

No. 756,036.

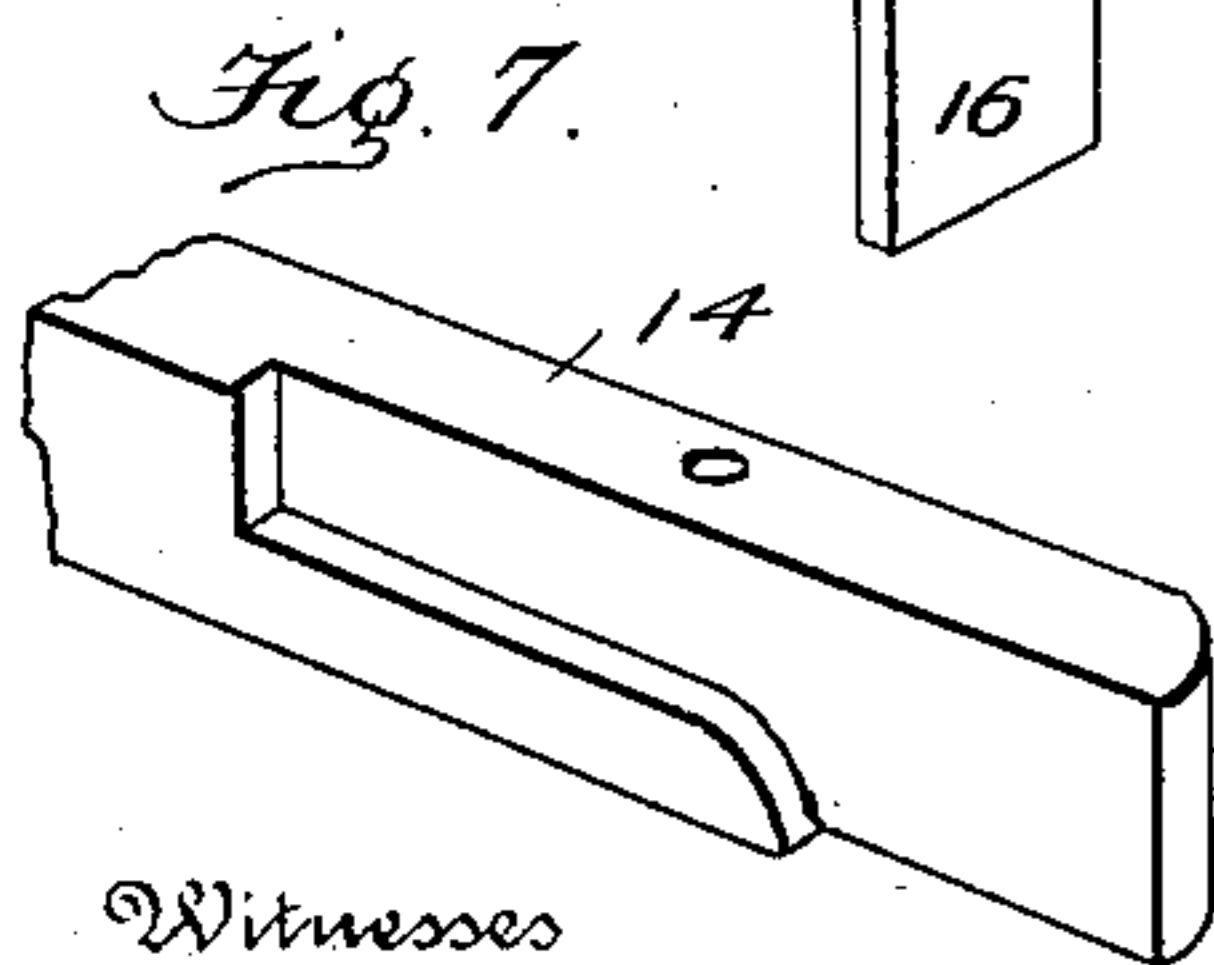
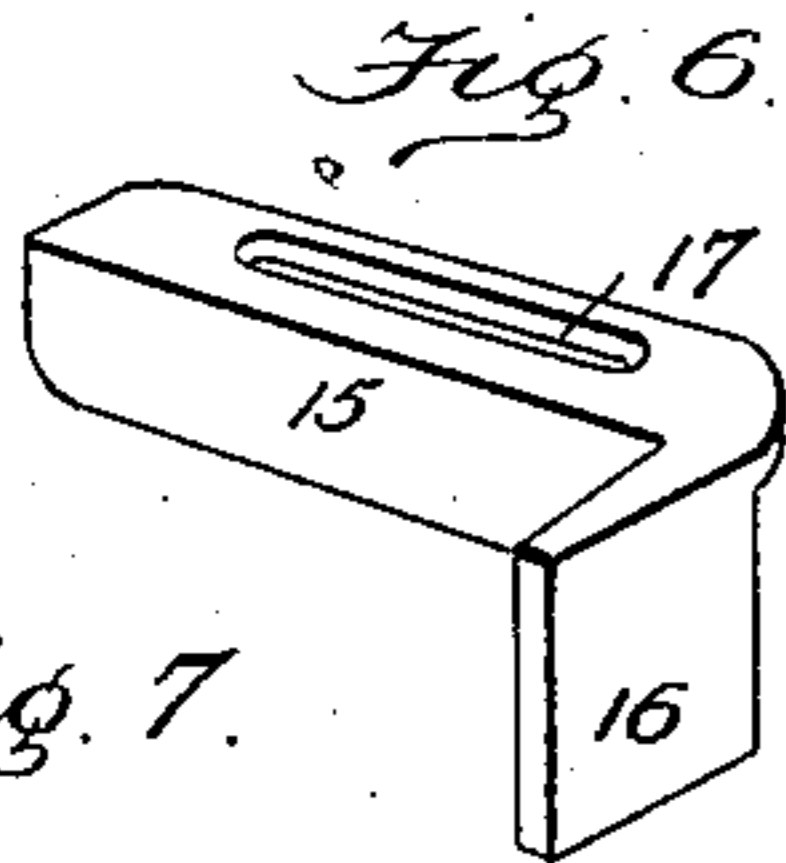
