3 Sheets--Sheet 1.

E. ARNOLD.

Loom for Weaving Tubular Fabrics.

No. 231,748. **Patented Aug. 31, 1880.**

Fig. 1.

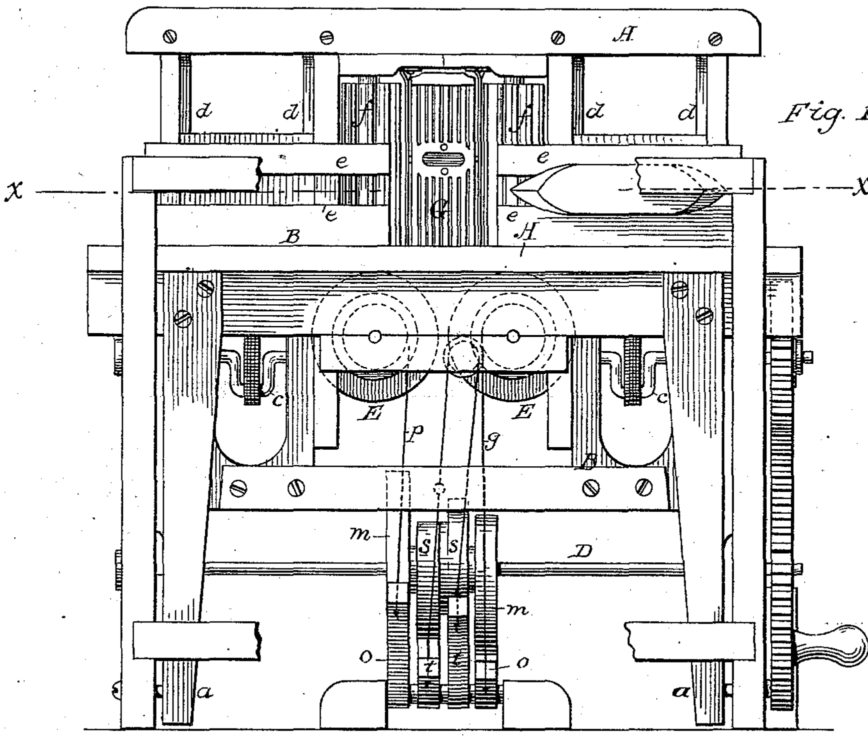
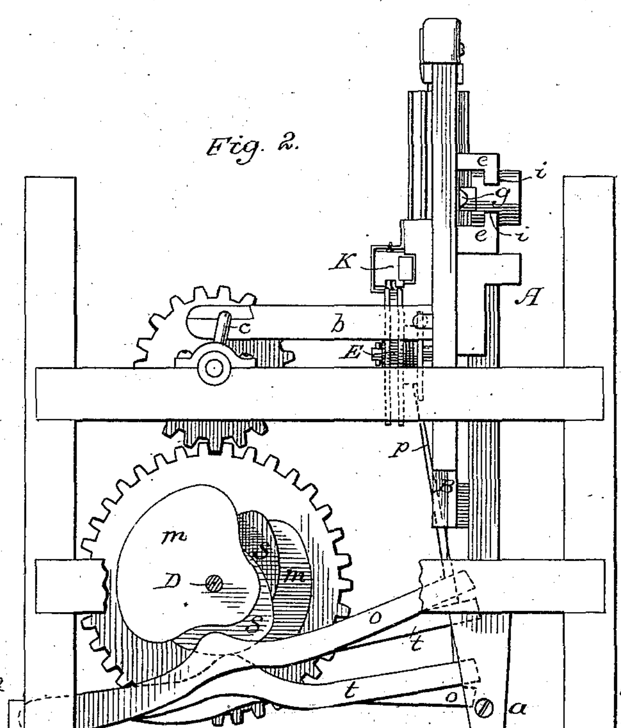


Fig. 2.



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3 Sheets—Sheet 2.

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Fig. 3.

