J. W. COOK.

AUTOMATIC WEFT REPLENISHING MECHANISM FOR LOOMS FOR WEAVING.

APPLICATION FILED MAY 7, 1908.

931,997. Patented Aug. 24, 1909.

3 SHEETS—SHEET 1.

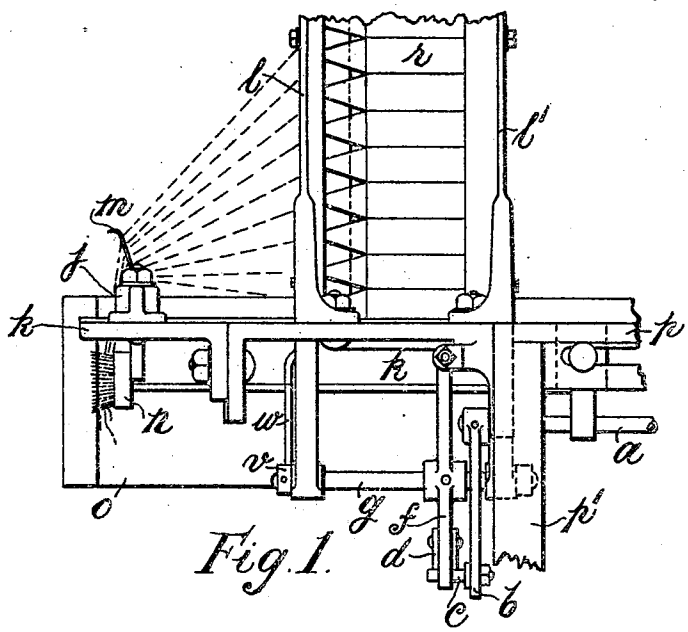

Fig. 1.

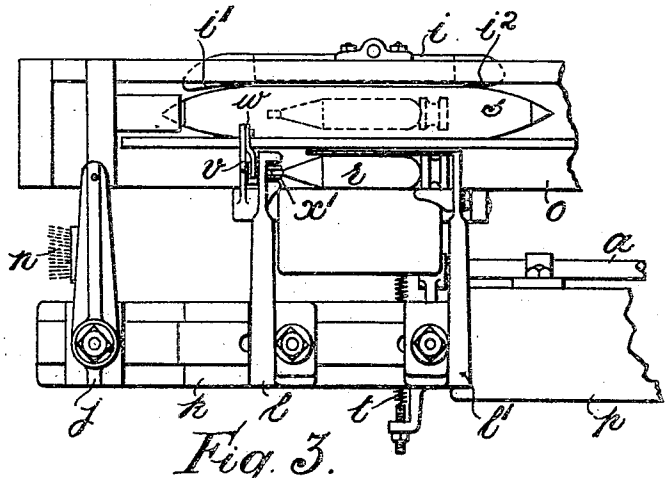

Fig. 3.

Witnesses.

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3 SHEETS—SHEET 2.

Fig. 2.

