

F. HOLMGREN.
 DROP HAMMER OR THE LIKE.
 APPLICATION FILED DEC. 2, 1908.

937,938.

Patented Oct. 26, 1909.
 3 SHEETS—SHEET 1.

FIG. 1.

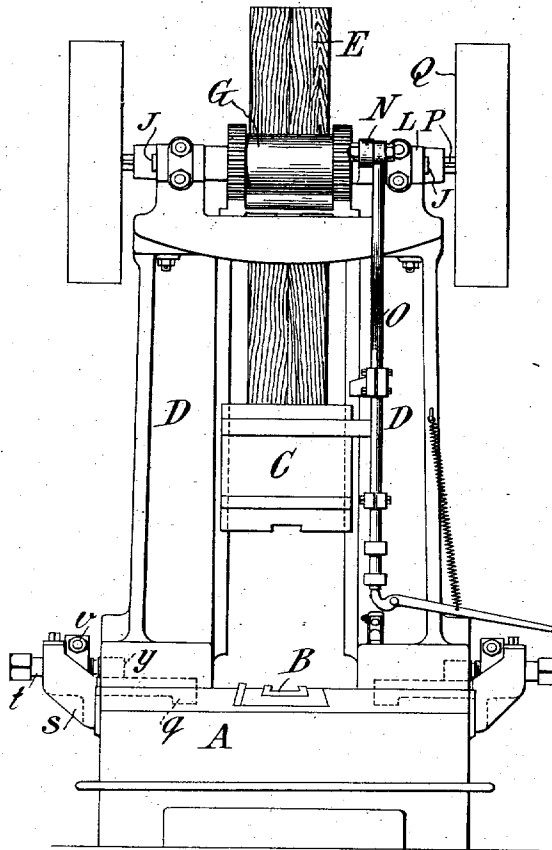
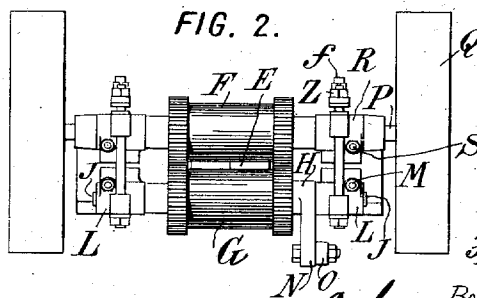


FIG. 2.



