

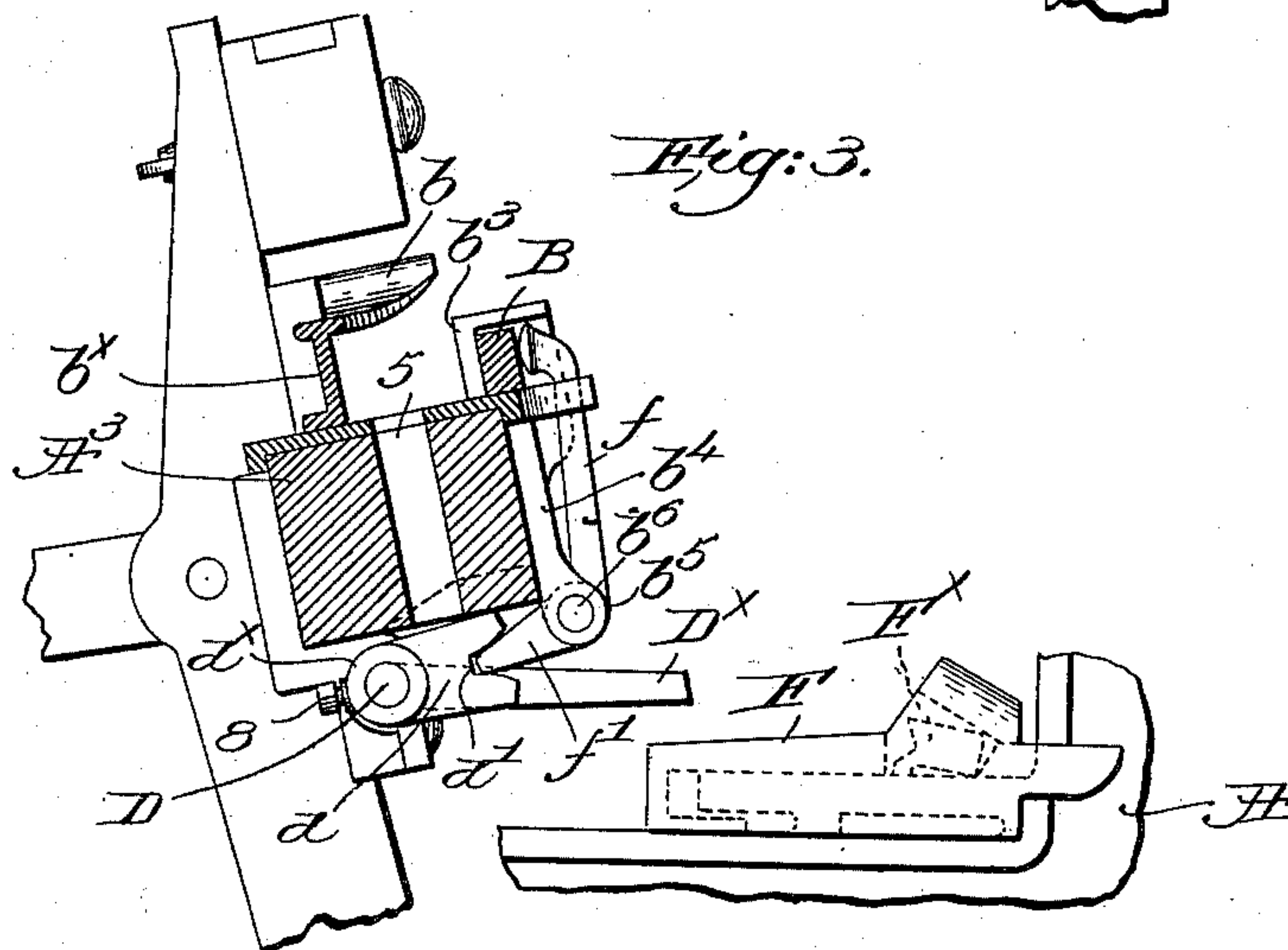
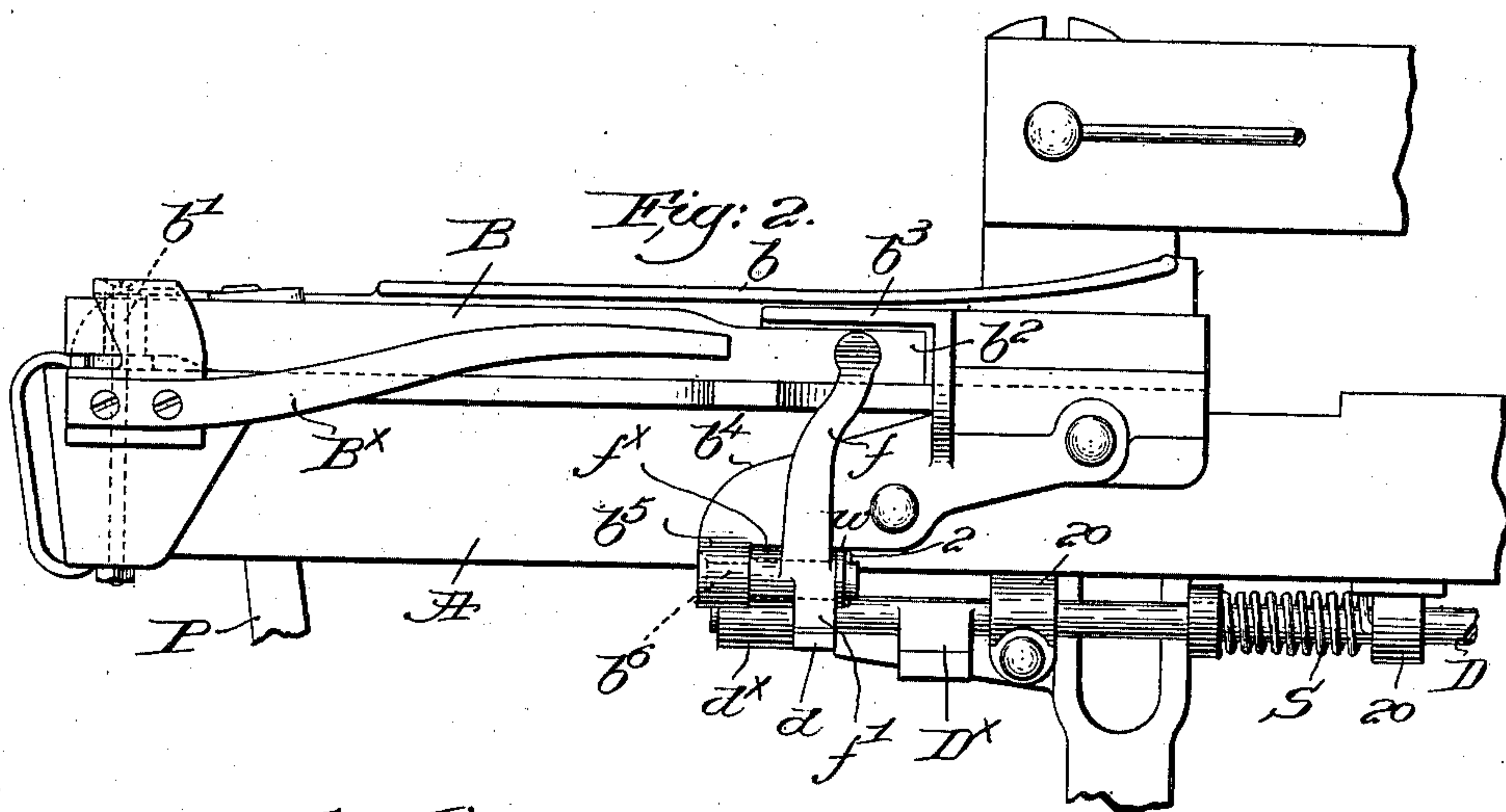
