

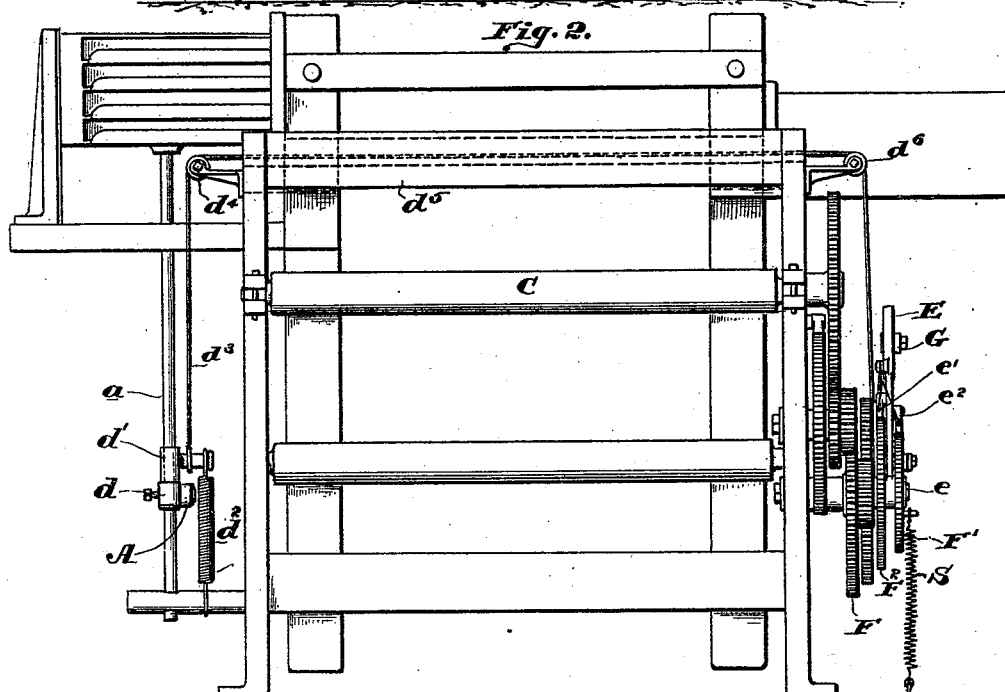
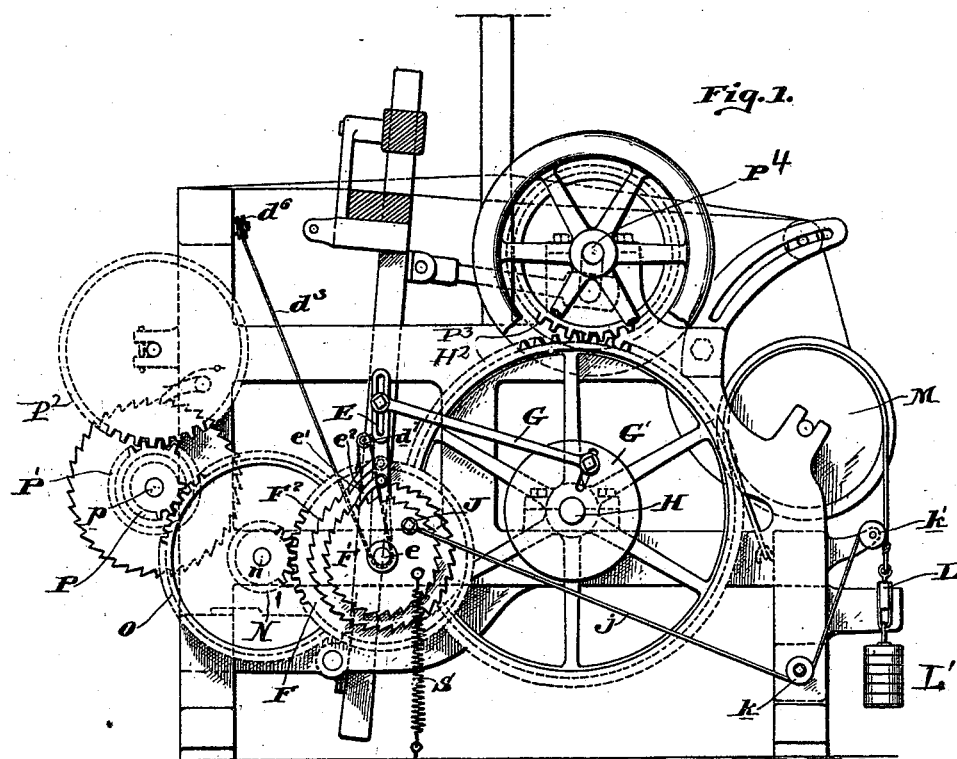
(No Model.)

