

(No Model.)

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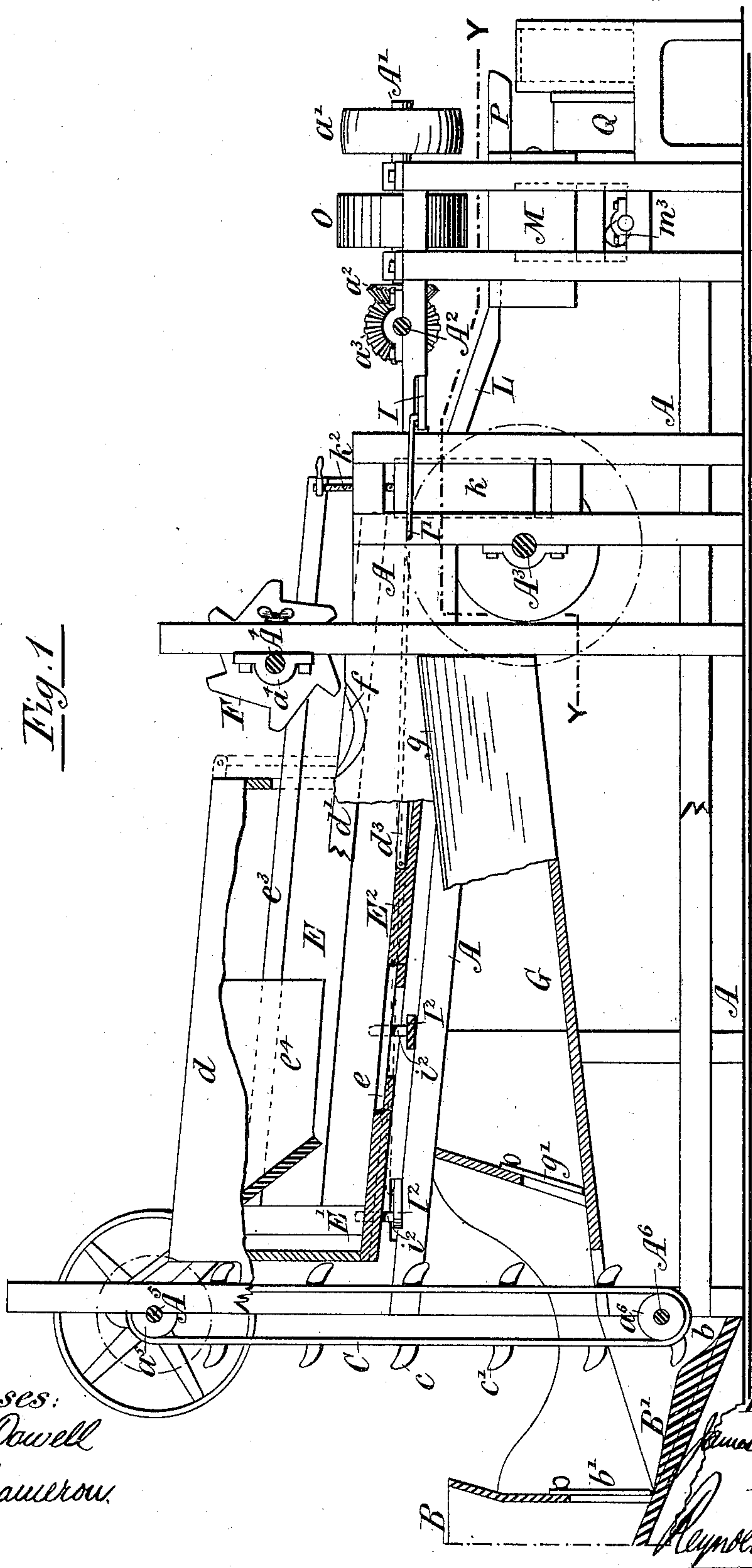
J. D. STORIE.

MACHINE FOR SORTING AND FINISHING CHAIN LINKS.

No. 369,620.

Patented Sept. 6, 1887.

Fig. 1



Witnesses:

C. M. Dowell

A. R. Cameron

Inventor

James Douglas Storie

Per Attys:

Reynolds & Kellum

(No Model.)

