

(No Model.)

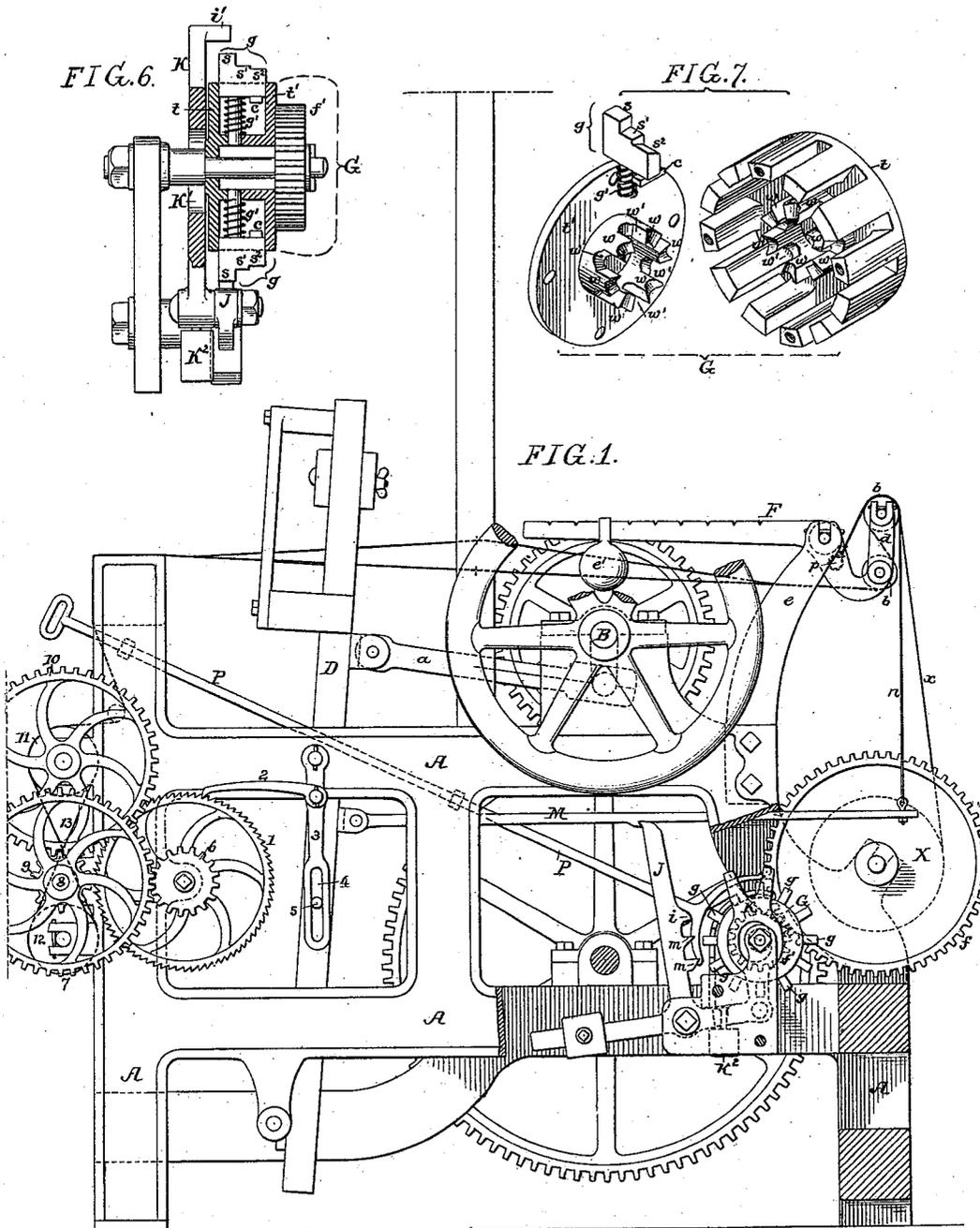
3 Sheets—Sheet 1.

T. LOVELIDGE.

LET OFF MECHANISM FOR LOOMS.

No. 355,617.

Patented Jan. 4, 1887.



Witnesses:
John E. Parker.
William D. Connor

Inventor:
Thomas Lovelidge
by his Attorneys
Howson & Sons

(No Model.)

