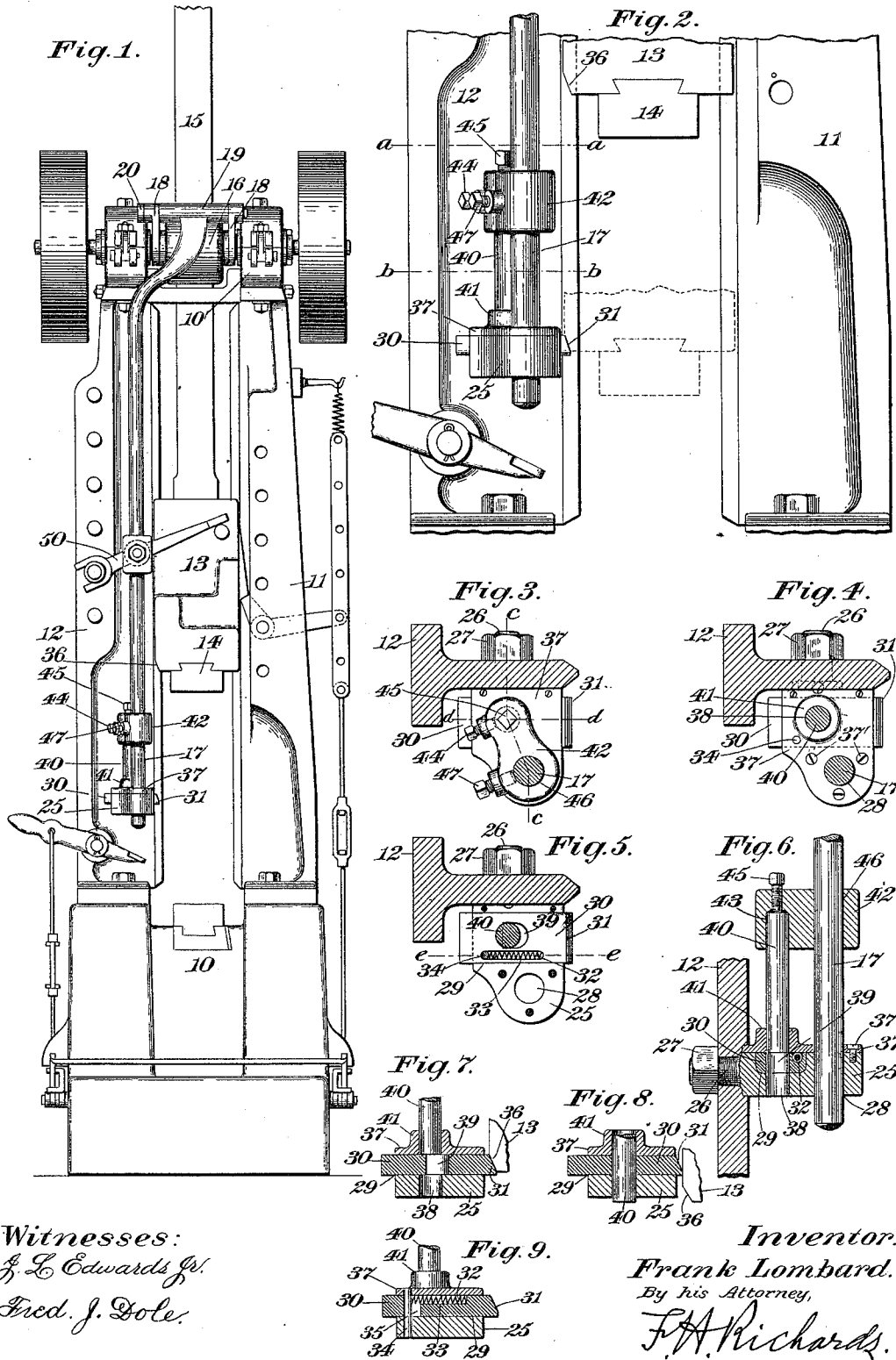


No Model.)

F. LOMBARD.
DROP HAMMER.

No. 566,199.

Patented Aug. 18, 1896.



UNITED STATES PATENT OFFICE.

FRANK LOMBARD, OF HARTFORD, CONNECTICUT.

DROP-HAMMER.

SPECIFICATION forming part of Letters Patent No. 566,199, dated August 18, 1896.

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To all whom it may concern:

Be it known that I, FRANK LOMBARD, a citizen of the United States, residing in Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Drop-Hammers, of which the following is a specification.