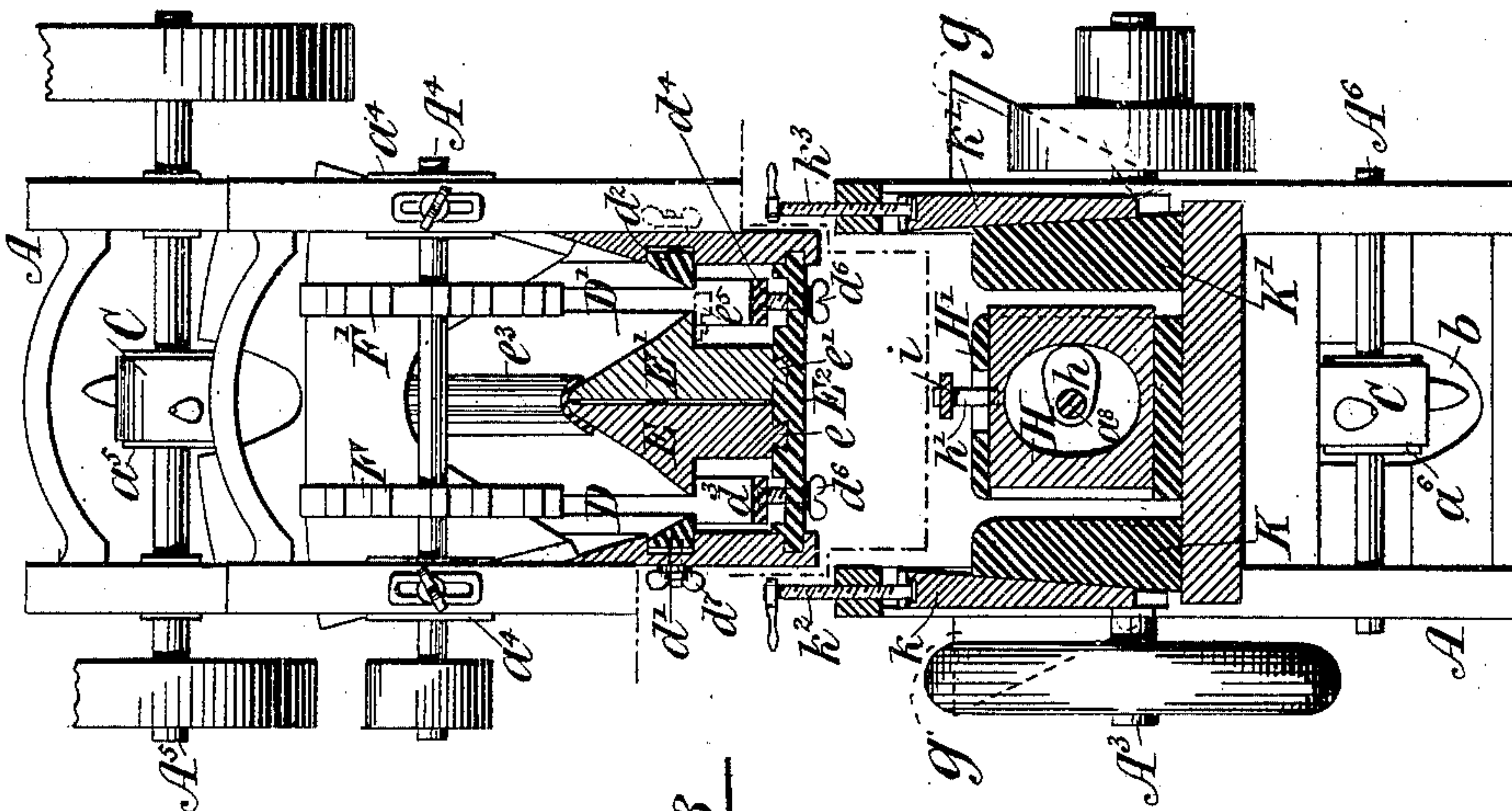
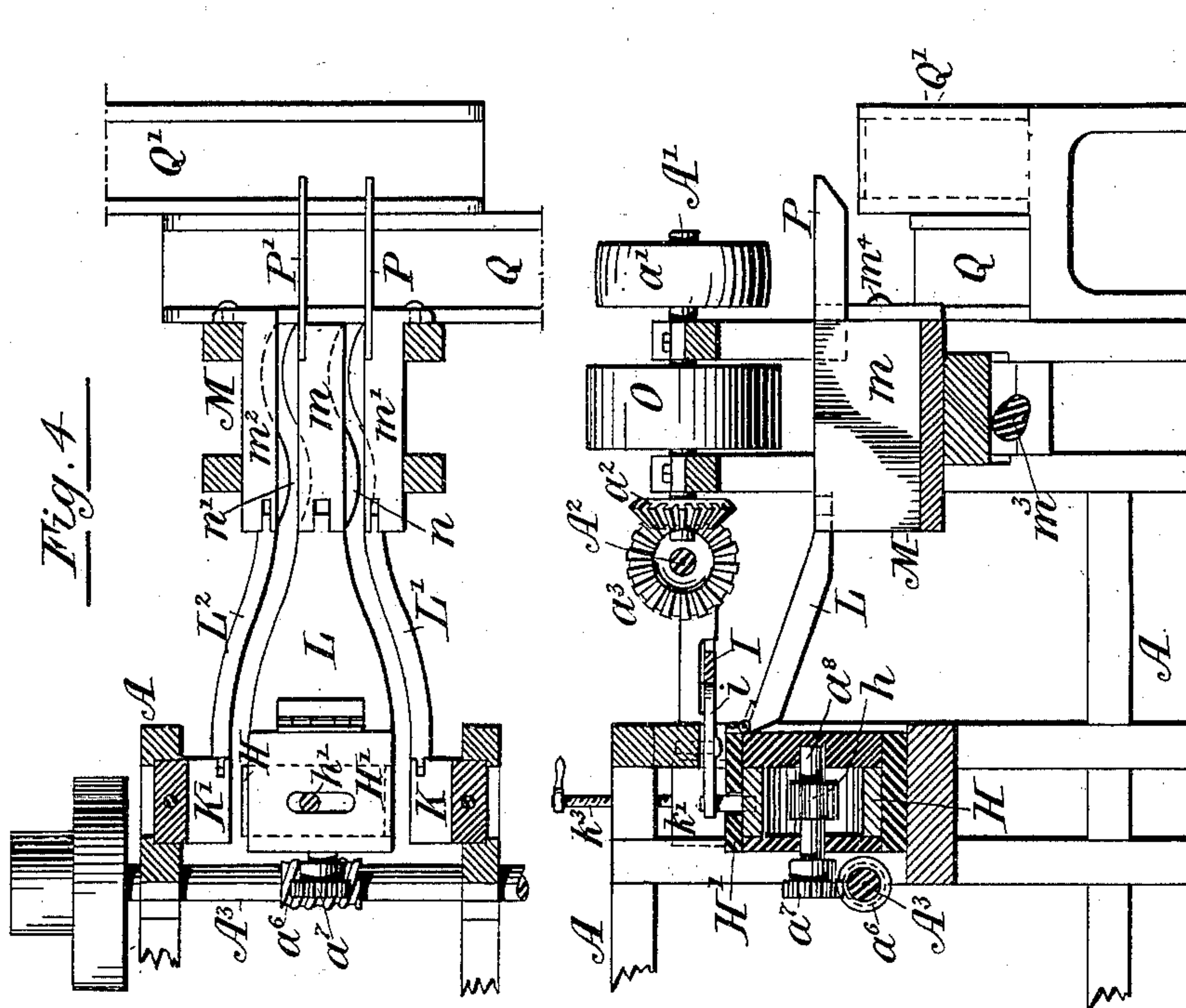
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Witnesses:

