

G. H. JONES.

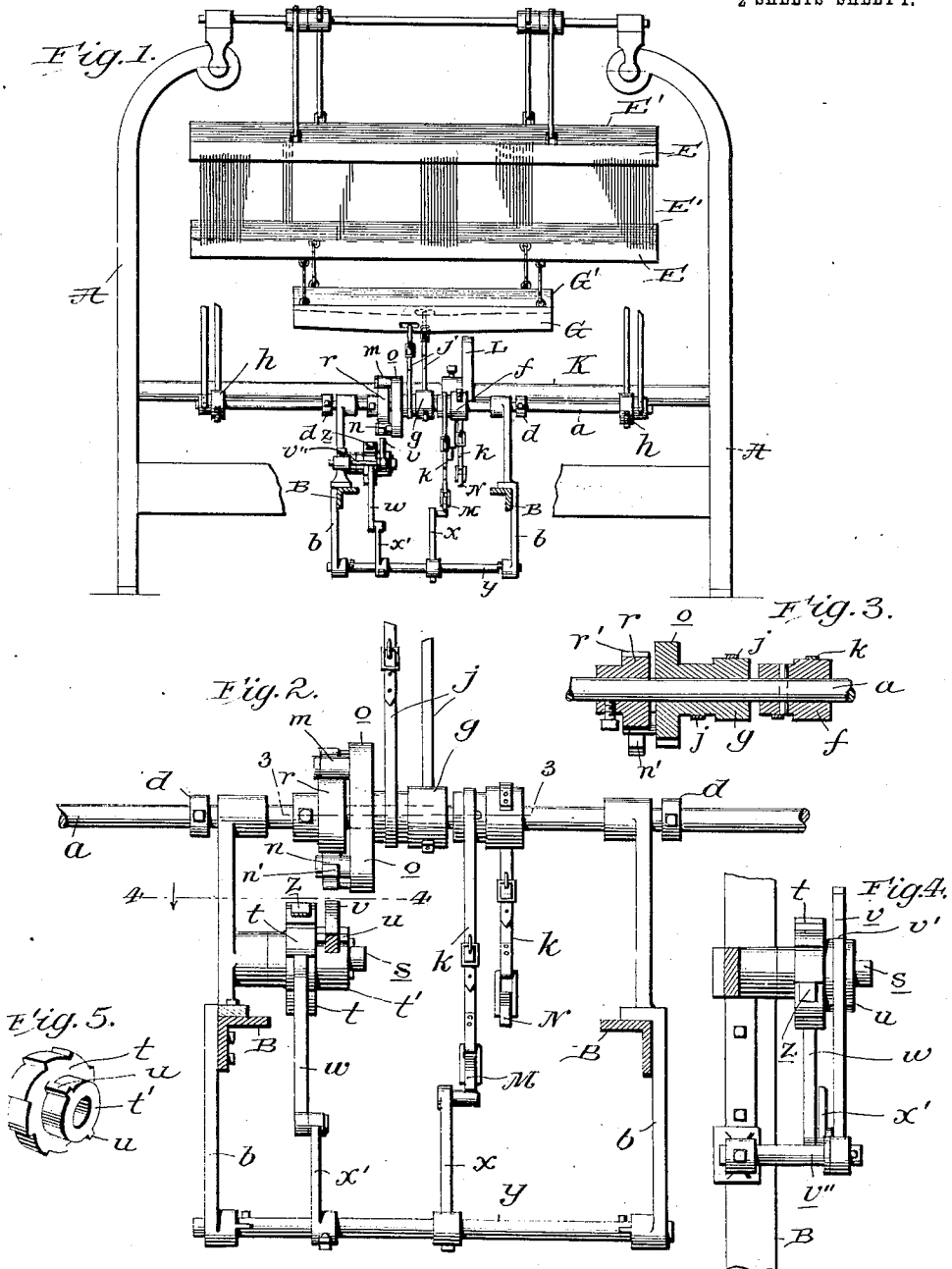
LOOM.

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1,035,353.

Patented Aug. 13, 1912.

