No. 799,352. PATENTED SEPT. 12, 1905.

M. MERRILL.

DROP HAMMER.

APPLICATION FILED MAR. 25, 1904.

2 SHEETS—SHEET 1.

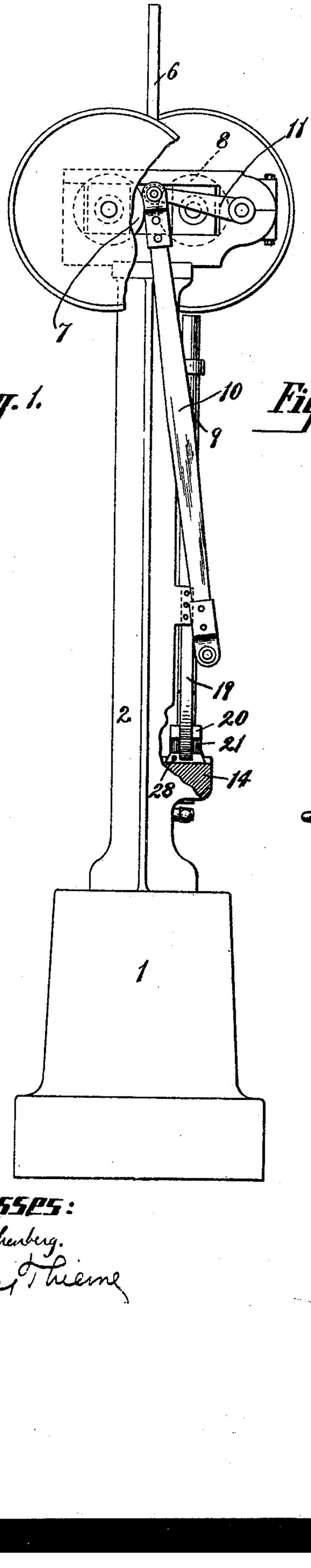

Fig. 1.

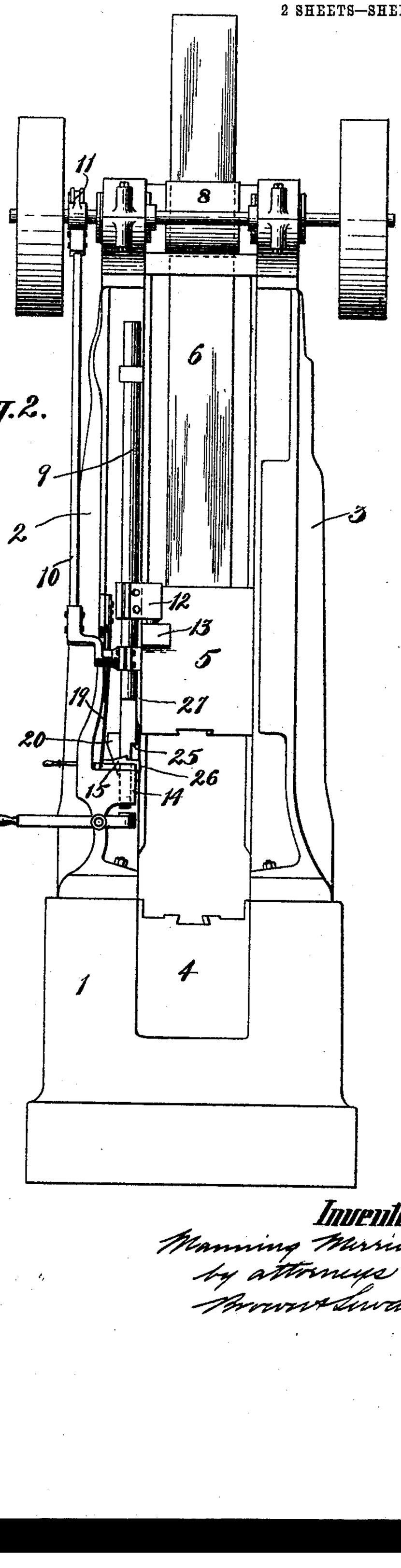

Fig. 2.

Witnesses:
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Inventor:
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2 SHEETS—SHEET 2.

Fig. 3.