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Fig. 3

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(No Model.)

4 Sheets—Sheet 4.

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Fig. 9

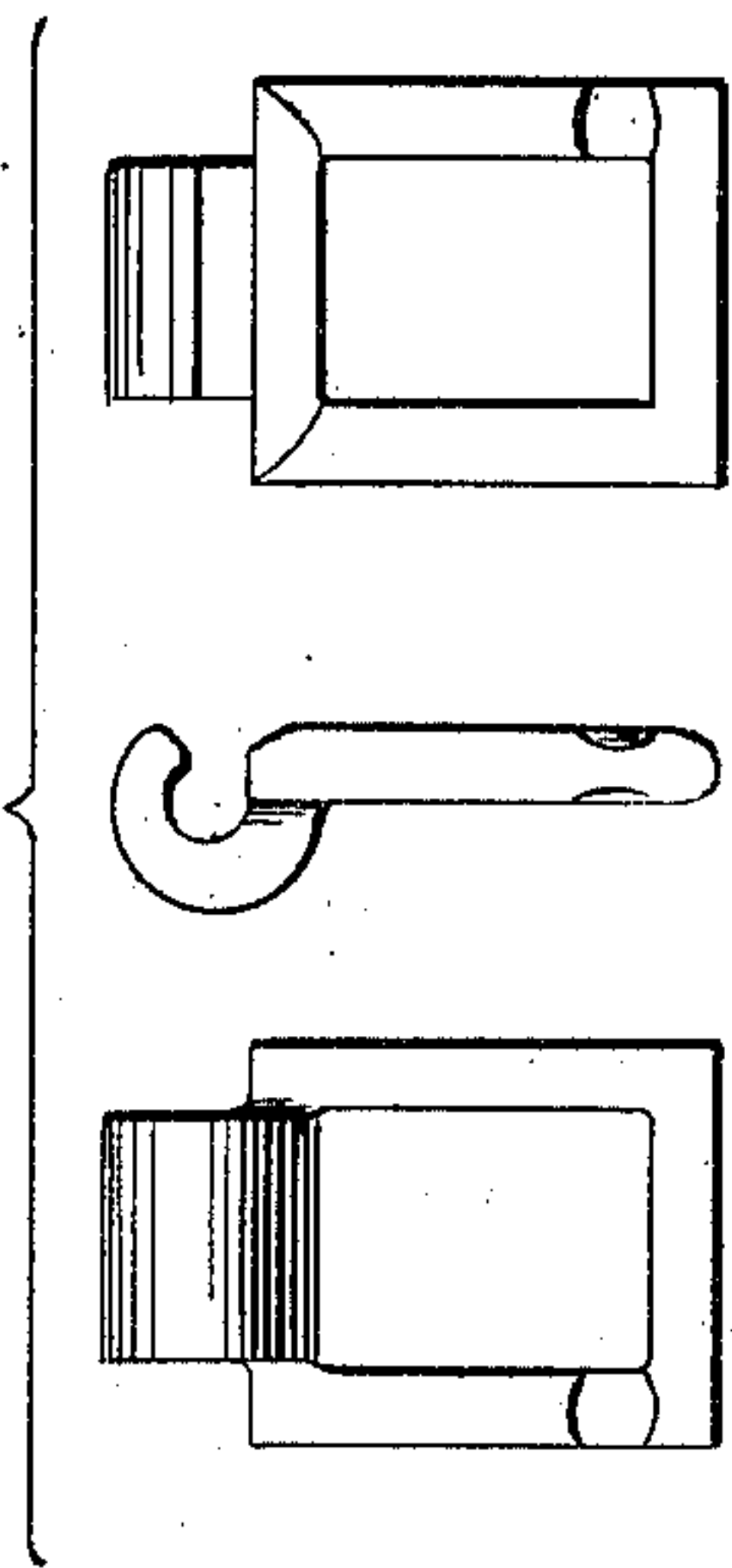


Fig. 8

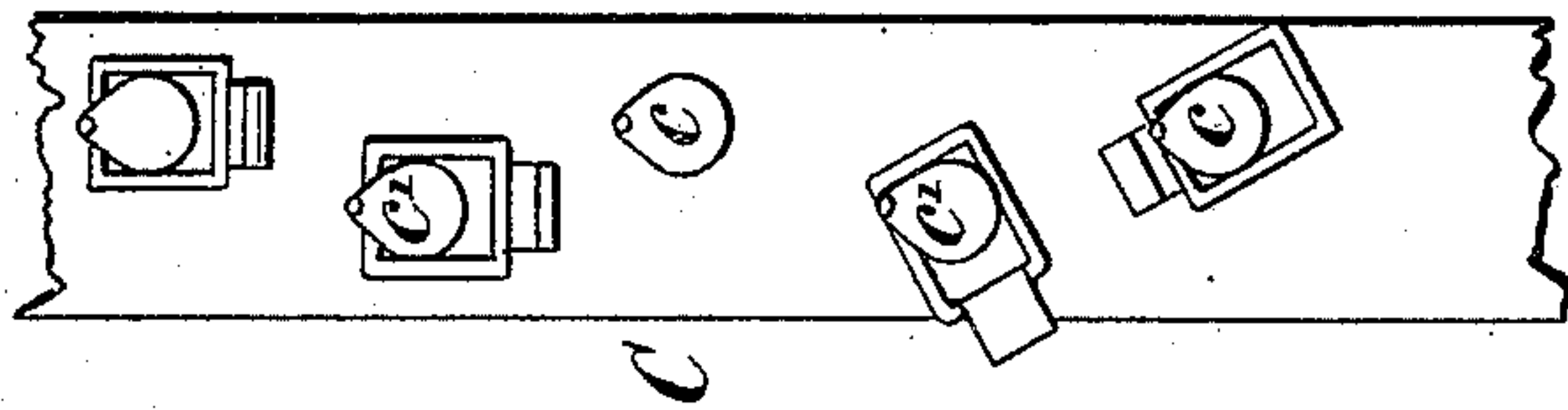


Fig. 6

