(No Model.) 3 Sheets—Sheet 1.

E. L. HOWE.

MACHINE FOR PUTTING TOGETHER CHAIN LINKS.

No. 317,790. Patented May 12, 1885.

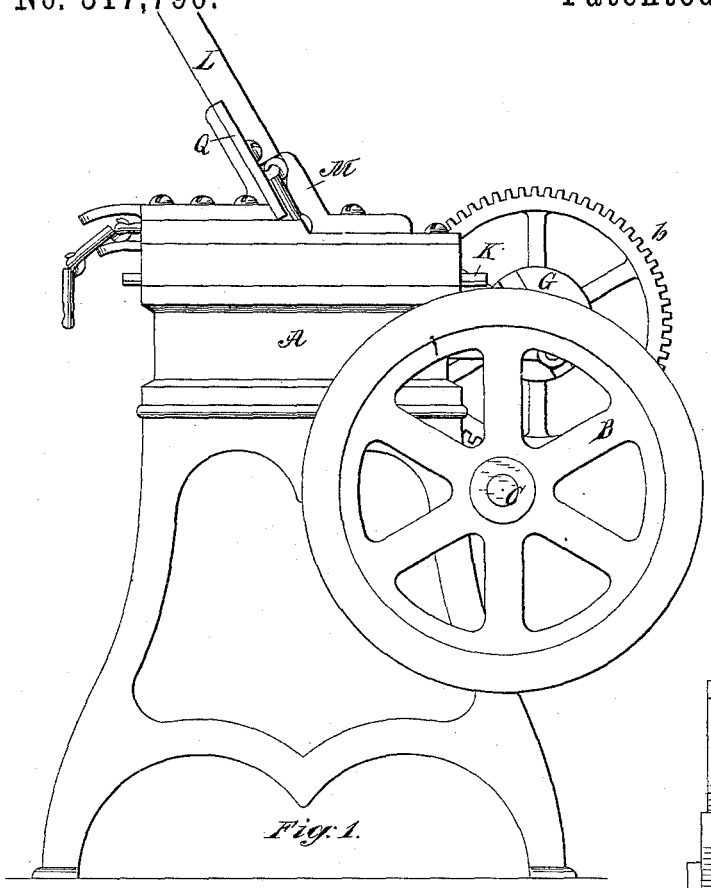

Fig. 1.