This invention relates to drop-hammers, and more especially to devices for permitting the means for elevating the hammer to be thrown into and out of action; and the object of the invention is to provide an improved means of this character which will be simple in its operation and construction, and which can be easily and quickly assembled and disassembled in case of breakage or other accident.

In the drawings accompanying and forming part of this specification, Figure 1 is a front view of a common form of drop-hammer, on a relatively small scale, with the improved means in position thereon. Fig. 2 is a front view of the upper portion of said drop-hammer frame, on an enlarged scale, with this improved means secured thereto and showing two different positions of the ram or hammer. Fig. 3 is a cross-sectional view taken in line *a a*, Fig. 2, and partly in elevation. Fig. 4 is a cross-sectional view taken in line *b b*, Fig. 2, and partly in elevation. Fig. 5 is a similar view to Fig. 4 with the cap of the bracket removed. Fig. 6 is a transverse sectional view, partly in elevation, taken in line *c c*, Fig. 3. Fig. 7 is a cross-sectional view taken in line *d d*, Fig. 3. Fig. 8 is a similar view to Fig. 7, showing a different position of the supplemental rod; and Fig. 9 is a cross-sectional view taken in line *e e*, Fig. 5.

Similar characters designate like parts in all the figures of the drawings.

As this improved means for permitting the actuation of the hammer-elevating mechanism forms but a part of a drop-hammer device, only so much of a drop-hammer as is deemed necessary properly to understand the improvement will be described, and that description will be, as far as possible, given in a general way, without going into the various details of such drop-hammer mechanism.

In the devices heretofore in use the means for normally holding the actuating-rod in a

lifted position, and for permitting the same to descend and thereby actuate the hammer-elevating mechanism into position to raise the ram, consists of a spring-actuated detent or holding device having a roll in position to be engaged by a cam or beveled face of the hammer or ram on its downward movement. In practice, however, it has been found that this means, as well as means similar in construction, not only cuts into the face of the ram and thereby more or less injures the same, but as it is necessary in such constructions of actuating means that it should project a considerable distance into the path of the ram, only certain sizes of dies can therefore be used with the same drop-hammer. Moreover, in the old constructions it is necessary to notch the actuating-rod, thereby not only weakening the same but necessitating considerable loss of stock, time, and labor in replacing the entire rod when such notch becomes worn. By this improved construction, however, it is only necessary to replace the supplemental rod hereinafter described when for any cause it is desirable; and, furthermore, the wear is brought on that part of the mechanism which can be easily and quickly renewed.

Referring now to one of the many forms of well-known drop-hammer mechanism—selected for the purpose of illustration—it comprises the base or anvil 10, carrying the usual side frames 11 and 12, having ways for guiding the ram or hammer 13, carrying the usual die 14. This hammer or ram is provided with the usual lifting-board 15, extending between a pair of continuously-rotative rolls 16, carried by the head 10' of the drop-hammer, and one of which rolls is eccentrically journaled in any suitable or desired way for adjustment toward and from the other roll, and which eccentric movement or adjustment of the rolls to engage or release the lifting-board 15 is obtained by means of a roll-shifting mechanism, preferably comprising the eccentric-actuating rod 17. This rod is pivotally connected at its upper end to rocker-arms 18, connected with the eccentric upon which the shiftable roll is journaled, said rod being shown with a transverse sleeve 19 at the upper end thereof, through which the bolt 20, connecting the two

rocker-arms together, extends. This eccentric-actuating rod 17 is shown disposed at one side of the hammer and is supported at or near its lower end thereof for sliding movement in parallelism with the path of movement of such hammer. It is distinctly to be understood, however, that my invention is not limited to the particular form of drop-hammer mechanism illustrated, as it is applicable to any kind in which a rod is employed for actuating the hammer-elevating means.