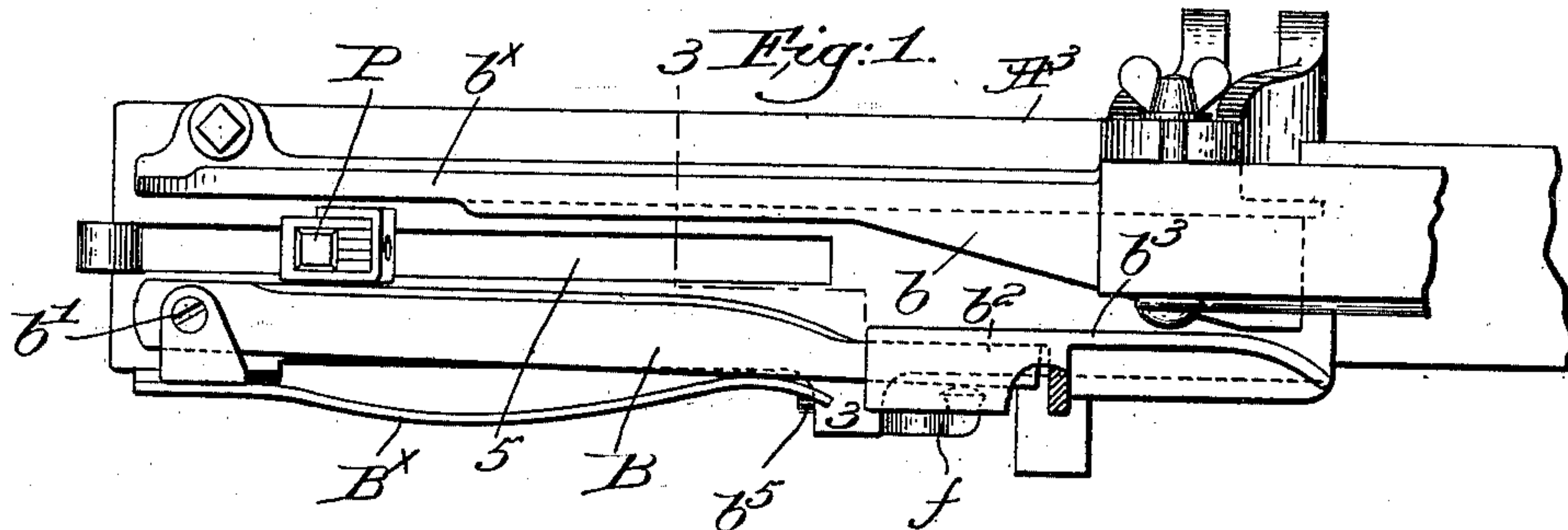
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PATENTED JUNE 16, 1903.