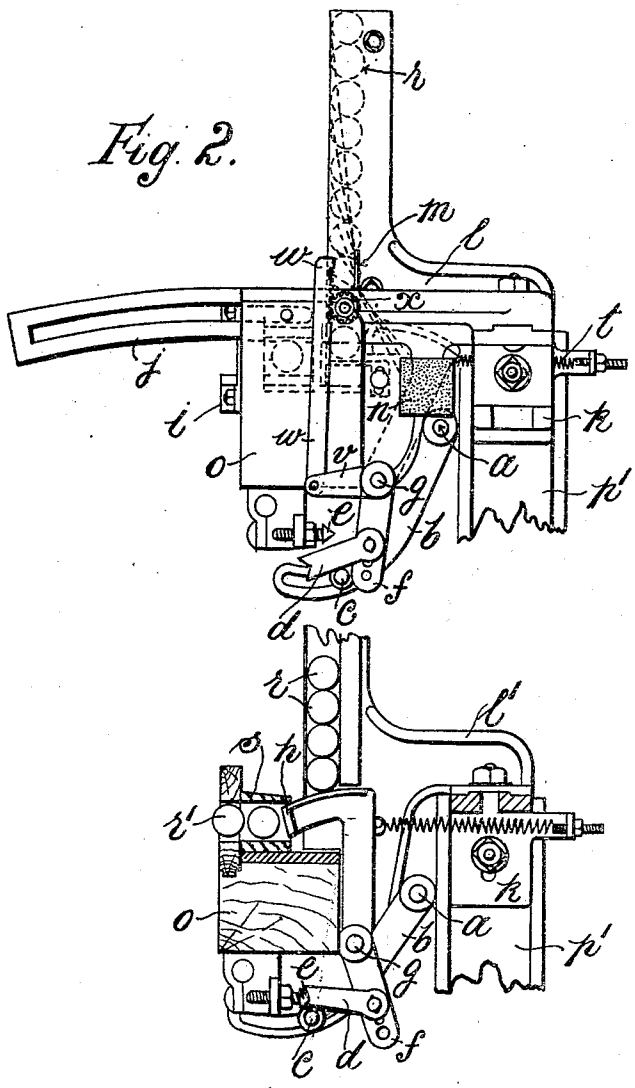

Fig. 4.

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3 SHEETS—SHEET 3.

Fig. 5.

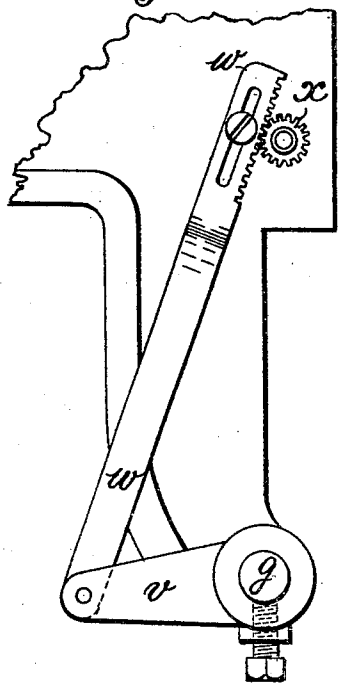


Fig. 6.

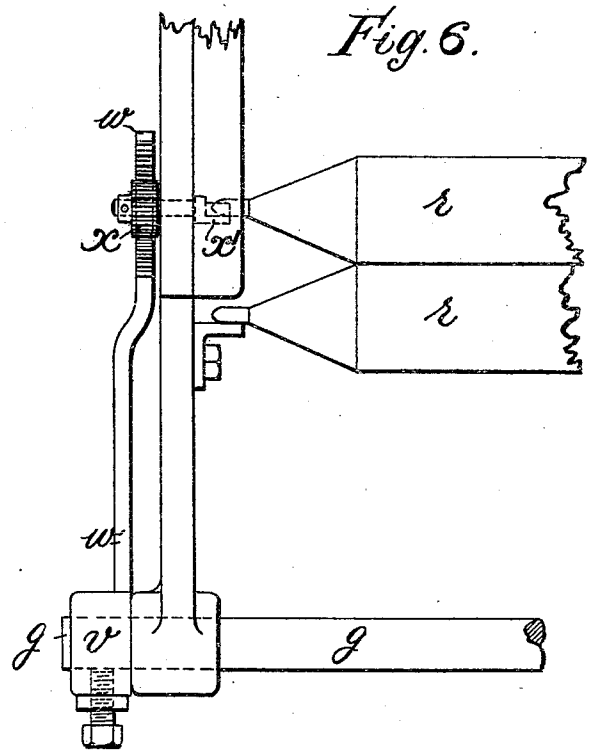


Fig. 7.

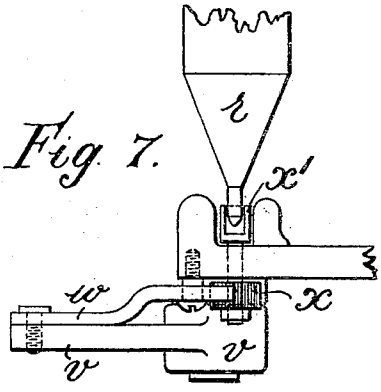
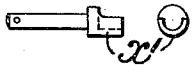


Fig. 8.



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UNITED STATES PATENT OFFICE.

JOHN WILLIAM COOK, OF DIDSBURY, NEAR MANCHESTER, ENGLAND.

AUTOMATIC WEFT-REPLENISHING MECHANISM FOR LOOMS FOR WEAVING.

