No. 633,020. Patented Sept. 12, 1899.

# D. J. MacDONALD.

## WEFTING MECHANISM FOR LOOMS.

(Application filed July 11, 1898.)

(No Model.) 3 Sheets—Sheet 1.

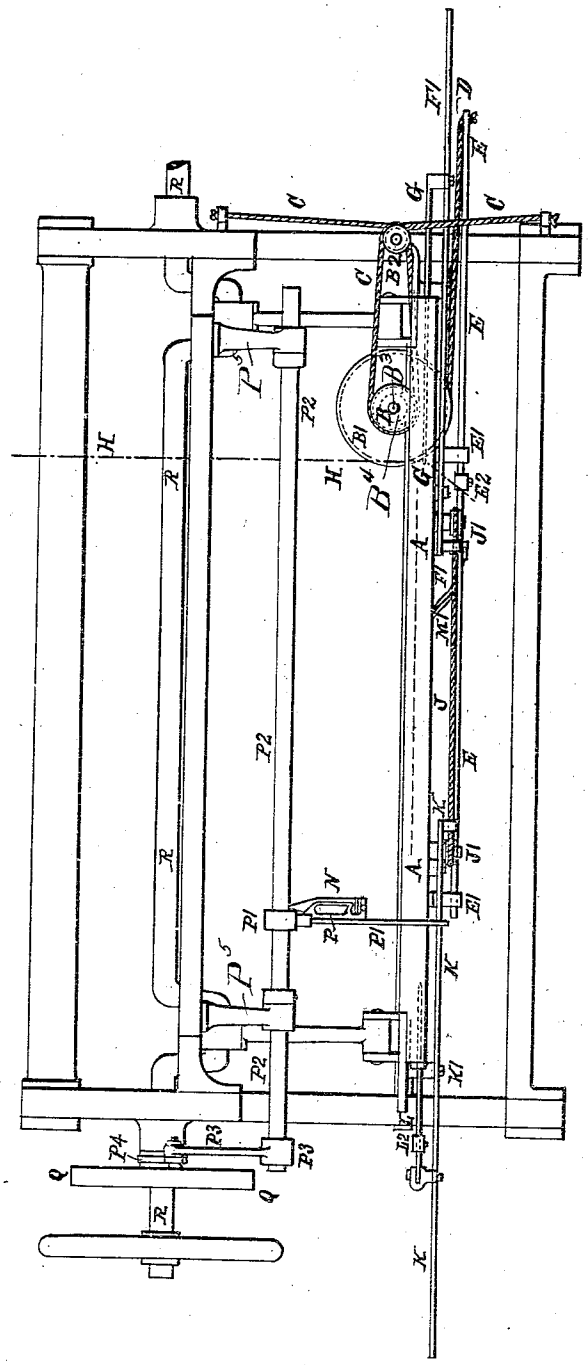


FIG. 1.

WITNESSES:

S. C. Connor

M. A. Miller

INVENTOR

DAVID JOHNSTON MacDONALD

BY

Howson and Howson

HIS ATTORNEYS.

No. 633,020. Patented Sept. 12, 1899.