3 Sheets—Sheet 2.

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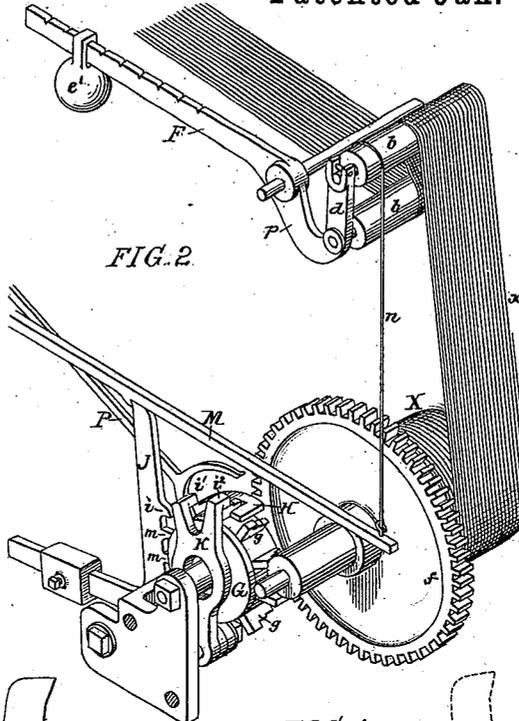


FIG. 2.

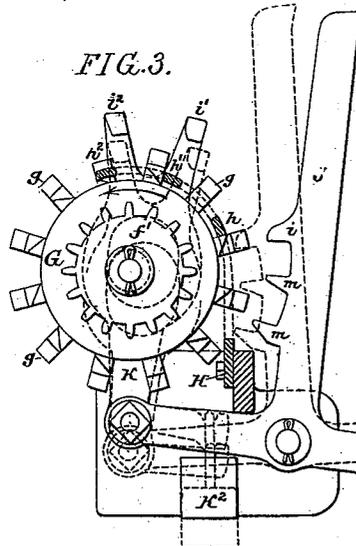


FIG. 3.

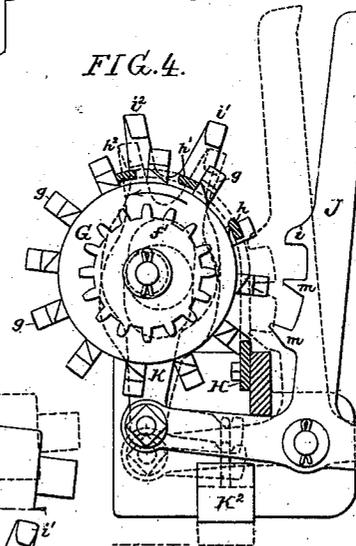


FIG. 4.

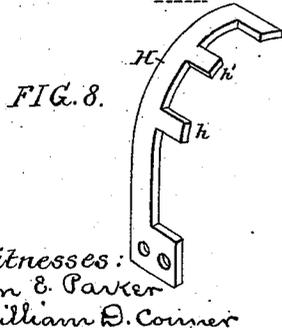


FIG. 8.

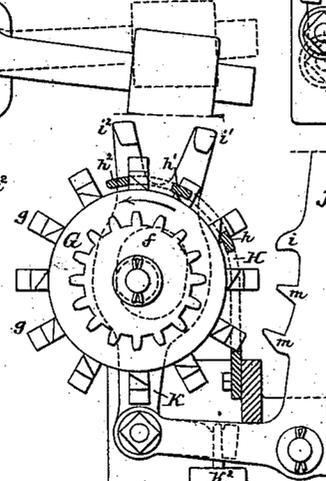


FIG. 5.

Witnesses:
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(No Model.)

3 Sheets—Sheet 3.

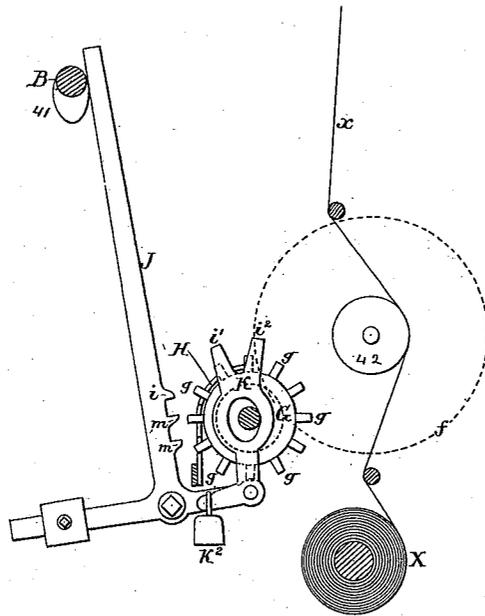
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Patented Jan. 4, 1887.

FIG. 9.



Witnesses:
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UNITED STATES PATENT OFFICE.

THOMAS LOVELIDGE, OF PHILADELPHIA, PENNSYLVANIA.

LET-OFF MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 355,617, dated January 4, 1887.

Application filed June 24, 1886. Serial No. 206,087. (No model.)

