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LETOFF DRIVE ROD ARM

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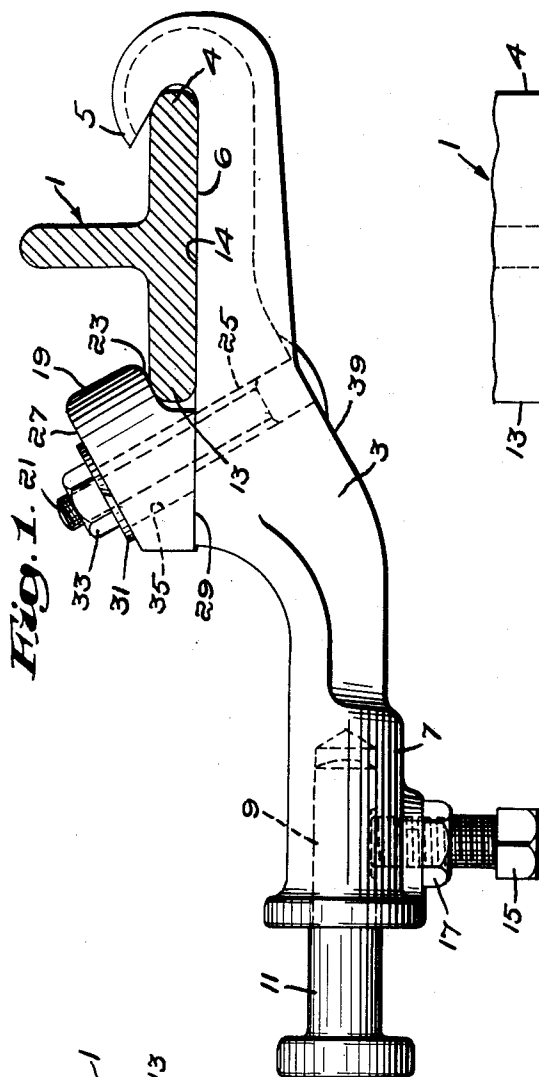


Fig. 1.

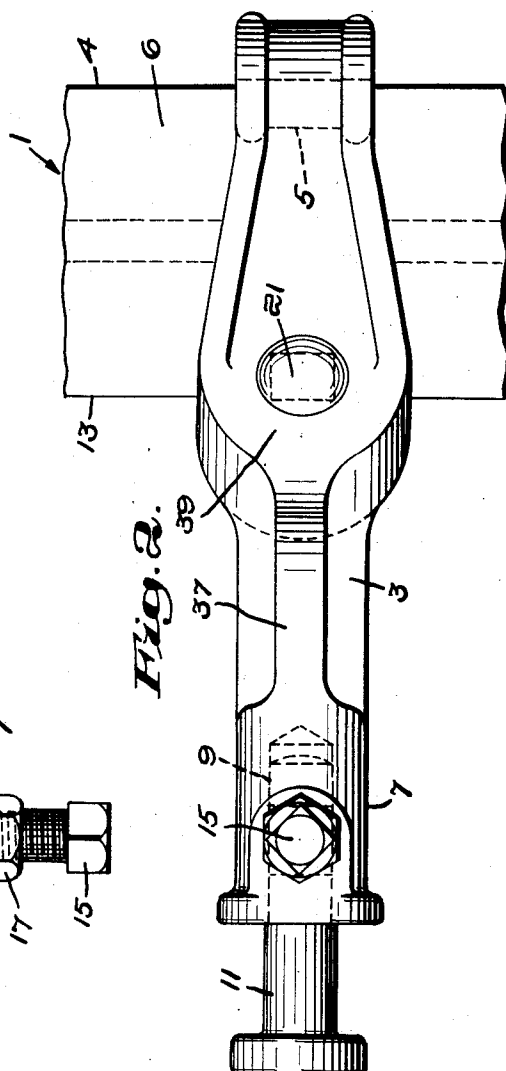


Fig. 2.

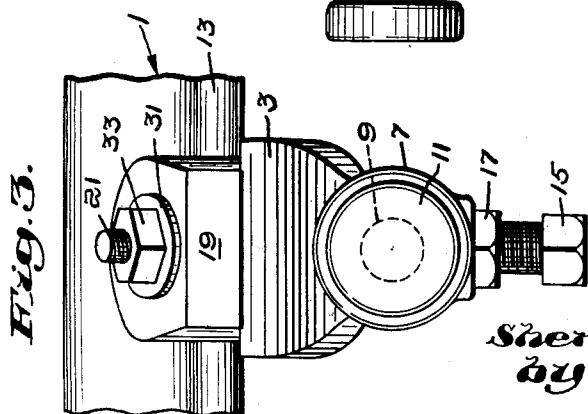


Fig. 3.