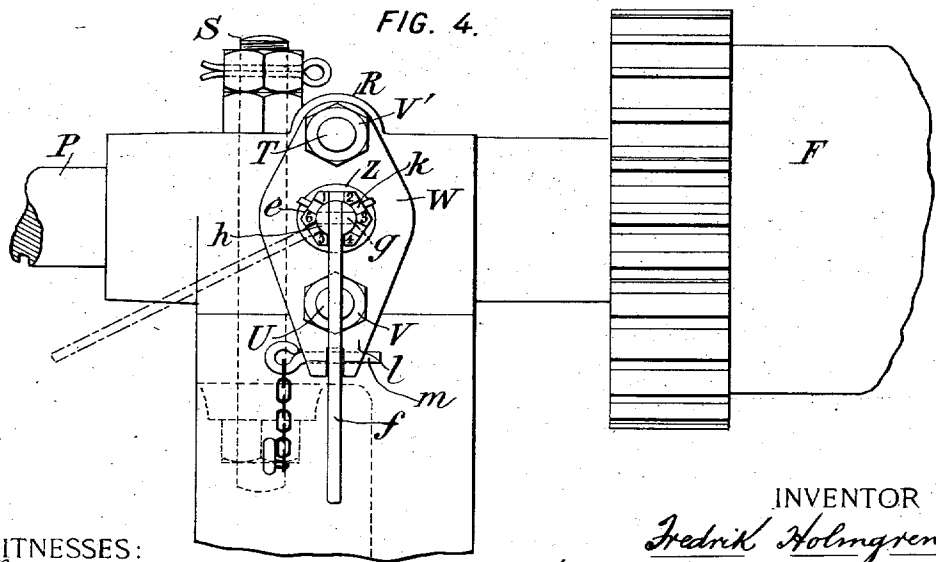
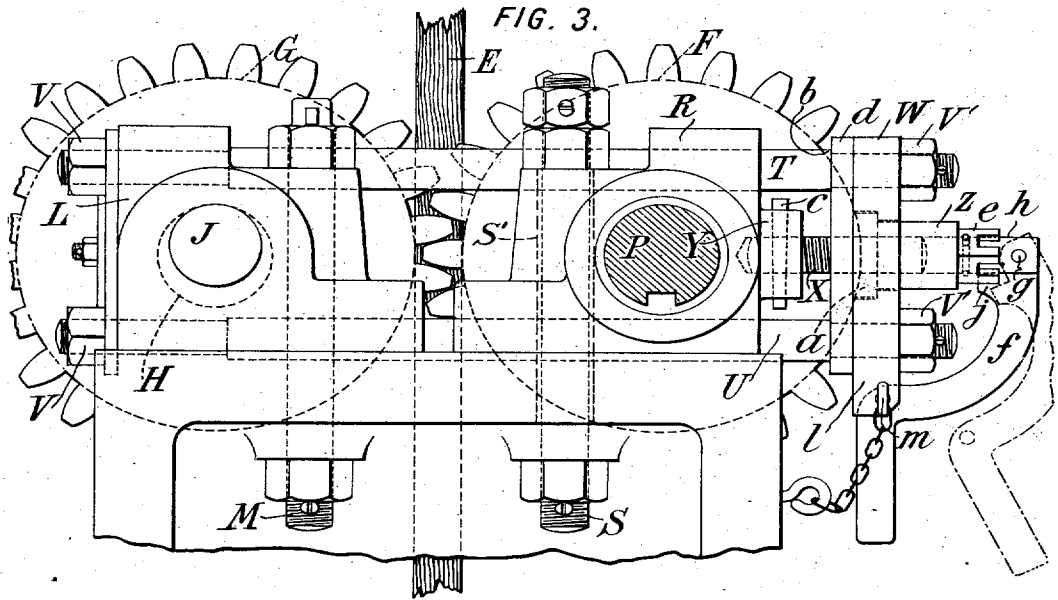
WITNESSES:
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3 SHEETS—SHEET 3.

FIG. 5.

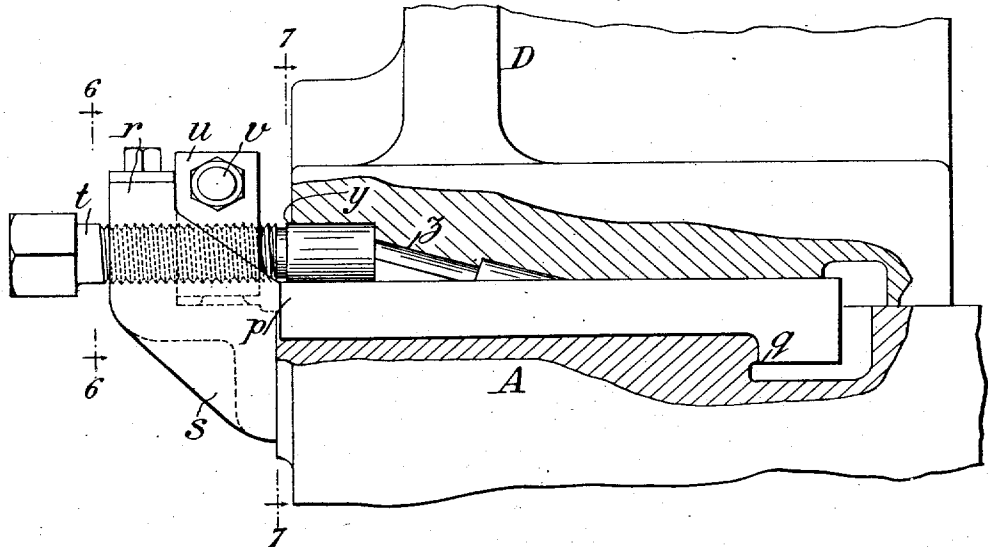


FIG. 7.

