

No. 762,236.

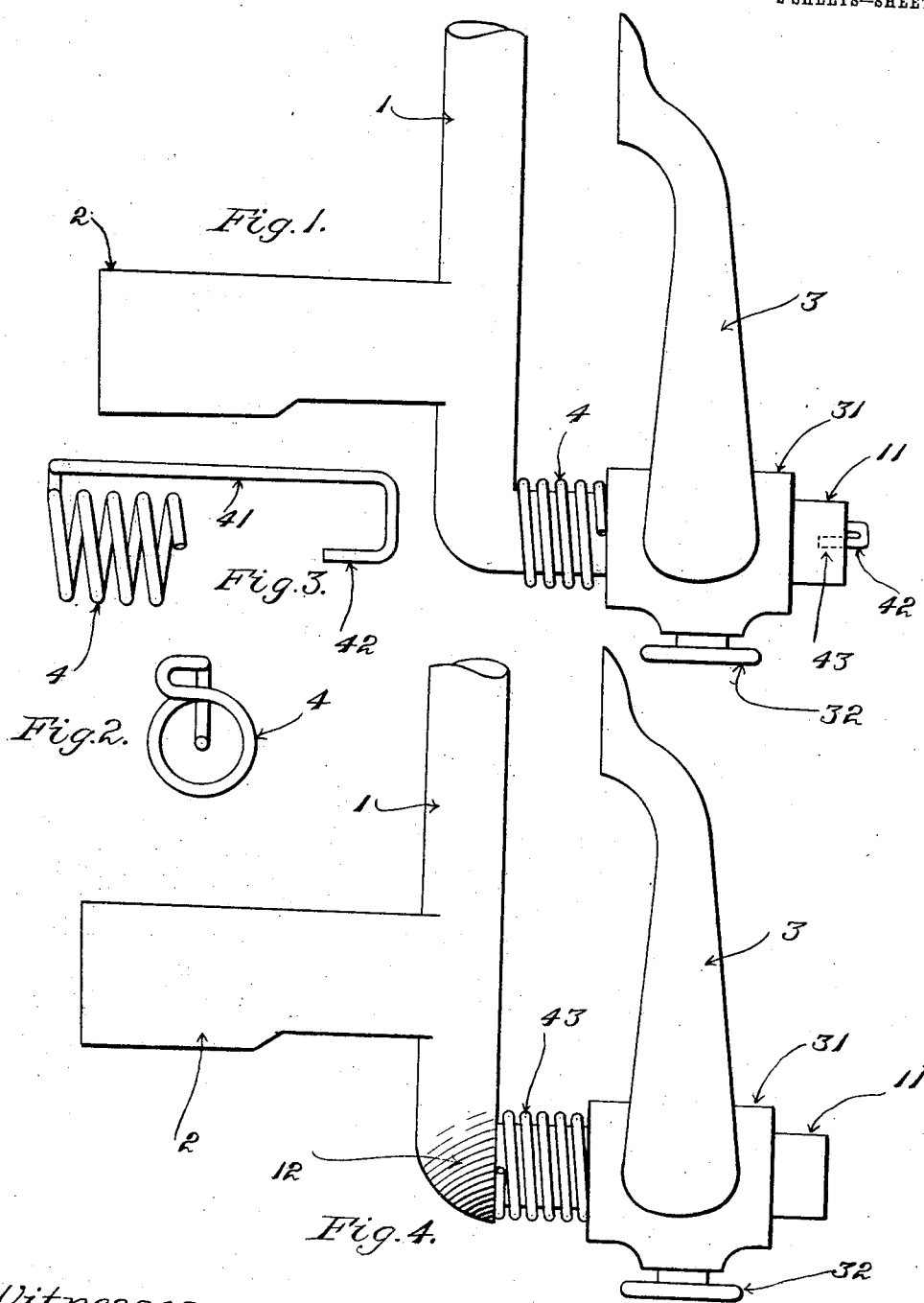
PATENTED JUNE 7, 1904.

J. H. HADFIELD.
SMASH PROTECTOR FOR LOOMS.

APPLICATION FILED SEPT. 25, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:
Oscar F. Hill
Aline Tarr

Inventor:
John H. Hadfield
by Macleod Calvert Randall
Attorneys.