2 Sheets—Sheet 1.

G. S. COX.
LOOM.

No. 492,144.

Patented Feb. 21, 1893.



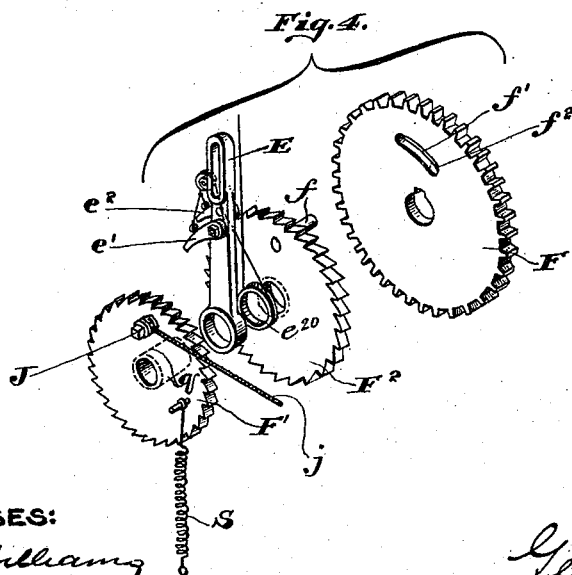
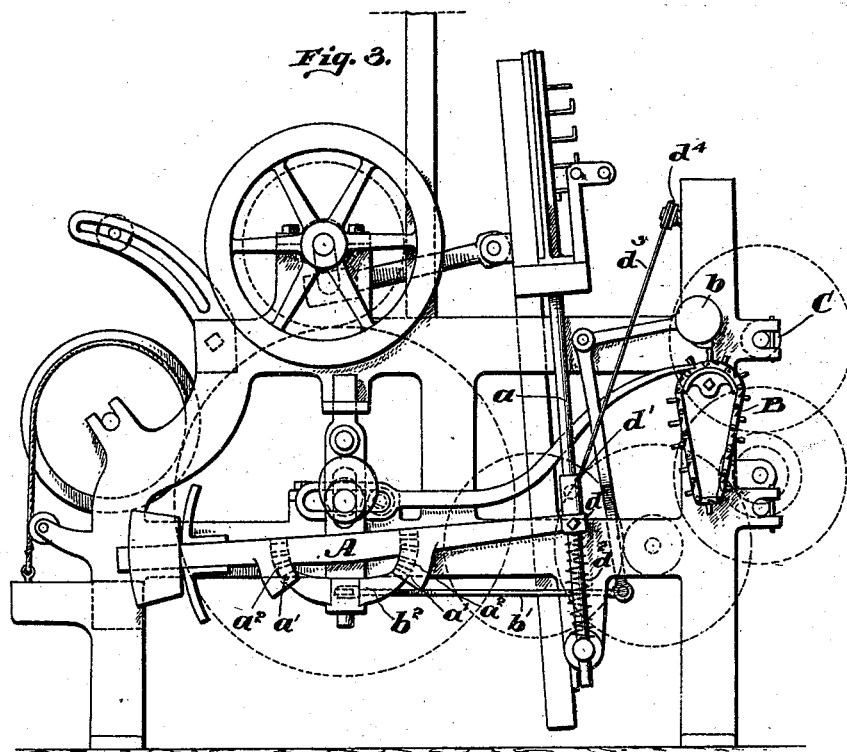
WITNESSES:
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LOOM.

