

(No Model.)

J. KINDER.

MACHINE FOR MAKING ORNAMENTAL CHAINS.

No. 348,850.

Patented Sept. 7, 1886.

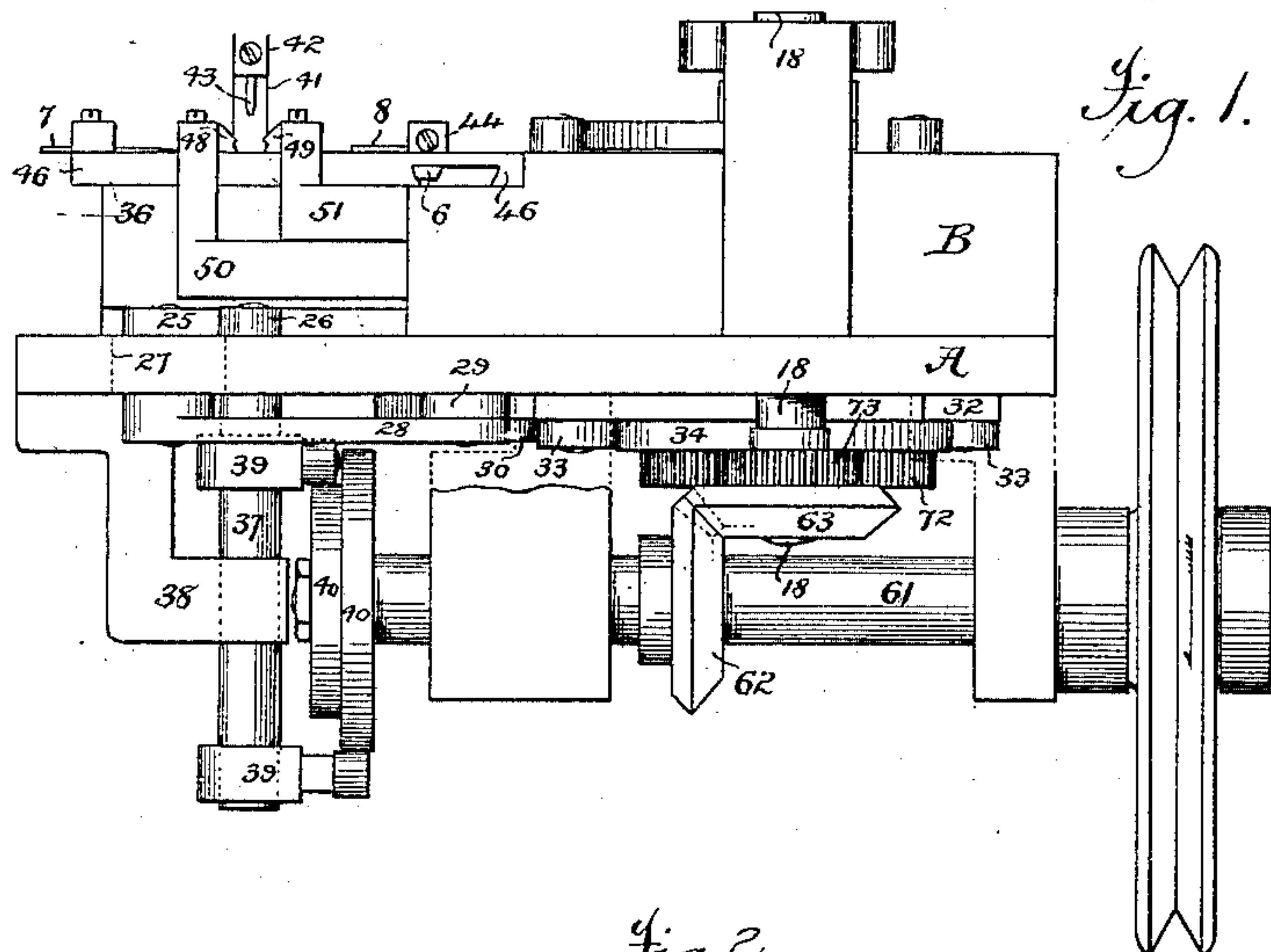


Fig. 2.