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UNITED STATES PATENT OFFICE

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LETOFF DRIVE ROD ARM

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10 Claims. (Cl. 139—100)

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This invention relates to improvements in let-off motions for looms and more particularly to an improved let-off drive rod arm.

It is customary to take the drive for the let-off motion from the lay motion by means of a drive rod connected to and actuating the let-off motion and itself actuated by a drive rod arm mounted on one of the lay swords. Conventionally this let-off drive rod arm is clamped to the lay sword at the proper level to give the desired stroke to the let-off actuating rod. Provision for thus clamping the drive rod arm to the lay sword is effected by forming the arm with a flat seating surface to go against the broad frontward face of the transverse web of the T-section lay sword. This seating surface terminates at its outward end in a hook to grip the outward flange of the transverse web of the lay sword, and a simple detachable washer-like lug clamps the inward flange of this web against the seating surface of the arm by reason of a bolt standing perpendicular to the seating surface on the arm and passing through a hole in the lug and through a hole in the arm. Sometimes the lug is formed with an oblique cam surface where it overhangs the flange of the lay sword, and sometimes this overhanging clamping surface is merely made to stand substantially parallel to the seating surface when bolted down.

However, unavoidable variations in the dimensions of the lay sword webs and the spacing of the lug along the seating surface on the arm render this structure inoperative or substantially so to exert any gripping force directed across the transverse web of the lay sword parallel to its frontward surface and to the seating surface on the arm and acting to thrust the lay sword into the hook. Instead, the clamping force of the lug is directed solely in one dimension, namely toward the seating surface on the arm, along the axis of the bolt and lug and against only the rearward surface of one of the two lateral flanges of the sword's transverse web, allowing the arm to become loose and wobble on the sword with consequent inaccuracies in the let-off action, and causing the eventual wearing of both hook and sword, which latter wear in turn makes it difficult or impossible to install even new replacement arms so that they will stay put in their correct location and relation.

As a result of such defects in these prior structures many complaints from the mills have been directed to the frequent loosening of such arms and the recurring failure of repeated attempts to keep the arms tight on the sword. The leading

object of the invention therefore is to provide an improved drive rod arm that can be rigidly attached to the sword and will stay tightly fixed thereon without developing any play whatever, in spite of variations in dimensions of either casting.

Another object of the invention is to provide a let-off drive rod arm that can be attached to the sword by a force having resultants acting in two dimensions, and by a force that can be increased to any degree wanted to give positive assurance against the arm eventually becoming loose, worn or inoperative.

Another object of the invention is to provide a drive rod arm of a simple and durable construction which saves weight and metal without any loss in strength or gripping action.

I have discovered that the objects of this invention can be attained by the novel method of disposing the bolt and preferably also the surface of the lug engaged by the bolt or its nut, in such angular relation to the transverse flange of the lay sword that the lug is slid along the arm in a direction toward the lay sword by the bolt as the bolt is tightened. Thus when the lug has come up against the seating surface of the arm which seats against the lay sword, continued tightening of the bolt produces motion of the lug in a direction along such surface thereby supplying an auxiliary component of clamping force not present in prior structures and directed against the edge of the flange on the lay sword.

An illustrative embodiment of the invention is shown in the accompanying drawings, in which

Fig. 1 shows part of a lay sword in section with the improved drive rod arm clamped thereto.

Fig. 2 is a side elevation of the parts of Fig. 1.

Fig. 3 is an elevation of the parts of Fig. 1 viewed from the left-hand side.

Referring to the drawings, a fragmentary portion of a lay sword of conventional form and section is shown at 1 with the improved drive rod arm of the invention in place thereon. This arm comprises a body member 3 of more or less conventional form and construction in general, having a seating surface 14 with the usual hook 5 at one end for engagement with one flange 4 of the transverse web 6 of the lay sword and at the other end the usual hub 7 having bore 9 therein for the reception of the usual pin 11 to which is connected the drive rod or link (not shown) receiving motion from the lay sword and transmitting it to the let-off motion to actuate the latter, there also being a tapped hole for the reception

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of the usual clamping screw 15 provided with a lock nut 17.