E. S. STIMPSON.  
PROTECTOR MECHANISM FOR LOOMS.

APPLICATION FILED FEB. 26, 1903.

NO MODEL.



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# UNITED STATES PATENT OFFICE.

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## PROTECTOR MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 731,391, dated June 16, 1903.

Application filed February 26, 1903. Serial No. 145,178. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD S. STIMPSON, a citizen of the United States, and a resident of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Protector Mechanism 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 relates more particularly to looms provided with front binders; and it is especially adapted for broad looms of this type where the shuttle has a very long travel compared with the stroke of the lay.

In front-binder looms it is usual to so arrange the dagger of the protector mechanism that it will strike somewhere on the breast-beam when the shuttle boxes improperly. With a high-roll take-up mechanism it is impracticable to employ such an arrangement of the dagger, as it would interfere with the take-up, and for many reasons a sliding frog mounted on the loom side, as is common in back-binder looms, is considered to be a much more desirable form of apparatus. A front-binder loom having a frog on the loom side forms the subject-matter of United States Patent No. 628,893, the protector rock-shaft having a rearwardly-extended hook to cooperate with the frog when the shuttle is boxed improperly. There is a practical objection to this construction, because the engagement of the hook with the rear end of the frog has a decided tendency to lift or tilt the frog as the lay beats up, unduly straining the parts and interfering with the proper operation of the mechanism.

My present invention has for its object the production of protector mechanism for a front-binder loom operating in connection with a frog on the loom side, but which is free from the objection stated and which will operate the frog in a manner very similar to the operation thereof in a back-binder loom.

One very important feature of my present invention is the increased speed and amplitude of movement of the dagger when moved

into inoperative position upon the entrance of the shuttle far enough into the shuttle-box to make a bang-off unnecessary. After the shuttle has reached a certain point in its path across the lay it is safe to raise the dagger, because then the shuttle will be far enough in the box to render further protection unnecessary, and when the shuttle reaches this point the quicker the raising of the dagger is effected the better, for the lay is at such instant rapidly approaching its front center. A great deal of banging off, especially on broad looms, is due to the fact that the shuttle does not get across the lay in time to raise the dagger soon enough and high enough to clear the frog, although the shuttle may have momentum enough to box it properly, the shuttle-path being very long compared with the short stroke of the lay. By providing for a very rapid lifting and increased amplitude of movement of the dagger as soon as the shuttle has reached the critical point in its path I obviate needless banging off. This acceleration in the speed with which the dagger is raised and the increase in the extent of its movement is effected in a very simple, direct, and efficient manner, a given movement of the binder-finger effecting a much greater movement of the dagger-point.

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

Figure 1 is a top or plan view of one end of a lay with a shuttle-box thereon provided with a front binder, one embodiment of my present invention being applied thereto. Fig. 2 is a front elevation of the mechanism illustrated in Fig. 1; and Fig. 3 is a transverse sectional view on the irregular line 3 3, Fig. 1, a portion of the loom side and the frog thereon being also shown.

