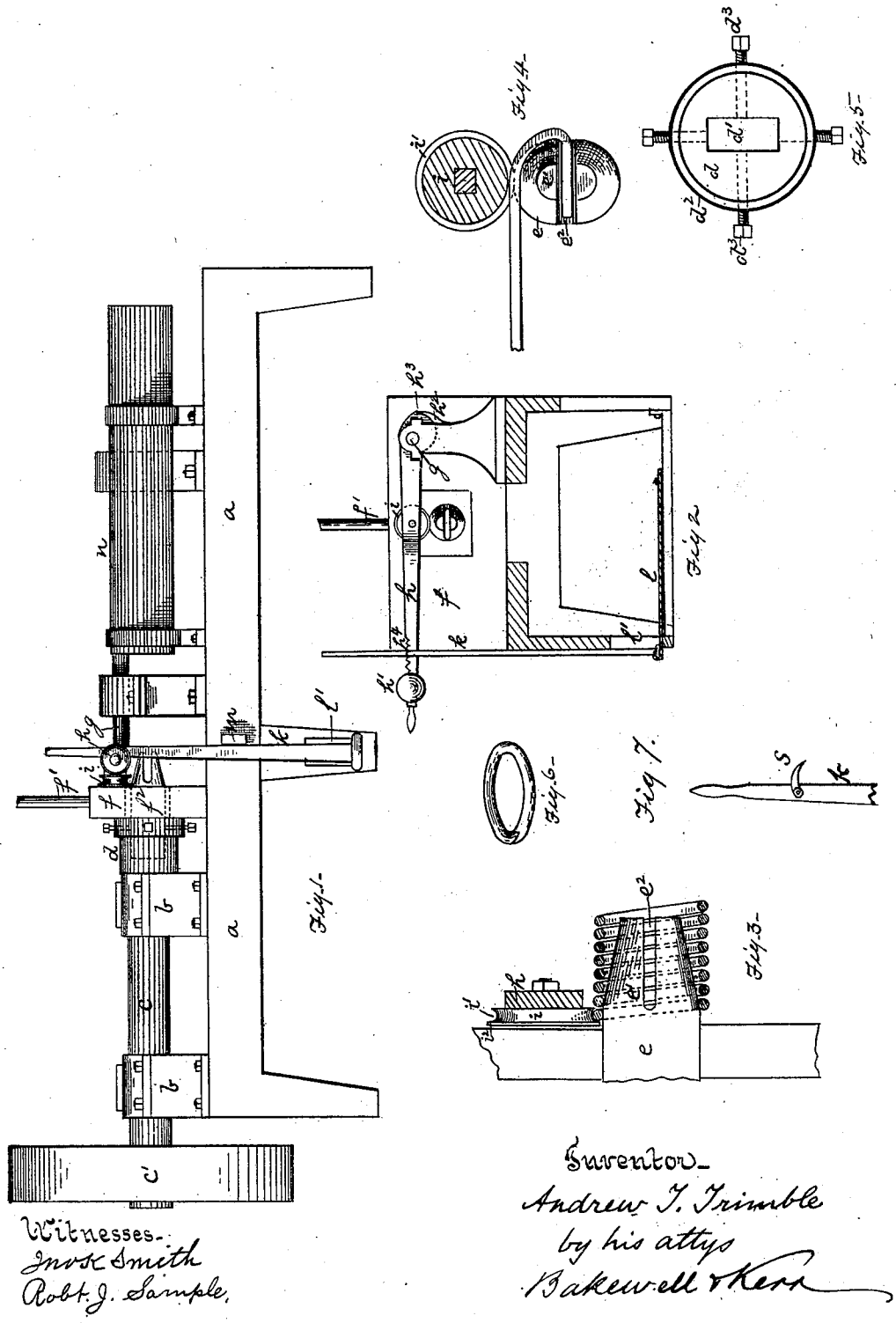
(No Model.)

A. T. TRIMBLE.

LINK WINDING MACHINE.

No. 270,861. Patented Jan. 16, 1883.



Witnesses.
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UNITED STATES PATENT OFFICE.

ANDREW T. TRIMBLE, OF NEW BRIGHTON, PENNSYLVANIA, ASSIGNOR TO THE PITTSBURG HINGE COMPANY, (LIMITED.)

LINK-WINDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 270,861, dated January 16, 1883.

Application filed May 11, 1882. (No model.)

To all whom it may concern:

Be it known that I, ANDREW T. TRIMBLE, of New Brighton, in the county of Beaver and State of Pennsylvania, have invented a new and useful Improvement in Link-Winding Machines; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of my improved link-winding machine. Fig. 2 is a vertical cross-section. Fig. 3 is an enlarged side view of the mandrel and bending-wheel. Fig. 4 is a cross-section of the same. Fig. 6 is a section of link. Fig. 5 is a view of the end of the mandrel-shaft. Fig. 7 is a detached view of locking-lever k and its pivoted hook s.

Like letters of reference indicate like parts in each.

In suitable bearings, b, upon a strong, substantial frame or table, a, I mount a shaft, c, on the outer end of which is a power-pulley, c', by which power is applied to the machine. On the inner end of the shaft c is a head, d, having a central rectangular slot, d', and a band, d^2, surrounding it, through which I extend four set-screws, d^3, or more or less, as may be necessary, which screws extend through the head and enter the rectangular recess d'. Their purpose is to bite upon the shank of the mandrel and secure the latter in the head. The mandrel e has a rectangular shank, which corresponds to and fits inside of the rectangular recess d' in the head d. At the other end the mandrel is beveled off at the corners and tapered down so that its end shall be of elliptical form in cross-section. The purpose of this is to give an elongated form to the chain-links. The tapered end e' of the mandrel e is slotted or recessed in the direction of its shorter diameter, the slot being of sufficient size to receive the end of the wire, rod, or bar of which the chain-links are formed. Placed on the bed of the machine, directly in front of the head d of the shaft c, is a block of metal, f, preferably cast-iron, which is water-cooled by means of pipes f', extending through it. It is provided with a central opening, f^2, through which the mandrel e projects. The projection of the mandrel from the front face of the block f is equal to the length of the tapered part e'. The purpose of the water-block f is twofold: first, to form a guide for the operation of the bending-roller hereinafter described, and, second, to cool the mandrel, which becomes highly heated by the coiling thereon of the hot rods.