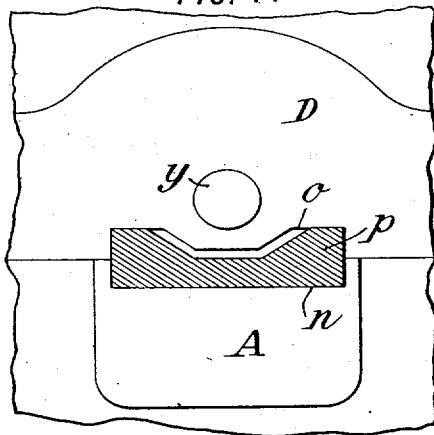
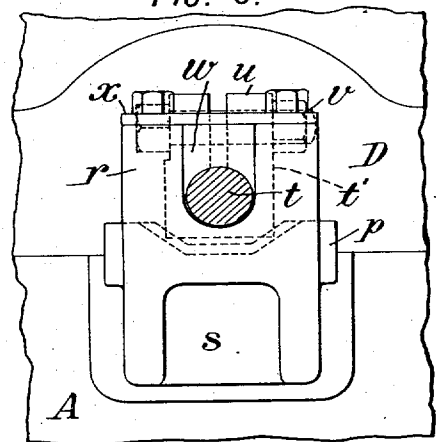


FIG. 6.



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UNITED STATES PATENT OFFICE.

FREDRIK HOLMGREN, OF NEW YORK, N. Y., ASSIGNOR TO E. W. BLISS COMPANY, OF
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DROP-HAMMER OR THE LIKE.

937,938.

Specification of Letters Patent.

Patented Oct. 26, 1909.

Application filed December 2, 1908. Serial No. 465,613.

To all whom it may concern:

Be it known that I, FREDRIK HOLMGREN, a citizen of the United States, and a resident of the borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Drop-Hammers or the Like, of which the following is a specification.

This invention aims to provide certain improvements adapted especially to the adjusting of parts of a drop hammer of a type commonly used in the manufacture of drop forgings, and applicable also to various other situations.

15 The accompanying drawings illustrate an embodiment of the invention.

Figure 1 is a front elevation of a drop hammer. Fig. 2 is a plan of the top of the same. Fig. 3 is a side elevation of the top 20 on a larger scale. Fig. 4 is an end view of a part of the top of the machine. Fig. 5 is a front elevation of an adjusting mechanism for one of the uprights on an enlarged scale. Fig. 6 is an end view of the same. 25 Fig. 7 is a cross-section of the same on the line 7-7 of Fig. 5.

Referring to the machine illustrated, the base A carries in a socket B a matrix or 30 lower die. The hammer C carries the upper die and slides between uprights D, and is suspended from a board E by means of which it is raised and lowered. The board runs between a back roll F and a front roll G, which are geared to each other and be- 35 tween which it is clamped to lift the hammer; the rolls separating in order to release it and drop the hammer. In this separating movement the front roll is moved forward, the back roll being stationary. The 40 gripping and releasing movement of the front roll is caused by mounting it upon an eccentric portion H of its shaft J, the latter being carried in bearings L, which bearings are fastened down upon the top of the side 45 frames by means of bolts M. An arm N is mounted on the shaft J of the front roll, and carries at its outer end a depending front rod O which is raised and lowered by stops and a treadle to turn the shaft J and the 50 eccentric H so as to shift the front roll outward or inward to release or grip the board. The construction thus far described is that of a well known type of drop hammer.

It is necessary for setting up the machine 55 and for adjusting it from time to time to

provide for a slight adjustment of the back roll F toward or from the front roll, either at one end or both ends, and my invention provides an improved mechanism for this purpose. The roll F is mounted rigidly on 60 a shaft P which is preferably the driven shaft carrying a belt pulley Q at one end or preferably one at each end, the shaft P being mounted in bearings R which are fastened by bolts S upon the top of the side 65 frames of the machine. The bearings R are adjusted bodily toward the bearings L, the bolts S passing through sufficiently elongated slots S' (Fig. 3) in the bearings to permit of the slight adjustment necessary. 70