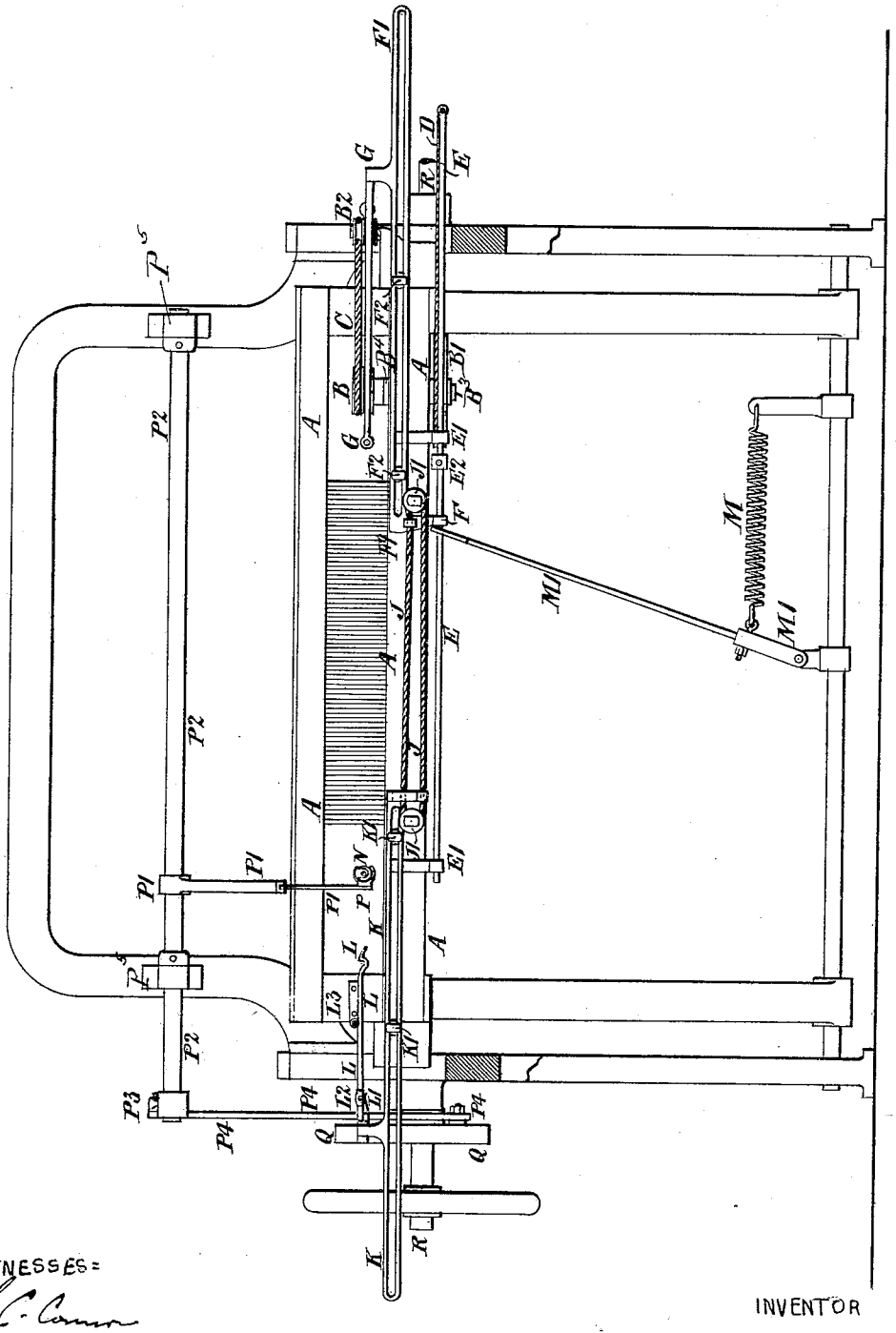
D. J. MacDONALD.

WEFTING MECHANISM FOR LOOMS.

(Application filed July 11, 1898.)

(No Model.) 3 Sheets—Sheet 2.

FIG. 2




WITNESSES:

A. C. Cannon

M. A. Miles

INVENTOR

DAVID JOHNSTON MACDONALD

BY Howson & Howson.

HIS ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 633,020. Patented Sept. 12, 1899.

D. J. MacDONALD.

WEFTING MECHANISM FOR LOOMS.

(Application filed July 11, 1898.)

(No Model.) 3 Sheets—Sheet 3.

FIG. 4.



FIG. 5.

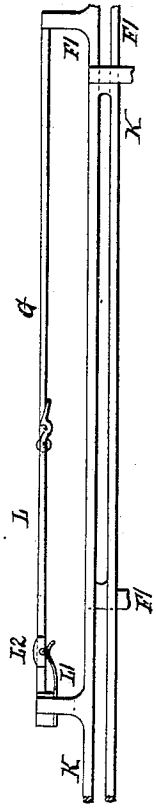


FIG. 6.

