

Sheet 1-2 Sheets.

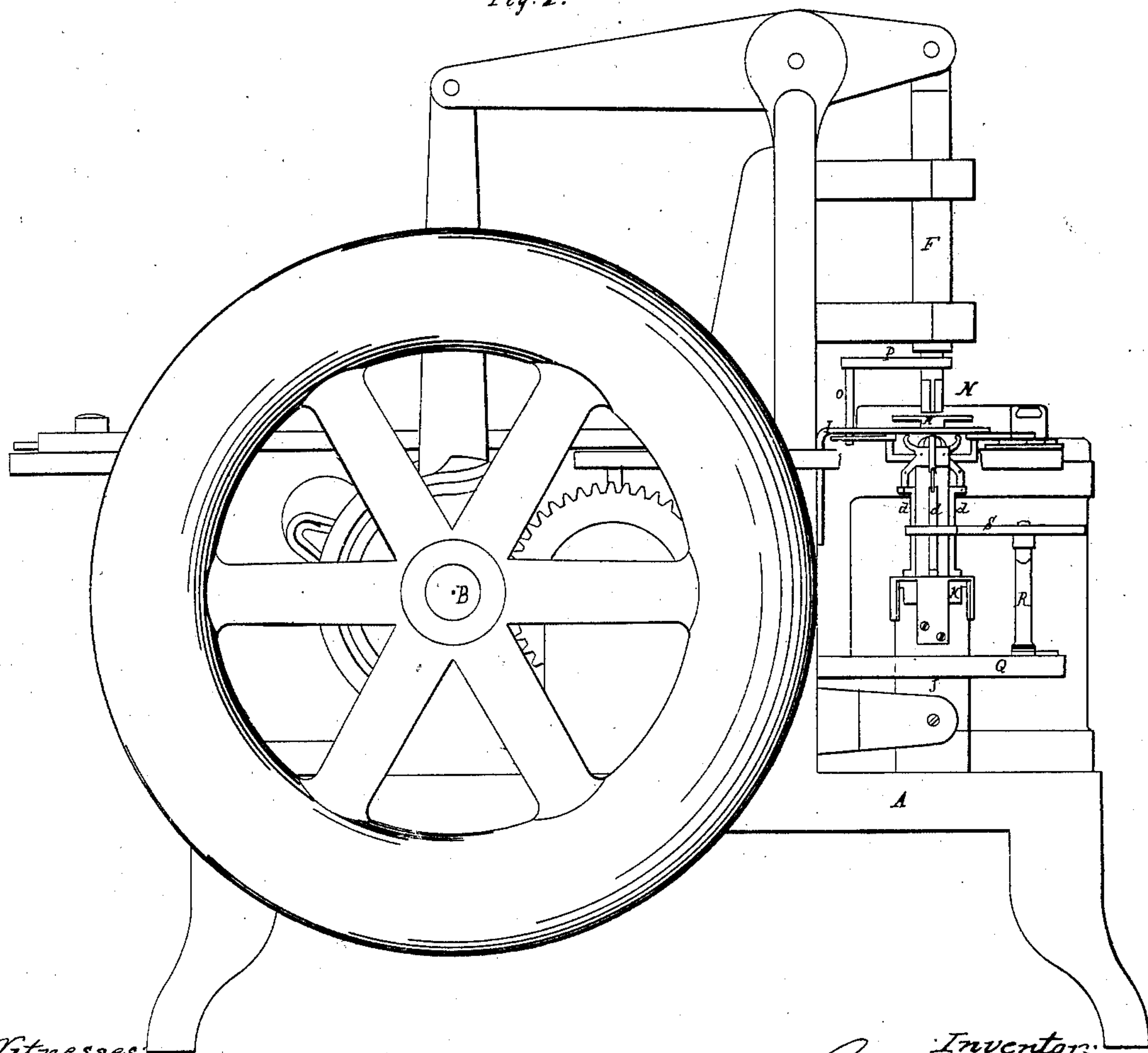
L. Towne,

Making Ornamental Chains,

Nº 26,801,

Patented Jan. 10, 1860.