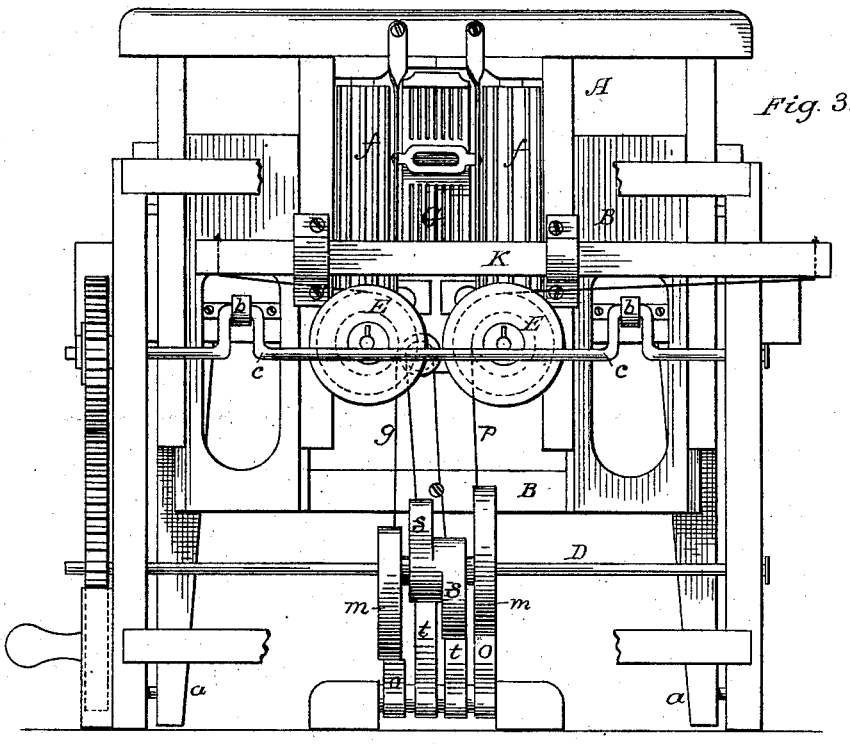
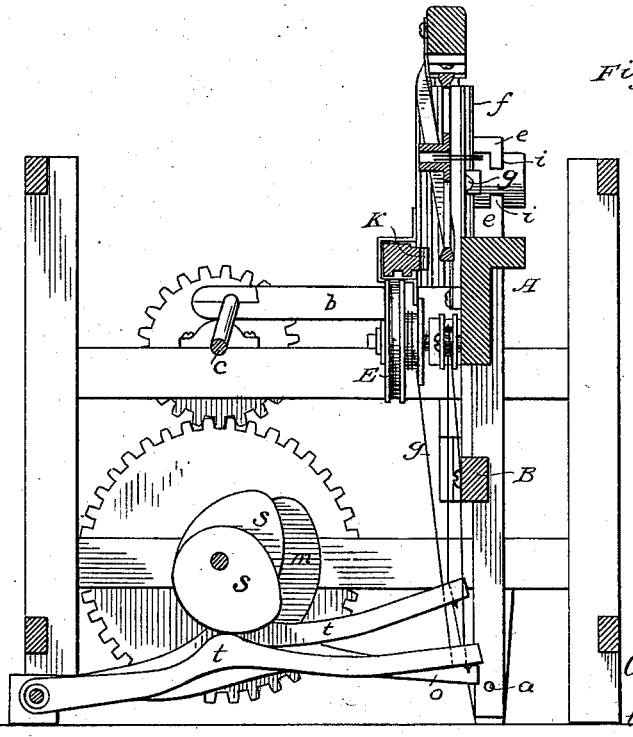


Fig. 4.



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3 Sheets—Sheet 3.

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Fig. 5.

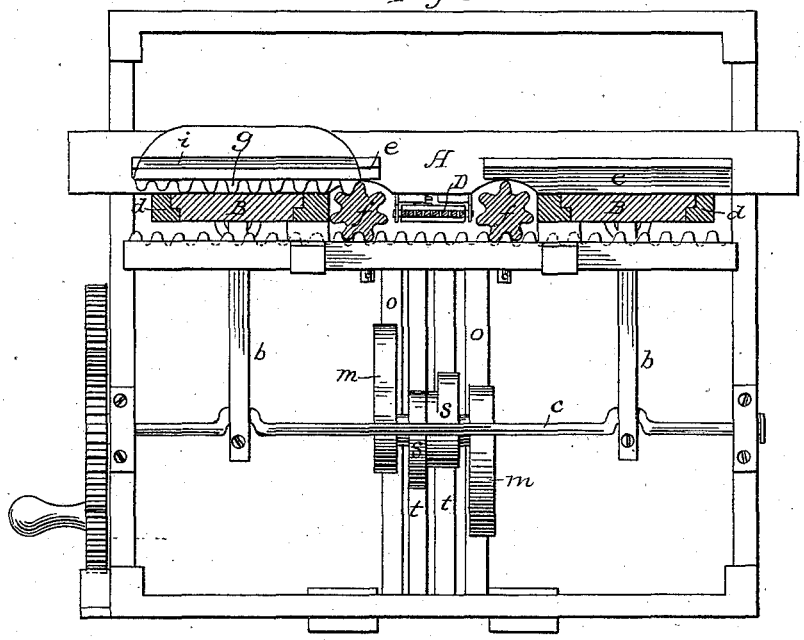


Fig. 6.

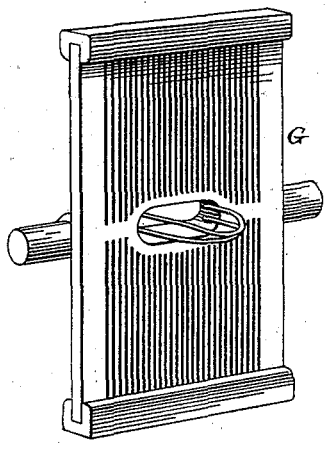
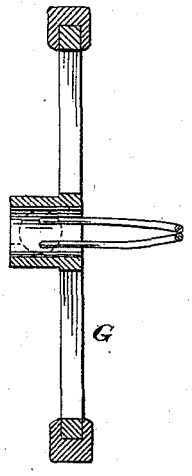


Fig. 7.