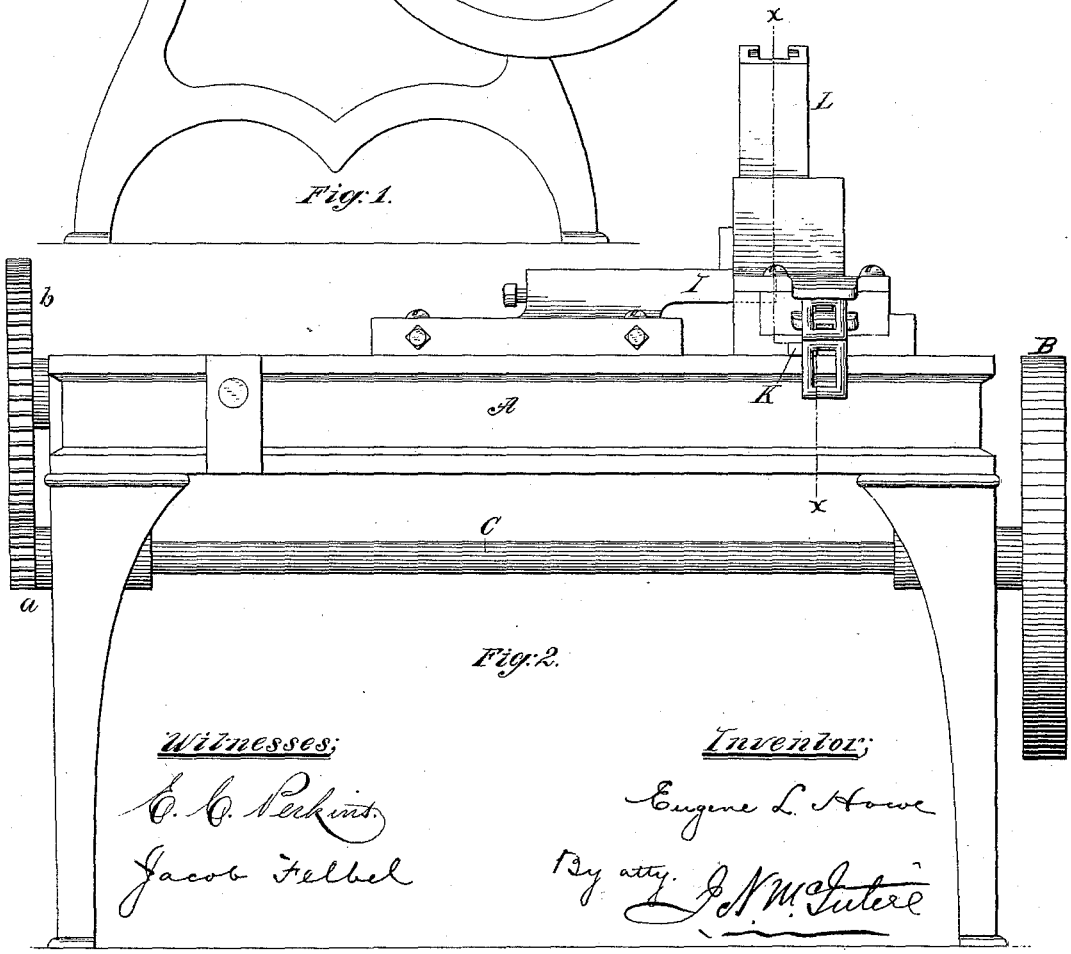

Fig. 2.

Witnesses:
C. C. Perkins
Jacob Felbel

Inventor:
Eugene L. Howe
By atty. D. N. McIntire

(No Model.) 3 Sheets—Sheet 2.

E. L. HOWE.

MACHINE FOR PUTTING TOGETHER CHAIN LINKS.

No. 317,790. Patented May 12, 1885.

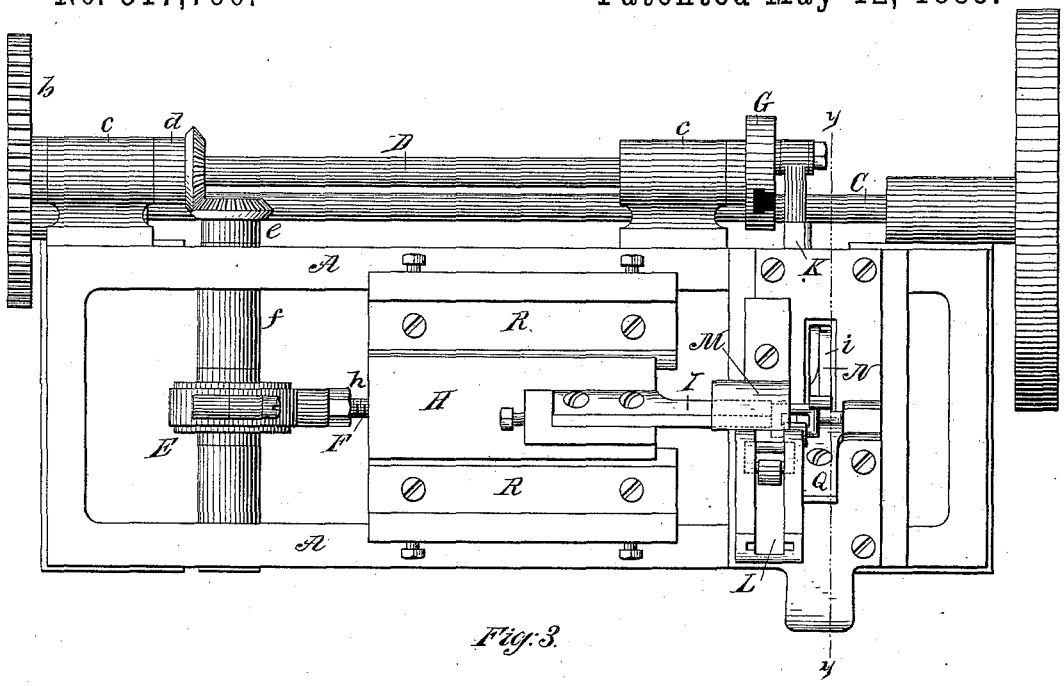

Fig. 3.