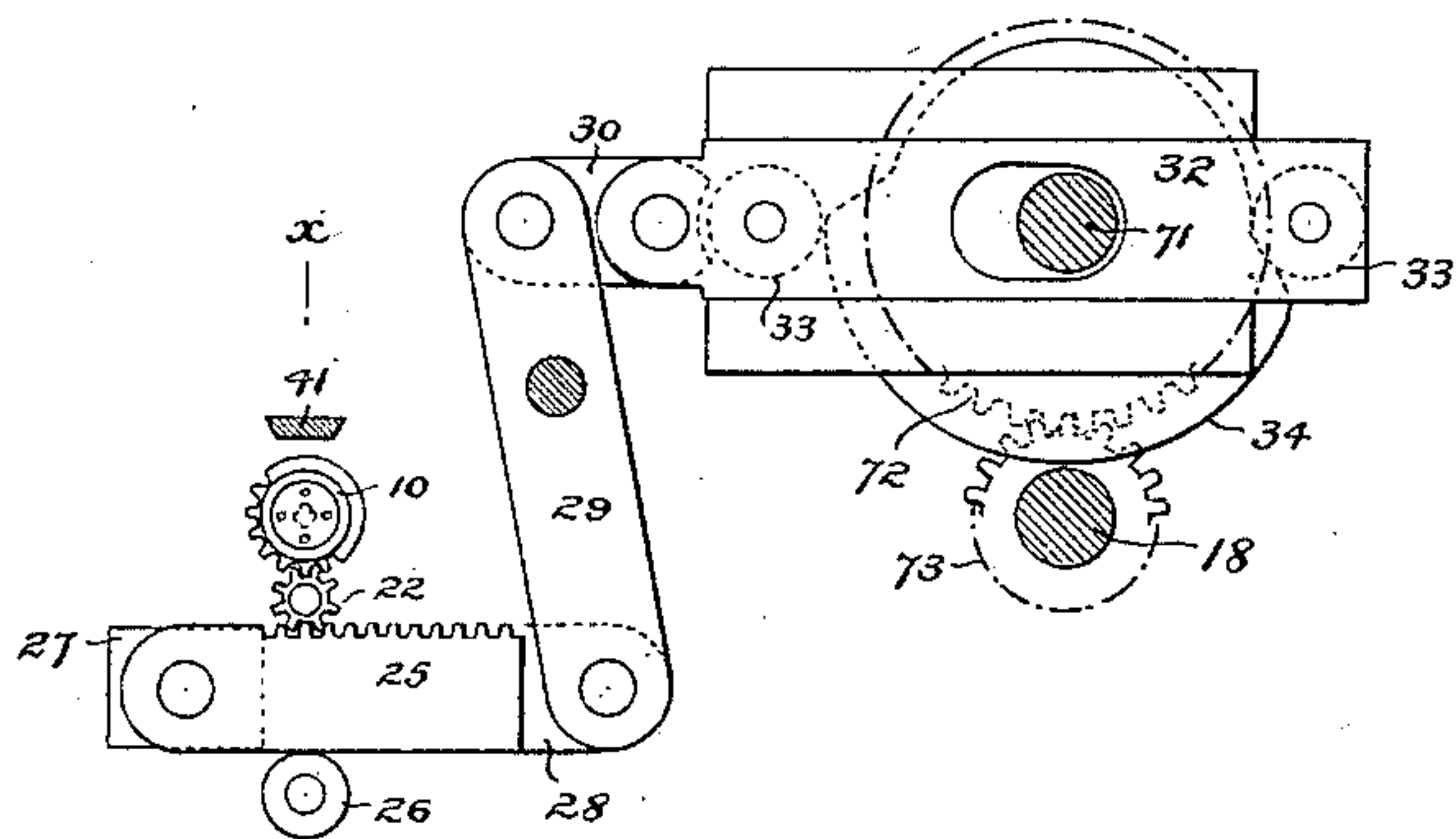


Fig. 3.