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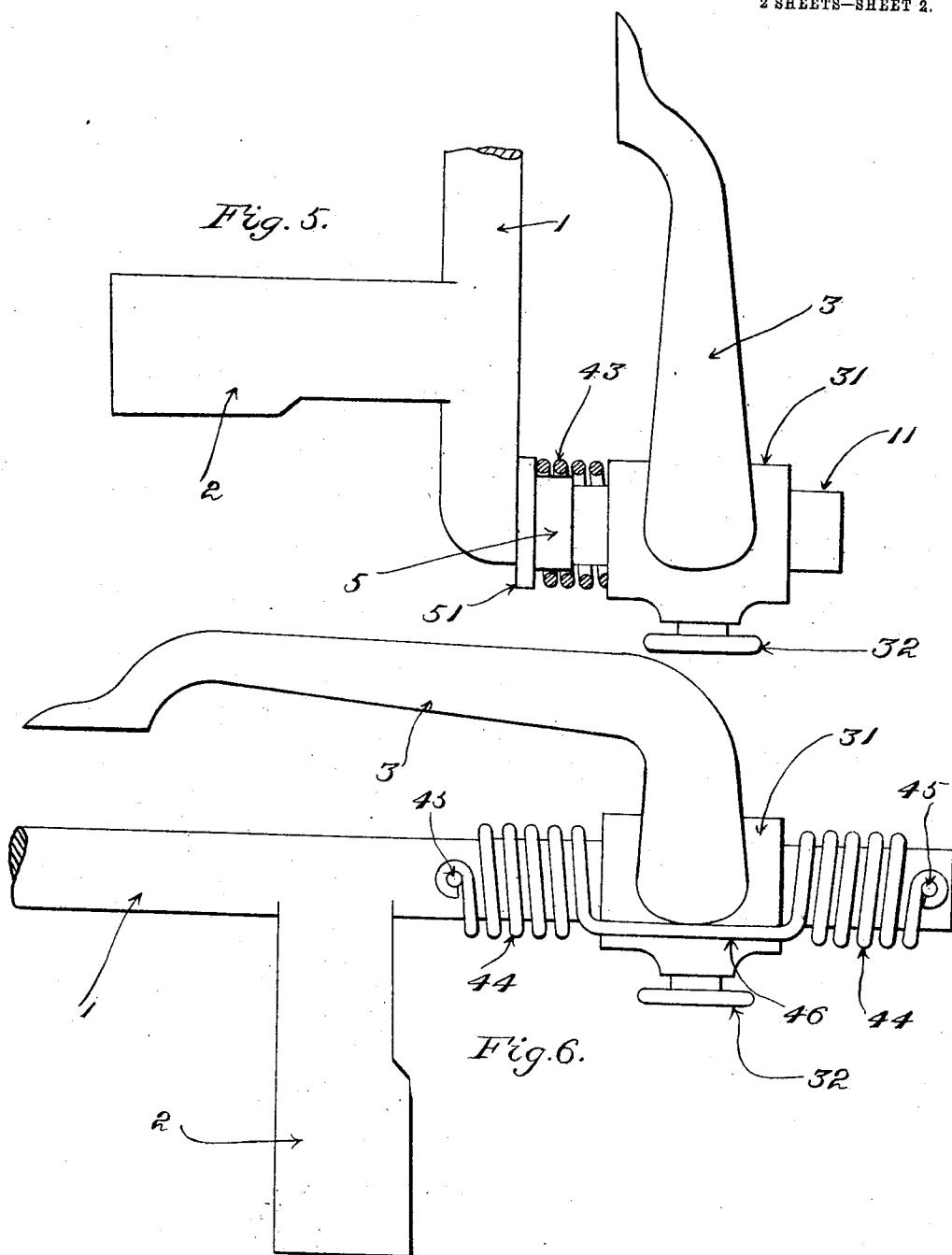
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John H. Hadfield
by Maceo Calver & Randall
Attorneys.

UNITED STATES PATENT OFFICE.

JOHN H. HADFIELD, OF FALL RIVER, MASSACHUSETTS.