Fig. 1.



Witnesses:
John Garthand
J. W. Moore.

Inventor:
Laureston Towne.

L. Torne,

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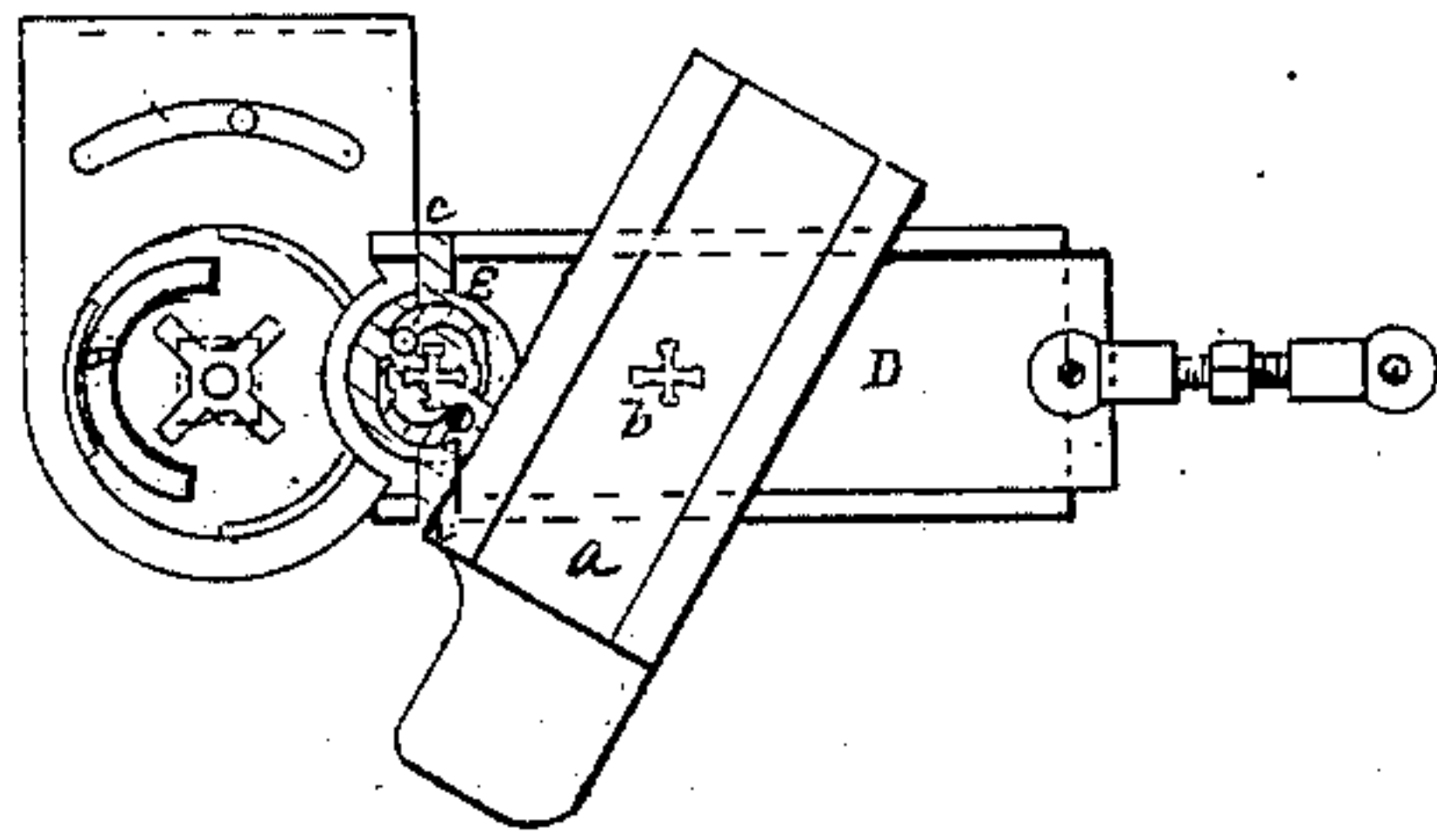


Fig. 2.