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WITNESSES:
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UNITED STATES PATENT OFFICE.

GEORGE S. COX, OF PHILADELPHIA, PENNSYLVANIA.

LOOM.

SPECIFICATION forming part of Letters Patent No. 492,144, dated February 21, 1893.

Application filed May 21, 1890. Serial No. 352,636. (No model.)

To all whom it may concern:

Be it known that I, GEORGE S. COX, a citizen of the United States, residing at Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Looms, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

The object of my improvement is to enable the rapid and ready production of blind passes or the formation of warp without filling, so that at the ends of the fabric, such as towels, I can obtain a sufficient extent of warp to produce fringe.

My improvement consists in certain attachments to looms whereby the tension on the warp is released, and, at the same time, the sand roller is caused to move rapidly so as to carry forward a sufficient extent of warp to form the fringe of any desired length.

In the drawings:—Figure 1 is a side elevation of a portion of a loom embodying my invention. Fig. 2 is a front elevation of portion of loom. Fig. 3 is a side elevation of portion of loom,—the side opposite to that of Fig. 1. Fig. 4 is a perspective view of detached parts.

Similar letters denote similar parts.

A is the ordinary shuttle box lever which is connected to the lifting rod *a* so as to bring the desired shuttle into position to be operated by the picker staff. This lever is operated under the control of the pattern chain B, which has projections or lugs of different heights and said pattern chain generally moving one sprocket for every two picks. Said projections act on the weighted feeler lever *b* which is connected to the rod *b'*, which in turn is connected to the ordinary anchor *b''*, which anchor is given a vertical reciprocatory motion in the ordinary manner.

On the box lever A are a series of steps *a'*, *a''*, &c. and the weighted feeler lever *b* brings the anchor into such position that it strikes different steps depending upon the extent of projection upon the pattern chain, and by this means the desired box is brought into position to be acted upon by the picker staff as in an ordinary loom.

C is the sand roller which moves the cloth forward as it is made.

d is the shoe attached to the lifting rod *a*, upon which the shuttle box lever acts to lift the shuttle box.

d' is a ring loosely surrounding the lifting rod and resting upon this shoe. To this ring is attached a spring *d''*, and a string or chain *d'''* also is attached to this ring *d'*, which string or chain passes over a pulley *d''* on the front of the loom on the back of the breast beam *d'''* and passes along the back of this breast beam to the opposite side of the machine to pulley *d'''* and passes around a roller *e''* on the shaft *e* and over pulley *d'''* attached to the lever E, on the gear shaft *e*. Connected to this lever are the pawls *e'*, *e''*, one on each side (see Fig. 4). The string or chain passes from the pulley *d'''* around the shaft *e* and over pulley *d'''*, on the lever E and is connected to the pawls *e'*, *e''*, it dividing out to connect with them.

F is a gear wheel on the shaft *e*, and *F'*, *F''* are two ratchet wheels on said shaft, the pawls *e'*, *e''* being adapted to work in the ratchets *F'*, *F''* respectively. The ratchet *F''* has a projection *f* on the surface which rests in a slot *f'* in the gear wheel F, and when said ratchet is at rest is at the point *f''* of said slot. The lever E has the link G connected to it at its upper end, the other end of the link G being connected to the crank disk *G'* which is mounted upon the cam driving shaft H, which shaft is operated through the gears *H''*, *P''*, by the main driving shaft *P''*.