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UNITED STATES PATENT OFFICE.

ELIJAH ARNOLD, OF OLNEYVILLE, RHODE ISLAND.

LOOM FOR WEAVING TUBULAR FABRICS.

SPECIFICATION forming part of Letters Patent No. 231,748, dated August 31, 1880.

Application filed January 30, 1880.

To all whom it may concern:

Be it known that I, ELIJAH ARNOLD, of Olneyville, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Looms for Manufacturing Rubber-Lined Hose; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to looms for weaving tubular fabrics such as are used for tubular hose of the smaller sizes; and it consists in special apparatus relating mainly to the lathes adapted to the purpose.

The apparatus is illustrated in the drawings hereto annexed, in which Figure 1 is a front elevation of a loom for weaving tubular fabrics containing my improvements; Fig. 2, a a side view; Fig. 3, a rear view; Fig. 4, a central vertical cross-section; Fig. 5, a horizontal section on line *x x*, Fig. 1; and Figs. 6 and 7, detail views of reed.

In these drawings the lathe is represented at A. It is pivoted at *a a*, and is given the ordinary oscillating motion by means of arms *b b* and a crank-shaft, *c*, as in any other of the ordinary mechanisms used for the purpose.

Within the lathe is a frame, B, adapted to slide in ways *d d d d*, and carrying shuttle-guides *e e*, arranged horizontally, and adapted to guide the shuttle from one side of the lathe to the other.

Within the frame of the lathe, on each side of the reed G, is a cylindrical gear-wheel, *f*. These wheels have bearings in parts of the frame of the lathe above and below, and project on the sides next the shuttle-guides sufficiently to mesh into a rack-bar, *g*, fixed to the inner face of said shuttle.

The shuttle is grooved, as shown at *i i*, Fig. 2, or in any other suitable way is held in the guides. It must be long enough to catch when impelled from side to side into one cylindrical gear before leaving the other, and its motion must be so limited that it may not be thrown quite clear of either gear when passing from the fabric.

I have represented the gears as impelled by a rack-bar, K, which extends across the rear of the lathe in suitable guides, and is moved by cams *m m* on the shaft D through treadles *o o*, cords *p* and *q*, and pulleys E. Similar cams *s s* and treadles *t t* operate cords which cause the shuttle-frame to rise and fall in order to permit the shuttle to be moved first above in one direction and then below the former in the other direction. These devices, however, may be varied without departing from the spirit of my invention.

Centrally located in the lathe is the reed G, differing from ordinary reeds, first, in having a central opening for the passage of the rubber tube with a wire former to regulate the size of the fabric, and also in being pivoted on horizontal bearings, so as to keep the former in line with the fabric during the oscillations of the lathe. Above and below the central opening are ordinary dents of the reed for the warp to pass through.

This apparatus may be used in connection with an ordinary loom, the warp being let off and the fabric taken up by suitable mechanism and the sheds formed by ordinary heddles.

The apparatus is so arranged that when, for illustration, one of the treadles has been depressed and the shuttle-frame lowered, it is followed by a depression of another of the treadles which operates the shuttle, which is thrown to right or left through a shed formed by the warp-threads of the lower half of the fabric. After the shuttle has passed through this shed the lathe is oscillated through the gearing before described, the main driving-wheel, which meshes with the small pinion on the crank-shaft, being keyed to the cam-shaft, thereby operating the treadles. The shuttle-frame then rises, and the treadles, through the pulleys and cords, cause the rack-bar to reciprocate, returning the shuttle, while elevated, through a shed above the former. A continuation of the operation forms a circular or tubular fabric. The wire former keeps the tubular fabric, in process of formation, at a uniform size, and as such former projects into the tube the fabric is woven upon an incompressible core and is made uniform in diameter throughout its length. The tipping of the pivoted reed, as before explained, permits the wire loop to be always parallel with the fabric.

I have found that rubber tubing may be evenly and expeditiously covered by this apparatus.

What I claim, and desire to procure by Letters Patent from the United States, is—

1. In a loom for weaving tubular fabrics,

the combination, with an oscillating lathe carrying a centrally-pivoted lathe and a shuttle-frame, of mechamism for vertically reciprocating the shuttle-frame, for oscillating the lathe, and moving the shuttle horizontally, substantially as described, and for the purpose set forth.

2. In a loom for weaving tubular fabrics, the combination, with an oscillating lathe carrying a centrally-pivoted reed and a shuttle-frame, of mechanism for vertically reciprocating the shuttle-frame, shuttles provided with racks, a rack-bar and pinions journaled in the frame, and mechanism for operating the rack-bar and oscillating the lathe, substantially as described.

3. The combination, with an oscillating lathe carrying a shuttle-frame and a centrally-pivoted reed provided with a former pivoted thereto, of mechanism for vertically reciprocating the shuttle-frame and moving the shuttle horizontally, substantially as described, and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ELIJAH ARNOLD.

Witnesses:
HIRAM T. MARSH,
H. M. DAGGETT, Jr.