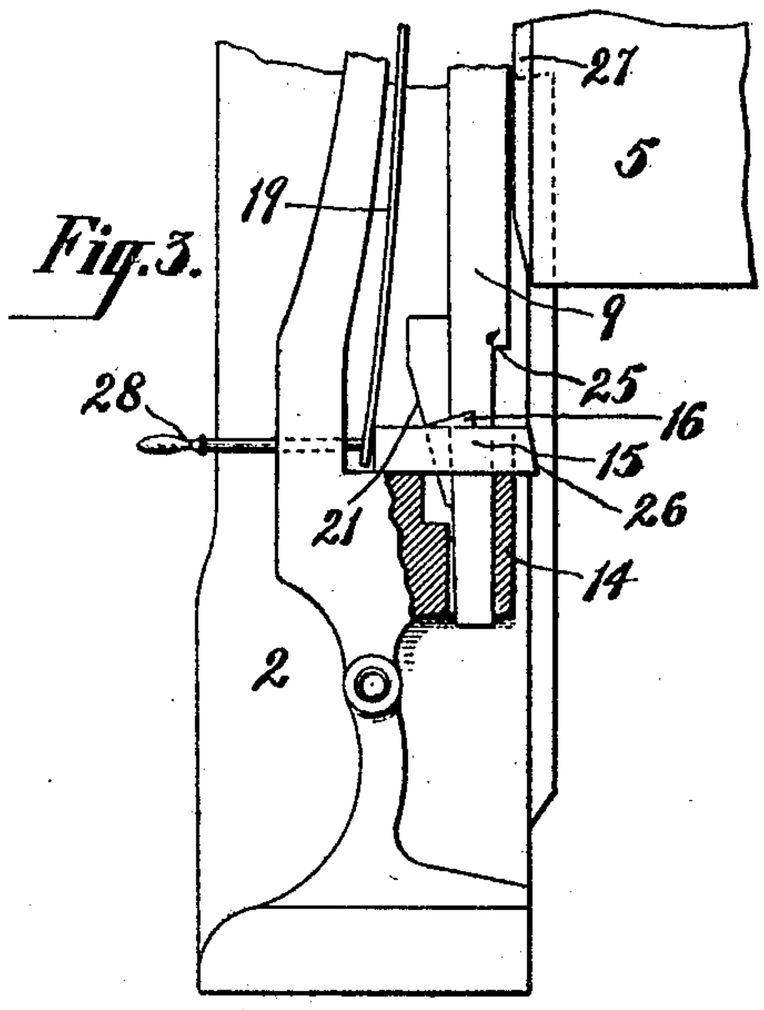


Fig. 5.

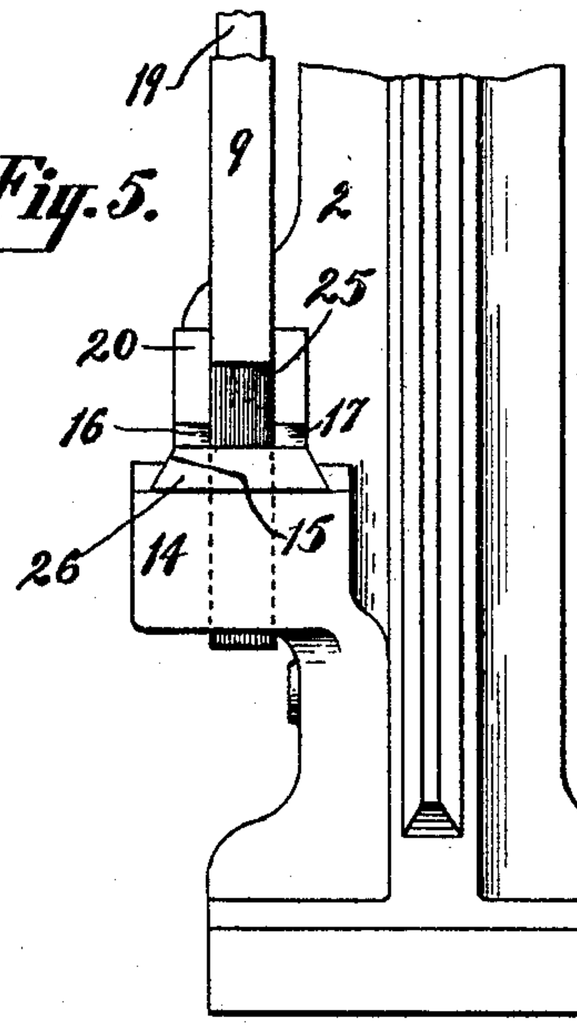


Fig. 4.

