

No. 775,868.

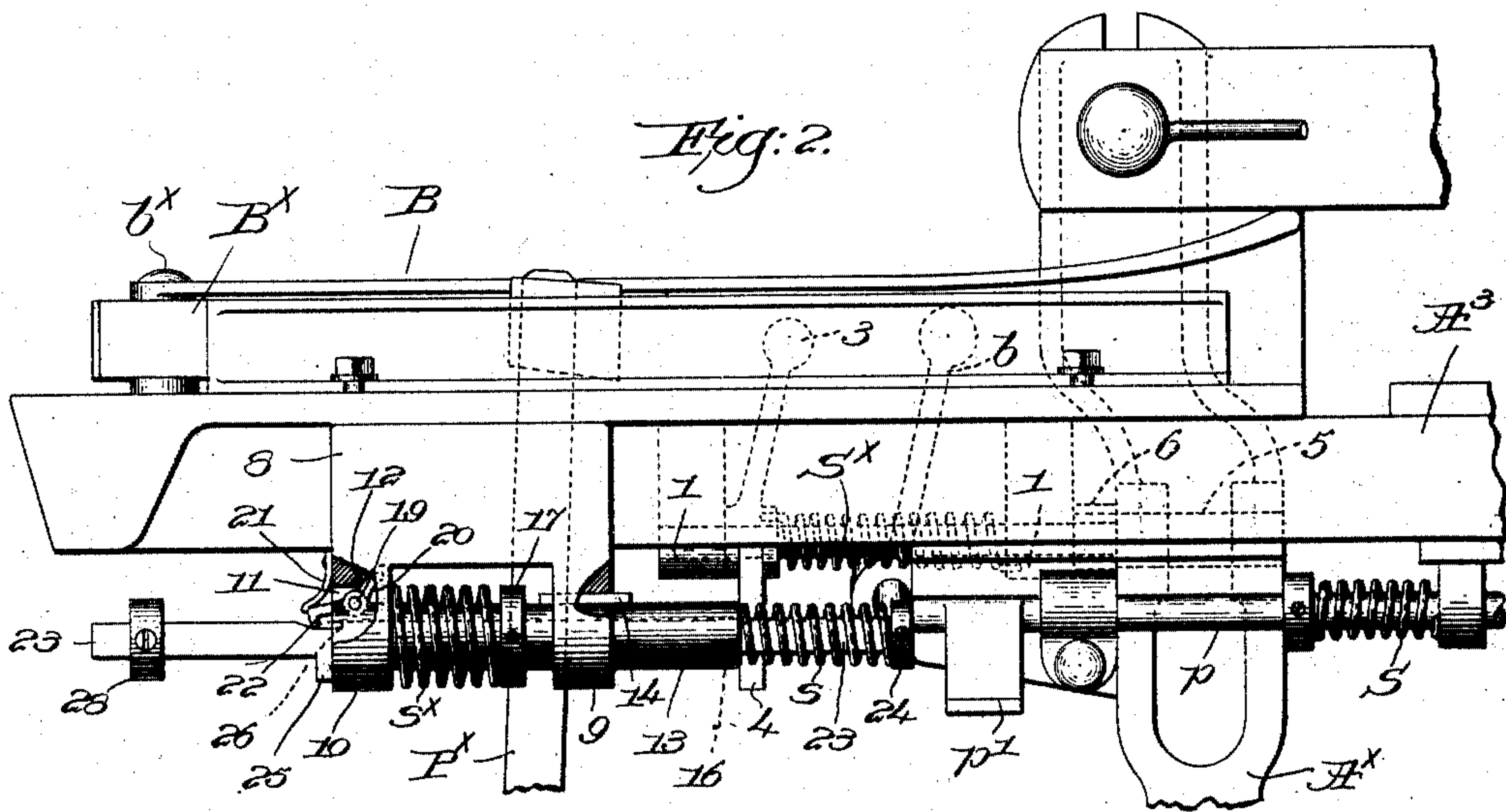