The bearings L and R at each side of the machine are held together by means of a pair of bolts T and U near the top and bottom of the bearings respectively. The nuts V (or corresponding heads) at one end of 75 the bolts T and U engage a fixed portion of the bearing L. The nuts V' at the opposite ends of the bolts engage a yoke W which transmits to the bearing R through an intermediate portion of the yoke the strains 80 upon the end of the yoke, and thus balances or equalizes these two strains. The yoke W is clamped upon each of the bolts T and U between a shoulder b and one of the nuts V'. 85 Preferably the adjustment of the bearing R is effected by means of a stud bolt X fastened at its inner end to a projection Y from the face of the bearing by means of a pin c, and threaded through a nut Z which is fastened 90 rotatively by means of a circular flange a within a corresponding socket formed in the yoke W, so that the nut may rotate but cannot move axially relatively to the yoke. The yoke W for convenience is made in two pieces, including a cover plate 95 d inclosing the flange a of the nut. The nut Z is provided with a hexagonal portion e extending clear of the other parts of the device so as to be easily accessible. The adjustment of these parts has to be made ordi- 100 narily with the hammer in operation so as to observe the action of the rolls relatively to the board, and because of the gears and pulleys and belts the position is difficult of access. The danger of injury is lessened and 105 the convenience and consequent accuracy with which the adjustment can be made are considerably improved by this provision of a single nut for adjusting the strain upon both the upper and the lower bolts T and U, 110

and by the projecting of this adjusting nut Z clear of the other parts of the apparatus.

For greater convenience I propose to provide a wrench which shall be permanently fastened in place and by which the nut Z can be adjusted without the workman having to carry a separate wrench about with him. Such a wrench is shown at *f*, being pivoted at *g* to a plug *h* which is rotatively mounted in the hollow end of the hexagonal portion *e* of the nut. The wrench is provided on its inner edge with a projecting portion *j* which when the wrench is swung to the position of Fig. 3 enters one of the notches *k* provided in the face of the nut. By swinging the wrench out on its pivot *g* it is free of the nut and may be swung around the axis of the nut to engage any one of the desired notches, after which it will be brought down to the vertical position shown in full lines in Fig. 4. Preferably it is locked in this position to prevent its dangling loosely, and particularly to lock the adjustment at a determined point. The locking of the wrench is conveniently effected by means of a downward extension *l* of the yoke having a notch into which the lower portion of the wrench fits, and by means of a pin *m* passing through suitable openings in said extension *l* of the wrench.

With the previous styles of apparatus it is always a difficult matter to adjust the opposite ends of the rolls equally. This result is easily secured by the present mechanism, the nuts Z being provided on their outer faces with numbers, 1, 2, 3, 4, 5 and 6, as shown in Fig. 4. When the machine is first set up the nut Z at one side is made to correspond in angular position with the corresponding nut Z at the other side, by bringing the numbers "1" upon the two nuts to corresponding points. Thereafter when one of the nuts is adjusted one, two, or three steps, and locked in this position by its wrench, the other nut needs only to be adjusted exactly the same number of steps. The careful calipering of the separation of the rolls at opposite sides ceases to be necessary.

With previous adjusting mechanism it has been generally necessary to arrange the belting to pull in a backward direction from the pulleys Q on the shaft of the back roll so as to take up lost motion in a direction away from the board, to prevent hot rolls, and to increase the life of the board. With the present adjusting device there is no lost motion and the belts may be run forward from the pulleys, facilitating in many cases the setting up of the machine in a desired location, and also removing the belts out of the way of the operator adjusting the top rolls.

The uprights D which support the rolls at the top, and which guide the hammers, are laterally adjustable upon the base A, in

order to bring the upper and lower dies in perfect alinement and for other purposes. The means for effecting this adjustment in previous hammers have been open to numerous objections, principally on the score of inaccessibility of the nut, so that in case of breakage of the latter the uprights had to be lifted entirely from the base in order to make the necessary repairs. The base has been provided with a lug extending up outside of the upright, and this lug is very much in the way in planing the base. An important feature of my improved device is the provision of a key which is separate from both the upright and the base and which in use lies partly in a groove in the bottom of the upright and partly in a groove in the top of the base, so that it can be separately manufactured and nicely fitted to each. Another feature of importance is the use of a separable lug which when removed permits the easy planing of the top of the base. The screw and nut for the adjustment are entirely on the outside, so that in case of breakage there is no difficulty in substituting a new screw or nut.