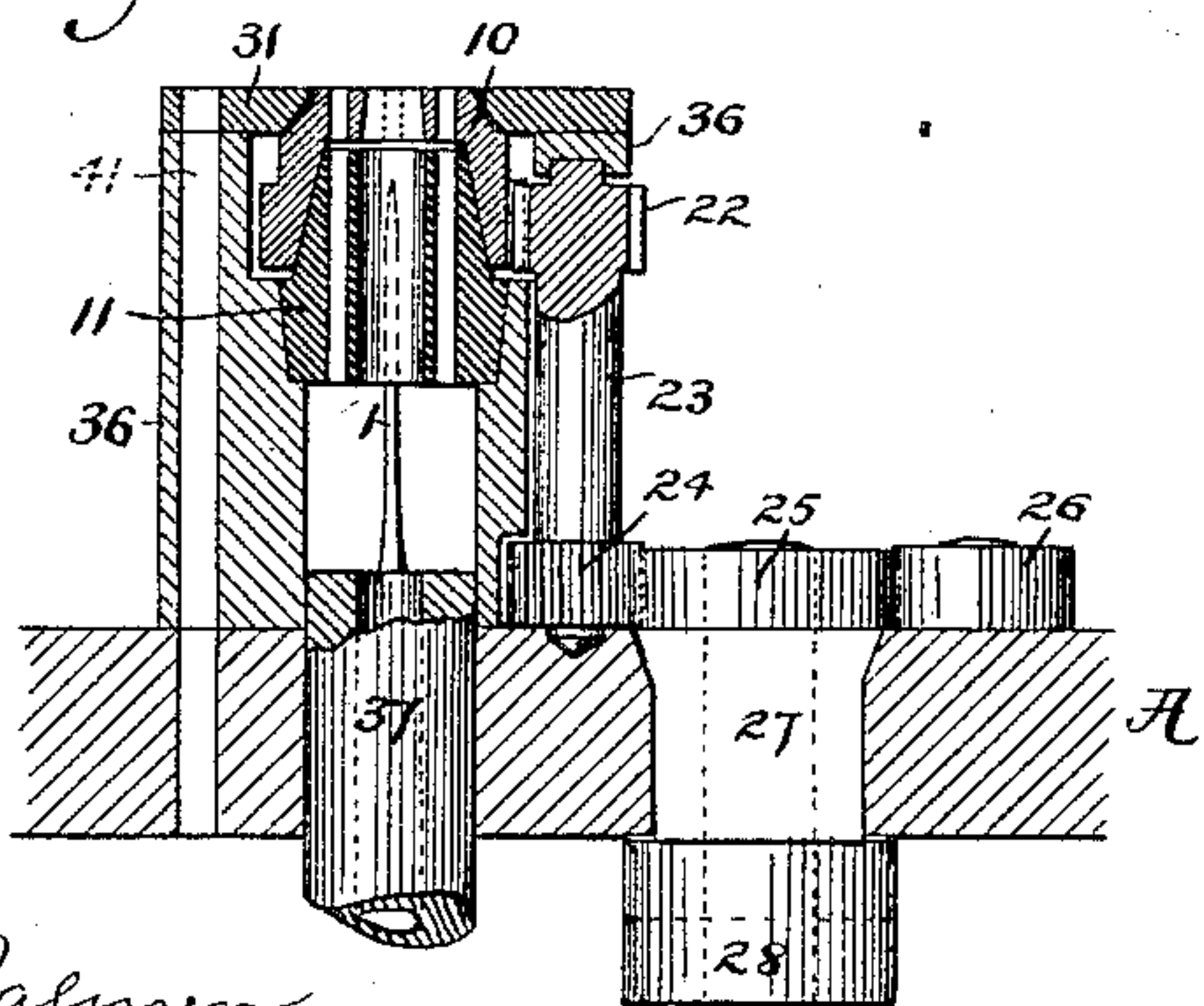
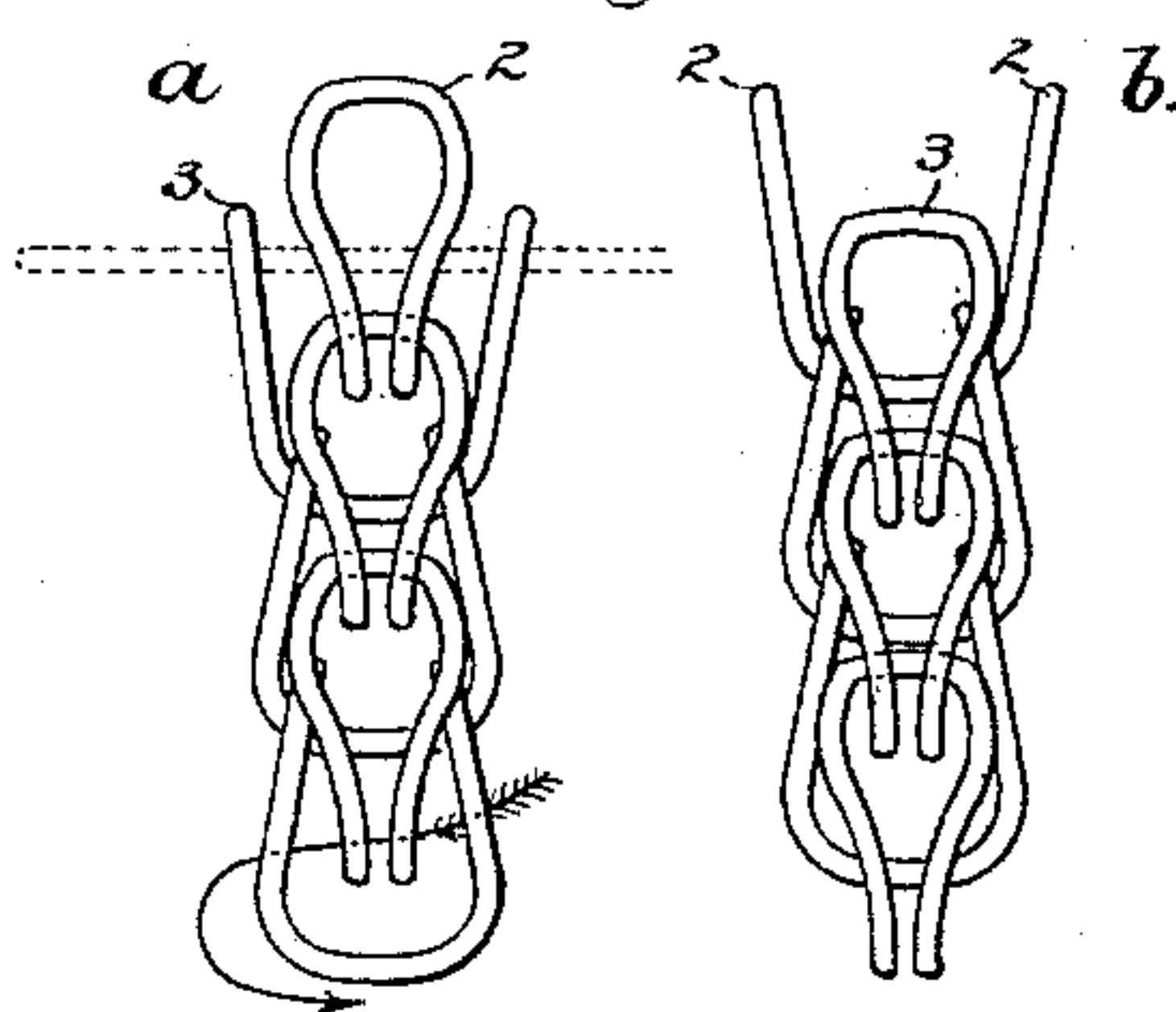