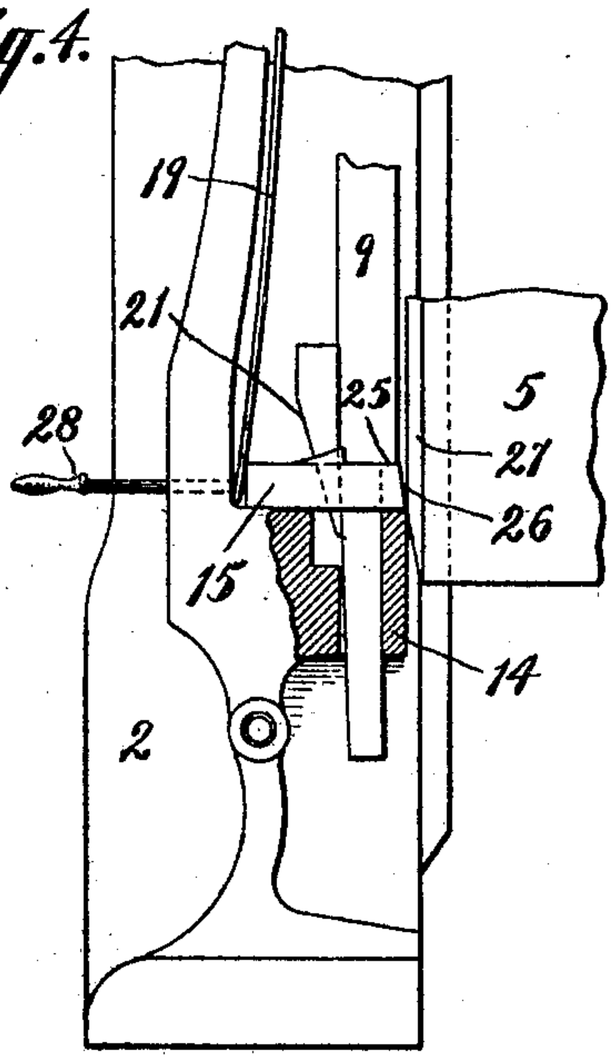


Fig. 6.

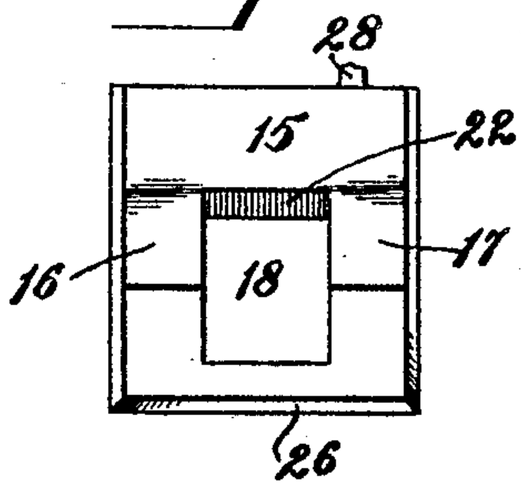


Fig. 7.

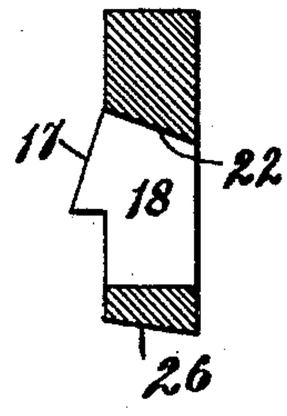


Fig. 8.

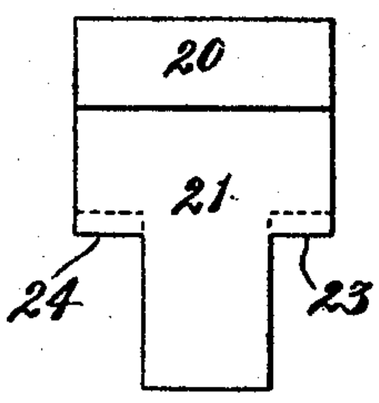
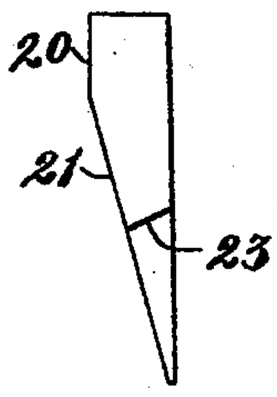


Fig. 9.