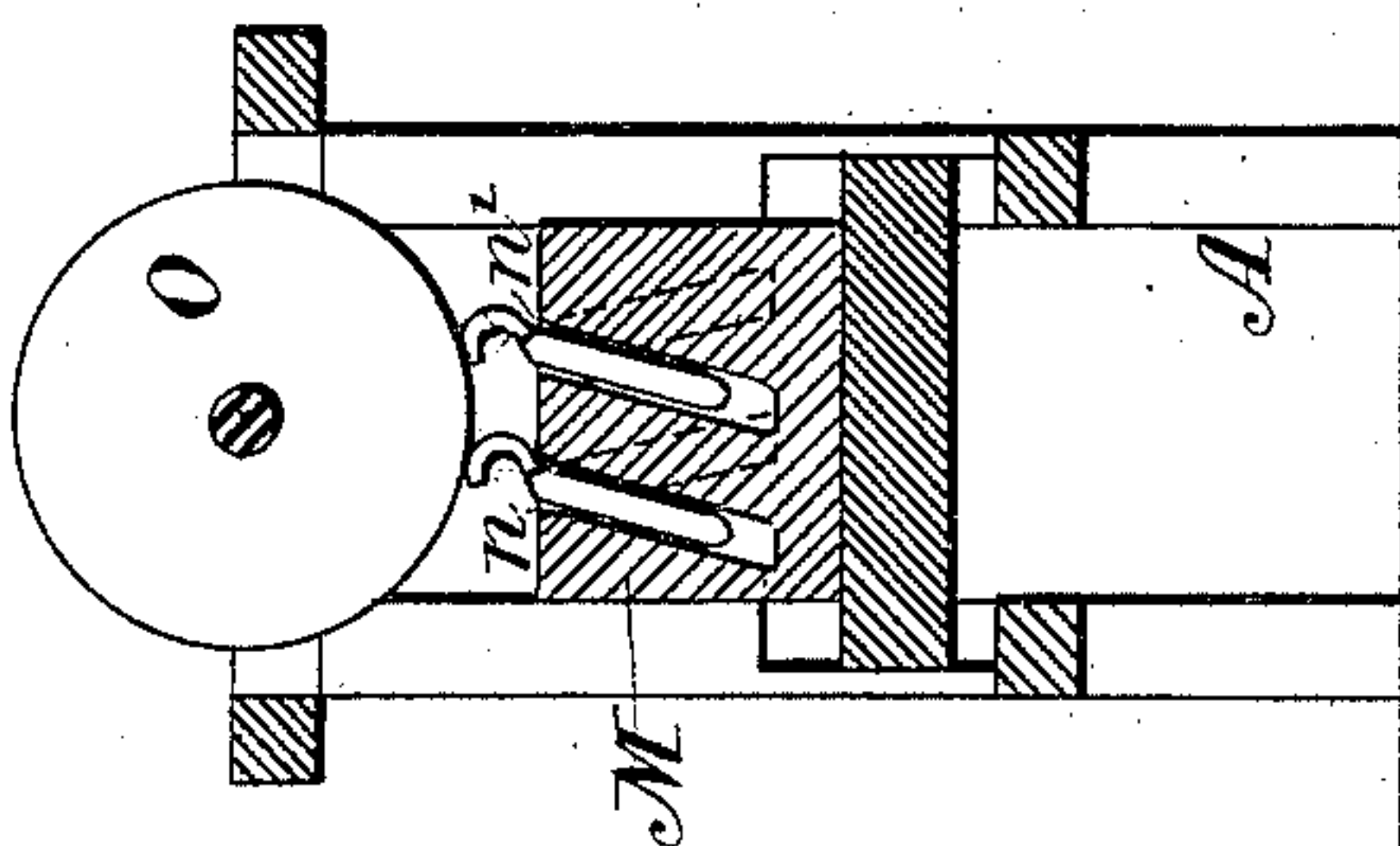
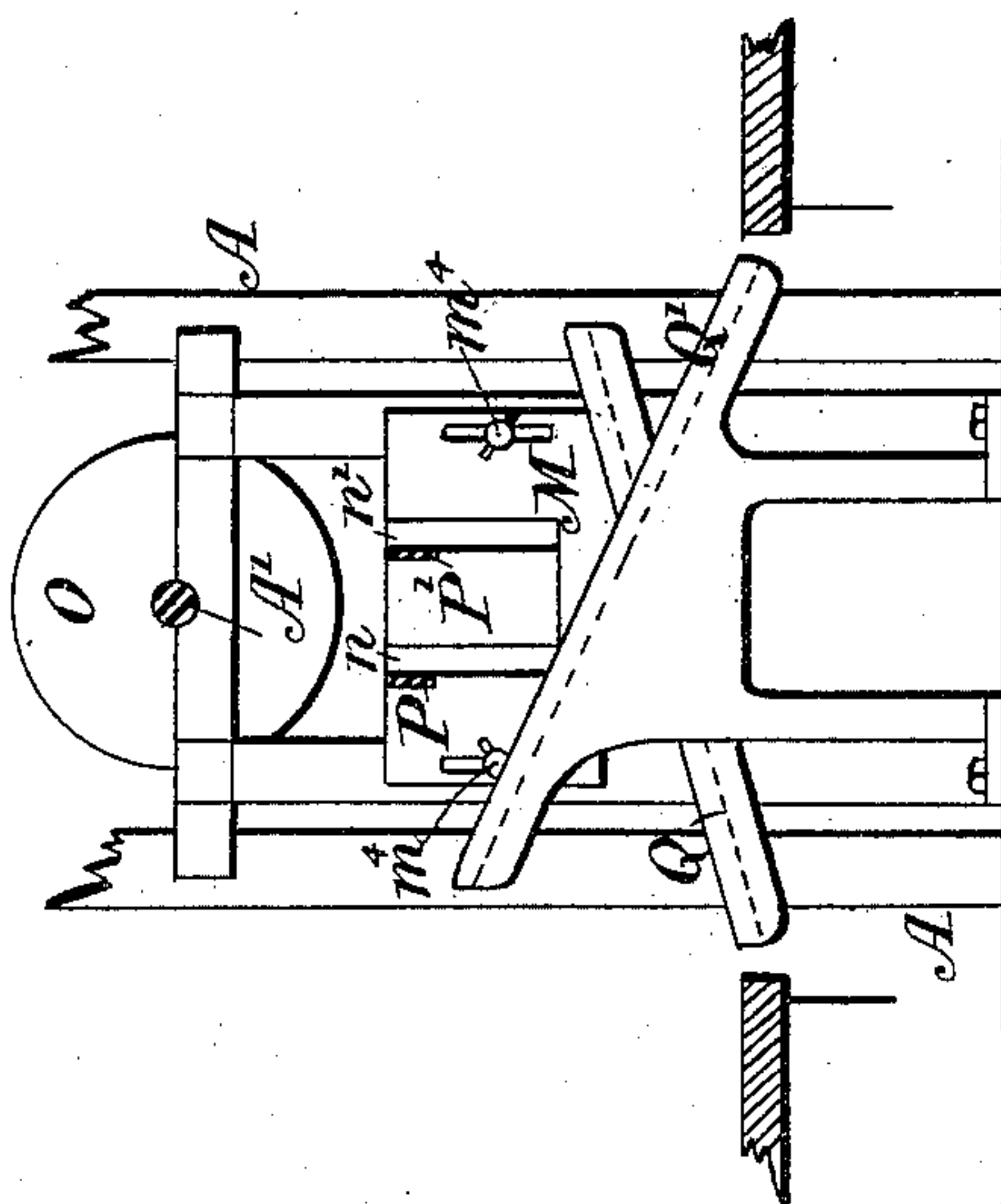


Fig. 7



Witnesses:

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A. R. Cameron.