2 SHEETS—SHEET 1.



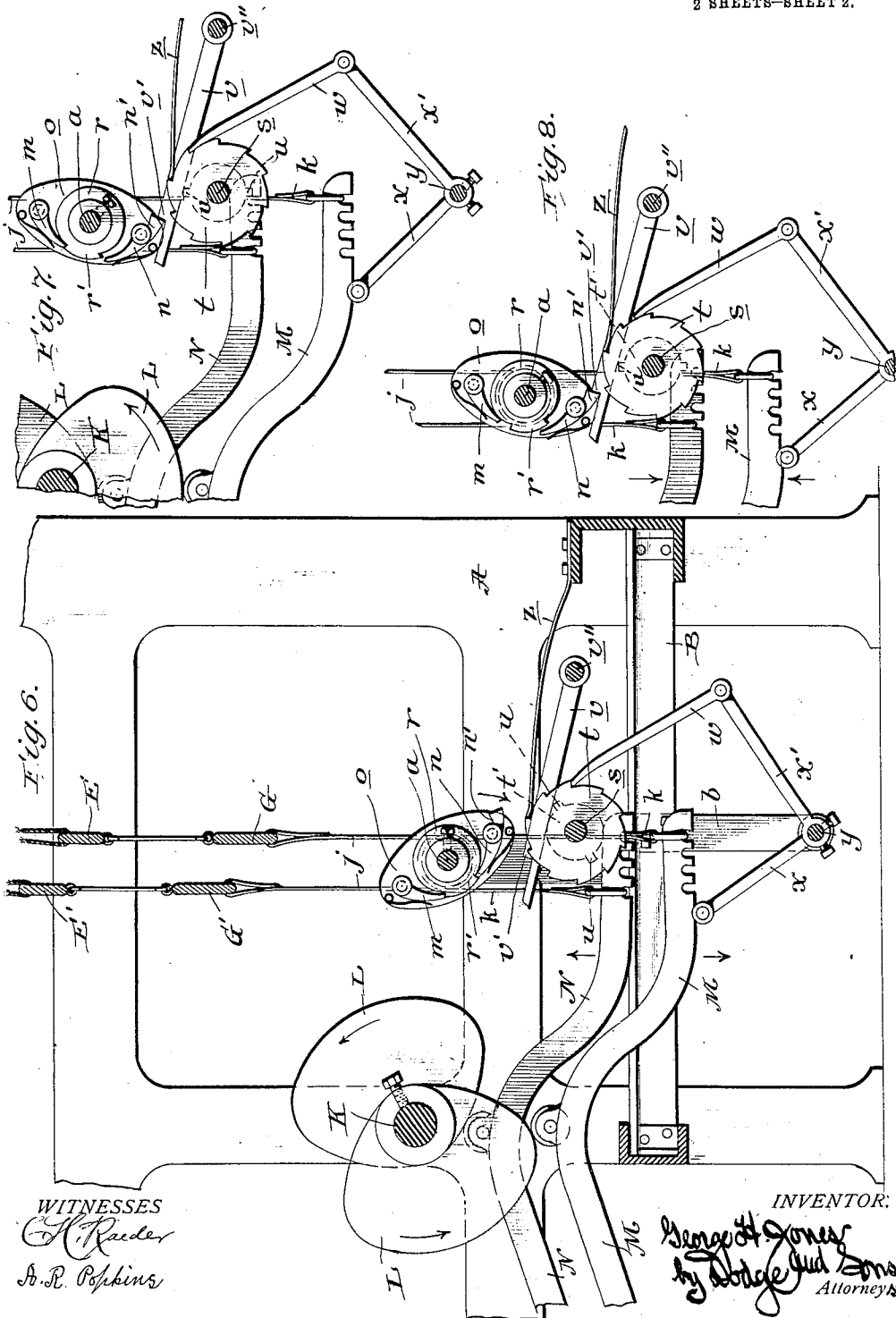
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LOOM.

1,035,353.

2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

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LOOM.

1,035,353.

Specification of Letters Patent. Patented Aug. 13, 1912.

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To all whom it may concern:

Be it known that I, GEORGE H. JONES, a citizen of the United States, and resident of Greenville, in the county of Greenville and State of South Carolina, have invented certain new and useful Improvements in Looms, of which the following is a specification.

The invention relates to looms, and has for its object the provision of means for controlling the shedding mechanism whereby the harness may be regularly operated and intermittently arrested at predetermined intervals of time to admit of extra or filling cords being run across the goods by any number of odd picks.

The object of the invention is to provide a simple form of apparatus to be applied to the standard form of loom for producing corded or cross-barred fabrics such as are generally woven on looms having dobby heads, said mechanism being adapted to be applied between the treadles and the harness and involving an oscillating shaft having a drum thereon connected with the respective treadles, a second drum thereon operatively connected with the shedding harness, means for normally locking the last mentioned drum to the shaft, and mechanism involving a pattern device actuated from a treadle for rotating the pattern device step by step and releasing the locking device at predetermined intervals to produce a dwell in the shed forming operation.

The invention is illustrated in the accompanying drawings, in which,

Figure 1 is a rear elevation of a loom embodying the invention, certain portions of the loom mechanism being omitted for the sake of clearness, Fig. 2 is an enlarged view, in elevation, of the actuating mechanism for controlling the formation of the shed, Fig. 3 is a section on line 3—3 of Fig. 2, Fig. 4 is a horizontal section on line 4—4 of Fig. 2, Fig. 5 is a perspective view of the ratchet and its associated pattern device, Fig. 6 is an enlarged longitudinal section through the loom showing the relation of the parts in the normal shed forming operation, Fig. 7 is a corresponding detail view illustrating the operation of unlocking the harness drum from its supporting shaft to produce a dwell in the shed forming operation, and Fig. 8 is a similar view

indicating the relation of parts just before the completion of the dwell.