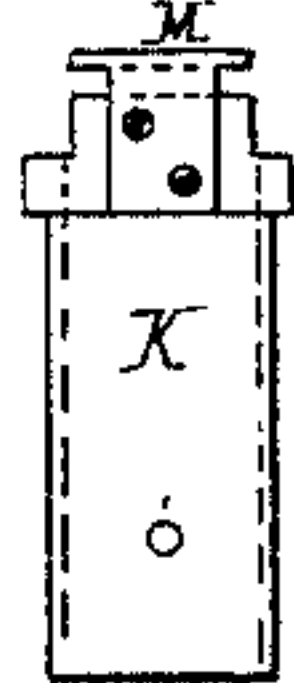
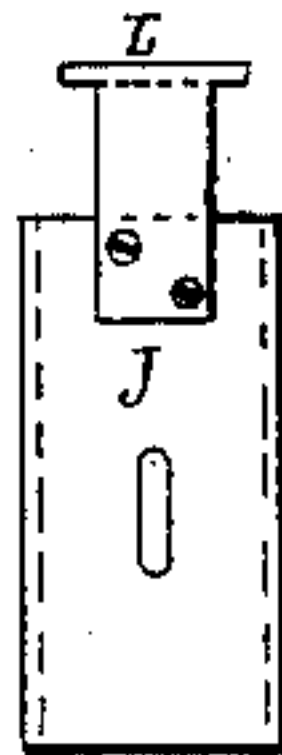


Fig. 7.