Inventor:

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UNITED STATES PATENT OFFICE.

JAMES DOUGLAS STORIE, OF OSHAWA, ONTARIO, CANADA.

MACHINE FOR SORTING AND FINISHING CHAIN-LINKS.

SPECIFICATION forming part of Letters Patent No. 369,620, dated September 6, 1887.

Application filed January 10, 1887. Serial No. 223,975. (No model.)

To all whom it may concern:

Be it known that I, JAMES DOUGLAS STORIE, of the town of Oshawa, in the county of Ontario and Province of Ontario, in the Dominion of Canada, have invented a certain new and useful Improved Machine for Sorting and Finishing Chain-Links; and I do hereby declare that the following is a full, clear, and exact description of the same.

10 This invention has for its object to do away with all hand-labor in the sorting out of chain-links and the grinding and finishing of same, having reference more especially to that class of links which are used in the formation of chain-bands—that is to say, those made of malleable cast-iron, and having a head or locking-knuckle formed on one end or side of the link. By my machine links of this class and of different sizes, if need be, are thrown when
20 in the rough state into a hopper, from whence they are elevated by a carrier and dropped into a trough, down which they travel with their heads or knuckles uppermost. This trough is adjusted so as to deliver only one
25 size of link at a time, all but the smallest size being knocked out by a picker and returned to the hopper. From the trough the links are led between a hammer and an anvil, or, in other words, subjected to a squeezing process, which straightens out the body of the link
30 without injuring the head. From this they pass in suitable ways to the grinding mechanism, this being arranged to grind and finish the heads or knuckles while the bodies of
35 links are held by a device which so slants or turns them as to insure the presentation of every part of the head-surface to the action of the grinders. The links are now finished, and I arrange to deliver them one after another
40 down an incline to the table, where each link will lie in the same direction and position with regard to its neighbor as will render the fitting together of the chain a very rapid and simple process.

45 I am not aware that the above work has been done by any machine or automatically-acting devices, and therefore feel myself only obliged to describe and illustrate one practical form of the invention, which will be sufficient to enable those skilled in the art to make
50 and practice the same.

For complete comprehension of my inven-

tion reference must be had to the accompanying drawings, forming part of this specification, in which similar letters of reference are
55 used to indicate like parts.

In said drawings, Figure 1 is a side elevation, partly in section, of a machine embodying my invention. Fig. 2 is a plan view of same. Fig. 3 is a transverse section on line
60 X X, Fig. 2. Fig. 4 is a sectional plan (on line y y, Fig. 1) of rear part of machine, and Fig. 5 a vertical sectional elevation showing the same mechanism. Fig. 6 is a cross-section showing links in position while being ground,
65 taken on line z z, Fig. 2. Fig. 7 is an end view illustrating my method of delivering the finished links; Fig. 8, details of my elevating-carrier with links upon the hooks; Fig. 9, details of a chain-link.

70 The machine thus illustrated and now about to be described in detail is what may be termed a "double" machine—that is to say, is so constructed that while raising the rough links from a common hopper it delivers them into
75 two troughs, each of which has a picker in connection therewith, and the hammer used for straightening the links is double-headed and reciprocating, so as to act at first upon a link from one trough and then upon another at the
80 opposite side. The grinding and delivery are also double operations, as will be seen.

A is any suitable framing, bearings in which are formed for a short horizontal shaft, A', carrying the driving-pulley a', (this being
85 preferably situated at the rear or delivery end of the machine,) and in said frame are also journaled transverse shafts A² A³ A⁴ A⁵ A⁶, with balance-wheels, band-pulleys, &c., to allow same to be properly driven. This ar-
90 rangement can be varied according to the ideas of the mechanic.

B is a hopper of suitable construction, into which the rough links are thrown; and B', an incline down which they slide to a well, b, b'
95 being a regulating-gate for the hopper. Just above this well is situated the shaft A⁶, and above this again the shaft A⁵ is located, these shafts being provided with central pulleys, (marked a⁶ a⁵, respectively,) over which travels
100 my elevator or carrier C. This is formed of an endless band or chain having hooks or curved fingers c c' arranged thereon in two lines, or "dodging" each other. These hooks or fin-

gers catch the links in the well *b* and carry same upward over the shaft A^5 , the series marked *c* dropping the links into a trough, *D*, and those indicated by *c'* feed the other trough, *D'*, both troughs being preferably arranged on an incline, as shown. These troughs are formed by a box, *d*, and sloping side walls, *d'* *d''*, the division between the two being made by two angular pieces, *E E'*, fitting closely together at the center and sliding one upon the other and in ways formed in a bed-plate, E^2 , feathers *e e'* being formed upon the bottom of the sliding pieces, and a cap or guide, e^3 , at the top angle being provided for this purpose.

e^4 is a sheet-metal cap for directing the links into the troughs.