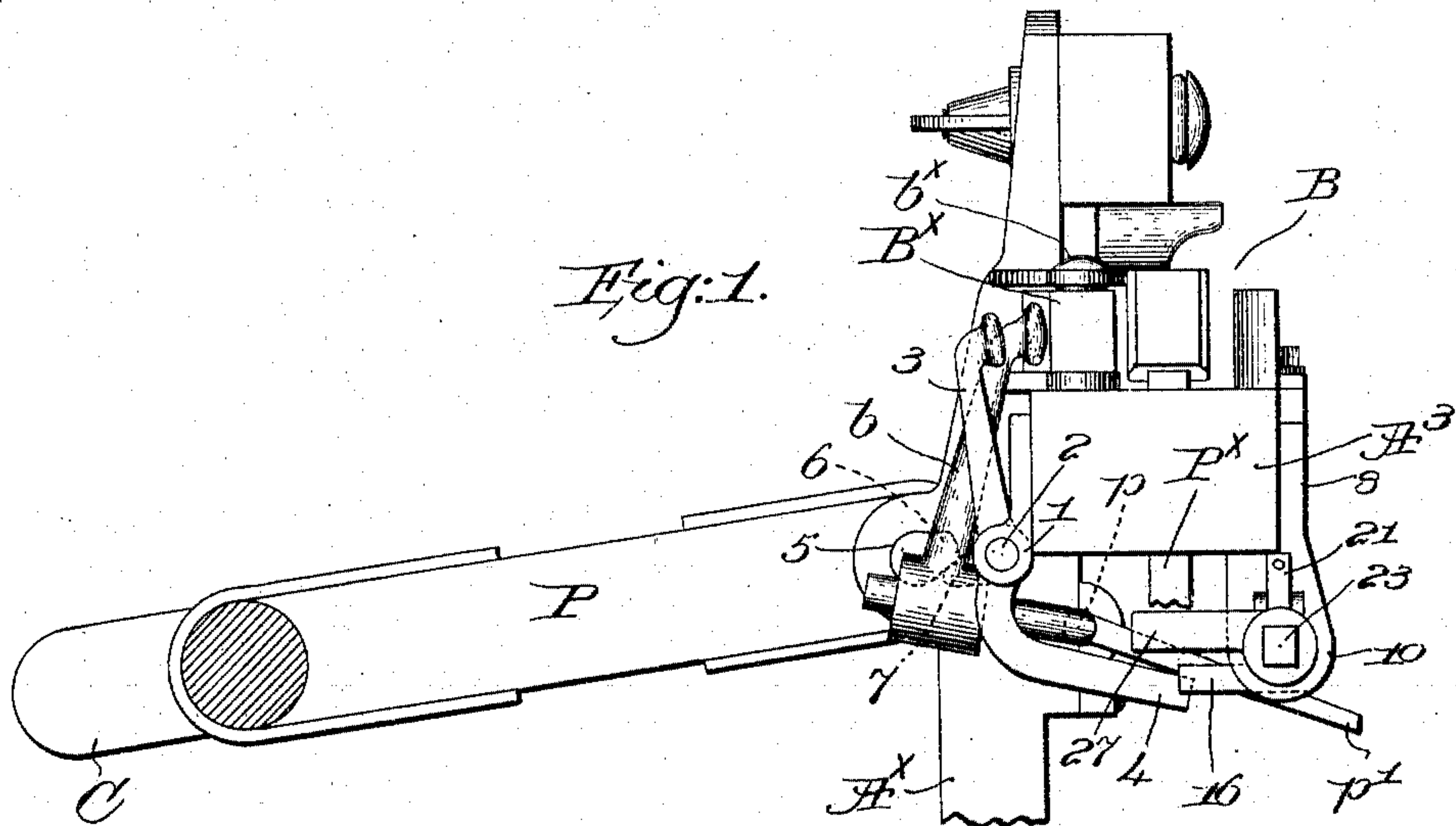
PATENTED NOV. 22, 1904.