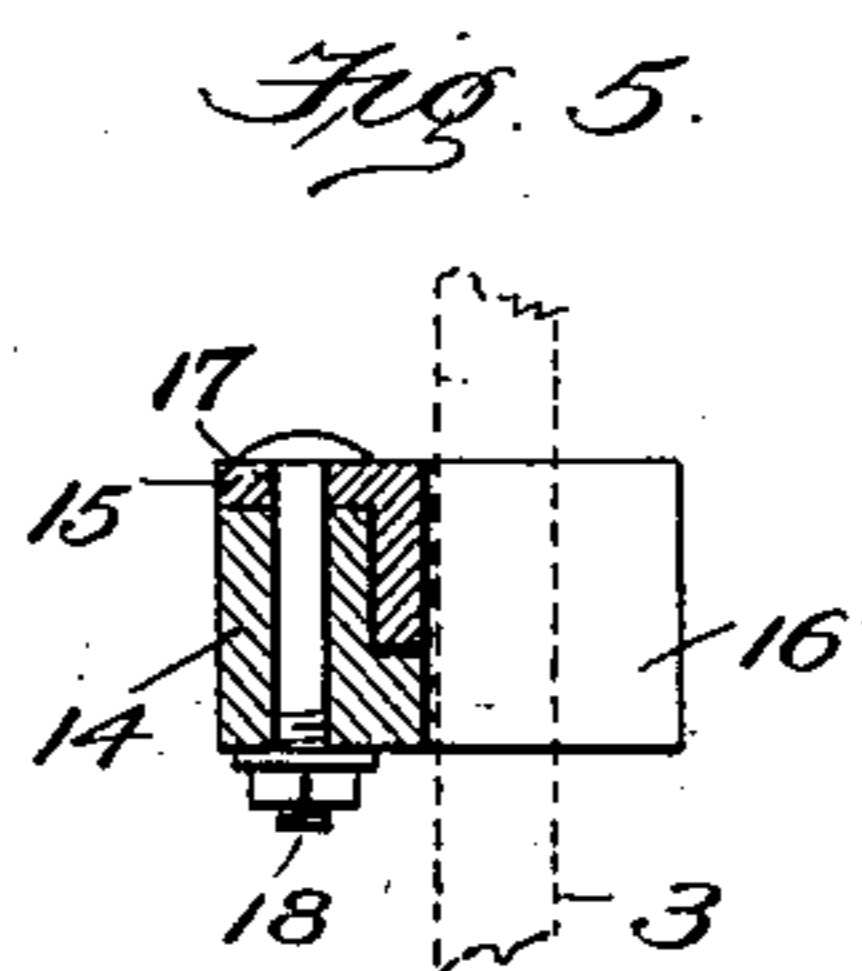
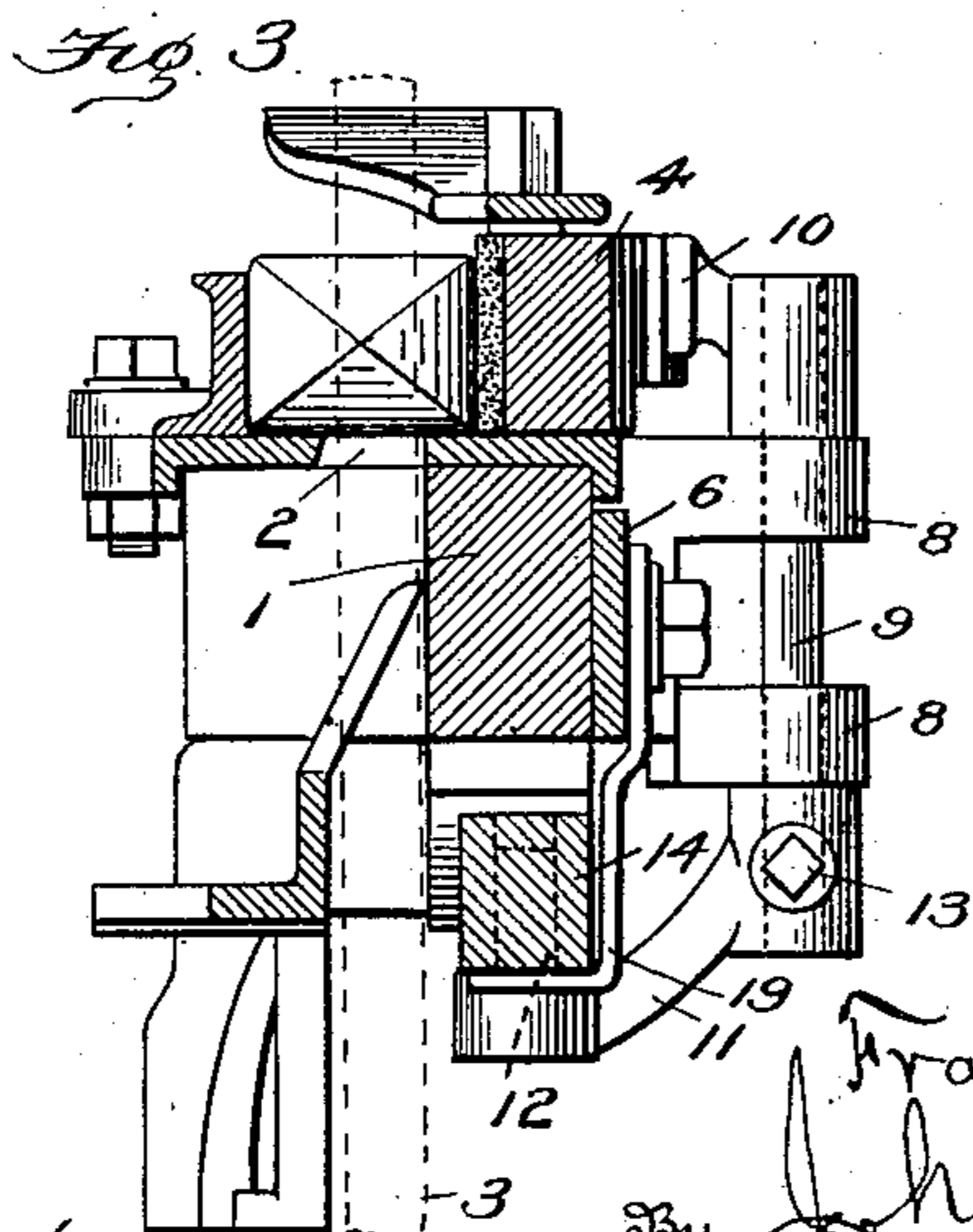