$d^3 d^4$ are adjustable false bottoms hinged to the bed-plate E^2 and extending for some distance underneath the troughs *D D'*, $d^5 d^6$ being set-screws or other suitable means for adjusting these false bottoms vertically to accommodate different lengths of links.

The sloping side walls, *d' d''*, are adjustable, so as to vary the width of the bottom openings in the troughs, by means of set-screws $d^7 d^8$, or other like devices.

The transverse shaft A^4 is journaled in bearings $a^4 a^4$, which are themselves vertically adjustable in a post of the frame *A*, as seen in Figs. 1 and 3, upon this shaft being mounted two pickers, *F F'*, formed from plates with toothed or serrated edges or composed of separate arms or their equivalents, said pickers being located just above the centers of the troughs *D D'* and their points coming down so close to the heads of the links traveling therein as to strike and throw back all links of a larger size and series than those for which the false bottoms are set at that particular time, said false bottoms causing the heads of the odd or larger links to project upward so far as to be struck and raised by the revolving pickers. Links which may happen to lie cross-wise in the troughs or upon the heads of those which are traveling properly will be removed by the pickers in like manner. The links thus thrown back will fall through an opening, *f*, made in the side of the framing *A* and into the mouth *g* of an inclined chute, *G*, (arranged underneath the bed-plate E^2 ,) down which they slide to the feeding end of the machine, being there received into a separate hopper or retained in the chute by a gate, *g'*. The front board of the box *d* will ordinarily serve to prevent the pickers from throwing the odd links too far; but other means may be provided for the purpose, such as loosely-suspended boards or strips just clearing the heads of the links, as shown by dotted lines in Fig. 1.

The shaft A^3 has mounted centrally thereon a worm, a^6 , into which meshes a gear, a^7 , the shaft a^8 of the latter being journaled (at right angles to A^3) in a box, *H'*, carried by the framing, within which works a reciprocating double-ended hammer, *H*, its sidewise motion being imparted from the shaft A^3 , its worm-wheel, and the gear to a cam, *h*, mounted on

the gear-shaft a^8 , said cam working in an oval-shaped recess within the hammer *H*, as shown in Figs. 3 and 5. The box *H'* is slotted at its top, to allow a projecting pin, *h'*, connected to the hammer to move laterally therein, to this pin being attached the end of a short lever, *i*, pivoted to a cross-bar of the frame and terminating in a cross-head or transverse bar, *I*, to the outer ends of which are connected side rods, *I' I'*, running forward, one on each side of the machine, and connecting with the outer ends of levers $I^2 I^2$, pivoted to the frame *A*, and to pins $i^2 i^2$, fastened firmly to the under sides of the sliding trough-pieces *E E'*, the bed-plate E^2 being slotted to receive said pins, as seen in Fig. 1.

Thus the motion imparted, as described, to the hammer actuates these several levers and causes the central angular trough-pieces, *E E'*, to slide alternately one upon the other longitudinally, giving the necessary vibration and assisting the links to travel down along the troughs until they clear the same, when a blow from a small projection, e^5 , with which each slide is provided at its end, will force each link forward into the space between the face of the hammer *H* and an anvil. There are of course two anvils, one opposite each face of the hammer, and these anvils *K K'* are adjusted by means of wedges *k k'*, worked vertically (in ways in the framing behind said anvils) by set-screws $k^2 k^3$, or other equivalent means.

Hinged or otherwise fastened loosely to the box *H'* is a plate or skid, *L*, and on either side of this and a short distance therefrom, and secured to the anvils, are bars $L' L^2$, all slanting toward and forming loose or self-adjusting connection with the guide-blocks which contain the links while their heads are being ground. In a double machine of this class the guide-block *M* is in three divisions, *m m' m^2*, or has formed in it longitudinally two grooves, *n n'*, into which the several links, after leaving the anvils and passing through the ways formed between the skid *L* and bars $L' L^2$, are forced one after the other. Between the framing-bars, just above the guide-block *M*, and mounted upon the horizontal driving-shaft A' , I arrange a grindstone, *O*, preferably of sufficient width and diameter to act upon two links (one in each of the grooves of the guide-block) at the same time. As will be seen clearly in Fig. 2, this grindstone is mounted close to the driving-pulley a' , and upon the same shaft is a miter-gear, a^2 , which meshes with a similar gear, a^3 , on the shaft A^2 , and thus driving the machine.

The guide-block *M* is adjustable vertically by means of a cam, m^3 , acting upon its under side, or upon the platform upon which it rests; or other means may be employed for this purpose. The ends of the outer sections may also be slotted, as seen in the end view, Fig. 7, and work upon set-screws $m^4 m^4$, screwed into posts of the frame.

The grooves *n n'* in the guide-block are ap-

proximately straight at the top, but are preferably made serpentine, helicoidal, or curved, as indicated lower down, in order to slant the links as they pass through, and thus present the whole rounded surface of the head or knuckle to the action of the grindstone.