M. L. STONE.
SHUTTLE LOCKING MEANS FOR LOOMS.

APPLICATION FILED SEPT. 1, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses,
Edward H. Allen.
J. Wm. Lutton.

Erwerdon;
Melvin L. Stone,
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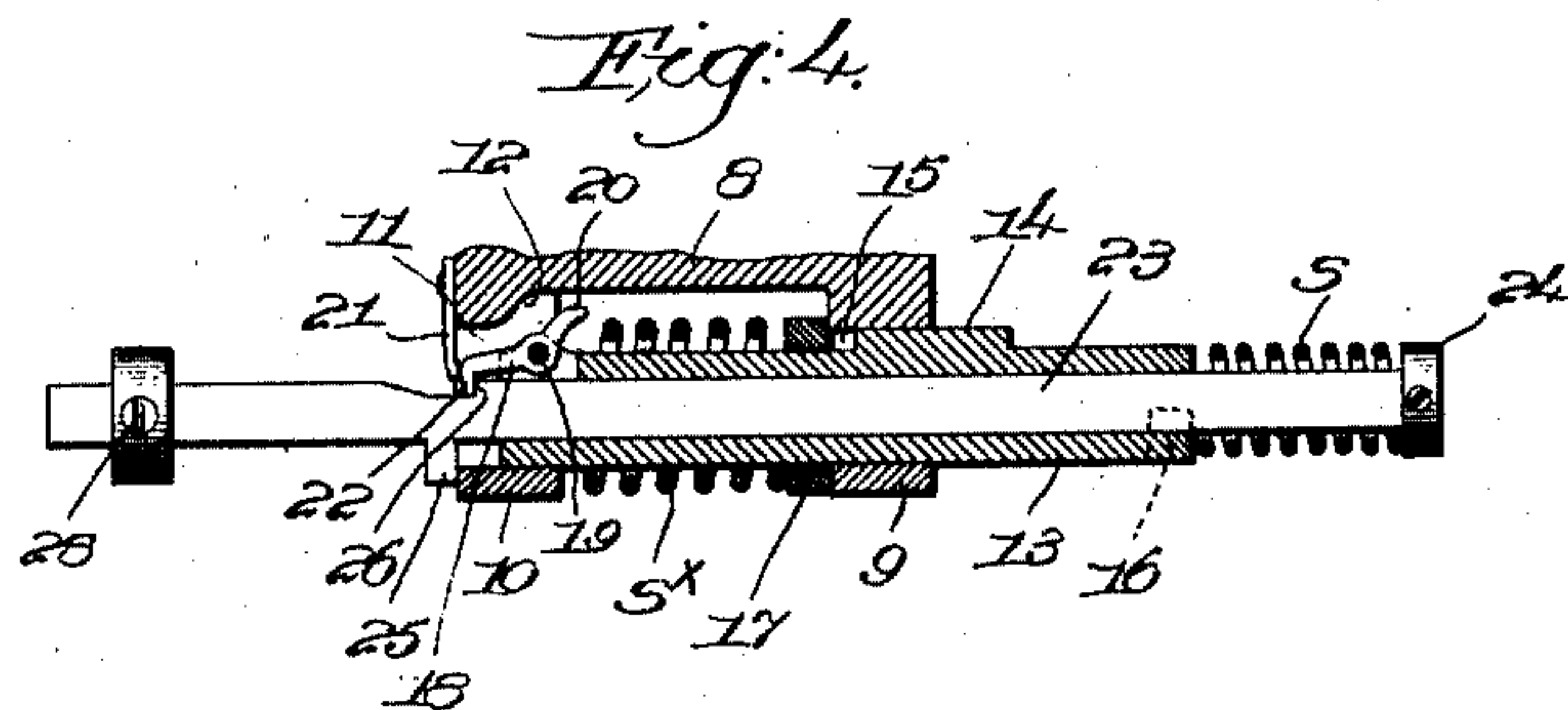
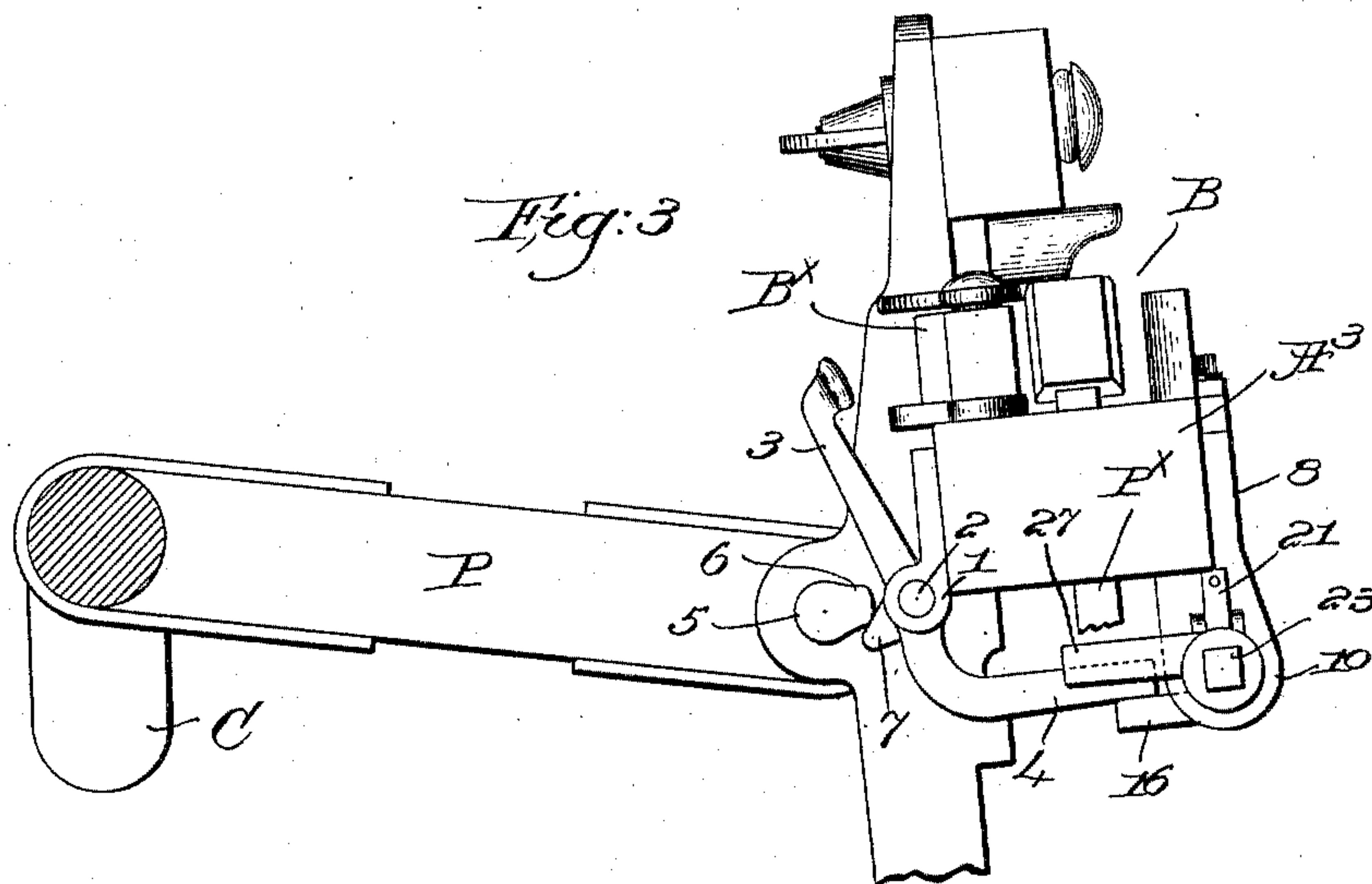
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2 SHEETS—SHEET 2.