Pivoted on the shaft g, mounted in bearings at the rear side of the machine, is a lever, h, having a weight, h', at its front end, and a spring, h^2, which, applied on the frame of the machine, bears against a notch, h^3, on the end of the lever, back of its pivotal point, and tends to aid the weight h' in throwing the lever down.

Journaled on the lever h, near its fulcrum, is a grooved bending-wheel, i, the groove i' of which is designed to receive the body of the wire, rod, or bar and bend it down upon the surface of the mandrel as the latter revolves under the roller. The side of the roller i which is next to the face of the block f has a thick rim, i^2, while the side next to the lever h has a thin or sharp rim. The lever h is notched or provided with a rack, as at h^4, in such a position as that when the lever is brought down upon the mandrel the rack extends over the opposite edge of the machine. Here it is secured by means of a rod or arm, k, which rises along the side of the machine, and is provided with a pivoted hook, s, which, when the lever is moved past it, swings out and hooks into one of the notches h^4, and thus holds the lever down upon the bending-mandrel. As the mandrel is of elliptical form and rotates in contact with the roller i, it is necessary that the lever h should be capable of giving way or rising when the long diameter of the mandrel comes into a vertical plane through the mandrel. This is accomplished by mounting the bar k upon a strong leaf-spring, l, which spring is fastened in the under part of the frame of the machine, and projects through the slot l' in one of the legs of the machine. The slot l' is of sufficient length to permit the spring to move sufficiently to accommodate the movements of the lever h to that of the mandrel e.

Upon the side of the machine I have placed a guide, m, to guide the rod k in its vertical movements. In front of the mandrel e, and mounted on the frame of the machine, is a trough, n, for receiving the coil as it leaves

the mandrel. This trough may be either open on top or it may be in the form of a tube, as shown.

The operation of my machine is as follows: The rod or bar, being still in a heated condition when it leaves the rolls, is carried to the machine and its end inserted into the slot e^2 of the mandrel *e*. The machine is then set in motion, and the mandrel, turning, brings the wire, rod, or bar under the bending-roller *i*, the groove of which is brought down upon the rod or bar. This roller presses the rod down upon the mandrel as it rotates under it, and causes it to bend to the shape of the mandrel. The bending-roller, keeping one position, follows the rod as it is drawn into the machine, and as each turn of the mandrel is made each successive coil of the rod pushes the preceding coils toward the end of the mandrel and down the incline. This causes the end of the rod which has been placed in the slot e^2 to be wedged out of the slot, and in due time to leave the end of the mandrel entirely. The narrow flange or edge of the grooved roller *i* permits the escape of the coils at that side with but little friction. And so the operation of coiling goes on until the rod is entirely coiled up into a spiral shape, a section of which is shown in Fig. 6. As the coil leaves the mandrel it passes into the trough *n*, whence it is removed at pleasure. If it is desired, a stripper consisting of a lever having a forked end may be placed at the inner end of the tapered mandrel and operated by a foot-treadle for the purpose of starting the coil, if for any reason the end which enters the slot should stick, and not pass out when pressed upon by the coiling of the rod upon the mandrel. This device, however, is only necessary occasionally, and the work may be done by prying the end with a bar of iron, or other tool. Usually, however, the coil will slip off without any trouble.

My machine is simple and cheap in construction, efficient in operation, produces a fine coil, is not liable to get of order, and effects a large saving in time and labor over old methods and prior machines known to me.

If it is desired to make a round link, the form of the mandrel would be changed correspondingly; but as the majority of chains have elongated links, my machine has been especially adapted to the production of such a coil. After the coil is removed from the machine it is placed upon a suitable holder and the single coils cut off with a cutter of the usual construction by a diagonal cut, as shown in Fig. 6. These links are then strung upon each other and the scarfed edges welded together in the usual way.

If desired, instead of running the water-pipes directly through the block *f*, I can make the mandrel hollow and have water-pipes extend through the center of the mandrel-shaft for keeping the mandrel cool.

Instead of using a leaf-spring, *l*, I may use a spiral spring to permit the rising and falling of the lever *h*.

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

1. In a link-winding machine, a winding-mandrel, jointly with a water-block surrounding the same, substantially as and for the purpose specified.

2. In a link-winding machine, a winding-mandrel, jointly with a water-block, through which the mandrel projects, and a bending device which coacts with the mandrel and is arranged in front of and adjacent to the face of the water-block, substantially as and for the purpose specified.

3. In a link-winding machine, the combination of a mandrel having different transverse diameters, a bending-roller mounted on a pivoted lever, a locking-bar or holding-arm provided with a spring which permits it to yield, and arranged to seize and release the pivoted lever of the bending-roller, substantially as and for the purpose specified.

4. In a link-winding machine, the combination, with the mandrel, of a bending-roll mounted on a pivoted lever, a weight arranged on the long arm of the lever, and a spring which bears against the lever back of its pivotal point, substantially as and for the purpose specified.

In testimony whereof I have hereunto set my hand this 1st day of May, A. D. 1882.

ANDREW T. TRIMBLE.

Witnesses:
W. B. CORWIN,
JAMES H. PORTE.