P P' are rails or rods, formed, preferably, of thin strips of metal, projecting outward from the end of the guide-block M, one being fastened to the central section, *m*, and the other to one of the outer sections flush with the upper edges of the sides of the grooves in such manner that the link-knuckle may hook over and slide along same. Immediately underneath these rails P P', I arrange chutes inclined in opposite directions and toward the table upon which the links are to be delivered.

In the drawings I show two chutes, Q Q', so that when the links come out of the guide-block with their knuckles so turned that they will hook onto the rails P P' they will all pass clear of the inner chute, Q, and drop onto the outer chute, Q', with their faces or hook portion downward—that is to say, with the head pointing toward the top of the chute and the link itself lying in the same plane as the face of such chute, (which is the proper way to deliver them in order to readily proceed with the formation of a chain;) but when those links which happen to be turned in the opposite direction pass out of the grooves in the guide-block they will not hook onto the rails, but fall immediately upon the chute Q, with their faces also downward, and in this manner both series will be delivered in the proper manner. It will of course be apparent that by reversing the position of the rails in respect to the grooves and the direction of the inclines the same result may be accomplished. The number of rails and inclines may also be increased, if so desired.

A particular feature in connection with the elevating of the rough links from the hopper by means of my carrier is that from the peculiar formation of the curved fingers or hooks *c c'*—viz., with a thick base next to the band and fine point projecting well upward, as shown—it matters not if the links when caught first hang crookedly upon said hooks, or with their heavy heads or knuckles upward, for they will naturally tend, under the vibration of the machine, to right themselves and hang with their heads downward before reaching the shaft A⁵, thus insuring their deposit into the troughs with their thin edges downward, (after the fashion of pins in a pin-finishing machine,) and enabling them to travel along supported by their heads on the side inclines.

From the above and from the drawings the operation of my machine will be so clearly understood that I need not further enlarge thereupon, but may say that the details of construction and arrangement of parts may be considerably varied by the simple use of mechanical skill without departing from the essential principles of my invention.

What I claim, and desire to secure by Letters Patent, is as follows:

1. In a machine for finishing chain-links, the combination, with an elevator and trough for conveying the links forward, of mechanism for squeezing and straightening the body of the link and grinding mechanism for finishing the head or knuckle, substantially as and for the purpose specified.

2. In a machine for finishing chain-links, the combination, with an elevator and trough for conveying the links forward, of mechanism for squeezing and straightening the body of the link, a guide-block having a helicoidal groove for the link to travel in, a grinder for finishing the head or knuckle, a rail extending outward from such guide-block, and chute for conveying the link to the table, all substantially as and for the purpose set forth.

3. In a machine for sorting and finishing chain-links, the combination, with a hopper for containing the rough links, an elevator for raising the same, and a trough fed by said elevator, of mechanism for throwing out misplaced links, devices for straightening the properly-placed links, and means for grinding and delivering same, all substantially in the manner described.

4. In a machine for sorting chain-links, the combination, with a hopper and trough, arranged substantially as described, of an endless traveling carrier having projecting hooks or fingers, for the purpose specified.

5. The combination, with the hopper and troughs D D', of the endless carrier C, having hooks or fingers *c c'* arranged thereon in two lines or dodging each other, substantially as and for the purpose specified.

6. The combination, with the frame A, of the troughs D D', made up of sloping side walls, *d' d''*, central angular pieces, E E', bed-plate E², and means for imparting an alternate backward and forward motion to said angular pieces, substantially as and for the purposes set forth.

7. The combination, with the troughs and with the bed-plate E², of the false or adjustable bottoms *d³ d⁴*, for the purpose described.

8. The combination, with the frame and a trough, of a picker for throwing out misplaced links, substantially in the manner set forth.

9. The combination, with the frame A, having the opening *f*, and with the troughs D D', of the shaft A and pickers F F', substantially as and for the purposes described.

10. The combination, with the frame A, troughs D D', and pickers F F', of the return-chute G, for the purpose described.

11. The combination, with the frame, of the laterally-moving double-faced hammer H, anvils K K', and means, substantially such as described, for operating said hammer, substantially as described.

12. The combination, with the frame A and sliding trough-pieces E E', of the laterally-moving double-faced hammer H, anvils K K',

shaft A^3 , having worm a^6 , gear a^7 , gear-shaft a^8 , cam h , working inside the hammer, and a system of levers connecting said hammer with said sliding trough-pieces, substantially as and for the purpose described.

13. The combination, with the frame and a grindstone, of the guide-block M, having ways or grooves, for the purpose described.

14. The combination, with the hammer and anvils and with connecting-ways $L L' L^2$, of the guide-block M, having grooves $n n'$, formed as described, and grindstone O, substantially as and for the purpose described.

15. The combination, with the guide-block

M, having the grooves, of the rails P P', projecting therefrom, and the chutes Q Q', substantially as and for the purpose specified.

16. The combination, in a chain-band-link-finishing machine, with the mechanism for holding and grinding the link, of an inclined chute and means for placing the link thereon with its face downward, substantially as and for the purpose described.

Toronto, 8th day of December, 1886.

JAMES DOUGLAS STORIE.

Witnesses:

R. A. KELLOND,

F. R. CAMERON.