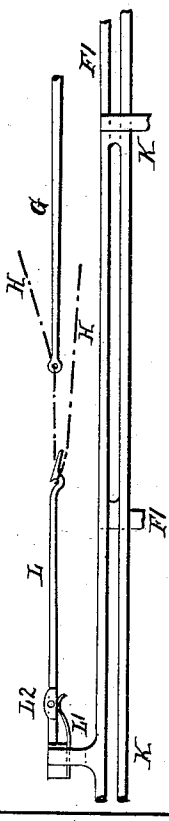
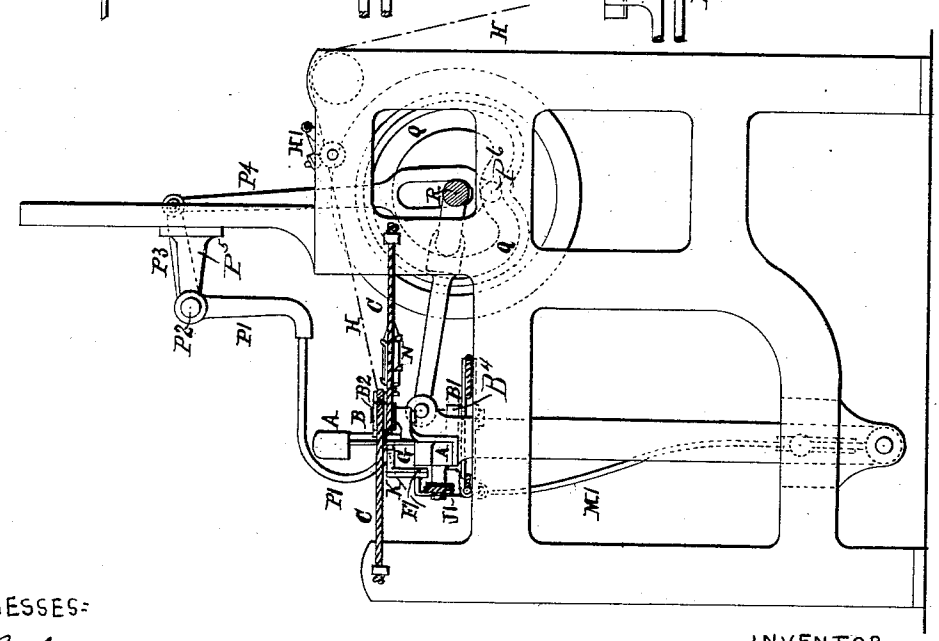


FIG. 3.



WITNESSES:

S. C. Connor

W. A. Miles

INVENTOR

DAVID JOHNSTON MACDONALD

BY Howson & Howson

HIS ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

DAVID JOHNSTON MACDONALD, OF DUNDEE, SCOTLAND.

## WEFTING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 633,020, dated September 12, 1899.

Application filed July 11, 1898. Serial No. 685,677. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID JOHNSTON MACDONALD, a subject of the Queen of Great Britain and Ireland, and a resident of Dundee, in the county of Forfar, Scotland, have invented certain Improvements in Wefting Mechanism for Looms, (for which I have applied for a British patent, No. 29,984, dated December 18, 1897,) of which the following is a specification.

My invention comprises new and simple mechanism for interweaving weft drawn off a stationary bobbin or roll with warps shed as in ordinary looms, so as to produce a web of any ordinary width.

In a loom provided with my improvements the weft passes through an eye at the end of a weft-rod, by which rod it is carried in loop form into the shed, but not completely through it. While the weft-rod is moving inward from the side of the loom from which the weft is drawn a hook-rod is moved inward from the opposite side, and its hook engages with the loop of weft, and both rods next retiring the hook-rod draws the looped weft through the remainder of the shed. The weft-loop is drawn by the hook-rod into a position in which a small shuttle carrying a thread passes through the loop to form a selvage.

My improved wefting mechanism is shown in the accompanying drawings.

Figure 1 is a plan, Fig. 2 a sectional front elevation, Fig. 3 a side elevation, and Figs. 4, 5, and 6 enlarged views, of the weft-rod and hook-rod.

The warp-shedding apparatus of the loom may be the same as in existing looms, and it is unnecessary to complicate the drawings by showing it.

The movements of the wefting mechanism are derived from the lathe A, which is arranged and works in an ordinary way.

On a spindle $B^3$, fixed to a bracket $B^4$ at the back of the lathe, there is set a pair of pulleys B B′, fixed to a sleeve or tube loose on the spindle. Around the upper pulley B, which is the smaller, there passes a cord C, the opposite parts of which, passing around a guide-pulley $B^2$, also carried by the lathe A, have their ends fixed to front and back parts of the side frame of the lathe, and the forward and backward movements of the lathe cause the pulleys to rotate alternately in opposite directions.