Fig. 4.



Attest:

T. H. Palmer  
J. A. Hovey

Inventor:

Julius Kinder  
by E. H. Graham  
att'y.



# UNITED STATES PATENT OFFICE.

JULIUS KINDER, OF BROOKLYN, ASSIGNOR TO THE SOLID LINK CHAIN  
MANUFACTURING COMPANY, OF NEW YORK, N. Y.

## MACHINE FOR MAKING ORNAMENTAL CHAINS.

SPECIFICATION forming part of Letters Patent No. 348,850, dated September 7, 1886.

Application filed June 29, 1886. Serial No. 206,662. (No model.)

*To all whom it may concern:*

Be it known that I, JULIUS KINDER, a subject of the German Emperor, residing at Brooklyn, Kings county, and State of New York, have invented certain new and useful Improvements in Machines for Making Ornamental and other Chains, fully described in the following specification, and represented in the accompanying drawings, forming a part of the same.

This invention relates to that class of chain-machines particularly set forth in United States Letters Patent No. 263,533, dated August 29, 1882, and embraces features of improvements thereon, which are applicable thereto, as well as other chain-machines.

In the drawings a practical embodiment of the improvements is illustrated in connection with so much of a machine as is necessary to a clear understanding thereof, in which—

Figure 1 is a side elevation of that portion of a chain-machine which automatically threads and interlocks the links together provided with the present invention. Fig. 2 is a plan view thereof, showing particularly the mechanism embracing this invention divested of its supporting-frame and parts of the apparatus which would obscure it. Fig. 3 is a sectional elevation taken on the line *x* of Fig. 2; and Fig. 4 shows views of a piece of chain being formed, the one looking at the side at right angles to that seen in the other.