931,997. Specification of Letters Patent. Patented Aug. 24, 1909.

Application filed May 7, 1908. Serial No. 431,455.

To all whom it may concern:

Be it known that I, JOHN WILLIAM COOK, machinist, of Didsbury, near Manchester, in the county of Lancaster, England, have invented certain new and useful Improvements in and Connected with Automatic Weft-Replenishing Mechanism for Looms for Weaving, of which the following is a specification.

My invention relates to mechanism for the purpose of supplying the shuttles of looms for weaving with cops, bobbins, pirns or the like of weft or filling upon the breakage, exhaustion or partial exhaustion of the weft or filling within the working shuttle. I so arrange my mechanism that I can apply it either to under or over pick looms.

In order that my invention may be better understood I have appended three sheets of drawings whereon:—

Figure 1. is a front view showing the device fixed to the loom. Fig. 2. is a side view showing the mechanism at rest. Fig. 3. is a plan view. Fig. 4 is a side view in section, showing the mechanism in action. Fig. 5 is a side elevation showing the mechanism for regulating the fall of the cops, bobbins, pirns or the like within the magazine. Fig. 6 is a front elevation of Fig. 5. Fig. 7. is a plan view of Fig. 5. Fig. 8. shows a detent x' in detail.

In carrying my invention into effect I attach or suitably couple to the weft fork holder of the loom or to any suitable feeler mechanism which will indicate the approaching exhaustion of the weft, a shaft or rod a suitably supported which I can extend across the loom or not as desired. In the arrangement of the parts as shown in the drawings the shaft a has been extended across the loom. On the end of the shaft a farthest from the weft fork holder I mount or suitably affix a short lever b which I call the stud lever. The stud lever b carries a stud anti-friction bowl or other suitable equivalent. In the drawings a stud c is shown attached to b by means of a nut. In close proximity to the stud lever b I place the lever f suitably fulcrumed at g and carrying at its lower end a short arm or dagger d. The said dagger d can be adjusted relatively to the lever f and can swing or move axially upon the stud or other suitable equivalent which attaches it to f. The dagger d rests upon the stud c carried by the lever b. I attach to the loom framing p, p' by means of the bracket k a hopper or magazine the sides of which are indicated by l and l' in the drawings. I can adjust the sides l and l' relatively one to another in order to accommodate different lengths of cops, bobbins, pirns or the like. Into this hopper or magazine I place the full cops, bobbins, pirns or the like of weft or filling r. It will be seen that the lowest cop, bobbin, pirn or the like occupies a position immediately in front of the upper end of the lever f which is formed at this portion with a suitable bearing or pushing face h. Upon the under side of the slay o of the loom I fix a projection or stop in the form of a stud and constituting a bunter e which moves backward and forward with the slay as the latter beats up the picks of weft. I pass the loose ends of weft from the cops, bobbins pirns or the like around a wire m, suitably supported, and through the bristles of a brush n but I do not bind myself to this method of retaining the said ends of weft.

For the sake of brevity, the term cop alone will be used hereinafter in the description and claims with the intention however of including also such terms as bobbins and pirns.

The action of my device is as follows:— Immediately upon the exhaustion or breakage of the weft within the shuttle the weft fork acts in the usual way, but instead of knocking off the loom, operates the shaft a and causes it to make a part of a revolution. In the case of a loom in which feeler mechanism is employed it will of course be understood that the shaft a is caused to operate from the said feeler mechanism and not from the weft fork. The movement of a causes the lever b to move upward (reference to Fig. 4 will show the parts clearly). In consequence of the upward movement of b the stud c raises the dagger d and supports it in the path of travel of the bunter e attached to the underside of the slay o. I do not bind myself to this actual construction but can extend or lengthen the lever f and suitably carry the dagger d so that a bunter projection attached to the slay sword or other moving part can come in contact with the said dagger. The forward movement of bunter e pushes the dagger d backward causing the lever f to fulcrum on g. The upper portion of f including the bearing face h is thus caused to move toward the front of the slay o and in doing so the bearing face h coming in contact with the lowest cop, within the magazine pushes a full cop, into the shuttle s and by

doing so expels the exhausted cop, r'. (Fig. 4.) The upper portion of the lever f adjacent to the pusher face h is constructed in such a manner that upon the forward movement of the said pusher lever f the next cop above the one being forced into the shuttle is supported on said upper portion of said lever so that it and the one above it are supported within the magazine. This is clearly shown in Fig. 4. I employ my peculiar formation of the upper portion of the pusher lever f in combination with mechanism for regulating the fall of the cops, within the magazine, which mechanism I describe later. I employ any suitable device in order to position the shuttle within the box in order to insure the cop being accurately placed therein. Immediately after the replenishing action the bunter e passing from contact with d, the spring t draws the lever f back into its normal position.

