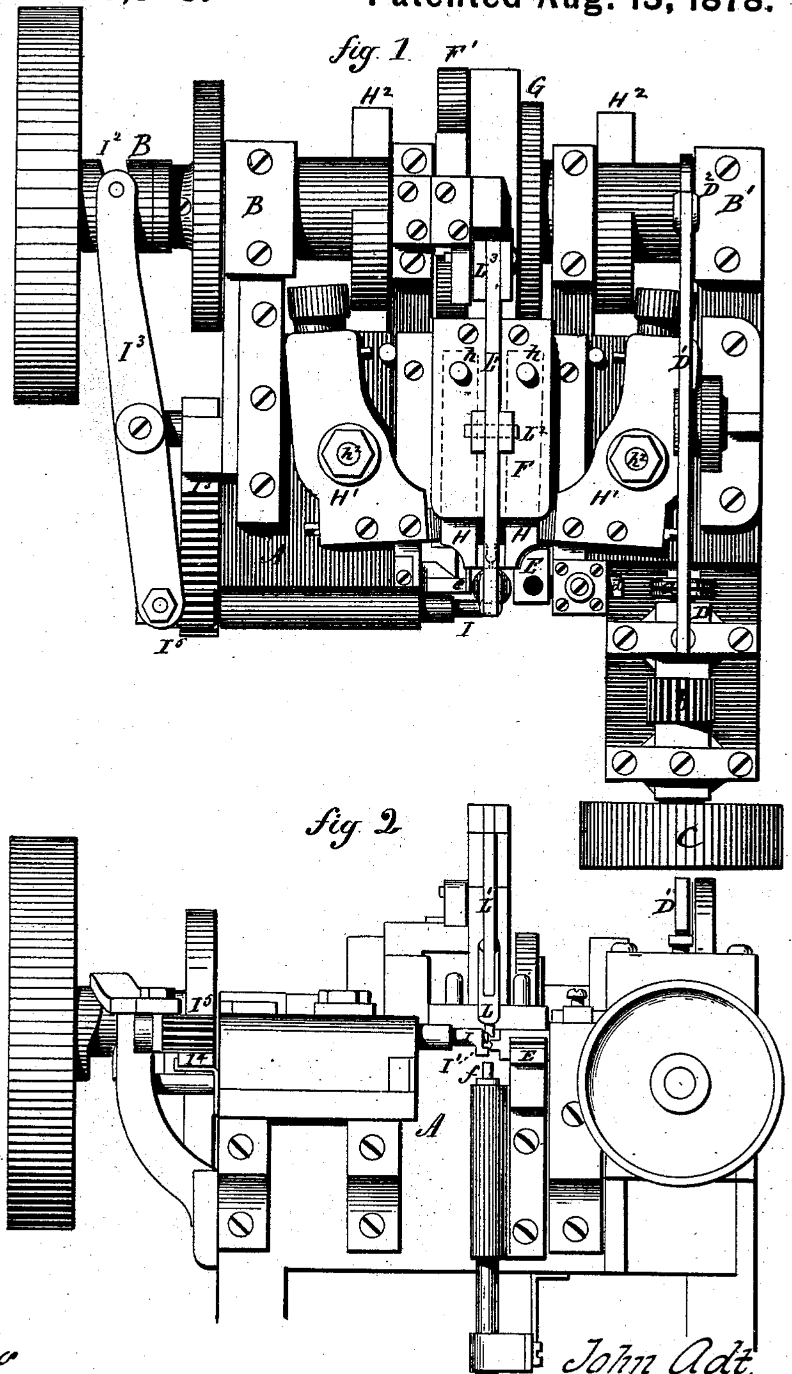
J. ADT.

Machine for Making Pump-Chains.

No. 206,995. Patented Aug. 13, 1878.



Witnesses

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fig. 3.