SMASH-PROTECTOR FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 762,236, dated June 7, 1904.

Application filed September 25, 1903. Serial No. 174,615. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. HADFIELD, a citizen of the United States, residing at Fall River, in the county of Bristol, State of Massachusetts, have invented a certain new and useful Improvement in Smash-Protectors for Looms, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 shows in plan a portion of the protector-shaft of a loom, the dagger and one of the protector-fingers with which the said protector-shaft is provided, and an embodiment of the invention applied in connection therewith. Fig. 2 is a view in end elevation of the form of spring which is represented in Fig. 1. Fig. 3 is a view of the said spring in side elevation. Fig. 4 is a view in plan corresponding with Fig. 1, but showing a different embodiment of the invention. Fig. 5 is a view corresponding with Fig. 1, but showing a still different embodiment of the invention, the spring being represented in horizontal section. Fig. 6 is a view showing in plan a further embodiment of the invention.

The object of the invention is to provide means for preventing the tendency to the occurrence of smashes in the warps, which exists in the case of looms as at present constructed. Looms now in use are equipped with "protector mechanism," so called, which is designed to obviate injury to the warp-threads in case the shuttle remains within the shed in the warp-threads instead of completing its flight through the shed from the shuttle-box, which is located at one side of the loom to the shuttle-box which is located at the opposite side thereof. In this mechanism the protector-shaft carried by the lay is furnished at its opposite ends with protector-fingers, and it carries also the dagger. The protector-fingers bear at their free ends against the swells or binders of the shuttle-boxes. When a shuttle occupies its proper position in one of the shuttle-boxes at the end of its flight across the loom, it holds the swell or binder pressed in-

wardly, and by the action of the said swell or binder against the corresponding protector-finger the protector-shaft is rocked, so as to hold the engaging end or point of the dagger elevated above the usual frog as the lay goes forward. Should, however, the shuttle fail to enter its box, the swell or binder of the latter will not be pressed out and the protector-fingers will be permitted to swing inward, with the result that the protector-shaft will occupy a position in which the dagger will engage with the shoulder of the frog as the lay goes forward, thereby causing the advance of the lay to be arrested and the driving power of the loom to be unshipped.

In the drawings—in Fig. 1, for example—the protector-shaft is designated 1, its dagger is marked 2, and the binder-finger at one end of the said shaft is marked 3. Frequently in practice the protector-shaft at each end thereof is formed or provided with a rearwardly-extending arm 11, and the protector-finger 3 is applied to the said arm. For the support of the protector-finger upon the arm the protector-finger is formed with an eye or hub at 31, which fits upon the arm, the protector-finger being fastened in place upon the arm by means of a clamping-screw 32, which latter fits a threaded hole that is tapped in the eye or hub 31 and engages at its inner end with the surface of the arm. This is a well-known construction in common use. In practice usually the protector-shaft has in connection therewith a spring (not necessary to be shown in the present case) operating with a tendency to turn the protector-shaft, so as to cause the protector-fingers at the opposite ends thereof to bear against the swells or binders (not shown) of the opposite shuttle-boxes on the lay. When the shuttle enters the shuttle-box at either end of the lay, it presses back the swell or binder of such shuttle-box against the corresponding protector-finger and by overcoming the power of the spring aforesaid, which is connected with the protector-shaft, turns the latter and raises the

point of the dagger 2 above the frog, (not necessary to be shown,) so as to permit the lay to continue its advance.