Upon the ratchet wheel *F'* is the projection J, to which is attached a rope or chain *j*, which passes over the pulleys *k* and *k'* and has its other end connected to the weighted lever L, which is used to put the proper tension on the warp upon the warp beam M. The gear wheel F gears into the wheel N upon the shaft *n*. Upon the same shaft *n* is the gear wheel O which works in the gear wheel P upon the shaft *p*. The gear wheel *P'* upon the shaft *p* works in the gear wheel *P''* upon the sand roller and during the ordinary action of the loom all these gears are revolved continuously by the usual take-up mechanism. The spring *d''* holds the string or chain *d'''* so that the pawls *e'* and *e''* are out of engagement

with their corresponding ratchets. The string or chain is inactive in the ordinary operation of the loom, but upon the pattern chain are placed at the desired positions lugs of a greater height than is necessary to bring any shuttle box in use into position; and this, through the intervention of mechanism hereinbefore described, causes the lifting rod *a* to raise an extra height. This is done at the end of the construction of a piece. This causes the chain *d*³ to become slack, and the pawls *e*¹, *e*² are allowed to drop into their respective ratchets. As the lever *E* is actuated by the cam shaft, as hereinbefore described, the ratchet wheels revolve, which causes the string or chain *j* to be moved forward, lifting the weight *L* from the warp, and the ratchet *F*² revolves the gear wheel *F*, which, by the gearing described, causes the revolution of the sand roller to be accelerated, bringing forward the warp and enabling fringe to be formed rapidly and satisfactorily. The cord *d*³ passes around the shaft *e* before it passes around the pulley *d*¹, so that the length of the said cord *d*³ is constant and is not affected by the movement of the lever *E*. The connection between the gear wheel *F* and the ratchet *F*² is made as described, so that the movement of the ratchet *F*¹ will lead that of the gear *F* and the weight will be taken off the warp before the sand roller is operated.

A spring *S* is at one end attached to the ratchet *F*¹, and the other end is attached to the floor or other fixed place, so that if sufficient fringe be not made in one motion of the lever *E*, and the pawls are moved back on the ratchet, the tension produced on the spring by the forward movement of ratchet *F*¹ will pull the said ratchet back the distance it moved forward.

The ratchet *F*² is provided with a hub having a friction face which is kept in contact with the ratchet *F*¹ so that when the ratchet *F*¹ is pulled back by the spring *S* the ratchet *F*² will also be moved back a distance equal to the length of the slot *F*¹ in the gear *F*, so that the ratchet *F*² will move that distance before it operates the gear wheel *F*, thus enabling the weighted lever *L* to be released from acting on the warp beam before the gear wheel *F* is operated, so that the tension on the warp is released before the sand roller is operated.

Instead of operating the lever *E* from the cam driving shaft, I can operate it from the main driving shaft directly.

When the machine is operating to weave the fabric, the ordinary means are used for operating the sand roller so as to take up the woven fabric.

Having now fully described my invention, what I claim, and desire to protect by Letters Patent, is—

1. The combination of a sand roller, a warp beam, a tension device on said warp beam, a driving shaft operatively connected to the

sand roller and to the tension device and mechanism whereby the tension device may be released from the warp beam in advance of the movement of the sand roller.

2. In combination, a lifting rod, means substantially as described to operate said rod, ratchet wheels as *F*¹, *F*², pawls adapted to rest in said ratchet wheels, a flexible connection substantially as described between said lifting rod and the pawls, a cam shaft and intermediate connection between said cam shaft and the pawls, a warp beam, a tension device for said warp beam, intermediate mechanism substantially as described between the ratchet wheel *F*¹ and the tension device of the warp beam to release said tension device, a sand roller and intermediate connection between the sand roller and the ratchet wheel *F*² to operate said sand roller.

3. In combination, a lifting rod, means substantially as described to operate said rod, ratchet wheels as *F*¹, *F*², a lever as *E*, pawls connected to said lever and adapted to rest in said ratchet wheels, a flexible connection substantially as described between said lifting rod and pawls, a cam shaft and intermediate connection between said cam shaft and the lever *E*, a warp beam, a tension device for said warp beam, intermediate mechanism substantially as described between the ratchet wheel *F*¹ and the tension device of the warp beam to release said tension device, a sand roller and intermediate connection between the sand roller and the ratchet wheel *F*² to operate said sand roller.