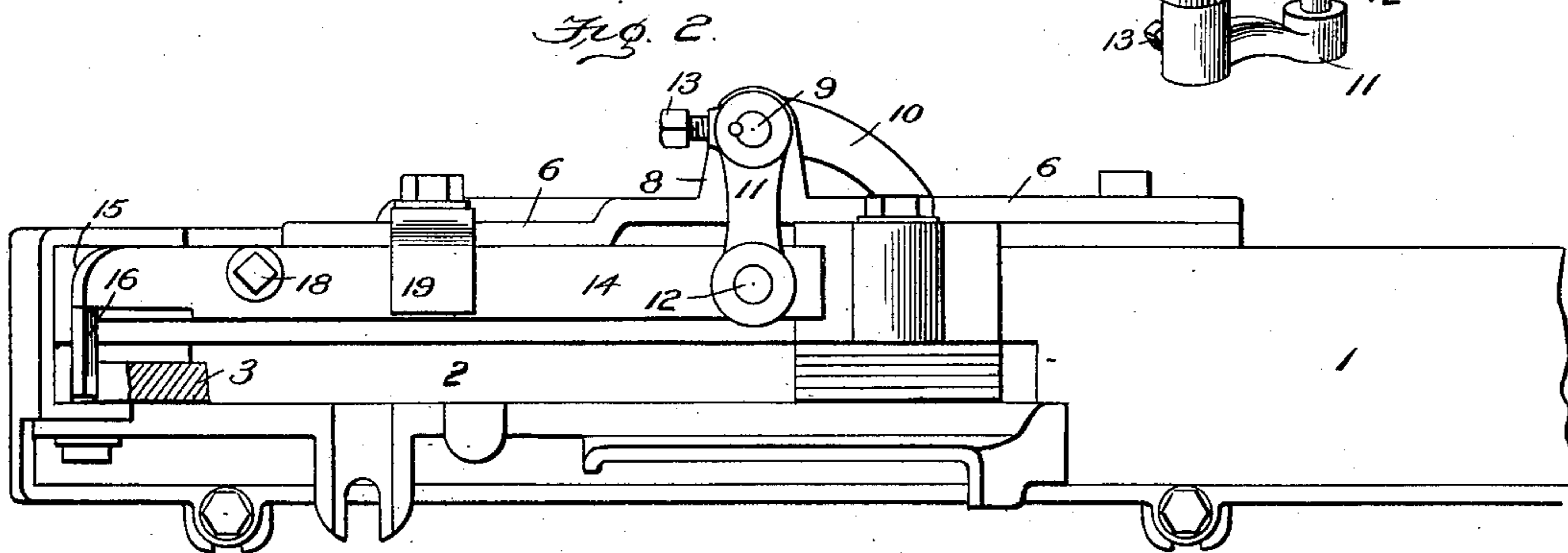
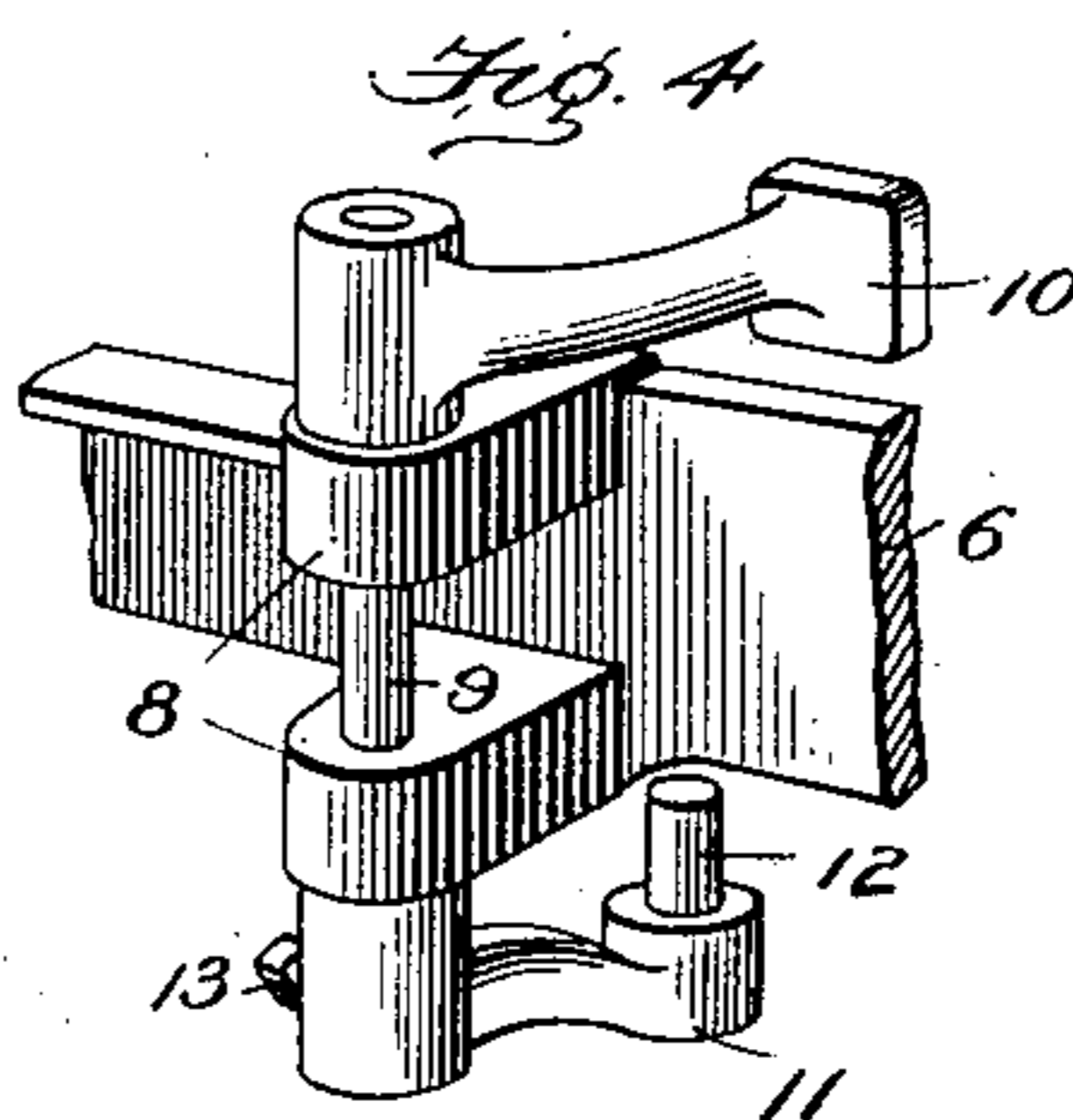