The machine described in said patent is designed to produce a chain having the links all threaded and interlocked in one direction—that is to say, wherein each succeeding link is threaded with the last preceding link or links, be it a single link or a double linked chain, as the case may be.

The present invention has for its object the production of a mechanism by which what is known as “round fox-tail” chain may be formed—that is to say, the formation of that class of chain wherein succeeding links are threaded first to one side to be interlocked with one or more preceding links, and then to a side at right angles to the first, whereby there are produced, practically, two interlocked series of links simultaneously and making one complete chain.

To this end the invention consists in the novel structure and combinations of devices too fully

hereinafter described to need further preliminary description.

Referring to said drawings it is to be understood that the plate A will in practice support all the mechanism of the threading and interlocking portion of the machine, it being obvious that so far as the link-forming mechanism is concerned it might be a separate apparatus, the links being fed into a suitable guide-tube, which, on being filled, may be transferred to the mechanism herein illustrated in position, so that the feeding-pin will feed a succession of links to the interlocking devices. As described in said patent, this plate A supports a table, 36, over which the links are fed to a vertical aperture therein, the upper edge of which serves as a die for suitably shaping the chain as it is made, and at the same time permits said chain to pass out of the machine. It is provided with a hollow spindle, 37, forming a continuation of said aperture, and through which the chain passes, at the upper end of which spindle project two needle-pointed tools, 1, that in the reciprocations of the spindle in turn protrude through small openings in the table, slightly above the same, and withdrawn below its surface by means of cams 40, which act upon bowls 39, secured to said spindle. These cams 40 are secured to one end of a shaft, 61, (the driver-shaft in this instance,) that is provided with a bevel-gear, 62, that meshes with a like gear, 63, at the lower end of a short vertical shaft, 18, that extends upward through the guide-frame B, and is there provided with cams (not shown) that act upon the slides 50, 51, and 44, which are each guided in their reciprocations by suitable ways formed in said frame B, as clearly shown in said patent. The reciprocations of the feeding-pin carrying slide 44 in turn moves the slide 46, that carries a horizontal needle, 7, by which the openings in the upturned ends of a link or links are enlarged, as well as placed in alignment to properly receive the succeeding link fed there-through by the feeding-pin 8. The slides 50 51 are provided with jaws 48 49, which overlie the table 36, by which the links, partially bent by the primary center punch, 43, are doubled to the extent desired, as fully set forth in said patent. The punch 43 is mounted vertically over the aperture in the table 36 in a head,



42, carried at the end of a vertical bar, 41, that is secured to the hollow spindle 37, and thus partakes of the reciprocations of the latter.

In order to enable succeeding links to be threaded with preceding ones first at one side and then at right angles thereto, there is provided a means by which the upturned ends of the partially-doubled links are brought in alignment with the feeding-pin 8, so that links will be suitably threaded with those previously doubled to form the two interlocked series of links making a single complete chain. (Shown in Fig. 4.) These means consist, broadly, of an oscillating block or thimble, as 10, provided in the table 36, having an aperture that forms the chain-shaping die, registering with the vertical aperture in said table for the passage of the chain out of the machine. This block or thimble is so mounted and arranged as to be capable of being automatically oscillated back and forth in about substantially ninety degrees of a circle and in properly-timed concert with the reciprocations of the link-feeding pin 8.

In practice I prefer to countersink the table 36 surrounding the vertical aperture therein, as shown, to provide a suitable seat for and the reception of the oscillating block 10, so that its upper surface will be even with that of the table. This seat is provided by a taper-nosed shoe, 11, firmly driven to a fixed position in said table, and bored centrally to provide a portion of the vertical aperture therein. The under side of the block 10 will of course be similarly provided with a taper countersunk bearing to properly fit over and receive the nose of said shoe. The upper portion of the block will also be formed slightly tapering, so that a plate, as 31, forming the upper surface of the table 36 will, fitting around the tapered upper portion, confine said block and hold it to its seat, as is clearly shown in Fig. 3.