The improved means for normally supporting the rod 17 in its roll-opening position, and for permitting the downward movement of the same at certain predetermined periods, comprises, in a general way, a supplemental member or rod fixedly secured to the actuating-rod 17 and operable by means of some suitable mechanism, such as a slide or latch mechanism, and in the preferred form thereof herein shown and described it comprises a bracket 25, secured in any suitable way to one of the side frames of the drop-hammer mechanism, as 12, and preferably adjacent to the lower end of the actuating-rod 17. In the construction shown this bracket 25 is secured in position by means of a threaded extension 26 and nut 27. When a sliding latch is employed, the bracket is provided with a transverse bore or opening 28, through which the lower end of the rod 17 passes, and with a recess 29, forming a way for the reception of such latch, one form of which is shown as a slide 30, having a beveled face 31, projecting into the path of movement of the drop-hammer or ram, and which slide is preferably disposed substantially in the rear of the adjusting-rod 17 and is held in position to be engaged by the ram on its downward movement by means of a spring, which in the present construction is shown in the nature of a spiral spring 32, disposed in a recess 33 of the slide and having one end thereof in engagement with a pin 34, which extends through an elongated slot 35 in said slide and into the bracket, whereby said spring will tend to force the beveled end 31 of the slide into position to be engaged by the ram or hammer, which is provided with a beveled or cam face for this purpose. This pin 34 also forms a means for limiting the outward movement of the slide when the pin is in engagement with the rear wall of the slot 35.

As a means for holding the slide in the recess of the bracket and the spring in the recess of the slide, the bracket is provided with a cap or plate 37, secured thereon by suitable fastening devices, such as by screws 37', and through which, by means of an opening in alinement with the bore 28 of the bracket, the actuating-rod 17 also passes in a manner that will be readily understood.

Extending through the bracket and its cap, in parallelism with the bore 28 and intersecting the slide-recess 29, is an opening or bore 38, preferably, however, of somewhat smaller

diameter than the actuating-rod opening 28. The slide 30 is provided with a slot 39, which, when said slide is in its normal ram-engaging position, will have a portion thereof out of alinement with the opening 38 in the bracket and cap, and which slot 39, however, when the slide is moved out of the path of the ram, will be in alinement with said bracket-opening 38. Sliding in this opening 38 of the bracket 25 is a supplemental member or rod 40, the lower end of which is guided by a projection 41 of the cap, and when the beveled end 31 of said slide is in the path of the ram the end of said rod 40 rests on that part of the slide which intersects the opening 38 in a manner that will be readily understood. The upper end of this rod 40 is fixedly and adjustably secured to a bracket 42 in any suitable way; but in the present construction the rod 40 is shown extending into a recess 43 of said bracket 42 and is clamped therein by means of a clamping device or screw 44, extending transversely into said bracket 42, and which rod is longitudinally adjustable to take up wear thereof by means of an adjusting device, such as a screw 45, which extends through said bracket from the top thereof, engages the upper end of said supplemental rod, and is adapted to move the same when the clamp device 44 is released. This bracket is fixedly secured to the actuating-rod 17 in any suitable manner, but is herein shown provided with a bore 46, through which said actuating-rod extends, said bracket being clamped thereto by means of a clamping device, such as a screw 47, which also extends transversely through said bracket 44.

In the operation of this improved device, when the hammer or ram has practically reached the limit of its descending stroke the bevel face 36 thereof engages the bevel face 31 of the latch or slide 30, forces the same backward, and carries the slot 39 thereof into alinement with the opening 38 of the bracket, and thereby permits the supplemental rod 40 and actuating-rod 17 to descend in their respective bores, whereby the eccentrically-journalled roll will be shifted into position to engage the lifting-board of the ram to raise the same in a manner that will be readily understood, such roll being moved from the ram-lifting board to permit the descent of the hammer in any suitable way, such as by means of a lever 50, pivoted to the actuating-rod 17 and having one end thereof in position to be engaged by the ram on its upward movement, whereby the actuating-rod will be raised and thereby simultaneously raise the supplemental rod 40 above the slide 30, which will be moved into position by means of its spring 33 to support such rod 40, and thereby the actuating-rod 17, in its raised position, and to also bring the bevel face 31 of the slide into position to be engaged on the next descent of the ram. By this construction of actuating-rod supporting and operating means, and by having the same practically independent of

the roll-actuating rod, the wear and strain will come entirely on the supplemental rod 40, so that the same can be easily replaced in case of wear or breakage, whereby a great saving in stock and in time and labor are secured.

It is obvious that other devices could be substituted for the sliding latch 30 shown as preferably employed, and that the means co-operating with said latch could be variously modified without departing from my invention.

Having described my invention, I claim—

1. The combination with an actuating-rod of a drop-hammer, of a latch; and a supplemental rod operatively connected to the actuating-rod and supported by the latch in one position of said latch.

2. The combination with an actuating-rod of a drop-hammer, of a spring-actuated latch; and a supplemental rod operatively connected with the actuating-rod and supported by the latch in one position of said latch.