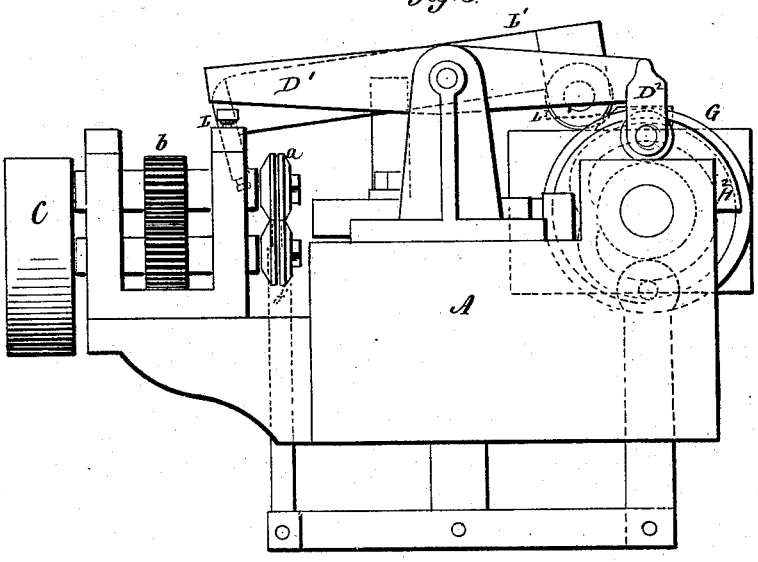

fig. 12

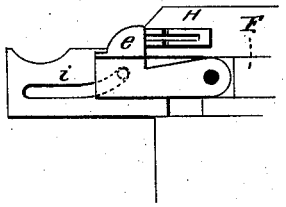

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Fig. 4

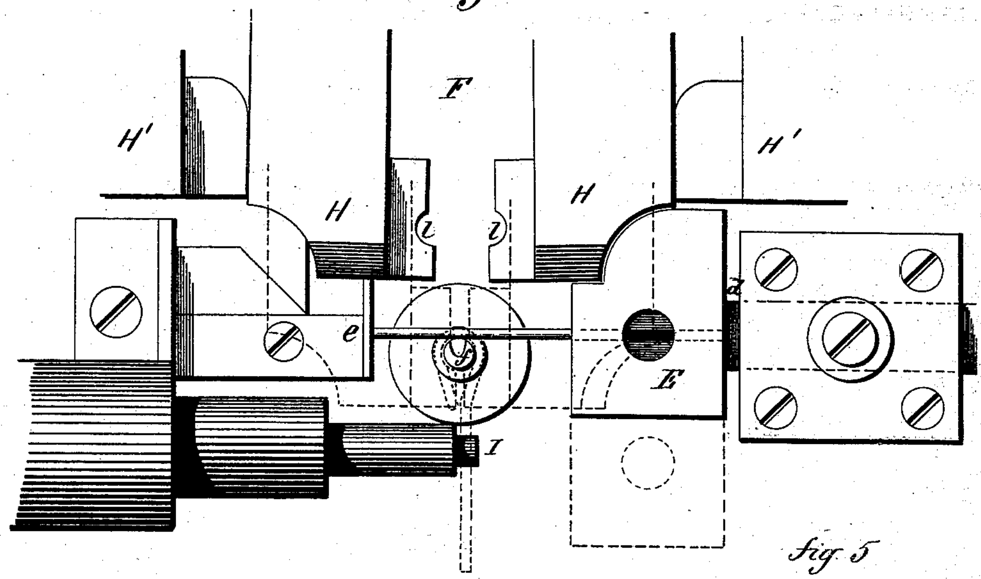


Fig. 5

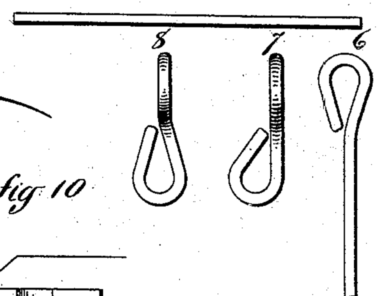


Fig. 9

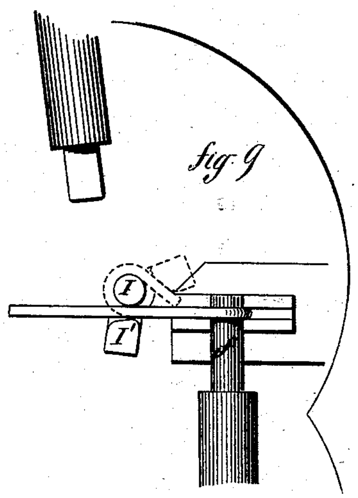


Fig. 10

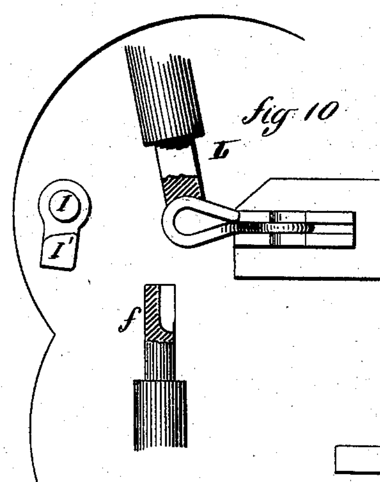
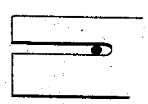


Fig. 11.