Witnesses,
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UNITED STATES PATENT OFFICE.

MELVIN L. STONE, OF LOWELL, MASSACHUSETTS, ASSIGNOR TO DRAPER COMPANY, OF HOPEDALE, MASSACHUSETTS, A CORPORATION OF MAINE.

SHUTTLE-LOCKING MEANS FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 775,868, dated November 22, 1904.

Application filed September 1, 1904. Serial No. 222,983. (No model.)

To all whom it may concern:

Be it known that I, MELVIN L. STONE, a citizen of the United States, and a resident of Lowell, county of Middlesex, State of Massachusetts, have invented an Improvement in Shuttle-Locking Means for Looms, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention has for its object the production of novel means for locking the shuttle of a loom in the shuttle-box to prevent rebound, and to position the shuttle at substantially the same point on each shot.

The binder in the present embodiment of my invention coöperates with protector mechanism as usual; but I have provided means to impart increased pressure to the binder when the shuttle reaches the proper point in the box to lock the shuttle thereat. Said means includes a spring which is set or wound by the backward movement of the lay and retained set and inactive until released at the proper time. Such release is effected by or through the shuttle, and herein I have shown the release effected by suitable tripping means operated by the picker-stick when it is thrown outward by impact of the shuttle.

The various novel features of my invention will be fully described in the subjoined specification and particularly pointed out in the following claims.

Figure 1 is an end elevation of a loom-lay and its shuttle-box with one embodiment of my invention applied thereto, the lay being shown at front center and the shuttle-box empty for better illustration. Fig. 2 is a front elevation of the mechanism shown in Fig. 1. Fig. 3 is a view similar to Fig. 1, but showing the lay at top center on its backward stroke, the auxiliary binder-controlling spring having just been set, the main binder-finger being omitted for the sake of clearness of illustration; and Fig. 4 is a partial longitudinal sectional detail of the tripping device in the position assumed when the auxiliary spring is maintained set.

The lay A^3 , lay-sword A^x , crank-shaft C, Figs. 1 and 3, pitman P, connecting it with the lay-sword, the shuttle-box B, binder B^x , pivoted at its outer end on the lay, the picker-stick P^x , adapted to swing back and forth in the usual longitudinal slot in the lay at the bottom of the shuttle-box, and the protector mechanism, including a rock-shaft p , having an attached dagger p' , a controlling-spring S, tending to depress the dagger, and the binder-finger b , operatively connected with said rock-shaft, may be and are all of well-known or usual construction.

When the incoming shuttle strikes the binder, the latter is thrown outward against the action of the spring S, Fig. 2, and not infrequently the shuttle will rebound after striking the picker before the binder is in position to prevent such rebound.

Various means have been devised to check or lock the shuttle, and thereby prevent rebound, and my present invention relates to means having such object in view, the construction, arrangement, and operation of the means herein described and illustrated embodying various novel features.

Suitable bearings 1, secured to the back of the lay below the shuttle-box, support a short rock-shaft 2, having secured to it an upturned auxiliary binder-finger 3 and a depending and forwardly-extended arm 4, a spring S^x , fixed at one end and at its other end secured to said rock-shaft, encircling the latter, as shown in Fig. 2.

The spring is termed hereinafter the "auxiliary" spring, it being so wound that when set or tightened it will upon release throw the finger 3 forward against the binder B^x and subject the latter to additional pressure.

The pin 5, which connects the lay-sword and the pitman P, is rigidly secured in the latter and has fixed upon it a setting device 6, Figs. 1 and 3, shaped as a short quick-motion cam.

A lump or cam 7, fast on the rock-shaft 2, is located in coöperative relation to the setting device, so that as the lay begins its backward stroke the downward rotative movement of such device 6 into the position shown

in Fig. 3 will act upon and depress the cam 7. Such action turns the rock-shaft from right to left, viewing Fig. 1, throwing back the finger 3 and elevating the arm 4 into the position shown in Fig. 3, at the same time setting or winding the spring S^x .

It is necessary to retain these parts inactive in the relative position shown in Fig. 3 until the incoming shuttle is about at the end of its stroke and then to release the auxiliary binder-pressure-producing means in order to prevent shuttle-rebound, and means for effecting such results will now be described.