Witnesses:

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Henry T. Thieme.

Inventor:

Manning Merrill

by attorneys

Brown & Seward

UNITED STATES PATENT OFFICE.

MANNING MERRILL, OF NEW YORK, N. Y.

DROP-HAMMER.

No. 799,352. Specification of Letters Patent. Patented Sept. 12, 1905.

Application filed March 25, 1904. Serial No. 200,009.

To all whom it may concern:

Be it known that I, MANNING MERRILL, a citizen of the United States, and a resident of the borough of Brooklyn, in the city and State of New York, have invented a new and useful Improvement in Drop-Hammers, of which the following is a specification.

My invention relates to an improvement in drop-hammers, and is more particularly directed to improvements in automatic friction-board-lifting drop-hammers, in which friction-rolls are engaged with and disengaged from the hammer-board for raising the hammer and permitting it to drop.

This present invention is directed to means for holding the drop-rod of the hammer at the limit of its upward movement after it has been raised by the hammer and the hammer begins its downward movement.

A further object is to provide new means for releasing the drop-rod as the hammer approaches the limit of its downward movement to permit the hammer-board to be engaged by the friction-rolls for raising the hammer.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 represents the hammer in side elevation, parts of the same being broken away to more clearly illustrate the novel features of my device. Fig. 2 is a view in front elevation of the hammer. Fig. 3 is a detail view, in front elevation, partially in section, of the wedge device and the adjacent parts, the hammer being shown in its raised position. Fig. 4 is a similar view with the hammer shown in its lowered position. Fig. 5 is an inside view of the parts shown in Fig. 3 with the hammer removed. Fig. 6 is a top plan view of the horizontally-sliding wedge. Fig. 7 is a longitudinal section through the same. Fig. 8 is an outer face view of the vertically-sliding wedge, and Fig. 9 is a side view of the same.

The base of the hammer is denoted by 1, the uprights by 2 and 3. The anvil is denoted by 4, the vertical sliding hammer by 5, and its lifting-board by 6. The stationary friction-roll is denoted by 7, and the sliding friction-roll by 8. The drop-rod is denoted by 9 and is connected by the rod 10 to the rock-arm 11, which controls the movement of the friction-roll 8 toward and away from the other roll in the well-known manner. This drop-rod 9 is provided with an adjustable abutment 12, which is engaged by a lug 13 on the hammer 5 as the hammer approaches the limit of its upward movement, so that the additional upward movement of the hammer will raise the rod a short distance sufficient to move the friction-roll 8 away from its engagement with the hammer-board 6.

The means which I have shown for automatically holding the drop-rod 9 at the limit of its upward movement until released by the hammer as it approaches the limit of its downward movement is constructed, arranged, and operated as follows: The lower end of the drop-rod has a vertically-sliding movement in a bottom guide 14 on the upright 2. A horizontally-sliding wedge 15 surrounds the drop-rod 9 and rests upon the top of the guide 14. This wedge 15 is provided with two inclined surfaces 16 and 17 upon opposite sides of the hole 18, through which the drop-rod 9 slides. The wedge 15 is held yieldingly at the limit of its inner movement by a spring 19, which in the present instance presses against the outer end of the said wedge. A vertically-sliding wedge 20 is inserted between the outer wall of the drop-rod 9 and the outer wall of the hole 18 in the wedge 15. The outer face of the wedge 20 is tapered, as shown at 21, and the outer wall 22 of the hole 18 is provided with a corresponding taper. The sides of the wedge 20 project beyond the side walls of the hole 18 in the wedge 15, producing shoulders 23 24, the bottoms of which are preferably inclined upwardly and inwardly for permitting them to ride upon the inclined surfaces 16 and 17 of the wedge 15.

The outer face of the drop-rod 9 may be slightly tapered, if so desired, to facilitate the gripping of the rod by the vertically-sliding wedge 20. The inner face of the drop-rod 9 is cut away near its bottom to form a shoulder 25, which serves as a stop to limit the downward movement of the rod 9 by engaging the top of the wedge 15. The inner end of the wedge 15 is preferably tapered downwardly and inwardly, as shown at 26. This inner end of the wedge 15 is engaged by a cam 27 on the side of the hammer 5 when the hammer is near the limit of its downward movement. The wedge 15 may be provided with a handle 28 for operating the wedges independently of the movement of the hammer.