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UNITED STATES PATENT OFFICE.

JOHN ADT, OF NEW HAVEN, CONNECTICUT.

IMPROVEMENT IN MACHINES FOR MAKING PUMP-CHAINS.

Specification forming part of Letters Patent No. **206,995**, dated August 13, 1878; application filed April 19, 1878.

To all whom it may concern:

Be it known that I, JOHN ADT, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Machines for Making Pump-Chains; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, which said drawings constitute part of this specification, and represent, in—

Figure 1, a plan or top view; Fig. 2, a front view; Fig. 3, an end view; Figs. 4, 5, 6, 7, 8, 9, &c., detached parts for illustrating the construction of the machine.

This invention relates to an improvement in machines for making chain such as used in that class of pumps for drawing water commonly called chain-pumps, but is applicable to making other classes of chain in which one end of the link is bent at substantially right angles to the plane of the other end; and the invention consists in the construction and combination of parts as hereinafter described, and more particularly recited in the claims.

A is the bed or frame of the machine, on which the operative mechanism is arranged; B, the driving-shaft, arranged at the rear of the machine, and so as to revolve freely in bearings B′, power being applied thereto in the usual manner for applying power to such machines.

At the front of the machine the device for feeding the wire from which the chain is to be made is arranged, and consists of two rollers, *a*, one above the other, and to which constant revolution is imparted by a pulley, C, on the shaft of one of the two rolls, the rolls geared together by a pinion, *b*. The inner box, D, which supports the upper roll, is free to rise up and down; but, to bear upon this box and depress the roll, a lever, D^1, is arranged, one end of which bears upon the box, and the other, actuated by a cam, D^2, on the driving-shaft. The cam D^2 acts upon the lever so as to force it to press upon the roll during the time the feed is required; hence the wire lying between the rolls will, at such times, be drawn into the machine, and, when the pressure is off, will be left free. The duration of this movement is according to the length of the wire required for a single link. The wire passes through a stationary tube, *d*, thence through a guide, E, which has a horizontal open slot, corresponding to the diameter of the wire, opening toward the front of the machine. This slotted guide is attached to and moves forward and back with a slide, F, the said slide actuated by a cam, F′, on the driving-shaft. The edge of the guide next the tube *d* runs in close proximity to the tube, and when it is in its rear position, as in Fig. 1, the wire fed in passes through the slot in the said guide, and then, when the guide moves forward, the rear of the slot strikes the wire and, in conjunction with the adjacent end of the tube *d*, cuts off the required length. The purpose of this slot will be more fully hereinafter described. To the same slide F a stop, *e*, is arranged, against which the end of the wire strikes as it is fed into the machine and insures the stoppage of the feed at the required time. The said stop is adjusted, relatively to the position of the cutting device, so that the distance between the stop and cutting device is equal to the length of the blank required—say, as seen in Fig. 5.

These parts are illustrated on a larger scale in Fig. 4.

Immediately after the wire has been thus fed in, and, as seen in Fig. 4, a former, *f*, is raised by means of a cam, G, and connections underneath the machine, as seen in Fig. 3, and at a position relative to the wire, as seen in Fig. 9; then the slide F continues its forward movement. On this slide two jaws or benders, H H, hinged respectively to the rear at *h h′*, and so as to open or close in a horizontal plane, are forced toward each other in such horizontal plane, respectively, by levers H^1 H^1 hung on the bed at h^2, independent of the slide F, and so that the said slide with the benders H H will move back and forth without moving the said levers H^1 H^1, and each actuated by its own cam H^3, so that at the proper time they will press toward each other at the forward end against the benders H H and close them, or allow the benders H H to open by a spring or otherwise, as indicated in broken lines, Fig. 1. As the slide F moves forward, therefore, the benders H H strike the wire blank each

side of the former *f*, bending the wire around it, as seen in broken lines, Fig. 4. The length of the wire on the side where the guide E is arranged is the longer end, the other end only being sufficient to form the first bend, and as clearly seen in Fig. 4. To close the wire around the former and give it the required shape, the benders have a cavity, *l*, in their face, which will allow it to close around the former in its forward position, as seen in Fig. 4, and thus close the wire together and shape the end, as seen in Fig. 6.