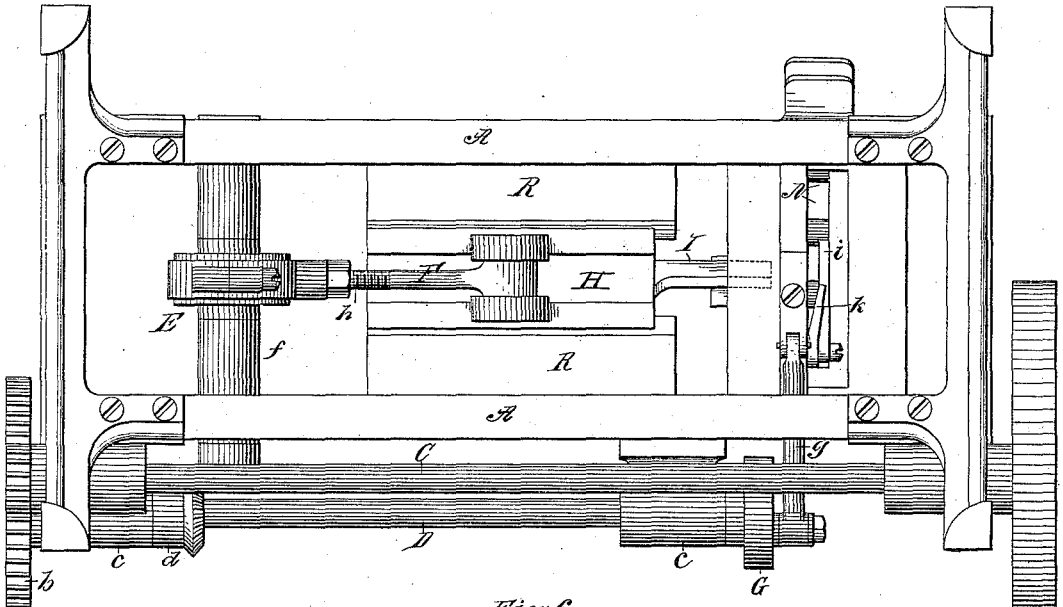

Fig. 6.

Witnesses;
E. C. Perkins.
Jacob Felbel

Inventor;
Eugene L. Howe
By atty. J. N. McGuire

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 3 Sheets—Sheet 3.

E. L. HOWE.

MACHINE FOR PUTTING TOGETHER CHAIN LINKS.

No. 317,790. Patented May 12, 1885.

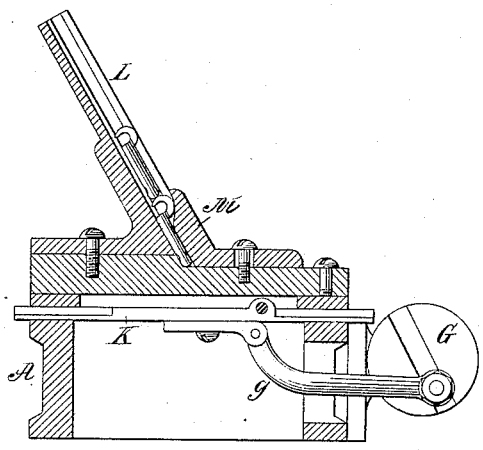

Fig. 4.

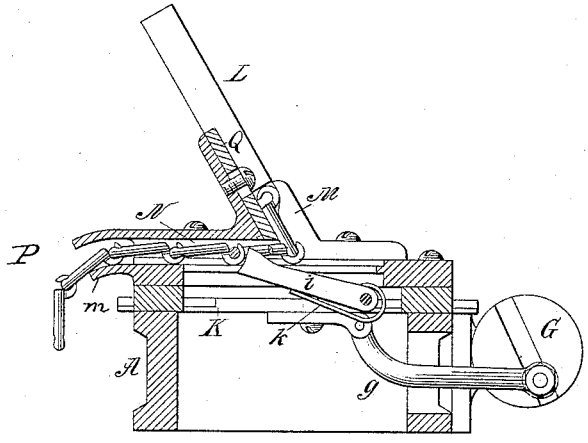

Fig. 5.

Witnesses;
C. C. Perkins.
Jacob Felbel

Inventor;
Eugene L. Howe
By atty.
J. N. W. Littlee

UNITED STATES PATENT OFFICE.

EUGENE L. HOWE, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE EWART MANUFACTURING COMPANY, OF SAME PLACE.

MACHINE FOR PUTTING TOGETHER CHAIN-LINKS.

SPECIFICATION forming part of Letters Patent No. 317,790, dated May 12, 1885.

Application filed October 6, 1884. (No model.)

To all whom it may concern:

Be it known that I, EUGENE L. HOWE, of Chicago, in the county of Cook and State of Illinois, have invented a Machine for Putting Together Chain-Links; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this application.

My invention relates to a new and useful improvement for putting together into lengths of chain the separate links of what is known in the market as the "Ewart Detachable Drive-Chain."

Previous to my invention it has been customary in making up the Ewart detachable drive-chain to put the separate links (which are made of malleable iron) together by hand, this method of putting together the links of all the chain ready for the market necessarily involving considerable expense to the manufacturer in the hand-labor necessary for this operation.