I employ mechanism for the purpose of regulating the fall of the cops, in front of the pusher face h and I show this mechanism in Figs. 5, 6, 7 and 8. Upon the shaft g which forms the pivot of the lever f I carry a crank v attached at its outer end to the end of the rack w. The rack as shown is provided with teeth which mesh with the teeth of a pinion x suitably carried on the magazine side. The pinion is compounded or has attached to it a crescent, half moon or cup shaped piece of metal or other suitable material x' forming a detent. Normally the concave side of the detent x' is upward and supports the tip or nose only of a cop, as is shown in Fig. 7. Upon the action of the change mechanism the shaft g is oscillated and the rack w actuated to rotate the pinion x and the detent x'. Part rotation only of the pinion takes place but sufficient to enable the cop, resting on the detent x' to be deposited in front of the curved upper part of lever f as seen as the latter recedes. The detent x' at the same time prevents the next uppermost cop, from moving downward. Upon the movement outward of the pusher face h and the oscillation of the shaft g the rack w is again actuated but in the reverse direction. This action causes the pinion to again make part of a revolution and causes the detent x' to assume its normal position.

The swell i employed for the purpose of checking the shuttle as it enters the shuttle box is novel in itself. I so shape the face of the swell at its rear end i', that is the end farthest within the shuttle box, and so cause it to project into the shuttle box that the incoming shuttle first comes into contact with this portion of the swell. The swell is caused to fulcrum and by doing so brings the opposite end i^2, or the end nearest the entrance of the shuttle box into contact with the heel of the said incoming shuttle. I form the face of the swell i^2 as is shown in my drawings especially in Fig. 4 in order to obtain a tight grip upon the shuttle. Should the shuttle continue to move forward after the outer end of the swell has cone in contact with it the grip is increased thus an effectual check upon the shuttle is obtained and any rebound of the said shuttle is prevented. Further I make the swell i formed with a slot for part of its length through which the empty cop can be ejected.

Having described my invention what I claim and desire to secure by United States Letters Patent is:—

1. In mechanism for automatically replenishing loom shuttles with weft, the combination with a cop magazine, of a lever having an upper portion projecting in a direction to horizontally eject one cop from the magazine and support the next one above it, said lever having a dagger pivoted to its lower portion, a fixed bunter for said dagger, a lever arm adapted to be actuated upon the exhaustion of the weft, and means carried by said lever arm for positively lifting said dagger into line with the bunter when said lever arm is actuated.

2. In mechanism for automatically replenishing loom shuttles with weft, the combination with a cop magazine having adjustable sides, of a lever having an upper portion projecting in a direction to horizontally eject one cop from the magazine and support the next one above it, said lever having a dagger pivoted to its lower portion, a fixed bunter for said dagger, a lever arm adapted to be actuated upon the exhaustion of the weft, and means carried by said lever arm for positively lifting said dagger into line with the bunter when said lever arm is actuated.

3. In mechanism for automatically replenishing loom shuttles with weft, the combination with a cop magazine, of a lever having an upper portion projecting in a direction to eject one cop from the magazine and support the next one above it, said lever having a dagger pivoted to its lower portion, a fixed bunter for said dagger, a lever arm adapted to be actuated upon the exhaustion of the weft, means being provided for lifting said dagger into line with the bunter when said lever arm is actuated, a crank arm movable with the first-mentioned lever, a rack connected with said crank arm, a pinion engaged with said rack, and a cup-shaped detent within the magazine and operatively connected with the pinion to be oscillated thereby, said detent being normally in position to receive the tip of a cop in its concavity.

In testimony whereof I have affixed my signature, in presence of two witnesses.

JOHN WILLIAM COOK.

Witnesses:

FRANK LASMITH,

JOHN JOWETT.