To all whom it may concern:

Be it known that I, THOMAS LOVELIDGE, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Let-Off Mechanisms for Looms, of which the following is a specification.

One object of my invention is to so construct a let-off device for looms that there will be a delivery of warp-threads in proper accord with the requirements of the take-up, a further object being to prevent any accidental delivery of warp-threads from the beam under the influence of the strain upon the warp-threads in beating up, and a still further object of the invention being to readily permit a free delivery of warp-threads at such times as may be required.

In the accompanying drawings, Figure 1 is a side view, partly in section, of sufficient of a loom to illustrate my improved let-off mechanism; Fig. 2, a perspective view of the let-off mechanism detached from the loom; Figs. 3, 4, and 5, diagrams illustrating the operation of the let-off; Fig. 6, a sectional view of part of the let-off device; Fig. 7, perspective views of part of the same, and Fig. 8 a detached view of the stop-plate. Fig. 9 is a diagram illustrating a modified plan of operating the let-off.

A represents the frame of the loom, and B the crank-shaft, the cranks of which are connected by rods *a* to the swinging lathe D of the loom, as usual.

The cloth-take-up mechanism may be of any desired character of positive take-up, this forming no essential part of my invention, although I have shown in the drawings take-up mechanism consisting of a ratchet-wheel, 1, operated by a pawl, 2, carried by a lever, 3, hung to the frame of the loom, and having a slot, 4, for the reception of a pin, 5, on the sword of the lathe, the spindle of said ratchet-wheel 1 having a spur-pinion, 6, which engages with a spur-wheel, 7, on a spindle, 8, the latter having a spur-pinion, 9, engaging with a spur-wheel, 10, on the spindle of the take-up roll 11, the cloth-roll 12 being driven from said take-up roll by means of a belt, 13.

The warp-threads *x* pass from the warp-beam X over rollers *b b*, carried by the up-turned end *d* of the short arm of a lever, F,

which is hung to a bracket, *e*, on the frame of the loom, the long arm of the lever being provided with an adjustable weight, *e'*, so that the tension upon the warp-threads can be properly regulated by shifting said weight.

The shaft of the warp-beam has a spur-wheel, *f*, which gears into a pinion, *f'*, secured to the inner face of the hollow drum G, the latter having projecting teeth *g*, acted upon by springs *g'*, Figs. 6 and 7, which tend to project them to a certain extent beyond the periphery of the drum, the extent of projection being limited by contact of lugs *c* on the teeth with the inner face of the shell of the drum. These teeth act in conjunction with stop-projections *h h' h''* on a segmental plate, H, so as to form an escapement for the drum—that is to say, when a tooth of the drum is in contact with the projection *h*, the tooth in advance will be some distance in the rear of the projection *h'*, and the second tooth in advance will be still farther in rear of the projection *h''*, so that when the first tooth is depressed so as to clear the projection *h* the tooth in advance will be stopped by contact with the projection *h'*, and when this tooth is depressed the tooth in advance of it will be stopped by contact with the projection *h''*, the depression of the latter tooth bringing a fresh tooth into contact with the first projection, *h*, of the plate, so that there will be three movements of the wheel to advance the same to the extent of one tooth. The let-off of the warp-threads from the beam is thus governed by the depression of the teeth of the drum G, and this is effected by means of pallets acting upon the teeth in succession.

There are in the present instance three pallets, *i*, *i'*, and *i''*—the first for operating the tooth in advance of the projection *h*, the second for operating the tooth in advance of the projection *h'*, and the third for operating the tooth in advance of the projection *h''*—the pallet *i* being carried by a lever, J, and the pallets *i'* and *i''* being formed on a sliding frame, K, which is connected to one arm of said lever and is operated thereby. As the lever J swings rearward, therefore, there is a simultaneous operation of the sliding frame K, and the pallets of the lever and frame are so arranged in respect to the projections of the plate H that the teeth of the drum G will be acted on

in succession by said pallets, as will be readily understood on reference to the diagrams, Figs. 3, 4, and 5.

The frame K has a slot, K', for the reception of the stud which carries the drum G, and the frame has an arm, to which is hung a weight, K², which tends to maintain the upper end of the frame in proper position for the action of the pallets upon the teeth of the drum.

The lever J has other pallets, *m m*, which serve as preliminary stops for the teeth, in advance of the stop *h*, when the lever J is in the position shown by dotted lines in Figs. 3 and 4.