I propose in my invention to provide for use a machine run by power, and by means of which, with simply an attendant to feed the separate chain-links into a supply chute or feeder, a much greater quantity of chain can be put together in the same time, and consequently at much less expense, than by the heretofore-practiced method of assembling the links by hand.

To this main end and object my invention consists in a machine embracing the novel devices and combinations of devices which will be hereinafter more fully described, and which will be particularly pointed out in the claims of this specification.

To enable those skilled in the art to which my invention relates to make and use my new machine for assembling chain-links in the manufacture of detachable drive-chains, I will now proceed to more fully describe my invention, referring by letters of reference to the accompanying drawings, which form part of this specification, and in which—

Figure 1 is an end view of my machine. Fig. 2 is a back view of the same. Fig. 3 is a top view. Fig. 4 is a vertical cross-section at the line *x x* of Fig. 2. Fig. 5 is a vertical cross-section at the line *y y*, Fig. 3. Fig. 6 is a bottom view.

In the several figures the same part will be found designated by the same letter of reference.

In the drawings, A is the main frame of the machine, which, as will be seen, is quite similar in design to the frame of an ordinary hand or engine lathe.

B is the main pulley or drive-wheel, to which the motive power is applied through the medium of an ordinary belt, said main pulley or drive-wheel being keyed fast on one end of the main shaft C, that is mounted in suitable bearings at the front side of the main frame, and which carries at its opposite end a spur-pinion, *a*, which engages with and drives a spur-gear, *b*, on the end of a counter-shaft, D. This counter-shaft is mounted, as shown, at the front side of the main frame and nearest its top in metallic stands *c c*, and has keyed fast to it a bevel-pinion, *d*, which engages with and drives a similar pinion, *e*, that is mounted on the front end of a cross-shaft, *f*, that turns in suitable bearings in the main frame A, near one end of the latter. Said counter-shaft D also carries at that end opposite to where it carries the spur-gear *b* a face-plate or crank-head, G, from which extends crosswise of the main frame a pitman, *g*, for driving a reciprocatory carriage or bar, K, which is provided with a pivoted pawl or arm, *i*, (which is kept up to its work by a spring, *k*,) that acts as a feeder or pusher, in a manner to be presently described, for feeding along and pushing out of the machine the completed chain, which latter is fed along within a sort of horizontal channel or guideway, N, from whence it passes in a finished condition out of the machine.

L is a feed-chute or obliquely-arranged feeder, into the upper end of which the separate links are successively placed by the attendant, and the lower end of which is so arranged relatively to the guideway N that the lowermost link in said chute will always be in the right position to be pushed sidewise into engagement with the front coupler-hook end of

the link at the tail end of the series of assembled links—that is, in the guideway N.

M is an adjustable inclined holder-plate, which, as seen, is arranged near the lower end of the chute L in such manner as to effect the retention in place of the lowermost link of the series fed into said chute, and to also act as a sort of guide to said lowermost link while it is being pushed edgewise into engagement with the link last fed into the guideway N.

Immediately over the rearmost open portion of said guideway N is arranged obliquely an adjustable plate, Q, the lower end of which operates to turn down into the guideway N each last-engaged link pushed from the lower end of the chute L. At the rearmost end of the guideway N there projects outwardly a sort of curved rest or lip-like device, *m*, over which the finished chain rides in its discharge from the machine.

E is an eccentric mounted fast on the cross-shaft *f*, and which operates the eccentric-rod F, which drives back and forth a reciprocatory carriage, H, that is mounted to slide between suitable ways, R R, that are adjustably secured, as shown, to the side pieces of the main frame A of the machine. This carriage has mounted upon it (so that it can be adjusted longitudinally) a pusher-bar, I, the outer end of which is arranged and adapted to come into contact with and push along successively and sidewise the lowermost links fed into the chute L, and to push each of said links in the proper manner and to the proper extent to effect engagement between the plain end bar of the same and the coupler-hook of the link last fed into the guideway N.

The throw of the carriage H, and consequently the stroke of the pusher I, remains always the same; but by means of the screw adjustment at *h* in the eccentric-rod F the path of motion or the locality of the stroke at the pusher I may be varied, for the purpose, as will be presently explained, of adjusting the machine to operate with links of somewhat different widths. The throw or stroke of the link-feeder *i* may also, for the same purpose, be varied by changing the throw or stroke of the pitman *g* where its wrist-pin and shoe-piece or jamb-collar are secured to the face-plate or crank-plate G.