To impart the necessary oscillations to the block or thimble 10, a portion of its periphery is provided with teeth that are engaged by those of a pinion, 22, mounted at the end of a short vertical stud, 23, that is also provided at its lower end with a similar pinion, 24, engaged by a rack-bar, 25, held to duty by a bowl, 26, mounted upon a stud fixed in the upper surface of the plate A, by which arrangement it will be readily seen that if a suitable reciprocatory movement is imparted to said rack-bar it will, through said connections, impart the required oscillations to said block. This movement may be imparted to the rack-bar 25 in any convenient manner; but as herein shown it is pivoted to a guide-block, 27, that slides in ways cut in the bed-plate A, which guide-block is connected through a link, 28, to one end of a straight lever, 29, the other end of which lever is, through a short link, 30, connected to the end of a reciprocating slide, 32, that carries bowls 33, that are acted upon by a suitably-shaped cam, 34, mounted upon a stud, 71, depending from the

under side of the bed-plate, and which is also provided with a gear-wheel, 72, that meshes with a smaller wheel, 73, fixed upon the short shaft 18. The slide 32 is slotted, as shown, to straddle and pass the stud 71, and is guided and supported in its reciprocations by suitable ways secured to the under side of the bed-plate A. The shoe 11 will be provided with small perforations on either side of the vertical aperture, to allow the passage of the needle-pointed tools 1, while the oscillating block 10 will be provided with two sets of perforations, as shown in Fig. 2, so that the tools 1 are permitted to rise therethrough after each oscillating movement of said block. Thus it will be seen, supposing the series of interlocked links *a*, Fig. 4, to be held by the oscillating block 10, and that the openings in the ends of the partially-bent link 3 are in alignment with the link-feeding pin 8, a forward reciprocation of said pin will feed a new link therethrough, whereupon the tools 1 will rise through the ends of said link to enlarge the opening at the ends, and, withdrawing the punch 43, will be caused to bear upon the center of said new link, partially bending or doubling it, and at the same time force it and the links composing the chain slightly downward through the aperture in said block, the bending-jaws 48 49 having previously or simultaneously therewith completed the doubling of the ends of said link 3. After this is effected and the bending-jaws have returned or are returning to their normal position, and the feeding-pin 8 also returning ready to feed another link, the block or thimble 10 will be oscillated or given a quarter-turn—say in the direction of the arrow, Fig. 4—through its connections from the cam 34, so as to present the open ends of the link 2, as seen at *b*, in the position previously occupied by the end of the link 3, and in alignment with the link-feeding pin 8 ready to be first pierced by the horizontal straightening-needle 7, and afterward receive a new link, fed by said pin 8, when the operations before described will be repeated, the block 10 and the chain being formed being then oscillated a quarter-turn back or in the reverse direction of the arrow and the next time in the direction first indicated, and so on back and forth.

It is obvious that instead of one link being interlocked with the ends of one doubled link, the operations might be so timed as to cause a link to be interlocked with the ends of two doubled links, as described in the patent before mentioned, the result being a more closely-formed chain, without departing from this invention. It also may be observed that the square fox-tail chain, either single or double, described in said patent may be made on a machine provided with the improvement herein described by simply disconnecting the gears 72 73, so that no motion is imparted to the rack-bar 25, and thence to the block 10.

What I claim is—

1. In a machine for making chain, the combination, with a link-feeder, as 8, of the oscil-



lating chain-holding block, substantially as described.

2. In a machine for making chain, the combination, with the punch or bending-tool 43, of the oscillating chain-holding block, substantially as described.

3. In a machine for making chain, the combination, with the punch or bending-tool 43 and needle-pointed tools 1, of the oscillating chain-holding block, substantially as described.

4. In a machine for making chain, the combination, with a link-feeder, as 8, and the bending-jaws 48 49, of the oscillating chain-holding block, substantially as described.

5. In a machine for making chain, the combination, with a link-feeder, as 8, and the horizontal straightening-needle 7, of the oscillating chain-holding block, substantially as described.

6. The combination, with the table 36, provided with an opening for the passage of the chain, of a chain-holding block, as 10, mounted so as to oscillate therein, substantially as described.

7. The combination, with the table 36, provided with an opening for the passage of the chain, and having a conical-nosed shoe, 11, of the chain-holding block 10, mounted so as to oscillate thereon, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JULIUS KINDER.

Witnesses:

GEO. H. GRAHAM,  
SAMUEL P. BELL.