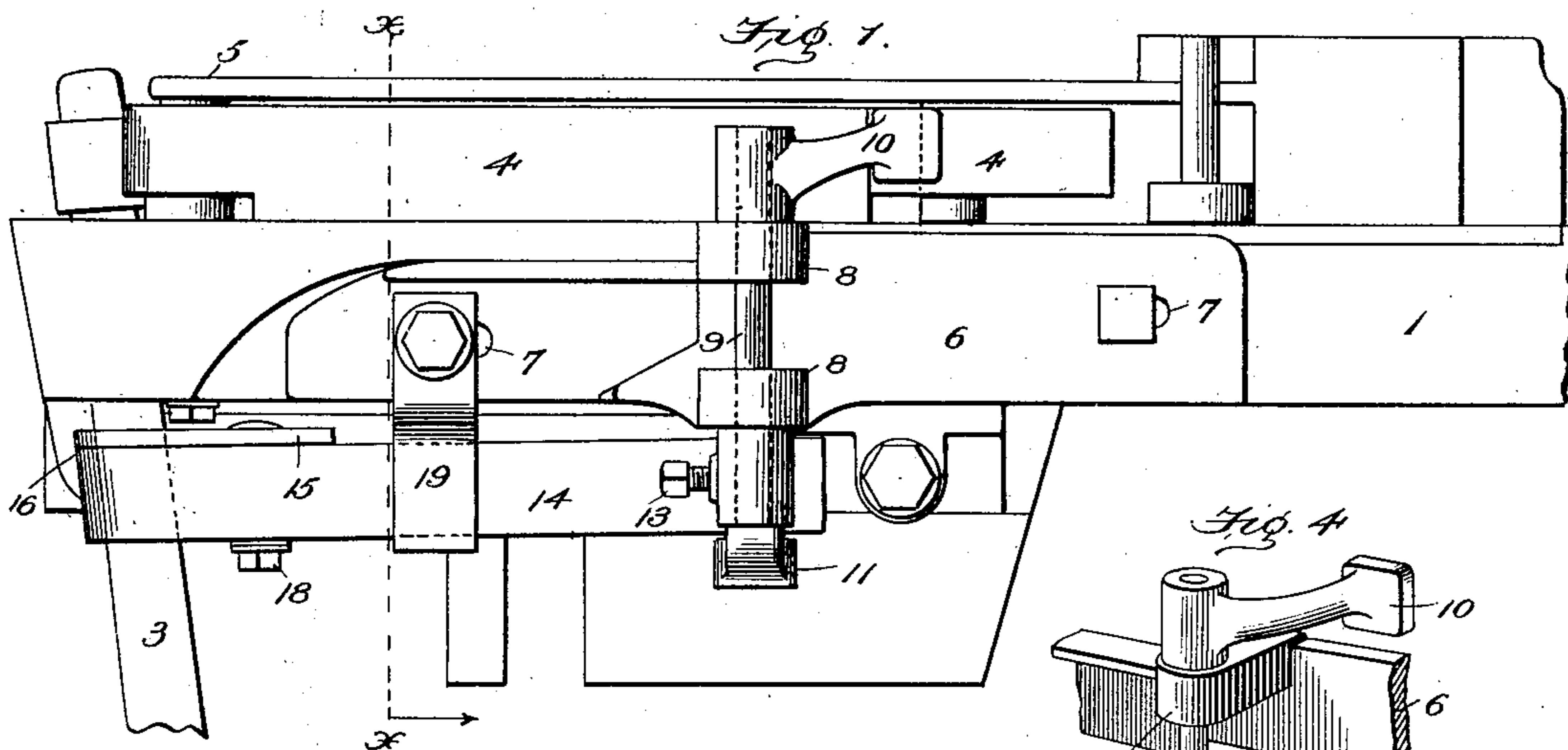
PATENTED MAR. 29, 1904.