Referring to the construction illustrated in detail in Figs. 5, 6 and 7, the base A is provided with a key-way *n* in its top surface, and the upright D with a corresponding key-way *o* in its under face, and a separate key *p* is fitted to these key-ways. This prevents any forward or backward movement of the upright relatively to the base while permitting adjustment laterally; that is, in the direction of the length of the key. In order to adjust the upright laterally, the key *p* is provided with a hook or enlargement *q*, the base being suitably cored to accommodate the same; and said key is provided at its outer end with a lug preferably in the form of an upward arm or hook *r* through which adjusting engagement with the upright D is effected, and preferably with a downward extension *s* bearing against the outer face of the base A.

The upward extension *r* is forked, as shown in Fig. 6, and carries the adjusting screw or bolt *t*, and it is provided with a polygonal socket *t'* holding a split nut *u* which has a clamping bolt *v* by which the bolt *t* may be clamped in any position of adjustment. The bolt is preferably held down by means of a bushing *w* and a cross-piece *x* fastened across the notch in the upright *r*. The base of the upright D is provided with a separate plug *y* driven into a socket formed therein and made of hardened steel and against which bears the end of the adjusting bolt *t*. A passage *z* is preferably provided back of the space carrying the plug *y* and by means of which the plug may be driven out to reset it or to substitute a new one.

By screwing it in the adjusting bolt *t* at one side, the base of the corresponding up-

right is pressed inward, and by slacking the corresponding adjusting bolt at the opposite side the entire upper part of the hammer is shifted laterally. In planing the base A it will be understood that the upwardly projecting portion *r* will be removed with the key, so that there will be no interference with the planing machine. In fitting the upright on the base these heavy parts will not need to be moved one to the other, but the comparatively light key can be carried to each and fitted carefully, effecting a saving of considerable labor. In case of breakage of the adjusting bolt or nut a new one can be quickly applied without disturbing the uprights.

What I claim is:—

1. In a machine of the class described, a pair of bearings for the corresponding ends of opposite rolls, and means for adjusting said bearings relatively to each other, said means comprising a pair of tie bolts connecting said bearings, a yoke engaging the corresponding ends of said bolts, and means for transmitting the strain from both said bolts through an intermediate point of said yoke to one of said bearings.

2. In a machine of the class described, a pair of bearings for the corresponding ends of opposite rolls, and means for adjusting said bearings relatively to each other, said means comprising a pair of tie bolts connecting said bearings, a yoke engaging the corresponding ends of said bolts, a bolt connected to one of said bearings, and a nut carried by said yoke and screwing on said bolt, said nut extending beyond the ends of said tie bolts.

3. In a machine of the class described, a pair of bearings for the corresponding ends of opposite rolls, and means for adjusting said bearings relatively to each other, said means comprising a bolt attached to one of said bearings, and a nut held against axial movement and rotatable on said bolt to adjust said bearing either forward or backward.

4. In a machine of the class described, a pair of bearings for the corresponding ends of opposite rolls, and means for adjusting said bearings relatively to each other, said means comprising a pair of tie bolts engaging at one end one of said bearings, a yoke carried at the opposite end of said tie bolts, and a bolt and nut connection between the other of said bearings and said yoke.

5. In a machine of the class described, a pair of bearings for the corresponding ends of opposite rolls, and means for adjusting said bearings relatively to each other, said means comprising a pair of tie bolts T and U connecting said bearings and engaging one of said bearings, a yoke W attached rigidly to the opposite ends of said tie bolts, a nut Z carried rotatively in said yoke but incapable

of axial movement therein, and a bolt X fastened to the other of said bearings and screwing through said nut Z, said nut Z projecting beyond the ends of said tie bolts T and U to permit its easy operation.