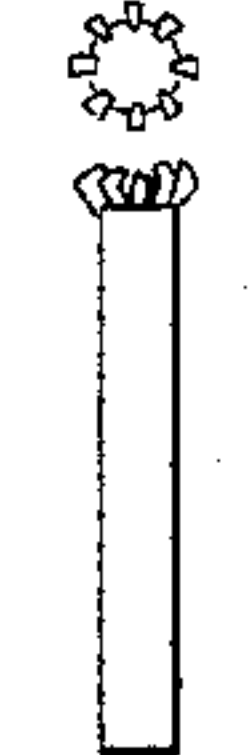
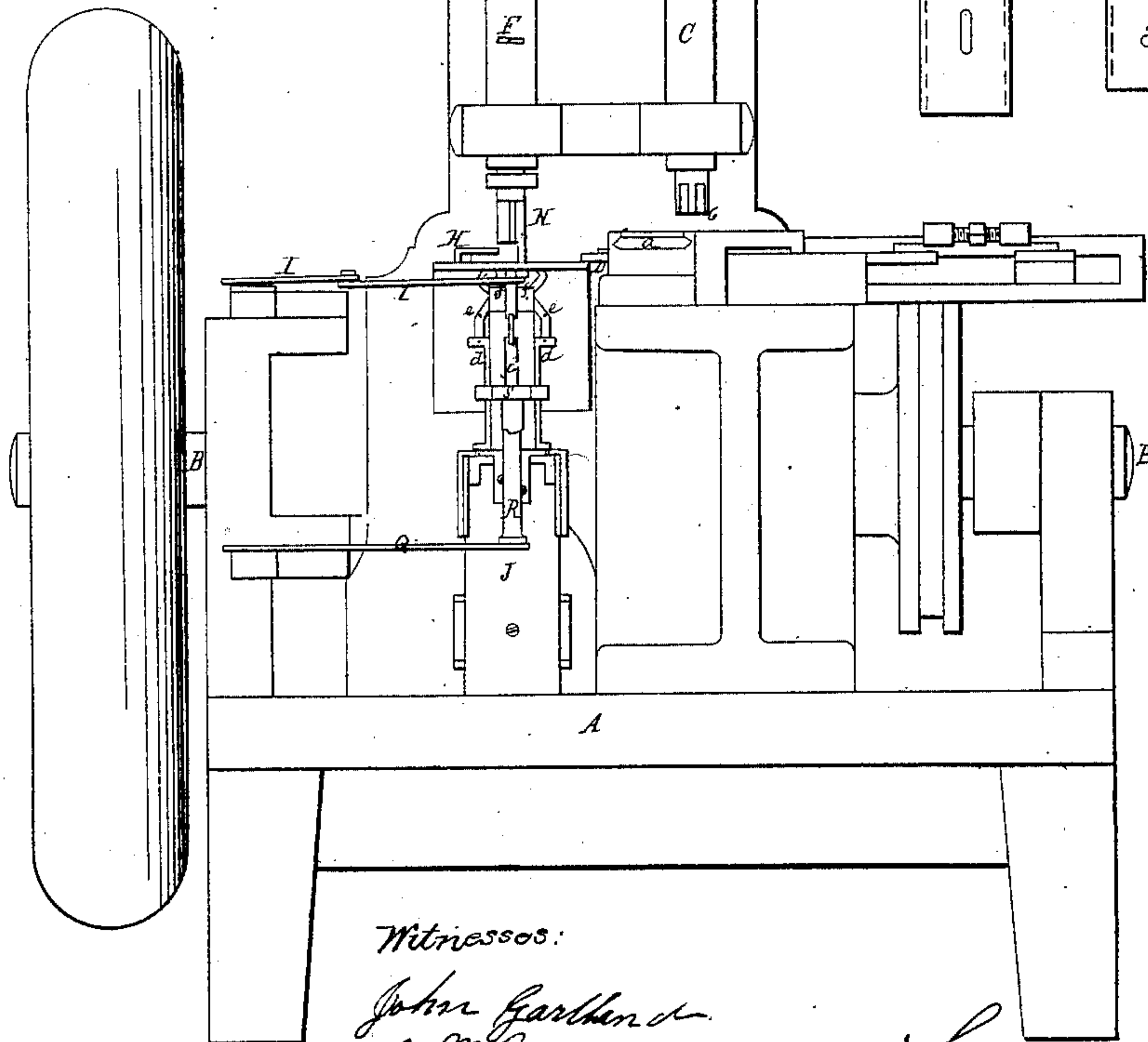
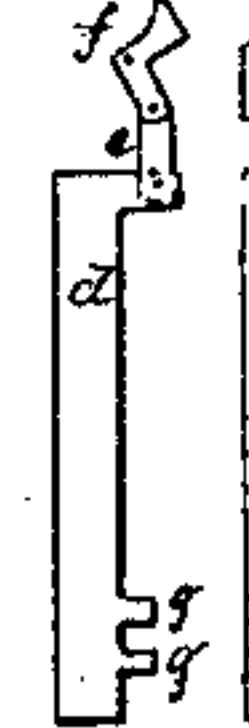


Fig. 8.



Witnesses:

John Gardner
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Inventor:

Lawrence Torne

UNITED STATES PATENT OFFICE.

LAURISTON TOWNE, OF PROVIDENCE, RHODE ISLAND.

MAKING CHAIN FROM SHEET METAL.

Specification of Letters Patent No. 26,801, dated January 10, 1860.

To all whom it may concern:

Be it known that I, LAURISTON TOWNE, of the city and county of Providence, in the State of Rhode Island, have invented a new and useful Improvement in Machines for Making Chain from Sheet Metal; and I do hereby declare that the following specification, taken in connection with the drawings making a part of the same, is a full, clear, and exact description thereof.

Figure 1, represents a side view of a machine constructed on my principle. Fig. 2, represents an end view of the same. Figs. 3, 4, 5 6 7 & 8, are details, to be hereinafter referred to—

In the Letters Patent of the United States heretofore granted to me bearing date Oct. 20 1857 and numbered 18,490 after detailing the mode of operation which characterizes the machine for making chain from sheet metal therein specially described, I use the following language in speaking of the various ways in which I had contemplated the application of the same principle in the formation of chain:

“The machine as above described, is made so as to turn or vibrate the chain to receive the links in alternate positions for interlocking the arms thereof. Instead of thus turning or vibrating the chain the links might be applied in alternate positions while the chain would remain in a fixed position. This method would require the angular vibration or turning of the link carrier or its equivalent—the punch, M, the lifters, *g*, *g* and fingers, *p*, *p* or if not the actual movement of all or any of them a double number alternately put in action would be required. Such an arrangement would be more complicated more difficult to arrange and less desirable in many respects than the method of moving the forming guide and chain but it is the same in principle as and can be considered only as a modification of the method adopted and described.”