4. In combination, a lifting rod, means substantially as described to operate said rod, ratchet wheels, as *F*¹, *F*², a lever as *E*, pawls connected to said lever and adapted to rest in said ratchet wheels, a flexible connection substantially as described between said lifting rod and pawls, a cam shaft, a link at the end of said lever *E*, a crank connecting said cam shaft and the link of the lever *E*, a warp beam, a tension device for said warp beam, intermediate mechanism substantially as described between the ratchet wheel *F*¹ and the tension device for the warp beam to release the tension device, a sand roller, and intermediate connection between the sand roller and the ratchet wheel *F*² to operate said sand roller.

5. In combination, a lifting rod, means substantially as described to operate said rod, ratchet wheels as *F*¹, *F*², pawls adapted to rest in said ratchet wheels, a flexible connection substantially as described between said lifting rod and the pawls, a cam shaft, intermediate mechanism between said cam shaft and the pawls, a warp beam, a tension device operating on said warp beam intermediate mechanism substantially as described between the ratchet wheel *F*¹ and said tension device to release said tension device, a gear wheel as *F*, having a slot, a projection upon the ratchet wheel *F*² adapted to rest in said slot in the

gear wheel F, a sand roller, and intermediate connection between the sand roller and the gear wheel F.

6. In combination, a lifting rod, means substantially as described to operate said rod, ratchet wheels as F', F², a lever as E, pawls connected to said lever and adapted to rest in said ratchet wheels, a flexible connection substantially as described between said lifting rod and pawls, a cam shaft and intermediate connection between said cam shaft and the lever E, a warp beam, a tension device for said warp beam, intermediate mechanism substantially as described between the ratchet wheel F' and the tension device of the warp beam to release said tension device, a gear wheel as F, having a slot, a projection upon the ratchet wheel F² adapted to rest in said slot in the gear wheel F, a sand roller, and intermediate connections between the sand roller and the gear wheel F; to operate said sand roller.

7. In combination, a lifting rod, means substantially as described to operate said rod, ratchet wheels, as F', F², a lever as E, pawls connected to said lever and adapted to rest in said ratchet wheels, a flexible connection substantially as described between said lifting rod and pawls, a cam shaft, a link at the end of said lever E, and a crank connecting said cam shaft and the link of the lever E, a warp beam, a tension device for said warp beam, intermediate mechanism substantially as described between the ratchet wheel F' and said tension device to release said tension device, a gear wheel, as F, having a slot, a projection upon the ratchet wheel F² adapted to rest in said slot in the gear wheel F, a sand roller, and intermediate connection between the sand roller and the gear wheel F to operate said sand roller.

8. In combination, a pattern chain, a lifting rod, means substantially as described to operate said rod, ratchet wheels as F', F², a lever as E, pawls connected to said lever and adapted to rest in said ratchet wheels, a flexible connection substantially as described between said lifting rod and pawls, a cam shaft and intermediate connection between said cam shaft and the lever E, a warp beam, a tension device for said warp beam, intermediate mechanism substantially as described between the ratchet wheel F' and the tension device to release said tension device, a sand roller and intermediate connections between the sand roller and the ratchet wheel F² to operate said sand roller.

9. In combination, a pattern chain, a lifting rod, means substantially as described to operate said rod, ratchet wheels as F', F², a lever as E, pawls connected to said lever and adapted to rest in said ratchet wheels, a flexible connection substantially as described between said lifting rod and pawls, a cam shaft, a link at the end of said lever E, and a crank connecting said cam shaft and the link of the

lever E, a warp beam, a tension device for said warp beam, intermediate mechanism substantially as described between the ratchet wheel F' and the tension device, to release said tension device, a sand roller, and intermediate connection between the sand roller and the ratchet wheel F² to operate said sand roller.

