(No Model.) 2 Sheets—Sheet 1.

# J. LEEMING.

## LOOM.

No. 457,731. Patented Aug. 11, 1891.

Fig. 2.

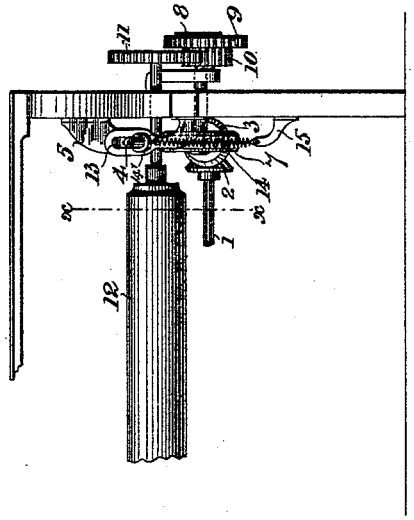
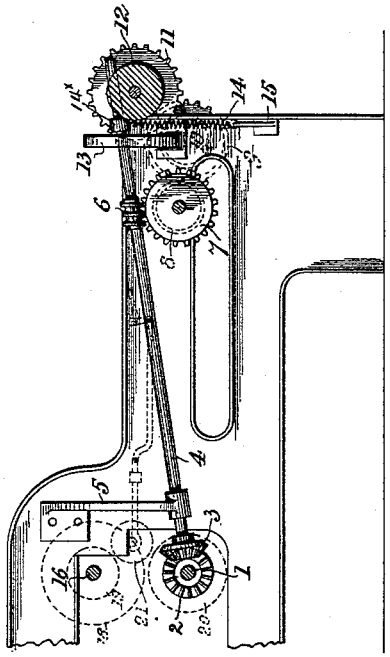



Fig. 1.




Witnesses.
J. Brierley Howard
Charles Ainley

Inventor.
John Leeming

(No Model.) 2 Sheets—Sheet 2.

# J. LEEMING.

## LOOM.

No. 457,731. Patented Aug. 11, 1891.

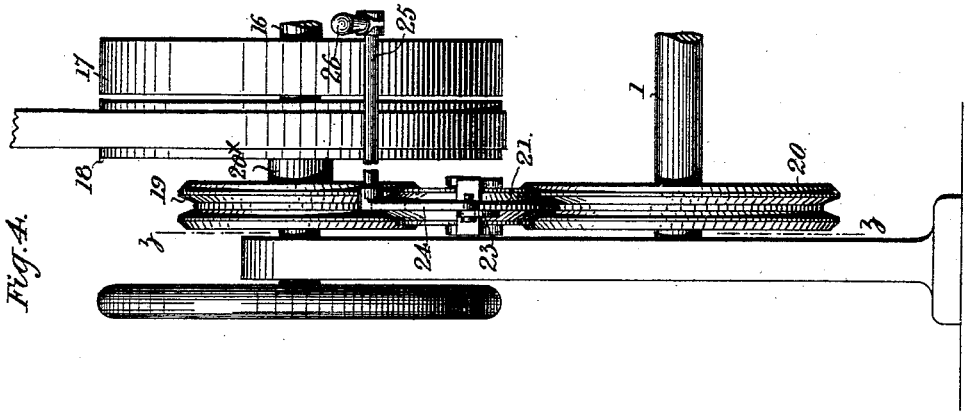



Fig. 4.

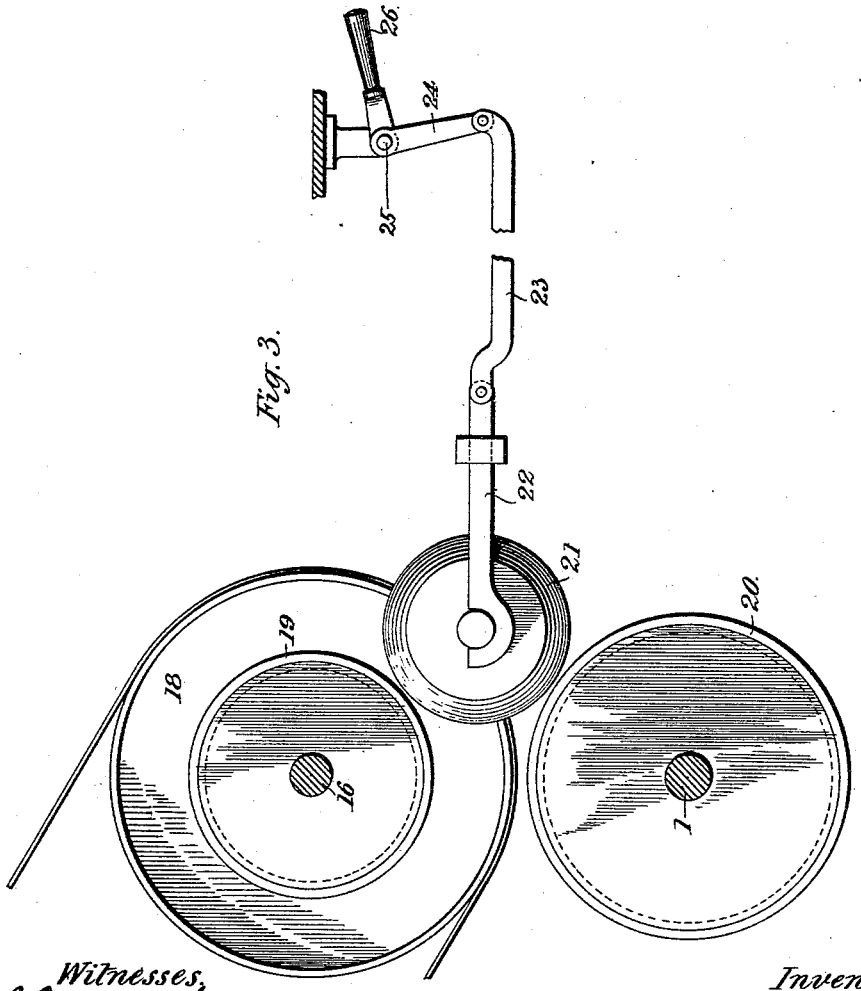



Fig. 3.