A plate 8, secured to the front of the lay, Figs. 1, 2, and 3, is provided with depending bearings 9 and 10, the latter being cut away at 11, Figs. 2 and 4, leaving an overhanging shoulder 12 for a purpose to be referred to. A tripping device is mounted to move longitudinally in said bearings and is shown as a sleeve 13, having a key 14 to enter a keyway 15 in the bearing 9 to prevent rotation of the sleeve, the latter having fixedly attached to its inner end a rearwardly-extended arm or detent 16. Between the bearings a collar 17 is secured to the sleeve, and a strong spring s^x is coiled around the sleeve between the collar and the bearing 10, said spring normally tending to move the sleeve to the right, Figs. 2 and 4, until the collar 17 abuts against the bearing 9, as in Fig. 4, and at such time the detent 16 is in operative position beneath the arm 4 (see Fig. 3) to retain said arm elevated and the spring S^x set. The outer end of the sleeve is recessed to receive a latch 18, pivoted on the sleeve at 19 and having an upturned tail 20, a leaf-spring 21 on the bearing 10 acting to normally depress the hooked end 22 of the latch. I make the bore of the sleeve 13 square or otherwise non-cylindrical to receive a correspondingly-shaped elongated bar 23, extended at both ends beyond the sleeve and having fast upon its inner end a collar 24, a spring s , lighter than spring s^x , being interposed between said collar and the nearer end of the sleeve 13. This spring s tends to move the bar 23 to the right, Fig. 2, until a stop 25 thereon engages the bearing 10, and at such time the latch 18 engages the shoulder 26 in the notched upper side of the bar, as in Fig. 4.

A bunter 27, extended across the path of the picker-stick P^x and adapted to be engaged thereby on its outward stroke, is adjustably secured to the outer end of the bar 23 by a set-screw 28.

When the arm 4 of the rock-shaft 2 is depressed by the spring S^x , (upon withdrawal of the detent 16,) the detent is held by its spring s^x , pressed against the side of said arm, as shown in Figs. 1 and 2, the collar 17 being held away from the abutment 9; but the spring s is free to move the bar 23 inward until the stop 25 engages the bearing 10, as shown in

Fig. 2, and the bunter 27 is then positioned in readiness to be hit by the picker-stick P^x when thrown outward by impact of the shuttle thereon.

Referring principally to Fig. 2, when the picker-stick is so thrown outward it engages and moves the bunter 27 and the attached bar 23 to the left, bringing the shoulder 26 into engagement with the latch 18, whereupon bar and sleeve 13 move in unison, withdrawing the detent 16 from beneath and releasing the arm 4.

The auxiliary spring S^x , which has been previously set, at once acts through the finger 3 upon the binder, and the locking-pressure is thereby brought to bear upon the shuttle. When the detent is thus tripped or rendered inoperative and moved to one side of the arm 4, the shoulder 12 engages the latch-tail 20 and disengages the latch from shoulder 26, so that the spring s^x is free to act to press the detent 16 against the side of the arm 4.

Upon the inward stroke of the picker-stick, when the lay is past top center the bunter 27 is released, and the spring s then restores the bar 23 to normal position, and, as has been described, the setting device 6 sets the spring S^x and lifts the arm 4 by the time top center is reached by the lay.

As soon as the arm is lifted it permits the spring s^x to expand and move the detent 16 into operative position beneath the arm, and thereupon the parts are in readiness for another operation, such as has been set forth.

The sleeve 13 may be termed a "detent-carrier" and the bar 23 a "trip" to positively move the detent-carrier in the direction opposite that due to the spring s^x until the said detent-carrier and trip are automatically unlatched.

From the foregoing description it will be manifest that the unlatching permits the detent-spring s^x to move the detent 16 into operative position as soon as the arm 4 is elevated, such elevation taking place before the picker-stick permits the bunter 27 to move inward.

As soon as the auxiliary spring S^x is permitted to act the binder-pressure is increased, the action of the main or ordinary binder-spring S thereby being augmented at the instant when it is most necessary.