Referring to the drawings A indicates the loom frame provided with the usual harness E, E' and treadles M, N actuated by cams L, L mounted upon cam shaft K.

Secured to the front and rear rails of the loom frame are two girths B, B to which are secured brackets or hangers *b, b*. Journaled in bearings in the upper ends of the brackets *b, b* is a shaft *a* provided with collars *d, d* to prevent longitudinal movement of said shaft. Journaled in similar bearings on the lower ends of the hangers *b, b* is a rock shaft *y* hereinafter more particularly referred to. On the outer ends of the rock shaft *a* are secured drums *h* which operate the usual selvage harness which is omitted for the sake of clearness, see Fig. 1.

Fast to the shaft *a* is a drum *f* to which are attached straps *k* running to the treadles M, N, by means of which said shaft is oscillated as said treadles move up and down under the influence of cams L, L. Loosely mounted on the shaft *a* is a second drum *g* engaged by straps *j* connected with the front and rear jack sticks G, G', which in turn are connected to the front and rear harnesses.

One end of the drum *g* is provided with a generally elliptical plate *o* upon the lateral face of which are pivoted two spring-pressed pawls *m, n*, adapted to normally engage oppositely facing shoulders on a collar *r* fast to the shaft *a*, and thereby lock drum *g* to shaft *a*, as indicated in Fig. 6. Pawl *n* is provided with a tail piece *n'* by means of which said pawl *n* may be rocked out of engagement with its cooperating shoulder on collar *r* and thereby unlock drum *g* and collar *r* and permit shaft *a* to oscillate while drum *g* and the harness connected thereto remain idle or stationary.

Pivoted on a short stub shaft *v''* secured in a standard or bracket attached to one of the girths B, see Figs. 1 and 4, is a lever *v*, having a shoulder *v'* near its outer end, which normally lies out of the path of travel of the tail-piece *n'* of pawl *n*, but which, when projected into the path of movement of said tail-piece swings pawl *n* out of engagement with the cooperating shoulder on collar *r*, thereby unlocking drum *g* from said collar *r* and shaft *a*.

Projecting from the left-hand hanger *b* is a stub shaft *s* upon which is mounted a ratchet-wheel *t* to which is secured a pattern device, which in its simplest form comprises a disk *t'*, having thereon peripherally-spaced lugs or abutments *u* which, as the ratchet-wheel *t* is rotated, successively engage and disengage the lever *v* to cause the latter to pass into and out of coöperative engagement with the tail-piece of pawl *n*. Obviously, in lieu of the pattern disk *t'*, with the lugs *u* thereon, a chain wheel with pattern lugs thereon or other equivalent pattern mechanism may be employed. A spring *z*, secured to the loom frame, bears upon the ratchet *t* and acts to prevent overthrow and any retrograde movement of the same.

Fast to rock-shaft *y* is a lever *x*, having on its outer end a bowl or roller adapted to contact with the lower edge of treadle *M*. Likewise, fast to rock-shaft *y* and laterally spaced from lever *x*, is a second lever *x'*, to the outer end of which is pivoted a pawl *w* coöperating with the teeth of ratchet-wheel *t*, the parts being so adjusted and arranged that, as the treadle *M* moves downward, lever *x* rocks the shaft *y*, thereby moving lever *x'* and pawl *w* upward, so that said pawl *w* rotates ratchet-wheel *t* and pattern disk *t'* forward one step, substantially equal to the length of one ratchet tooth. As the treadle *M* moves upward the weight of lever *x'* and pawl *w* rocks shaft *y* in the opposite direction, so that the end of pawl *w* falls behind the shoulder of the next succeeding ratchet tooth and the mechanism is in position for a subsequent operation, a suitable stop being provided to prevent lever *x* from following the treadle in its upward movement for more than the desired distance.