F. A. MILLS.
SHUTTLE LOCK FOR LOOMS.

APPLICATION FILED SEPT. 15, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses

Edwin L. Bradford
Anne B. Johnson

Inventor
Francis Arthur Mills
By Johnson & Johnson
his Attorneys

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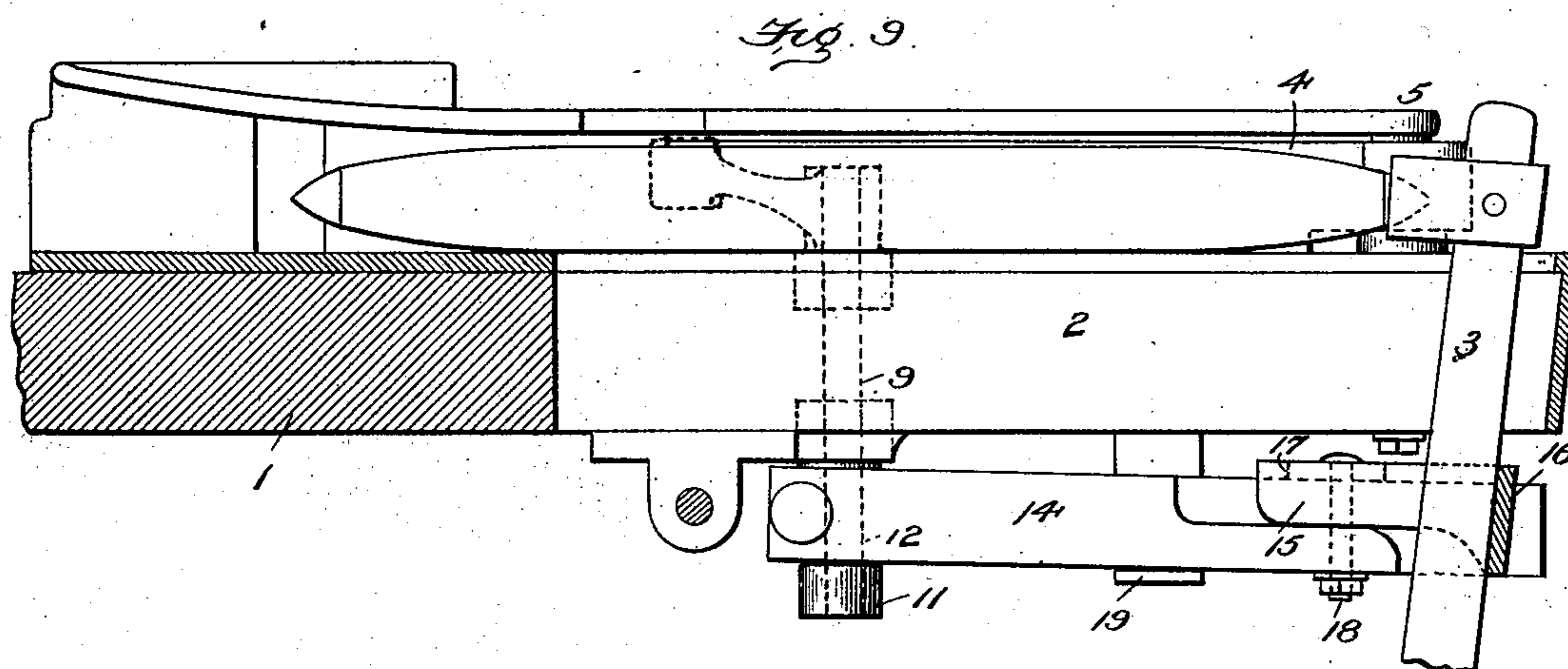
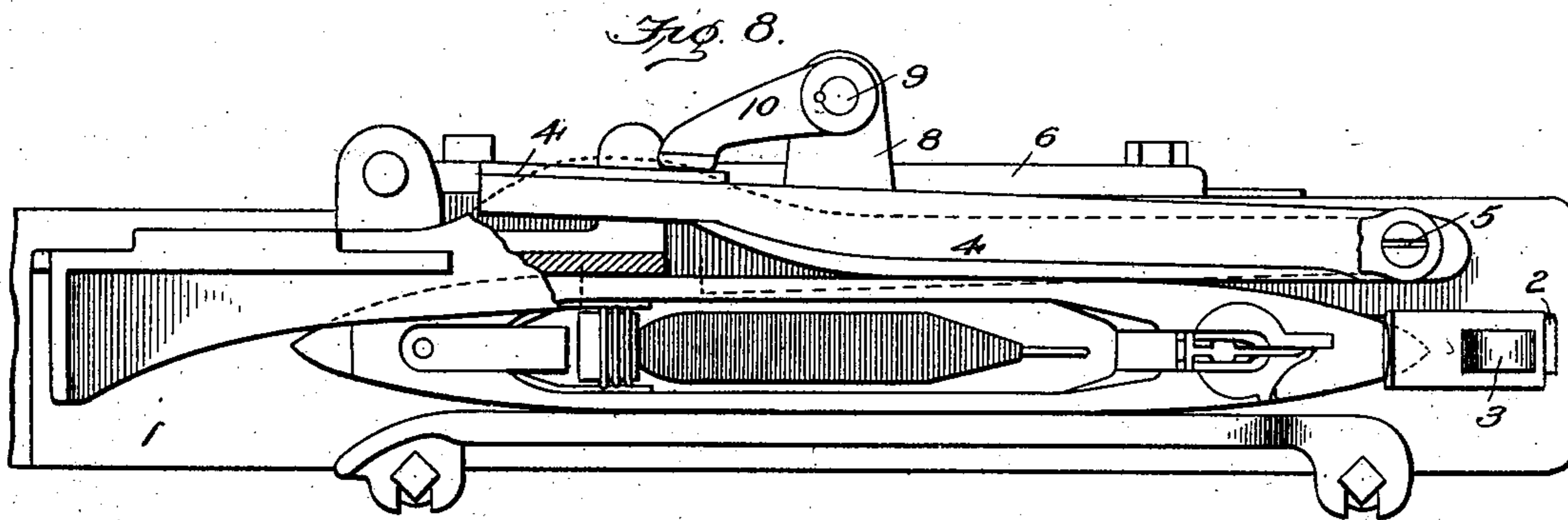
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UNITED STATES PATENT OFFICE.

FRANCIS ARTHUR MILLS, OF LAWRENCE, MASSACHUSETTS, ASSIGNOR
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SETTS.

SHUTTLE-LOCK FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 756,036, dated March 29, 1904.

Application filed September 15, 1903. Serial No. 173,278. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS ARTHUR MILLS, a citizen of the United States of America, residing at the city of Lawrence, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Shuttle-Locks for Looms, of which the following is a specification.

The following description, read in connection with the accompanying drawings, will enable any one skilled in shuttle-locking mechanism for looms to understand my invention and to practice it in the form in which I prefer to employ it; but it will be understood that my invention is not limited to the precise form and details of construction herein illustrated and described, as various modifications and changes may be made without exceeding the scope of the claims in which my invention is set out.

The object of my invention is to effect the locking of the shuttle in the shuttle-box at a desired position by the provision of a leverage locking mechanism which will permit the full and unimpaired force of the blow or impact of the shuttle upon the picker or picker-stick to be transmitted to the shuttle-binder to cause it to engage and hold the shuttle under the full force of the blow of the shuttle upon the picker. I obtain this result by the deliverance of the impact blow upon the free or unattached end of a slidable-arm connection which has the function of a bunter, whose other end is connected to and operates a lever device engaging the shuttle-binder. This bunter-arm connection has provision for making it shorter or longer, whereby it may be adjusted for rendering effective the locking of the shuttle at any point of its throw into the shuttle-box.

This device is especially important in what is known as the "magazine-loom" in the patent to Northrop, No. 529,940, dated November 29, 1894, in which it is necessary that the shuttle be stopped at a desired position in the shuttle-box to permit a perfect transfer of a bobbin of filling from the magazine to the shuttle.