The modification above indicated I have developed in the following manner: A is the table or platform on which the various parts of the mechanism are arranged.

B is the main shaft on which the several cams and a toothed pinion are placed from which the different motions hereinafter described are derived.

A strip or ribbon of metal having been prepared it is presented to the machine over

the die plate, *a*, (Figs. 2 and 3), and by any feeding device having an intermittent motion is drawn over the cutting die, *b*, (Fig. 3). While the strip of stock is at rest the plunger C, Fig. 2, descends and passing through the cutting die, *b*, cuts out from the strip a blank link of the form desired. (In the present instance the link resembles in shape a Maltese cross, and corresponds in all respects to the form of the cutting die, *b*.) The blank link so cut is deposited by the plunger into a similarly shaped recess or cavity in the carrier D which is in waiting to receive it under the cutting die. Plunger, C, being operated by means of a cam on the main shaft through the intervention of lever connections now rises clear of the cutting die—the shape of the actuating cam being such that it shall descend once only at each revolution of the crank. As it is intended to turn each link of which the chain is to be composed relatively to the last link in the chain such a fractional part of the circle as shall enable the arms of the two to interlock I construct the carrier differently from the one shown in the Letters Patent heretofore granted to me and above referred to, in order to accomplish that result.

Near the extremity of the sliding plate D which has a reciprocating motion derived through lever connections from a cam on the crank shaft I place a supplemental plate or shallow cup E on the carrier plate D so arranged that it can have an angular motion on its axis around a fixed center within the plate D. In this part of the whole device which I call the “carrier” the blank link rests when it falls from the cutter, and it is obvious that if the position of the supplemental plate E relatively to the carrier plate D be from any cause changed after the link has been deposited upon it the blank link which it bears, will be turned with it. Suppose now the plunger, C to have deposited a blank link on the supplemental plate of the carrier. The revolution of the driving shaft causes a cam to operate on the carrier through the means of a connecting lever and move it to a position directly over the mouth of the tube within which the chain is formed.

As the carrier approaches the end of its path of travel the arms C, C with which the supplemental plate E is provided come

in contact with the shifting gage stop H and the supplemental plate being as has been stated free to move on its axis it is thereby made to assume a position due to that of the stop. A third cam on the main shaft now puts the punch, N, in action and after causing it to descend through the carrier, and force the blank link into the mouth of the forming tube returns it to its former position. The bottom of that part of the carrier upon which the blank rests being perforated with an opening sufficiently large to admit of the passage of the punch without allowing the blank to fall through, unless forced through the perforation by the punch, it follows that the arms of the link after it has been deposited in the forming tube, will be bent up nearly at right angles to the body of the link. As the subsequent operations of the machine are performed upon the last mentioned link after the next succeeding link has been deposited in its proper place I will omit them until that time.

The first link having been deposited in the mouth of the forming tube, the carrier returns to its first position under the cutting die, b, the supplemental plate, in the retreat of the carrier being turned back to the proper position for receiving the link by an equivalent instrument or device to the one already described for presenting the link to the tube. Having received a second blank, the carrier proceeds again toward the mouth of the tube, but in the mean time the stop H has by the action of the lever connections I, I operated by a cam driven by a toothed pinion on the main shaft been shifted in its position to a part of the circumference of a circle distant from its position when the first link was presented by as many degrees. As it is necessary to turn the link for the purpose of making the arms thereof interlock the arms of the last link in the chain. It is obvious that the plate E with the link upon it, will in consequence be turned to the same extent. The punch F, N, now descends and deposits the second link within the tube with its arms interlocking the arms of the first link. Two of the four bending instruments, d, d, arranged around the forming tube at the same distance from each other as the arms of the link employed are now put in action and in the present instance bend over two opposite arms of the first link; this done, the other two bending instruments bend over the remaining pair of arms of the first link causing them to overlap the pair already bent down. Punch N now descends and clenches the four.