The lay  $A^3$ , longitudinally slotted at 5 for the picker-staff P, and the shuttle-box comprising a fixed back wall  $b^x$ , top or cover plate  $b$ , and front binder B, the latter fulcrumed at its outer end at  $b'$  on the lay and having its inner end  $b^2$  pressed by a spring  $B^x$  against



the fixed guard or stop plate  $b^3$  at the mouth of the shuttle-box, may be and are of substantially well-known construction.

In Fig. 3 I have shown a frog F slidably mounted on the loom side A and having a frog-lift  $F^x$  near its forward end of usual construction.

The protector rock-shaft D, mounted in suitable bearings 20 on the lay, Fig. 2, and provided with a forwardly-extended dagger  $D^x$ , depressed by a spring S to engage the frog when the shuttle fails to box, is so far substantially as is common in back-binder looms and familiar to those skilled in the art.

In accordance with my present invention I have secured to the outer end of the rock-shaft by a set-screw 8, Fig. 3, the hub  $d^x$  of a short forwardly-extended arm  $d$ , bifurcated or notched at its front end at  $d'$ , as best shown in Fig. 3. The guard or stop plate  $b^3$  has secured to or forming part of it a depending bracket  $b^4$ , extended over the front of the lay and provided with a boss  $b^5$  to receive a stud  $b^6$ , parallel to and in front of the protector rock-shaft and slightly above it, as shown in Fig. 3, and projecting inward from the boss. Upon this stud is loosely mounted the hub  $f^x$  of the upturned binder-finger  $f$ , its upper end bearing against the front face of the binder B, and an arm  $f'$  on the hub is extended beneath the lay and enters the bifurcated end  $d'$  of the arm  $d$  on the rock-shaft D, the arm  $f'$  being much shorter than the binder-finger. The latter and said arm  $f'$  form a bell-crank, and the action of the protector-spring S, tending to depress the arm  $d$ , serves through coöperation with the arm  $f'$  to maintain the binder-finger pressed against the binder. A washer  $w$  and cotter-pin 2, Fig. 2, retain the hub  $f^x$  of the bell-crank in place on the stud  $b^6$ . Owing to the difference in leverage between  $f$  and  $f'$  it will be manifest that any given movement of the binder-finger outward, as by impact of the incoming shuttle upon the binder, will operate through the coöperating short arms  $f'$  and  $d$  to give the dagger  $D^x$  a much greater upward movement and at an accelerated speed. When the shuttle reaches the point where the dagger can be raised with safety, the lay at such instant being well forward toward front center, the mechanism described operates to quickly raise the dagger a considerable distance, so that it will pass over the frog as the lay beats up and the shuttle completes its travel into the shuttle-box, the rapidity with which the dagger is raised preventing engagement with the frog. Were it not for the accelerated

movement of the dagger the lay in its forward movement would tend to bring it into engagement with the frog and cause bang-off unnecessary.

By the arrangement herein shown I obtain in a front-binder loom the various advantages of construction and operation of the protector mechanism and side frog common in a back-binder loom, while obviating unnecessary bang-off.

In a broad loom wherein the shuttle travels in the neighborhood of ninety inches, being thrown when the lay is at or near top center, and the lay-stroke is probably under six inches it will be manifest that there is a very small part of the lay-stroke remaining after the shuttle has reached the point where further protection is unnecessary. The dagger must not be raised before the shuttle reaches such point, and it must then be raised very quickly or the loom will bang off when the shuttle "homes" properly in the shuttle-box. Such bang-off is entirely obviated by the invention hereinbefore set forth.

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 thereon provided with a front binder, protector mechanism coöperating therewith, including a frog, a spring-controlled rock-shaft having a forwardly-extended dagger and a short, bifurcated arm, and a pivoted binder-finger having a short arm to coöperate with said bifurcated arm and accelerate the speed with which the dagger is moved into inoperative position by or through outward movement of the binder.

2. In a loom, a lay having a shuttle-box thereon provided with a front binder, a pivoted bell-crank on the lay the longer, upturned arm of which constitutes a binder-finger, a spring-controlled dagger having an attached short arm in operative engagement with the short arm of the bell-crank, and a frog to be at times engaged by the dagger, the difference in leverage between the arms of the bell-crank acting to move the dagger with accelerated speed into inoperative position when the binder is thrown outward by the incoming shuttle.

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

EDWARD S. STIMPSON.

Witnesses:

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