Referring to the drawings, Figure 1 is a rear side view of the right end of a loom-lay,

showing the picker-stick as having been driven by the impact of the shuttle in engagement with the free bunter end 16 of a connection-arm arranged at the under side of the lay and by which the impact of the shuttle is transmitted to the binder. Fig. 2 is a bottom view of the same. Fig. 3 is a transverse section on the line *x x* of Fig. 1. Fig. 4 shows in perspective the binder-lever and its lever device 11, which is pivoted to and operated by the slidable-arm connection. Fig. 5 shows in cross-section the adjustable bunter end 15 of the impact connection-arm. Fig. 6 is a perspective view of the same. Fig. 7 shows in perspective that end of the connection-arm to which the bunter is adjustably secured. Fig. 8 shows in top view the right end of a loom-lay and its shuttle-box and the shuttle in the position as having been locked in the shuttle-box by my new locking mechanism. Fig. 9 is a vertical section of the same, showing the free end of the bunter connection-arm as having received the impact of the picker-stick and having actuated the binder-lever.

The lay 1, having the shuttle-box thereon and the slot 2 for the picker-stick 3 and the binder 4, pivotally mounted at 5 and forming one side of the shuttle-box, are of the well-known or usual construction.

The invention which constitutes the subject of this patent is carried out by means which I will now state. A plate 6, bolted to the rear side of the lay, is provided with slots 7 7 at the fastening-bolts, by which it may be adjusted horizontally, and has two outward-projecting lugs 8 8, which form bearings for a vertical shaft 9, on the end of which above the upper lug the binder-lever 10 is fixed with its free end standing obliquely inward and forward for engagement with the free end of the shuttle-binder. On its lower end beneath the lower lug the shaft has a lever 11, which extends inward beneath the lay and is provided at its inner free end with a vertical pin 12. A screw-bolt 13 fastens this lever on its shaft, and resting upon the lever in engagement with its pin is a connection-arm 14, extending beneath the lay to the end of the latter, where it is provided with an adjust-

able bunter, which, as shown, is an L-shaped plate 15, the angle end 16 of which forms the bunter and extends across the path of the picker-stick to receive its blow, as in Fig. 2.

5 This end of the connection-arm is not fastened to the lay, but is free to move, so that it instantly transmits the full force of the blow of the shuttle to the binder-lever—that is, there is nothing to prevent the full force of the blow of the shuttle to the lever device through the slidable connection arm or bar, as the impact end of the latter has no connection, but is free to move under impact to transmit the force thereof to a lever device then upon the binder and the binder upon the shuttle. A slot 17 in the bunter-plate allows of its adjustment by the bolt 18 on the connection-arm to lengthen or to shorten it, whereby the locking movement of the binder may be so timed as to cause the shuttle to be locked at any desired point in the shuttle-box. A hanger 19, Fig. 3, on the lay supports the free end of the connection-arm, so that the latter, connected to the lever-pin 12, rests upon the end of the lever and upon the angle end of the hanger, so that the impact on the connection-bar causes it to give a quick jerk on the lever-pin 12, thereby rocking the shaft 9 and forcing the binder-lever against the binder to lock the shuttle. The mounting of the rock-shaft 9 on the side of the lay provides a direct connection for the binder-lever at the top of the lay and for the lever 11 at the bottom of the lay for the attachment of the impact-receiving connection, and for this arrangement the plate 6, with its bearing-lugs for the rock-shaft, forms a firm mounting for the impact-receiving connections below the lay. It will be understood that each end of the lay is provided with identical shuttle-locking mechanism and that the impact of the shuttle against the picker forces the picker-stick against the angle bunter end of the connection-arm, thereby causing the latter to be forced back, carrying with it the lever-pin 12, which rocks the shaft 9 and drives the lever 10 against the shuttle-binder and the binder against the shuttle locking it. It will be understood that the swell of the binder will be in position to make contact with the shuttle as it enters the box and moves the binder, carrying with it the lever 10, and rocking the shaft 9 will, by the lever 11, move its connection-arm inward to place its bunter-impact-receiving end in position to again receive the impact to lock the incoming shuttle.

Looking at Fig. 2, it is important to note that the impact connection-arm 14 is arranged at the rear side of the slot 2 and that its impact-receiving end 16 crosses the slot in order to receive the impact of the picker-stick, that the binder-lever stands obliquely to the binder to give a lateral pressure thereon, while the lever 11 stands at about right angles to the

path of the picker-stick, so that a very slight movement of the arm is sufficient to transmit full force of the shuttle impact to the binder-lever upon the binder and the binder upon the shuttle.

I have referred to Fig. 4 as a "lever device," meaning thereby a shaft device having a double lever function—that is, a lever function upon the binder and a lever function with the slidable impact connection-bar.