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Charles. Ainley

Inventor.
John Leeming

# UNITED STATES PATENT OFFICE.

JOHN LEEMING, OF BRADFORD, ENGLAND.

## LOOM.

SPECIFICATION forming part of Letters Patent No. 457,731, dated August 11, 1891.

Application filed October 14, 1890. Serial No. 368,065. (No model.) Patented in England August 12, 1887, No. 11,017.

*To all whom it may concern:*

Be it known that I, JOHN LEEMING, a subject of Her Majesty the Queen of Great Britain, residing at Bradford, in the county of York, England, have invented a certain new and useful Improvement in Looms, (for which I have obtained Letters Patent in Great Britain under date of August 12, 1887, No. 11,017,) of which the following is a specification.

My invention relates to the taking-up and reversing motions of looms for weaving; and it consists of mechanism for positively operating the taking-up roller or cloth-beam and for effecting the reversal of the loom and of said taking-up roller.

To clearly explain the nature of my invention, reference is made to the accompanying drawings, in which—

Figure 1 is a side elevation on line *x x* of Fig. 2 of a portion of a loom, showing my improvements applied thereto. Fig. 2 is an end elevation of the same. Fig. 3 is a side view, on an enlarged scale, of the reversing motion, taken on line *z z* of Fig. 4; and Fig. 4 is an end view of the same.

To the tappet-shaft 1 of the loom a bevel-wheel 2 is applied, which gears with a bevel-wheel 3 on a shaft 4, supported at one end by a bracket 5, affixed inside the frame of the machine. The shaft 4 has a worm 6 thereon gearing with a worm-wheel 7, the spindle of which passes through the frame and has attached to it a pinion 8, said pinion driving a second pinion 9, which in turn drives pinions 10 and 11, the latter being secured on the spindle of the taking-up roller or cloth-beam 12. The other end of the shaft 4 is supported in an elongated opening or eye of a bracket 13, the worm 6 being kept in engagement with the worm-wheel 7 by means of a spring 14, attached to a collar $14^{\times}$ on the shaft and to a small bracket 15 on the frame of the machine. When it is desired to turn the take-up roller 12 back by hand, the shaft 4 is lifted, so as to disengage the gears 6 and 7 when the roller may be reversed.

The tappet-shaft 1 is driven in the usual way from the crank-shaft 16, having thereon fast and loose pulleys 17 18, as shown in Fig. 4. For the purpose of driving the tappet-shaft in the reverse direction, however, when it is desired to mechanically reverse the loom and take-up motion together, I affix a grooved friction-pulley 19 on the crank-shaft 16 and a similar pulley 20 on the tappet-shaft 1. The pulley 19 is fast on a boss $20^{\times}$ of the loose pulley 18 and runs freely therewith.

Between the two friction-pulleys, but normally out of engagement therewith, is a third pulley 21, the rim of which is shaped to engage with the rims of the other two, as shown, said pulley being carried on an arm 22, connected through a link 23, with an arm 24, to the spindle 25, to which a handle 26 is applied. When it is desired to stop the loom, the belt is shifted to the loose pulley 18, as usual; but to reverse the same the handle 26 is forced down, so as to bring the friction-pulley 21 into engagement with the pulleys 19 20, when the tappet-shaft 1 will be driven in the reverse direction, and through its gear-wheels 2 3, shaft 4, worm-gearing 6 7, and pinions 8 9 10 11 the take-up roller will also be reversed. To prevent improperly-timed use of the handle 26, a holding-catch of some description may be applied thereto, if desired.

What I claim is—

1. In a loom, the combination of the tappet-shaft, the take-up roller, the worm-wheel with connections to the take-up roller, the shaft 4, extending over the take-up roller and having its end free to be lifted by hand, the worm on said shaft, the slotted bearing 13, and the spring for holding the shaft normally downward to cause its worm to engage with the worm-wheel.

2. In a loom, the combination of the take-up roller, the driving connections thereto, said connections being detachable to allow the take-up roller to be turned back when desired, the loose driving-pulley, and the reversing mechanism in connection therewith, substantially as described.

3. In a loom, the take-up roller, the worm-wheel with geared connections thereto, the shaft 4, adapted to be lifted and carrying a worm to engage the worm-wheel, the tappet-shaft with geared connections for operating

the worm-shaft, a friction-pulley on the tappet-shaft, the loose driving-pulley having a friction-pulley combined therewith, and an intermediate friction-pulley with means for throwing the same into engagement with the friction-pulley on the tappet-shaft and that on the loose pulley, substantially as described.

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

JOHN LEEMING.

Witnesses:
J. BRIERLEY HOWARD,
CHARLES AINLEY.