My invention is not restricted to the precise construction and arrangement herein shown and described, for the same may be varied or modified in different particulars by those skilled in the art without departing from the spirit and scope of my invention.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a loom, a lay having a shuttle-box and a spring-controlled binder, spring-actuated means to impart additional pressure to the

binder, a detent to retain said means inoperative, and means to render the detent inoperative, said means being operated independently of the binder by or through the action of the shuttle as it reaches substantially the end of its stroke.

2. In a loom, a lay having a shuttle-box and a binder, protector mechanism cooperating therewith, spring-actuated means to impart additional pressure to the binder, a detent to maintain said means inoperative, and means, including a trip actuated by or through the shuttle independently of the binder and protector mechanism, to release the detent and increase the binder-pressure as the shuttle reaches substantially the end of its stroke.

3. In a loom, a lay having a shuttle-box and a binder, means to impart locking-pressure upon the binder when the shuttle is boxed, said means including a spring-actuated binder-finger, a detent, means operated by backward movement of the lay to tighten the spring and render the detent operative to retain the said binder-finger retracted, and means to automatically render the detent inoperative and effect release of the said binder-finger as the shuttle reaches the end of its stroke.

4. In a loom, a lay having a shuttle-box and a binder, protector mechanism cooperating therewith, means, including an operating-spring, to impart additional pressure upon the binder, devices operative upon the backward stroke of the lay to set the spring, and releasing means to permit the spring to operate by or through the action of the shuttle as it reaches the end of its stroke.

5. In a loom, a lay having a shuttle-box and a binder, protector mechanism cooperating therewith, a spring-controlled rock-shaft having an attached finger to act upon the binder, means to turn said shaft, and wind the spring as the lay swings back, a detent to automatically hold the spring set, and means to trip the detent and thereby release the spring as the shuttle reaches the end of its stroke.

6. In a loom, a lay having a shuttle-box and a binder, protector mechanism cooperating therewith, a picker-stick, spring-actuated means automatically set by backward movement of the lay and adapted to impart additional pressure to the binder, a detent to retain said means inactive when set, and means actuated by the picker-stick when swung outward by the shuttle to render the detent inoperative and permit the operation of said spring-actuated means.

7. In a loom, a lay having a shuttle-box and a binder, protector mechanism cooperating therewith, a spring-controlled rock-shaft having an attached cam and an auxiliary binder-finger, a setting device actuated by backward movement of the lay to engage the cam and thereby set the spring, a detent to automatically retain the spring set, and means operated by or through the incoming shuttle to trip the detent and release the spring, whereby the latter operates the rock-shaft and its attached binder-finger to impart additional pressure to the binder.

8. In a loom, a lay, having a shuttle-box and a binder, main and auxiliary springs to act thereupon, means actuated by or through backward movement of the lay to set the auxiliary spring, and a device actuated by or through the shuttle as it reaches substantially the end of its stroke to release said spring and permit the same to act upon the binder.

9. In a loom, a lay having a shuttle-box and a binder, main and auxiliary springs to act thereupon, means actuated by or through backward movement of the lay to set the auxiliary spring, a picker-stick, a detent to retain the spring set, and tripping means to render the detent inoperative by or through outward movement of the picker-stick, to permit the auxiliary spring to act, said tripping means including a longitudinally-movable detent-carrier, and a spring to move it in one direction to render the detent operative.

10. In a loom, a lay having a shuttle-box provided with a binder, protector mechanism cooperating therewith, an auxiliary binder-finger, a spring-controlled rock-shaft on which it is mounted and provided with an arm, a longitudinally-movable detent-carrier, a detent thereon movable into position to retain said arm lifted when the rock-shaft is turned to set its spring, means to turn said rock-shaft by or through backward movement of the lay, a spring to move the detent into operative position, a trip to move it in the opposite direction to release said arm and permit the previously-set spring to turn the rock-shaft, and means to actuate the trip by or through the shuttle as it reaches substantially the end of its stroke.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MELVIN L. STONE.

Witnesses:

ALBERT O. HAMEL,
WILLIAM RHODES.