The operation of the device is as follows: Presupposing that the hammer is in the position shown in Fig. 4, the drop-rod will be at

the limit of its downward movement and the vertically-sliding wedge will be released because of the lifting of the same by the outward movement of the horizontally-sliding wedge 15. As the hammer travels upwardly its cam 27 will be disengaged from the wedge 15, thus permitting the spring 19 to slide the wedge inwardly. This movement will permit the wedge 20 to drop downwardly into position to grip the drop-rod 9 the moment it should tend to drop. As the hammer approaches a predetermined limit of its upward movement its lug 13 will engage the abutment 12 and lift the rod 9 a sufficient distance to release the hammer-board 6 from the lifting-rolls. This will permit the hammer to drop. The rod 9, however, will be gripped at the limit of its upward movement by the wedge 20. As the hammer 5 approaches the limit of its downward movement its cam 27 will engage the inner end of the wedge 15, forcing it outwardly, and thereby raising and releasing the wedge 20 from the rod 9, permitting the rod to drop, and thereby also permitting the lifting-rolls to again engage the hammer-board 6 for raising the hammer.

The device herein described is extremely simple and effective and obviates the tendency of the drop-rod to break the parts, such as the latch now in common use, because of the rod being commonly permitted to drop a short distance after it has been lifted to the limit of its upward movement. Furthermore, the device which I have described herein is noiseless.

It is evident that changes might be resorted to in the form, construction, and arrangement of the several parts without departing from the spirit and scope of my invention. Hence I do not wish to limit myself strictly to the structure herein set forth; but

What I claim is—

1. In a drop-hammer, the hammer, the lifting-rolls, the drop-rod arranged to be raised by the hammer as the hammer is lifted, a guide for the drop-rod, and a vertically-sliding wedge arranged to cramp the drop-rod within its guide when the rod is at the limit of its upward movement.

2. In a drop-hammer, the hammer, the lifting-rolls, the drop-rod arranged to be raised by the hammer, a guide for the drop-rod, a vertically-sliding wedge for cramping the rod in the guide when the rod is at the limit of its upward movement and means for lifting the wedge and thereby releasing the rod when the hammer is near the limit of its downward movement.

3. In a drop-hammer, the hammer, the lifting-rolls, the drop-rod arranged to be raised by the hammer, a guide for the drop-rod, a wedge for cramping the rod in the guide when the rod is at the limit of its upward movement and a second wedge for supporting the first-named wedge, the second wedge arranged to be operated by the hammer for releasing the first-named wedge and thereby the drop-rod when the hammer is near the limit of its downward movement.

4. In a drop-hammer, the hammer, the lifting-rolls, the drop-rod arranged to be raised by the hammer, a vertically-sliding wedge for holding the rod at the limit of its upward movement and a horizontally-sliding wedge for supporting the vertically-sliding wedge in operative position and operated by the hammer for releasing the vertically-sliding wedge and thereby the rod when the hammer is near the limit of its downward movement.

5. In a drop-hammer, the hammer, the lifting-rolls, the drop-rod arranged to be raised by the hammer, a vertically-sliding wedge for holding the rod at the limit of its upward movement, a horizontally-sliding wedge for supporting the vertically-sliding wedge in its operative position, and a cam on the hammer arranged to engage the horizontally-sliding wedge for causing it to release the vertically-sliding wedge and thereby the drop-rod when the hammer is near the limit of its downward movement.

6. In a drop-hammer, the hammer, the lifting-rolls, the drop-rod arranged to be raised by the hammer, a vertically-sliding wedge for holding the rod at the limit of its upward movement, a spring-actuated horizontally-sliding wedge for supporting the vertically-sliding wedge in its operative position, and means carried by the hammer for moving the horizontally-sliding wedge against the tension of its spring for releasing the vertically-sliding wedge and thereby the drop-rod when the hammer is near the limit of its downward movement.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 22d day of March, 1904.

MANNING MERRILL.

Witnesses:

FREDK. HAYNES,

HENRY THIEME.