In accordance with the invention, a clamping lug 19 of novel type is forced to move both toward the seating surface 14 on the arm and also toward the hook 5 at the far end of such seating surface. Such movement brings about the gripping of the web 6 of the lay sword not only by pinching the flange 13 between the lug and the opposing section of surface 14, which was usually the only force operating in the prior structure and left the hook 5 free to move back and forward and up and down on flange 4; but it also draws hook 5 over flange 4 and thereby cams this flange against seating surface 14 at this end of such surface also.

Thus the lug 19 is attached to the drive rod arm by a bolt 21 obliquely disposed to the seating surface 14 of the arm so that in addition to applying the component of force perpendicular to surface 14 acting to clamp the lug 19 against such surface, it exerts a component of force lengthwise of the arm and along its seating surface 14, thus attaining a tight grip on the lay sword which is rigidly wedged between a jaw 23 of the lug and the oblique under side of the hook 5. Bolt 21 is disposed at an angle preferably of around 60° to seating surface 14, this angle being partly established by the slant of bolt-hole 25 and also by the 30° slant of surface 27 of the lug with respect to seating surface 14. Lug 19 is urged toward the lay sword not only by the oblique pull of the bolt, but also by reason of its wedge shape shown in Fig. 1; the oblique relation of surface 29 of the lug to the axis of the bolt and to the plane of the surface 27 which is engaged by washer 31 and receives the force of the bolt as nut 33 is tightened causes a camming action on lug 19 with resultant movement of the lug toward the sword along surface 14. When lug 19 has come up against seating surface 14, all further movement must be in a direction along such surface. Lug 19 is provided with an oblique slot 35 for the bolt so as to permit this advance. Thus the spaced relation between the opposing jaws afforded by undercut surface 23 of the lug and the beveled undersurface of hook 5 is variable and automatically conforms to the width of the lay sword in spite of variations in the dimensions of the parts.

With bolt 21 disposed at 60° to the seating surface 14 and lug 19 comprising a 30° wedge resting on surface 14, the primary force impelling the flange 4 of the lay sword into hook 5 is substantially half as powerful as that clamping the sword against surface 14, since the component of force along surface 14 is in the ratio of 1:2 to the component of force perpendicular to such surface. Any desired angle, and corresponding ratio of the two forces exerted in the two dimensions, can of course be adopted.

The force attaching the drive rod arm to the lay sword can be increased to any degree desired or needed to fix the arm rigidly and permanently on the sword, by continuing to tighten the bolt 21; at the same time it is substantially independent of any variations in the dimensions of either casting. Additionally, the inner radius of the hook 5 and the undercut jaw 23 of the lug are purposely made smaller than the expected radius of the flange of the sword, to make certain of a tight wedging grip forcing the transverse web of the sword against the seating surface 14 in spite of such variations in the related parts.

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As shown in Fig. 2, the novel drive rod arm has a single integral metallic rib 37 which runs down the middle of such arm and joins a pad 39 on which the bolt head seats, the hole 25 being square to receive the square end of the shank of the bolt. By providing a single rib in this manner in place of the ribs of prior structures which had to be made double in order to be spaced apart to admit the bolt head between them, a saving in weight of metal is effected without a consequent loss of strength, durability, or gripping action, the parts being made of malleable iron in the customary manner.

In applying, the hook 5 and the loosely connected slotted lug 19 of the arm are positioned to grip the flanges 4, 13, respectively, of the lay sword, the arm is brought to the desired position by being slid vertically along the surface of the lay sword, and nut 33 on the angularly disposed bolt 21 is tightened to lock the arm securely in place.

While I have illustrated and described a certain form in which my invention may be embodied, I am aware that many modifications may be made therein by any person skilled in the art, without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited to the particular form shown, or to the details of construction thereof, but

What I do claim is:

1. In a let-off motion for a loom, the combination with the lay sword thereof, of a let-off actuating arm having a hooked integral end portion, a lug mounted on the arm, and a bolt extending obliquely through the lug urging the latter along the arm slidably toward the hooked end securing the arm to the lay sword as the bolt is tightened.

2. In a let-off motion for a loom, the combination with the lay sword thereof, of a let-off actuating arm having a flat seating surface and a hooked integral end portion, a lug mounted on the arm, and a bolt extending through the lug at an oblique angle to the seating surface of the seating surface urging said lug along the arm toward the hooked end and securing the lay sword against the seating surface and between the hook end and the lug as the bolt is tightened.