In view of what has already been described, the following explanation, taken in connection with the drawings, will serve to explain the operation of my chain-link-assembling machine.

Supposing the machine to be properly adjusted and in working order, an attendant supplies the feed-chute L with the separate links, being careful to place each one in with the plain end bar lowermost, and with the back of the coupler-hook toward the front or open side of the chute, as illustrated in the drawings. At each revolution of the cross-shaft *f* the pusher I is caused to make one forward and one back stroke, and at each forward stroke said pusher forces along edgewise the lowermost link fed into the chute L to the proper point to effect a complete engagement of the plain end bar of said lowermost link with the open coupler-hook of the link last supplied to the guideway N, and at each back-stroke of said pusher I the next link in the chute L descends by gravity to take the place of the link which was just previously pushed away. While the pusher I is making its back-stroke or return movement the pitman *g*, actuated by the cross-head or crank-plate G, causes the link-feeder or spring-pawl *i* to make a stroke or movement, (crosswise of the main frame of the machine and backwardly,) which movement or stroke of said device *i* operates to push from beneath the series of united links that lie in the guideway N to an extent equal to the length of one link, and by this positive or enforced movement of these united links the link which was last put into engagement by the action of the pusher I, and which was left by it resting in an upwardly-projecting and oblique position against the outer surface of the plate Q, is turned over and forced downwardly into a horizontal position within the guideway N by being drawn along beneath the lower end of said plate Q, the link-feeder or pawl *i* engaging always with and pushing against the link previously drawn down into the said guideway N. In this manner, so long as the chute L is kept supplied with the separate links properly placed therein, the continuous running of the machine operates to intermittently push the lowermost link of the series in the chute into engagement with the forward link of the series of engaged links in the guideway N, and thus the links are rapidly and successively assembled or put together, and the finished chain of coupled links passes out at the exit or discharge point P of the machine. It is necessary to have the plate M made adjustable, so that links of slightly-different thicknesses may be properly held in place at the lower end of the chute, and may be properly guided while being pushed therefrom into a coupled condition, and it is also necessary, in order to adjust the machine to work with links of somewhat different widths, that the feed-chute L should be capable of adjustment laterally, and for this purpose the covering-plate or top Q of the guideway N, to which said chute is secured, is made adjustable laterally. By a slight up and down adjustment of the obliquely-arranged plate Q the lower end of the latter may be set at pleasure to work with perfection in operating upon links of slightly-different thicknesses.

Of course many modifications in the construction of my machine may be made without changing its principle of construction or mode of operation, and many of the details of construction may be changed without departing from the spirit of my invention, the main feature and advantage of which rests in a machine of a construction such that by the combined offices of an inclined chute containing a

column of separate links, a pusher device to feed the lowermost link sidewise from beneath said chute, a suitable guideway to receive and hold in horizontal position the link into which the last-mentioned link is to be coupled, and means for positively feeding the coupled links intermittently and to the proper extent to bring the coupler-hook of the last link of the series always into position for the engagement sidewise therewith of the plain end bar of the link fed from the lower end of the feed-chute the separate links will be perfectly and rapidly put together automatically, as hereinbefore explained.

Having now sufficiently explained the nature of my invention and described the construction and operation of my machine to enable those skilled in the art to make and use the latter, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with a chute or guide adapted to receive and contain the links placed therein, and a pusher device for periodically feeding sidewise therefrom the lowermost link, a guideway or receptacle for holding in proper relative position the link with which the link pushed from the supply-column or feed-chute is to be engaged, substantially as set forth.

2. In combination with the guideway for containing two or more assembled links, an inclined chute or feeder, and means for pushing or feeding from the latter the links placed therein, a positively-moved link-feeder, *i*, arranged and operating to periodically move the assembled links to the proper extent to bring the last one of the series into proper relationship with the link to be next engaged with it, substantially as set forth.

3. In combination with a suitable guideway for the assembled links, and means for pushing them forward within said guideway, an obliquely-arranged plate or device, Q, arranged and operating to force over and downwardly into said guideway the link last assembled and left projecting upwardly from the coupler-hook of the link with which it was forced into engagement, substantially as hereinbefore set forth.

4. In combination with the obliquely-arranged feed-chute L and the pusher I, an adjustable retaining and guide plate or device, M, arranged and operating in the manner and for the purposes explained.

In witness whereof I have hereunto set my hand this 16th day of September, 1884.

EUGENE L. HOWE.

Witnesses:
GLENN P. HOWE,
JOHN H. NICKELSON.