6. In a machine of the class described, a pair of bearings for the corresponding ends of opposite rolls, and means for adjusting said bearings relatively to each other, said means comprising a bolt attached to one of said bearings, and a nut held against axial movement and rotatable on said bolt to adjust said bearing either forward or backward, a wrench permanently connected to said nut, and means for locking said wrench when it is in rigid engagement with said nut, so as to prevent the rotation of said nut.

7. In a machine of the class described, a pair of bearings for the corresponding ends of opposite rolls, and means for adjusting said bearings relatively to each other, said means comprising a rotary member for effecting said adjustment and provided with notches *h*, a plug rotatively mounted in said member, a wrench *f* pivotally mounted upon said rotatable plug and adapted to be swung into and out of rigid engagement with the notches of said rotatable member, and means for fastening said wrench when in such rigid engagement so as to prevent the rotation of said member.

8. In a machine of the class described, a pair of rolls, a pair of bearings at the ends of each of the rolls, and means for adjusting the bearings at one end relatively to those at the other end, said means comprising a pair of scales, one carried by the adjusting means for each end, and adapted to be brought into corresponding positions to indicate a corresponding amount of adjustment at each end.

9. In a machine of the class described, a base, and an upright adjustable thereon, in combination with a key separate from both said parts and engaging both said parts at the front and back edges of the key to prevent a forward or backward movement of one relatively to the other, said key being disengaged from one of said parts at the ends of the key so as to permit adjustment of one relatively to the other in the direction of the length of the key.

10. In a machine of the class described, a base, and an upright adjustable thereon, in combination with a lug separate from and adapted to be engaged with one of said parts and to overlie the other, and an adjusting screw passing through said lug and adjusting the other of said parts.

11. In a machine of the class described, a base, and an upright adjustable thereon, in combination with a lug removably connected to one of said parts, a bolt screwing through said lug and engaging the other of said parts to effect the said adjustment, said bolt and lug being outside of said base and upright.

12. In a machine of the class described, a base, and an upright adjustable thereon, in combination with a lug *r* overlapping said upright and having a hooked engagement with said base whereby it may be readily separated therefrom, a nut *u* carried by said lug, and a bolt *t* passing through said nut and engaging said upright to adjust the same.
13. In a machine of the class described, a base, and an upright adjustable thereon, a key *p* entering suitable ways in the top of said base and the bottom of said upright respectively and having a hook engagement with said base, a threaded member carried by the outer portion of said key, and a bolt screwing through said threaded member and engaging said upright to effect said adjustment.
14. In a machine of the class described, a base, and an upright adjustable thereon, in combination with a key *p* entering ways in said base and said upright respectively and having a hook engagement with said base and having at its outer end an upwardly projecting member *r*, a split nut *u* carried nonrotatively by said member *r*, a bolt *v* for clamping said split nut, an adjusting bolt *t* screwing through said nut, and a plug *y* of hardened steel in said upright and engaged by the end of said adjusting bolt *t*.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

FREDRIK HOLMGREN.

Witnesses:

CHAS. J. ELLSWORTH,
JAS. A. EDEN, Jr.

Correction in Letters Patent No. 937,938.

It is hereby certified that in Letters Patent No. 937,938, granted October 26, 1909, upon the application of Fredrik Holmgren, of New York, N. Y., for an improvement in "Drop-Hammers or the Like," an error appears in the drawings requiring correction as follows: Sheet 3, Fig. 5, between the passage *z* and the key *p* hatching lines should appear; and that the drawings of the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 14th day of December, A. D., 1909.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.

12. In a machine of the class described, a base, and an upright adjustable thereon, in combination with a lug *r* overlapping said upright and having a hooked engagement with said base whereby it may be readily separated therefrom, a nut *u* carried by said lug, and a bolt *t* passing through said nut and engaging said upright to adjust the same.
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14. In a machine of the class described, a base, and an upright adjustable thereon, in combination with a key *p* entering ways in said base and said upright respectively and having a hook engagement with said base and having at its outer end an upwardly projecting member *r*, a split nut *u* carried nonrotatively by said member *r*, a bolt *v* for clamping said split nut, an adjusting bolt *t* screwing through said nut, and a plug *y* of hardened steel in said upright and engaged by the end of said adjusting bolt *t*.

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