Fixed to and wound partly around the lower and larger pulley B′ there is a cord D, which receives an increased motion because of the difference of size of the pulleys B B′ and which is fixed at its outer end to the outer end of a bar E. This bar E slides in guides E′, fixed to the lathe, and has on it an adjustable collar $E^2$, which when the bar E has moved a certain distance toward the left hand encounters an eyed bracket F, through which the bar E passes, and which projects down from a bar F′, which is slotted and arranged to slide on pins $F^2$, fixed to the lathe. This bar F′, which moves partly under the warps, has fixed to it by an upwardly-projecting arm a weft-rod G, placed so as to enter the shed of the warps and provided with an eye at its inner end, through which eye the weft H passes from a roll or bobbin at the back, tension being applied to it by a small weighted lever H′ pressing it upon a guide, over which it passes.

The bar F′ has fixed to its inner end an endless cord J, extending around two pulleys J′, carried by the lathe and having fixed to an opposite part of it a slotted bar K, (like the bar F′, but at the opposite side of the loom,) which slides on pins K′, fixed to the lathe, and which has attached to it by an upwardly-projecting arm a hook-rod L. When the weft-rod G is moved inward from the right hand by the bar F′, the endless cord J causes the bar K to carry the hook-rod L inward from the left hand and the hook engages with the weft-loop in a manner that will be understood from Figs. 4, 5, and 6, the weft-loop being drawn through to the left-hand side of the warps when the hook-rod L returns outward. The outward or return movements of the weft-rod G and hook-rod L are produced by the recoil of a spring M, connected to a lever M′, the upper end of which bears on the bracket F of the bar F′.

The loop of weft is by the outward movement of the hook-rod L drawn to a position a little beyond the left-hand side of the warps at the beginning of the forward movement of the lathe, and the loop is passed over a small pointed shuttle N, partly by the forward motion of the lathe and partly by a backward motion of the shuttle. The shuttle N is held

with its point directed backward in a cradle P, fixed to a lever P′, which is curved to clear the lathe-rail and is fixed on a rocking shaft $P^2$, carried by brackets $P^5$, fixed to the loom-framing. On one end of the rocking shaft $P^2$ there is fixed a lever $P^3$, which has joined to it a rod $P^4$, provided at its lower end with an antifriction-roller $P^6$ to be acted on by a grooved cam Q, fixed on the crank-shaft R, the rod $P^4$ being slotted, so as to be guided by the shaft R, which passes through the slot. Immediately on the weft-loop becoming engaged with the shuttle N it is released from the hook-rod L. This hook-rod L is jointed to the projection on the bar K, but is held up by a spring L′, and there is on it an adjustable projection $L^2$, which on the rod moving outward passes under a small antifriction-roller $L^3$ on a pin fixed to the lathe, this roller causing the hook end of the rod to be depressed free from the weft-loop. On the lathe moving backward after each beat-up it proceeds a short distance (to allow of sufficient opening of the new shed) before the bars F′ K′, which carry the weft-rod G and hook-rod L, are acted on, the distance depending on the space between the bracket F and the collar $E^2$, which last is adjustable on the rod E. The weft-rod G and hook-rod L are entered into the shed during the remainder of the backward movement of the lathe, and on the lathe moving forward again the rods G L are withdrawn, the weft-loop is threaded by the shuttle-thread, and the newly-laid weft is beat up.

What I claim as my invention is—

In a needle-loom, the oppositely-moving weft-rod and hook and an endless cord to operate the rod and hook, in combination with means for working such cord, consisting of a cord C, the lathe the loom-framing to which the ends of the cord C are fixed, pulleys B and $B^2$ carried by the lathe and around which said cord C passes, a larger pulley B′ fixed to pulley B, a cord connected to and passing around the pulley B′, a rod E also connected to the last-mentioned cord and to the endless cord, and a spring to effect the return movement, all substantially as described.

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

DAVID JOHNSTON MACDONALD.

Witnesses:
WILLIAM YOUNG,
ALFRED LANDALE.