10. In combination, a pattern chain, a lifting rod, means substantially as described to operate said rod, ratchet wheels as F', F², pawls adapted to rest in said ratchet wheels, a flexible connection substantially as described between said lifting rod and the pawls, a cam shaft, intermediate mechanism between said cam shaft and the pawls, a warp beam, and a tension device connected to said warp beam intermediate mechanism substantially as described between the ratchet wheel F' and the said tension device to release said tension device, a gear wheel as F, having a slot, a projection upon the ratchet wheel F² adapted to rest in said slot in the gear wheel F, a sand roller, and intermediate connection between the sand roller and the gear wheel F, to operate said sand roller.

11. In combination, a pattern chain, a lifting rod, means substantially as described to operate said rod, ratchet wheels as F', F², a lever as E, pawls connected to said lever and adapted to rest in said ratchet wheels, a flexible connection substantially as described between said lifting rod and pawls, a cam shaft and intermediate connections between said cam shaft and the lever E, a warp beam, a tension device for said warp beam, intermediate mechanism substantially as described between the ratchet wheel F' and the tension device to release said tension device for the warp beam, a gear wheel as F, having a slot wheel, a projection upon the ratchet wheel F² adapted to rest in said slot in the gear wheel F, a sand roller, and intermediate connection between the sand roller and the gear wheel F, to operate said sand roller.

12. In combination, a pattern chain, a lifting rod, means substantially as described to operate said rod, ratchet wheels, as F', F², a lever as E, pawls connected to said lever and adapted to rest in said ratchet wheels, a flexible connection substantially as described between said lifting rod and pawls, a cam shaft, a link at the end of said lever E, and a crank connecting said cam shaft and the link of the lever E, a warp beam, a tension device for said warp beam, intermediate mechanism substantially as described between the ratchet wheel F' and the tension device to release said tension device for the warp beam, a gear wheel as F having a slot, a projection upon the ratchet wheel F² adapted to rest in said slot in the gear wheel F, a sand roller, and intermediate connection between the sand roller and the gear wheel F, to operate said sand roller.

13. In combination, a pattern chain, a lift-

ing rod, means substantially as described to
operate said rod, ratchet wheels as F', F²,
pawls adapted to rest in said ratchet wheels,
a flexible connection substantially as de-
scribed between said lifting rod and the pawls,
5 a cam shaft and intermediate connection be-
tween said cam shaft and the pawls, a warp
beam, a tension device for said warp beam,
intermediate mechanism substantially as de-
scribed between the ratchet wheel F' and the
10 tension device to release said tension device
for the warp beam, a sand roller and inter-
mediate connection between the sand roller
and the ratchet wheel F², to operate said sand
15 roller.

14. In combination, a pattern chain, a lift-
ing rod, a shoe upon said lifting rod, a ring or
similar device surrounding said rod, means
substantially as described to operate said rod,
20 a string or chain attached to said ring, rollers
attached to the breast beam of the machine
over which said string passes, ratchet wheels
F' and F², a lever pivoted upon the shaft of
said ratchet wheel, a roller on the shaft around
25 which said string or chain passes, a roller upon
said lever around which said chain passes,
pawls attached to said lever to which said
string or chain is connected, said pawls being
adapted to rest in said ratchet wheels, a cam

shaft, a link connected with the end of said 30
lever E, a crank connecting said cam shaft
and the link, a warp beam, a tension device
for said warp beam, intermediate mechanism
substantially as described between the ratchet
wheel F' and the tension device to release 35
said tension device of the warp beam, a gear
wheel as F, having a slot, a projection upon
the ratchet wheel F² adapted to rest in said
slot in the gear wheel F, a sand roller, and in-
termediate connection between the sand roller 40
and the gear wheel F, to operate said sand
roller.

15. In combination a sand roller a warp
beam, a tension device for said warp beam,
ratchet gears operatively connected to said 45
roller, pawls engaging with said ratchet wheels,
a shaft adapted to operate said pawls, con-
trolling mechanism and intermediate mech-
anism between the gearing and the tension
devices of said warp beam, substantially as 50
specified.

In testimony of which invention I have here-
unto set my hand.

GEORGE S. COX.

Witnesses:

GEO. W. REED,
FRANK S. BUSSOR.