The operation of the apparatus as described is as follows: Assuming that it is desired to weave a fabric with filling cords which are run across the goods at, say, every eighth, ninth and tenth pick; during the preceding picks, the shed is formed in the regular way for each travel of the shuttle by means of the normal operation of treadles *M*, *N*, which are forced down successively by cams *L*, *L'*. The reciprocating motion of the treadles imparts a regular oscillating motion to shaft *a* through straps *k* and drum *f*, the oscillation of said shaft *a* imparting a regular and alternating reciprocation of the harness *E*, *E'* by means of drum *g* and straps *j*, as will be understood, said drum being locked to shaft *a* by pawls *m*, *n* on plate *o* engaging the shoulders on collar *r*, as in Fig. 6. Each downward movement of the treadle *M* causes the end of said treadle to engage the end of lever *x* and rock the shaft *y*, thereby causing lever *x'* to move pawl *w* upward and

rotate the ratchet-wheel *t* one tooth-space. The intermittent rotation of ratchet-wheel *t* eventually brings one of the lugs *u* into engagement with the lower edge of lever *v*, thereby lifting said lever *v* into the path of the tail *n'* of pawl *n*, and, as said tail travels over the lever, causes a disengagement of the pawl from the locking shoulder on collar *r* and permits the tail-piece as the parts reach the position shown in Fig. 7, to engage the shoulder *r'*. Said pawl *n* is thereby held out of engagement with its coacting shoulder on collar *r*, thereby releasing or unlocking plate *o* and drum *g* from the shaft, so that said drum *g* remains stationary. The lug *u* remains in contact with lever *v* during a predetermined number of movements of treadle *M* or picks of the shuttle, depending upon the length of the face of said lug *u* and the number of teeth on the ratchet-wheel. During this engagement of the lug *u* with the lever *v* the drum *g* remains stationary on the shaft *a* and the harness is caused to dwell or remain stationary while the treadles continue to rock up and down and the shaft *a* to oscillate, so that a number of picks of the shuttle may be effected to run the desired number of filling cords or yarns through the shed. When lug *u* passes out of engagement with the lever *v* the latter will drop by reason of gravity, thereby disengaging the shoulder *n'* of said lever from the tail piece of pawl *n* and permitting the pawl to again engage its coöperating shoulder on the collar *r* during the succeeding oscillation of said collar. The foregoing operation is repeated as each lug *u* passes into and out of engagement with the lever *v* and during such operation the movement of the harness is arrested while the predetermined number of picks is effected.

Having thus described my invention, what I claim is:

1. In a loom, the combination of the harness; a shaft; means for operating the harness from the shaft; cam and treadle mechanism for oscillating said shaft; and means interposed between one treadle and the shaft and actuated by the treadle to effect a disconnection of the harness-operating means and the shaft and a consequent predetermined rest period of the harness.

2. In a loom, the combination of the harness; a shaft; a loose drum on the shaft for operating the harness; means for normally locking the drum to the shaft; cam and treadle mechanism for oscillating said shaft; and means interposed between one treadle and the shaft and actuated by the treadle for periodically unlocking the drum from the shaft and effecting predetermined rest periods of the harness.

3. In a loom, the combination of the harness; a shaft; a loose drum on the shaft for operating the harness; means for normally

locking the drum to the shaft; cam and treadle mechanism for oscillating said shaft; a lever for releasing said locking means; and means actuated by a treadle for
 5 operating said lever at predetermined intervals to produce corresponding rest periods of the harness.

4. In a loom, the combination of the harness; a shaft; a loose drum on the shaft for
 10 operating the harness; means for normally locking the drum to the shaft; cam and treadle mechanism for oscillating said shaft; a lever for releasing said locking means; a
 15 rotary pattern device cooperating with said lever to engage the same with said locking means at predetermined intervals; and means operated from a treadle to drive the pattern device.

5. In a loom, the combination of the harness; a shaft; a loose drum on the shaft for
 20 operating the harness; means for normally locking the drum to the shaft; cam and treadle mechanism for oscillating said shaft; a lever for releasing said locking means; a
 25 rotary pattern device cooperating with said lever to engage the same with said locking means at predetermined intervals; a ratchet for moving the pattern device step by step; and a pawl actuated by a treadle for rotating
 30 the ratchet, whereby predetermined rest periods of the harness are effected.

6. In a loom, the combination of the harness; a shaft; a drum on the shaft for reciprocating the harness; a collar fast to the

shaft and having oppositely-directed shoulders; pawls on the drum normally engaging said shoulders to lock the drum to the shaft; cam and treadle mechanism for operating the shaft; and means interposed between one treadle and the shaft and actuated
 40 by the treadle to effect a disconnection of the harness-operating drum and the shaft, and a consequent predetermined rest-period of the harness.

7. In a loom, the combination of the harness; a shaft; a drum on the shaft for reciprocating the harness; a collar fast to the shaft and having oppositely-directed shoulders; pawls on the drum normally engaging
 45 said shoulders to lock the drum to the shaft; cam and treadle mechanism for operating the shaft; a lever for releasing one of the pawls which lock the drum to the shaft; a rotary pattern device cooperating with said
 50 lever to engage the same with said locking pawl at predetermined intervals; a ratchet for moving the pattern device step by step; and a pawl actuated by a treadle for rotating the ratchet, whereby predetermined rest-
 55 periods of the harness are effected.

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

GEORGE H. JONES.

Witnesses:

DAVID JENNINGS,
 HENRY HORNER.