3. In a let-off motion for a loom, the combination with the lay sword thereof, of a let-off actuating arm having a flat seating surface and a hooked integral end portion, a lug mounted on the seating surface of the arm, and a bolt extending through the arm and lug at an oblique angle to such surface of the arm clamping the lug and lay sword against such surface and directing an auxiliary clamping force along the flat surface toward the hooked end as the bolt is tightened on the arm.

4. In a let-off motion for a loom, the combination with the lay sword thereof, of a let-off actuating arm having a flat seating surface and a hooked integral end portion, a lug mounted on the seating surface of the arm, and a bolt extending through the lug at an oblique angle to such surface of the arm urging said lug along the flat seating surface and against the lay sword, and drawing the hooked end of the arm in the opposite direction toward the lay sword.

5. In a let-off motion for a loom, the combination with the lay sword thereof, of a drive rod arm having a hooked integral end portion and a flat seating surface, a lug mounted on the arm and engaging the lay sword, and a bolt extend-

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ing through the lug obliquely to such seating surface, clamping the lug and lay sword to such surface and drawing the hooked end of the arm in the opposite direction toward the lay sword with substantially half as much force as is exerted in clamping the lay sword against the seating surface on the arm.

6. In a let-off motion for a loom, the combination with the lay sword thereof, of a drive rod arm having a flat seating surface and a hooked integral end portion, a lug provided with a slot mounted on the seating surface of the arm and engaging the lay sword, and a bolt extending through the arm and the slot in the lug at an oblique angle to such surface of the arm clamping the lug and lay sword against such surface and drawing the hooked end of the arm in the opposite direction toward the lay sword with substantially half as much force as is exerted in clamping the lay sword against the seating surface on the arm.

7. In a let-off motion for a loom, the combination with the lay sword thereof, of a drive rod arm having a flat seating surface and a hooked integral end portion, a lug mounted on the seating surface, and means on the arm exerting a force against the lug in a direction toward and angularly disposed to the seating surface so that part of the force is exerted in drawing the hooked end of the arm in the opposite direction toward the lay sword and part of the force is exerted in clamping the lay sword against the flat seating surface on the arm.

8. In a let-off motion for a loom, the combination with a lay sword thereof having lateral flanges, of a drive rod arm having a flat seating surface and a hooked integral end portion, a lug undercut to fit over one flange of the lay sword and mounted on the seating surface, and a bolt extending through the lug and arm at an oblique angle to such surface clamping the undercut portion of the lug over one flange and urging said lug slidably along the seating surface toward the hooked end.

9. In a let-off motion for a loom, the combination with the lay sword thereof having lateral flanges, of a drive rod arm having a flat seating

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surface and a hooked integral end portion, a lug slidably mounted on the seating surface having an undercut portion to fit over one flange of the lay sword and having one surface parallel to the seating surface of the arm and another surface oblique to such seating surface, and a bolt extending through the lug and arm perpendicular to the oblique surface clamping the lug and the lay sword against the seating surface and also drawing the hooked end of the arm around the flange of the lay sword with substantially half as much force as is exerted in clamping the lay sword against the seating surface on the arm.

10. In a let-off motion for a loom, the combination with a lay sword thereof having lateral flanges, of a drive rod arm having a flat seating surface and a hooked integral end portion engaging one flange of the lay sword, a lug mounted on the seating surface provided with a jaw facing the hooked end portion of the arm and provided with an undercut portion to fit over the other flange of the lay sword, the lug having one surface parallel to the seating surface of the arm and another surface oblique to such seating surface, and a bolt extending through the arm and the lug perpendicular to the lug's oblique surface clamping the lug to the seating surface and also causing relative movement of the lug along the seating surface bringing the jaw of the lug into gripping contact with its flange of the lay sword.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
495,766	Wilby	Apr. 18, 1893
966,906	Grannis	Aug. 9, 1910
983,939	Scott	Feb. 14, 1911
1,113,506	Taylor	Oct. 13, 1914
1,496,694	Watson	June 3, 1924
1,662,539	Schmidt	Mar. 13, 1928
1,964,803	Alsaker et al.	July 3, 1934
2,059,413	Taylor	Nov. 3, 1936
2,097,470	Richardson	Nov. 2, 1937
2,164,846	Thompson	July 4, 1939