foot automatically at the time of feeding forward the work. The rear end of said lever is extended back past the cam, and is connected by rod N with a suitable treadle, (not shown,) whereby the operator can lift the presser-foot for placing the work beneath it. A spring, *m*, connects the lever with a projecting portion, *a*, of the frame for giving the required pressure and raising the rear end of the end rod, N, when the treadle is released.

P indicates set-screws or adjusting devices for raising or lowering the shaft B and its cams L^2 F′, and thereby regulating the working of the upper punching and eyelet-setting tools. An adjustable guide, *h*, is arranged on the table H for gaging the distance at which the holes are formed from the edge of the work.

R indicates a brake in combination with a wheel or surface, R′, connected with the shaft B. Said brake may be omitted, if desired.

The several cams are formed and disposed in a manner to give the desired movement to the levers at the proper times in the order of their rotation, the operation of punching a hole, feeding forward the work, and delivering and setting an eyelet in said hole being accomplished at a single revolution of the shaft.

The operation is as follows: Assuming the pulley D′ to be running by the action of the driving-power, the operator, by depression of treadle-rod N, raises the foot M and places the work in position on the table H, and allows the presser to rest upon it, then depresses lever D^3, which permits clutch D^2 to take effect to cause the revolution of the shafts D and B, putting the cams and mechanism into action. The punch descends upon the anvil, forming a hole through the work. The presser is lifted, releasing the work, and the punch and anvil swing laterally, carrying the work forward the distance of the feed or spacing. The presser then descends and the punch is raised and with the anvil returns to its place. The eyelet-sets then close together, and the chute advances in time to deliver an eyelet upon the picker or receiving-pin as it moves upward, and retreats in season to allow the sets to force the eyelet into the hole and there upset or clinch it. The sets then return to place, and the clutch, having made its revolution, is tripped by its lug meeting the end of the lever, and is automatically thrown off and the machine stopped; or, if the lever D^3 is retained depressed, the machine continues to run, and the operations as above are indefinitely repeated.

I am aware that combined punching and eyeleting mechanism in which the work is advanced or fed forward by the punching devices has heretofore been devised, and I do

not, therefore, herein broadly claim mechanism having such capabilities, irrespective of the peculiar construction and manner of operation of the improved machine, as herein explained.

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

1. The combination, substantially as hereinbefore described, of the lower setting-tool, I, its supporting-rod I′, the lever I^2, the crank *d*, and shaft D, for the purposes set forth.

2. The combination, substantially as hereinbefore described, of the shaft D, having crank *d*, the cam-shaft B, the gears C, the lower set, I, upper set, L, levers I^2 and L′, and cam L^2, for the purposes set forth.

3. The combination, substantially as hereinbefore described, of the anvil-lever G, vertically pivoted or hinged at its rear end, the punching-lever F, fulcrumed upon said anvil-lever, as at *e*, the cam F′, and means for imparting lateral movement to said anvil-lever, for the purposes set forth.

4. The combination, substantially as hereinbefore described, of the anvil-lever G, vertically pivoted or hinged at its rear end, the punching-lever F, fulcrumed upon the side of said anvil-lever, the feed-lever G^3, connected with said anvil-lever at its front end, the adjustable fulcrum G^4, the cam-shaft B, and cams F′ and G^6, for the purposes set forth.

5. The combination, substantially as hereinbefore described, of the anvil-lever hinged at its rear end for laterally-swinging action, and supported on the frame, as at *g*, the punching-lever F, fulcrumed upon the side thereof, as at *e*, the feed-lever G^3, adjustable fulcrum G^4, eyelet-setting tools I and L, their operating-levers I^2 and L′, shafts B and D, crank *d*, and cams G^6, F′, and L^2, for the purposes set forth.

6. The combination, with a non-adjustable swinging punching device adapted for feeding forward the work in a combined punching and eyeleting machine, of an auxiliary actuating-lever having a longitudinally-adjustable fulcrum-bearing and an adjustable fulcrum-stud supported in connection with the frame, whereby the distance of throw can be varied without derangement of the punching mechanism, as set forth.

7. The combination, with punching and eyelet-setting mechanisms, of the eyelet-delivering chute mounted to have movement on its support, a spring, substantially as described, for maintaining its normal position, and a stop device adapted to intercept said chute in its forward movement and prevent conjunction thereof with the receiving and setting devices, substantially as set forth.

8. The combination, substantially as described, of the eyelet chute and hopper J J^4, their supporting-arm J′, and the spring *s*, said chute being movably attached on its support and retained at normal position by said spring, for the purpose set forth.

9. The combination, substantially as described, of the upright supporting-arm J′, the chute J, movably supported on said arm and provided with lug *k*, the spring *s*, the stop K, adapted for engagement with said lug, and stop-operating connections K′ K^2, for the purposes set forth.

10. The combination, substantially as hereinbefore described, of the eyelet reservoir or chute J, its supporting-lever J′, fulcrumed at E^2, and provided with a cam-slot, J^3, the eyelet-set lever I^2, provided with stud or roll I^3, engaging said slot, and means for vibrating said lever I^2, for the purpose set forth.

11. The combination, substantially as hereinbefore described, of the eyelet-chute J, its supporting-arm J′, the eyelet-set I, its reciprocating rod I′, lever I^2, and crank *d* and shaft D, the set L, lever L′, cam-shaft B, and cam L^2, for the purposes set forth.

12. The combination, substantially as described, of the vertical shaft B, the cam M^2, the lever M′, presser-foot M, treadle-rod N, and spring *m*, and punching mechanism having lateral movement for advancing the work, as set forth.

13. In combination, substantially as hereinbefore described, the upright shaft B, having a series of cams, G^6, F′, L^2, and M^2, disposed thereon as shown, the operating-shaft D, the punching and anvil mechanism operated by levers F and G, and feed-lever G^3, the eyelet-sets I L, operated by levers I^2 L′, the presser-foot M, its lever M′, the treadle-rod N, and spring *m*, for the purposes set forth.

14. The combination, substantially as described, with the levers L′ and F, respectively fulcrumed on bar E and stud *e*, for working the upper part of the punching and eyelet-setting devices, and the vertical cam-shaft carrying cams that actuate said levers, of adjusting devices, as screws P, adapted for moving said cam-shaft, with its cams, up or down, thereby regulating the working-adjustment of the punch and sets, as set forth.

Witness my hand this 6th day of May, A. D. 1886.

CHARLES A. CORMAN.

Witnesses:
CHAS. H. BURLEIGH,
S. R. BARTON.