I have stated that the plate 6, which carries the shuttle-locking lever device is rendered adjustable by the horizontal slots 7 7, and it will be understood this adjustment is for the purpose of setting the plate so as to cause the binder-lever to be set nearer to or farther from the free end of the binder to stop the shuttle at any desired point in the shuttle-box. This adjustment of the plate necessarily carries with it the under lever 11 and its impact connection-arm, so that it may also be necessary to adjust the lever 11 and the bunter of the impact connection-arm to conform with the adjustment of the plate, so that the impact of the picker-stick upon the bunter of the connection-arm will be simultaneous with the locking impact of the binder-lever upon the shuttle. There is therefore a coöperation between the adjustment of the plate which carries the lever locking device, the adjustment of the under lever, and the adjustment of the impact connection-arm bunter; but these adjustments may be independent of each other, as may be found necessary to obtain the perfect action of the connection-arm with the picker-stick and the binder-lever with the shuttle.

I claim—

1. In a loom, a picker and picker-stick, the lay, a shuttle-box, having a shuttle-binder, a horizontal slidable connection arm or bar arranged on the lay having a bunter on one end, crossing the path of the picker-stick, a lever device on a lever of which the other end of said connection arm or bar is loosely mounted whereby the bunter connection receives and imparts the force of the impact of the shuttle to the lever device and the lever device to the shuttle-binder and the binder upon the shuttle.

2. A shuttle-box, a picker-stick, a binder, a binder-lever and a shaft upon which it is mounted, a lever on the lower end of said shaft, an arm connected to said lever terminating in a bunter and movable by engagement with the picker-stick, and means to adjust the length of the arm, thereby to render effective the locking pressure of the binder upon the shuttle at any point of its travel in the box.

3. A shuttle-box, a shuttle-binder, a binder-lever, a picker and picker-stick, a horizontal slidable connection-arm supported beneath the lay, its outer end terminating in an adjustable bunter and movable by engagement with the picker-stick, and a lever device loosely connected with the inner end of said slidable

arm transmitting the full force of the impact of the shuttle upon the binder to lock the shuttle and prevent rebound.

4. In a loom, a lay, a shuttle-box, a binder, a binder-lever, a picker-stick, a shaft on the lay, a binder-lever on the upper end of the shaft and a lever on its lower end, an arm having one end connected to and supported on the lower lever, a hanger on the lay supporting the other end of the arm, the outer or free end of the arm terminating in a bunter and movable with said lever under the impact of the shuttle, for the purpose stated.

5. In a loom and in combination with a shuttle-binder, picker, picker-stick and lever device, a slidable connection-arm movable longitudinally beneath the lay, means connecting its inner end with a lever of said lever device and its outer end terminating in a bunter crossing the path of the picker-stick for the purpose stated.

6. In a loom and in combination with the lay, the shuttle-binder, a picker and picker-stick, a plate on the lay having lugs, a shaft vertically mounted therein, the binder-lever on the upper end of the shaft, the lower end of the shaft extending below the lay, and a slidable arm or bar loosely connected with this end of the shaft adapted to receive the impact of the picker or picker-stick to rock the shaft.

7. In a loom and in combination with the lay, the shuttle-binder, a picker or picker-stick, a shaft vertically mounted on the lay, the binder-lever on the upper end of the shaft, a lever on the lower end of the shaft extending beneath the lay and having a pin on its inner end an arm fitted loosely on the pin and seated on its lever, and terminating in a laterally-projecting bunter for receiving the impact of the picker or picker-stick.

8. A loom-lay, a shuttle-box thereon, a binder and a binder-lever, a picker-stick, a horizontal slidable connection-arm beneath the lay having a bunter and movable by engagement with the picker-stick, a lever connecting the slidable connection-arm beneath the lay, a rock-shaft connecting the lower lever and the binder-lever, impact of the shuttle on the picker acting through the slidable bunter con-

nection-arm to move said lever and thereby through the transmitting means to deliver the full force of the impact upon the binder.

9. In a loom, the lay, a shuttle-box thereon, a picker-stick and a shuttle-binder, a horizontal connection-arm slidably arranged beneath the lay at one side of the path of the picker-stick, its front end having a bunter crossing the path of the picker-stick, a lever device including the binder-lever on the rear side of the lay having a lever connection with the inner end of the slidable arm and operated by the latter.

10. In a loom, the lay, a shuttle-box thereon, a picker and picker-stick and a shuttle-binder, lever members constituting the shuttle-locking device, a plate carrying the lever members, means for adjusting said plate to set the impact locking-lever in proper relation to the free end of the binder, and a slidable impact connection-arm connected to the lever device, the other end of said slidable arm terminating in an adjustable bunter crossing the path of the picker-stick.

11. In a loom, the lay, a shuttle-box thereon, a picker and picker-stick, and a shuttle-binder, a shuttle-locking device formed of a vertical shaft, a binder-lever thereon, and a lever on the shaft beneath the lay, an adjustable supporting-plate for the lever locking device, a slidable impact connection-arm loosely pivoted on the under lever, and an adjustable bunter on the impact end of the slidable connection-arm, the several adjustments cooperating to render effective the functions of the bunter and of the binder.

12. In a loom, and in combination, the lay, a shuttle-box, a shuttle-binder, a picker and picker-stick, and a lever locking device consisting of a shaft having a lever at each end and a slidable impact-bar loosely mounted on one of said levers.

In testimony whereof I affix my signature in presence of two witnesses.

FRANCIS ARTHUR MILLS.

Witnesses:

A. E. H. JOHNSON,
GUY H. JOHNSON.