3. The combination with an actuating-rod of a drop-hammer, of a spring-actuated and slotted latch; and a supplemental rod operatively connected with the actuating-rod and supported by the latch in one position of said latch.

4. The combination with an actuating-rod of a drop-hammer, of a latch; and an adjustable supplemental rod operatively connected to the actuating-rod and supported by the latch in one position of said latch.

5. The combination with a frame and a drop-hammer-actuating rod, of a bracket secured to said frame; a spring-actuated latch in position thereon; a supplemental rod supported by the latch in one position thereof; a second bracket having a recess for the reception of the upper end of the supplemental rod, and fixedly secured to both of said rods; and adjusting means carried by said second bracket for longitudinally adjusting said supplemental rod relatively to the actuating-rod.

6. The combination with a frame, of a drop-hammer-actuating rod; a bracket secured to said frame; a latch supported thereon; a supplemental rod supported by said latch in one position thereof; a second bracket secured to said rods; and means for longitudinally adjusting said supplemental rod relatively to the actuating-rod.

7. The combination with a frame, of a drop-hammer-actuating rod; a supplemental rod operatively secured to said actuating-rod; a recessed bracket secured to said frame and having a pair of openings extending therethrough, one for the passage of the actuating-rod and the other for the passage of the supplemental rod; a latch supported in the recess of said bracket and having a slot communicating with the supplemental-rod opening and adapted to support said supplemental rod in one position of said latch; and a removable cap secured to said bracket and having a pair

of openings in alinement with the openings of the bracket.

8. The combination with an actuating-rod of a drop-hammer, of a latch; a supplemental rod operatively connected to the actuating-rod and supported by the latch in one position of the same; and means for raising the actuating-rod and thereby the supplemental rod to permit the latch to support said supplemental rod.

9. The combination with an actuating-rod of a drop-hammer, of a latch and a supplemental rod operatively connected to the actuating-rod and supported by the latch in one position of the same; and means for raising said supplemental rod to permit the latch to support the same in raised position.

10. The combination with a frame of a drop-hammer and an actuating-rod thereof, of a supplemental rod operatively connected to said actuating-rod; a bracket secured to said frame and having a pair of openings extending therethrough, one for the passage of said actuating-rod and the other for the passage of said supplemental rod; a spring-actuated latch on said bracket having a slot communicating with the supplemental-rod opening of the bracket; and means for lifting said actuating-rod and thereby the supplemental rod to permit the latch to support the same in raised position.

11. The combination with a frame of a drop-hammer and an actuating-rod thereof, of a supplemental rod operatively secured to the actuating-rod; a recessed bracket secured to said frame and having a pair of openings extending therethrough, one for the passage of the actuating-rod and the other for the passage of the supplemental rod; and a spring-actuated latch disposed in the recess of the bracket and having a slot communicating with the supplemental-rod opening in one position of said latch.

12. The combination with a frame of a drop-hammer and an actuating-rod thereof, of a supplemental rod operatively connected to the actuating-rod; a recessed bracket having a pair of openings extending therethrough, one for the passage of said actuating-rod and the other for the passage of said supplemental rod; a bevel-ended latch disposed in the recess of said bracket and having a slot communicating with the supplemental-rod opening in one position thereof, said latch having a recess and a slot communicating therewith; a pin extending through said last-mentioned slot and into said bracket and acting as a stop to limit the forward movement of said latch; and a spring disposed in said recess and operative to carry the beveled end of the latch into the path of movement of a drop-hammer.

13. The combination with a frame, of a drop-hammer-actuating rod; a bracket clamped to said actuating-rod and having a recess; a supplemental rod having its upper end dis-

posed in said recess and clamped to said
bracket; an adjusting device carried by said
bracket and operable to longitudinally adjust
said supplemental rod; a recessed latch-sup-
5 porting bracket secured to the frame and
having a pair of openings, one for the pas-
sage of the actuating-rod and the other for the
passage of the supplemental rod; a spring-
actuated latch disposed in said recess and
10 having a slot communicating with the sup-
plemental-rod opening of said bracket in one
position of said latch and adapted to support
said supplemental rod in another position of
said latch.

14. The combination with an actuating-rod 15
of a drop-hammer, of a supplemental device
movable bodily therewith; and means actua-
ted by the hammer for holding and releasing
said device.

15. The combination with an actuating-rod 20
of a drop-hammer, of a device independent
of, and movable bodily with, said rod; and a
latch for holding and releasing said device.

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Witnesses:

F. C. BLAND,
R. B. WELLS.