Where a definite and positive take-up on each pick of the loom is required, the lever J may be operated by a cam or crank on the crank-shaft B of the loom, a cam, 41, being shown for this purpose in Fig. 9. The warp-threads in this case, however, should pass from the warp-beam over a let-off beam, 42, to which the escapement device is connected, as it is necessary that the diameter of the let-off beam shall always be uniform where there is a definite movement of the same at stated intervals to effect the let-off of the warp. I prefer, however, to effect an intermittent let-off of the warp-threads in accordance with the requirements of the loom. This object I attain by operating the lever J by means of a catch-arm, M, hung to the sword of the lathe, and connected at the outer end to a cord or wire, *n*, which passes over the upper roller, *b*, of the lever F, and is secured to a pin, *p*, on the short arm of said lever.

As the cloth is taken up the short arm of the lever F is drawn down and the catch-arm M is permitted to engage with the lever J; but as soon as there has been a sufficient let-off of warp-threads to permit the short arm of the lever F to rise to the proper extent the catch-arm M will be lifted clear of the lever J, and the operation of the latter will be stopped until there is again a sufficient taking up of the cloth to warrant a further let-off of warp-threads.

While there is always sufficient slack in the warp to permit the easy shedding of the same by the heddles or harness, the sudden longitudinal strain upon the warp-threads, due to the beating up of the lathe, has no effect upon the let-off; as, owing to the upturned end of the lever and its two rollers, this strain is exerted almost in a direct line with the fulcrum of said lever.

The use of three pallets and three projections on the retaining-plate permits a fine graduation in the let-off, and is preferred in looms for weaving fine goods, a coarser let-off being available in looms for weaving terry goods.

When it becomes necessary to provide for the free let-off of the warp-threads from the beam, as in making fringe on towels, scarfs, &c., the teeth of the escapement-drum may be depressed by means of the forked end of a bar, P, guided on the loom-frame, so that said teeth will be free from the influence of the retaining-

projections of the plate H, and each tooth is beveled on the rear side, so that the drum G can be readily turned backward to tighten the warp when necessary.

I prefer to provide each tooth with three portions, *s*, *s'*, and *s''*, the portion *s* being the highest and being acted upon by the pallets, the portion *s'* being somewhat less in height and being acted upon by the forked end of the releasing-bar P, and the portion *s''* being the lowest and coming into contact with the stop-projections of the retaining-plate, this portion being beveled on the rear side, as specified.

To provide for the proper guidance of the shanks of the teeth, I form the hub of the drum G in two parts, one part being carried by one head, *t*, of the drum, and the other part by the opposite head, *t'*, of the same, as shown in Figs. 6 and 7, each of these parts of the hub having alternating projections *w* and recesses *w'*, the recesses of one part of the hub receiving the projections on the opposite part, and the base of each recess and the end of the projection entering the same forming guides for one of the shanks of the teeth.

The drum G might be formed on or secured to the end of the let-off beam directly; but I prefer to connect it to the let-off beam by reducing-gearing, as shown, in order to permit a finer graduation of the let-off than would be possible if the drum were connected directly to the beam.

I claim as my invention—

1. The combination of the let-off beam, an escapement-drum connected thereto and having movable teeth, stops for engaging said teeth, pallets for depressing the teeth, and means for operating said pallets, all substantially as specified.

2. The combination of the let-off beam, the escapement-drum connected thereto and having movable teeth, stops for engaging the said teeth, a lever having a pallet for operating on the teeth, lever-operating mechanism, and a sliding frame connected to the lever, and also provided with a tooth-operating pallet, all substantially as specified.

3. The combination of the let-off beam, the escapement-drum connected thereto, the movable teeth and stops therefor, a pallet-lever for operating said teeth, a lever having an upturned short arm, with upper and lower guides for the warp-threads, a catch-arm connected to the said warp-lever and adapted to engage with the pallet-lever, and means for operating said catch-arm, all substantially as specified.

4. The combination of the let-off beam, the escapement-drum connected thereto and having movable teeth, stops for engaging the said teeth, pallets for depressing the teeth, means for operating said pallets, and a presser-bar, whereby the teeth may be depressed independently of the pallets in order to free them from the control of the retaining-stops, all substantially as specified.

5. The combination of the movable teeth

with a drum having a two-part hub with engaging projections and recesses, forming guides for the shanks of the teeth, all substantially as specified.

5 6. The combination of the pallets, stops, and releasing-bar, and mechanism for operating the pallets, with the escapement-drum having stepped teeth, as set forth.

10 7. The combination of the take-up and let-off mechanism with a warp-lever having an

upturned short arm, with upper and lower guides for the warp-threads on said arm, all substantially as specified.

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

THOMAS LOVELIDGE.

Witnesses:

WILLIAM D. CONNER,
HARRY SMITH.