The object of the horizontal slot in the guide E will now be seen by reference to Fig. 11. It is essential that the end of the wire that lies within the slot should be carried forward in a horizontal plane, and as it cannot turn from that plane until it passes from the slot, and as it cannot pass from the slot until the benders have taken sufficient hold upon it to prevent its turning, the slotted guide therefore serves to insure the proper position of the blank after the first bend.

To make the second bend, a horizontal former, I, is employed, which in diameter corresponds to the former *f*. On the under side of this former there is a lug, I^1, projecting parallel with the former I, as seen in Fig. 2, and after the first bend is completed, as before described, the former I is moved into position over the wire by a cam, I^2, acting through a lever, I^3, and so that the former passes above the wire and the lug I^1 below it, as seen in Fig. 9. When it has arrived at this position a rotary movement is given to the former by means of a toothed rack, I^4, working in a pinion, I^5, on the shaft of the former, which brings the lug I^1 up against the wire, carrying the outer end up over and down onto the body of the wire, as seen in broken lines, Fig. 9, leaving the bend in a vertical plane, as seen in Fig. 7—that is, so that the under side is in line with the plane of the previously bent end. As the stop *e* would come in contact with the shaft of the former if not removed, the stop is hung to the slide F, as seen in Fig. 12, toward the rear, and on its forward end is a stud working in a slot, *i*, in the frame. This slot inclines downward, so that as the said stop moves forward it will be forced downward by the slot, and raised again as it returns.

Having performed the work of bending, the former I retreats, also the former *f* drops, leaving the bent wire in the grasp of the benders H H, which retreat, carrying the bent wire with them; and as they approach their rear movement, a final bend is given by a bender, L, arranged in the end of a lever, L^1, which is hung on the slide F, as at L^2. The rear end of the lever rides up an incline, L^3, forcing the forward end down and bringing the bender L upon the end of the link, so as to bend it downward, as seen in Fig. 10, thus bringing the eye at that end of the link central with the other end, and as seen in Fig. 8. This completes the link, and leaves the open part of the forward end of the link in the line of the incoming wire, and so that the next wire will pass directly through that end of the link, and the end of the second be made as before described for the first, and thus unite the two, and so on with each successive link, the benders H H opening so soon as the entering wire engages the last link, so as to secure it.

The general method of bending as hereinbefore described is old, and known as the Kellogg & Atwood patent, November 12, 1850, No. 7,768, and it is upon this improvements are made, some of the advantages of which are the operating of the benders by independent levers, which are in themselves hung upon the bed while the benders are moving forward and backward. This enables the benders to be hung far back, very near the operating-cams, and so that the arc on which the benders move will be upon a radius very much larger than can be done in the Kellogg and Atwood machine, while the power through the levers H^1 H^1 is applied to their forward ends, and the fulcrum of these levers, forward near the ends, produces the same effect of power as if the levers H^1 H^1 were the benders, as in the Kellogg and Atwood machine. Also, the horizontal guide, through which the wire passes, and which insures its being bent in the horizontal plane; also, the stop made movable, and so as to drop down out of the way by means of the forward movement of the slide to which it is hung; also, the last bender L, which is made to operate by means of the movement of the slide, it being hung thereto, and operated through a stationary cam or incline on the bed.

I claim—

1. In a machine for making chain, the combination of the benders with the stop *e*, the said stop hinged to the slide which carries the benders, and in connection with an incline or cam-shaped stationary groove, so as to fall and rise respectively by the forward and rear movement of the slide which carries the benders, and substantially as described.

2. The two benders H H, hinged to the slide, and so as to move forward and back with it, combined with their respective levers, pivoted directly to the frame, and operating to close and permit the opening of the benders, and without longitudinal movement of the said levers, substantially as described.

3. The combination of the benders H H and former *f* with the former I and the bender L, the latter hung upon the slide, and so as to move forward and back with it, and a stationary cam to depress the bender L near the rear movement of the slide, substantially as and for the purpose described.

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