It happens frequently in practice that the clamping-screw, as 32, which is employed in connection with each protector-finger, fails to hold the latter securely in place upon the corresponding arm 11 of the protector-shaft, and hence it results that the protector-fingers change their position upon the arms 11 during the working of the loom. Frequently the shift or slip of the protector-fingers upon the arms of the protector-shaft is toward the axis of the protector-shaft and also toward the swell or binder. In this changed position the protector-finger acts to limit the outward movement of the swell or binder as the shuttle enters alongside the latter. It also varies the effective leverage, so that a greater pressure is transmitted by the upper end of the protector-finger to the corresponding swell or binder from the spring which is connected with the protector-shaft and so that, conversely, a greater proportionate resistance is experienced by the shuttle in entering the shuttle-box at the end of its flight across the loom in consequence of the change of leverage. It happens frequently as a result of the foregoing that the shuttle is unable to force itself entirely into the shuttle-box, it being arrested, while the rear end of the shuttle is still left projecting inward toward the middle end of the loom, past the selvage-warps, and into the shed. When now the lay completes its advance, the portion of the shuttle which remains within the shed in the warps produces a smash in the warp-threads in being carried forward against the fell. During this advance of the lay the dagger will be held raised above the shoulder of the frog in consequence of the fact that the shuttle being partly entered into one of the shuttle-boxes presses the swell or binder of the said shuttle-box outward, and thereby turns the protector-shaft, so as to raise the dagger, which will thus be rendered inoperative to arrest the forward movement of the lay and cause the driving power to be unshipped.

In carrying my invention into effect I provide, in connection with each protector-finger, a spring by means of which in case the protector-finger becomes loose enough upon the protector-shaft to slip out of place the protector-finger shall be prevented from slipping or shifting in a direction toward the axis of the protector-shaft. Thereby the defective operation aforesaid is prevented, with the result that the production of smashes through the cause stated is prevented.

In Fig. 1 the spring employed (it being marked 4 and being shown separately in Figs. 2 and 3) is a coil-spring. The coil of the said spring is slipped upon the arm of the pro-

jector-shaft between the eye or hub 31 of the protector-finger 3 and the bend or shoulder where the arm and protector-shaft join. This spring is intended to act by its tension against the said eye or hub 31, so as to prevent the latter from advancing upon the arm of the protector-shaft toward the axis of the protector-shaft in case the clamping-screw 32 should fail to act efficiently.

In Figs. 1, 2, and 3 the spring is shown as having the forward end of its coil provided with a prolongation 41, which extends rearwardly and at its free end is bent into substantially U shape, the extremity 42 being inserted into an axial hole (indicated in dotted lines at 43) that is bored in the free end of the arm 11 of the protector-shaft. By means of the prolongation or extension 41 of the spring the latter is held in position against thrust derived from tendency of the eye or hub 31 of the protector-finger to move toward the axis of the protector-shaft.

In Fig. 4 the spring employed is a simple coil-spring 43, which is threaded upon the arm 11 and interposed between the eye or hub 31 of the protector-finger 3 and the bend where the said arm and the protector-shaft join each other, a projecting shoulder being formed, as at 12, upon the shaft, or it might be upon the arm itself, to constitute an abutment from which the spring 43 may react.

In Fig. 5 the arrangement is essentially the same as in Fig. 4, with the exception that a thimble or ferrule 5 is applied to the arm 11, the said thimble or ferrule 5 resting against the protector-shaft 1 at the angle between the protector-shaft and its arm 11 and being furnished with a projecting flange, as 51, against which the corresponding end of the coil-spring 43 may take bearing. The sleeve of the said thimble or ferrule passes into the interior of the coil of the spring 43.

In Fig. 6 the eye or hub 31 of the protector-finger 3 is mounted upon an end portion of the protector-shaft 1, which is in line with the length of the said protector-shaft, and in this instance the spring is formed with two coils 44 44, which are fitted upon the protector-shaft at opposite sides of the eye or hub 31. The said coils are held from turning around the protector-shaft by suitable means, as through the engagement of the opposite ends of the wire of which the spring is composed with pins, as 45 45, which are driven into the protector-shaft. The portion 46 of wire connecting the said coils 44 44 extends across in front of the upright portion of the protector-finger, as clearly indicated in Fig. 6, and engages with the latter.

In all of the embodiments of the invention which are illustrated in the drawings and herein described the tendency of the springs is to hold the protector-finger from accidental shift

of position in a direction toward the axis of the protector-shaft and toward the swell or binder.

I claim as my invention—

5 The combination with the protector-shaft, the protector-finger mounted thereon, and means for securing the protector-finger upon the protector-shaft, of the spring for prevent-

ing accidental shift of the position of the protector-finger upon the protector-shaft.

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

JOHN H. HADFIELD.

Witnesses:

SAMUEL HADFIELD,
CHAS. F. RANDALL.

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