Each of the bending instruments, in the present instance, consists of a slide, d, united to a bell crank shaped pick, f, (Fig. 8,) by the connecting link, e. The slide, d, works in a longitudinal groove in the sheath Fig. 6 which incases the stationary forming tube,

Fig. 7, and the bell crank, f, being hinged to the sheath at the angle it is apparent that as the slide, d, is raised the point of the pick will be thrust forward. Two of the slides d, d, are operated by the sheath J (Fig. 4) and the other two by the sheath K Fig. 5—the one being within the other. The upper head of each being formed as shown at L and M, in the drawings, (Figs. 4 and 5,) and the connection between each sheath and the pair of slides which it operates being made by means of two projections, g, g, on each slide, (Fig. 8) between which the plates L or M work freely. The sheaths J and K are raised at the proper times so as to effect the operation of the bending picks as above described by means of lever connections worked from cams on the main shaft. A third blank is now brought forward and the same operations as were described with reference to the first link are repeated—the bending instruments always acting upon the arms of the next preceding link, turning them down successively by pairs over the body of the last link deposited.

When a single winged-punch like the one shown in the drawing is employed it is of course necessary to turn it upon its axis in order that the wings may correspond with the arms of the several links upon which it is successively to operate, and where only four bending instruments are used it is also necessary to shift their position around the forming tube in order that they may act upon the arms of the link next preceding the last one deposited. The devices which I employ to secure this mode of operation are these: The punch shank F has its lower extremity formed into a socket within which the cylindrical stem (not shown in drawing) of the punch N is fitted. The same lever which by the cam previously spoken of shifts the position of the stop H is by means of the rod, O, and arm P (Fig. 1) attached to the punch stem—so that whenever the stop E is shifted the punch N will be correspondingly turned on its axis. The same cam which operates the stop and punch is also made to change the position of the bending instruments simultaneously with the shifting of the stop, by means of the rod R, and arm S attached to the sheath, Fig. 6, which encircles the forming tube and on which the bending instruments are mounted; thus with certainty and precision the relations of the punch, the stop and the devices for bending over the arms are maintained to each other, so that whenever the position of one with reference to the forming tube is changed the position of the other two will be correspondingly changed also.

As the principle upon which the chain is made in this machine requires the forming tube to remain stationary, and as only four bending instruments are used, it follows that

the tube must be so constructed that the picks can operate equally well on any two successive links of the chain. The forming tube is accordingly made as shown at Fig. 7
5 with eight slots cut in the upper end of it, four of which admit the points of the picks as they are thrust forward to bend the arms of the first link and the four remaining alternate ones admit the same picks when
10 thrust forward to bend over the arms of the second link.

It is obvious that the principle above described can be successfully applied to making chain, the links of which have a different
15 number of arms from the links of the chain which the specific machine described is adapted to make. In such cases it will become necessary to turn each link on its axis before it is presented to the chain to a
20 greater or less extent according to the number of arms employed and the desired result can be obtained by modifying the form of the cam which actuates the stop punch and bending picks. If a link is used with an
25 odd number of arms the bending picks should correspond in number to the number of the arms and if it is desired to bend over all the arms of each link simultaneously one

of the cams for operating the picks shown in this machine may be dispensed with. 30

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

1. Forming that portion of the carrier in which the blank link is transported in such a manner that it can be made to turn on
35 an axis which shall be coincident with the axis of the blank link upon it substantially as described.

2. The combination of the supplemental plate E or its equivalent with a stop E or
40 its equivalent for the purpose of determining the extent of rotation which shall be given to the plate E and thus insure the proper presentation of the blank to the chain substantially as described, for the pur-
45 poses specified.

3. I claim the mode of operation substantially as specified by means of which the punch N, stop E, and bending picks, *d, d, d*
50 or their equivalents are made to coöperate in alternate positions in relation to the forming tube, for the purposes set forth.

LAURISTON TOWNE.

Witnesses:

JOHN GARTLAN,
J. W. MOORE.