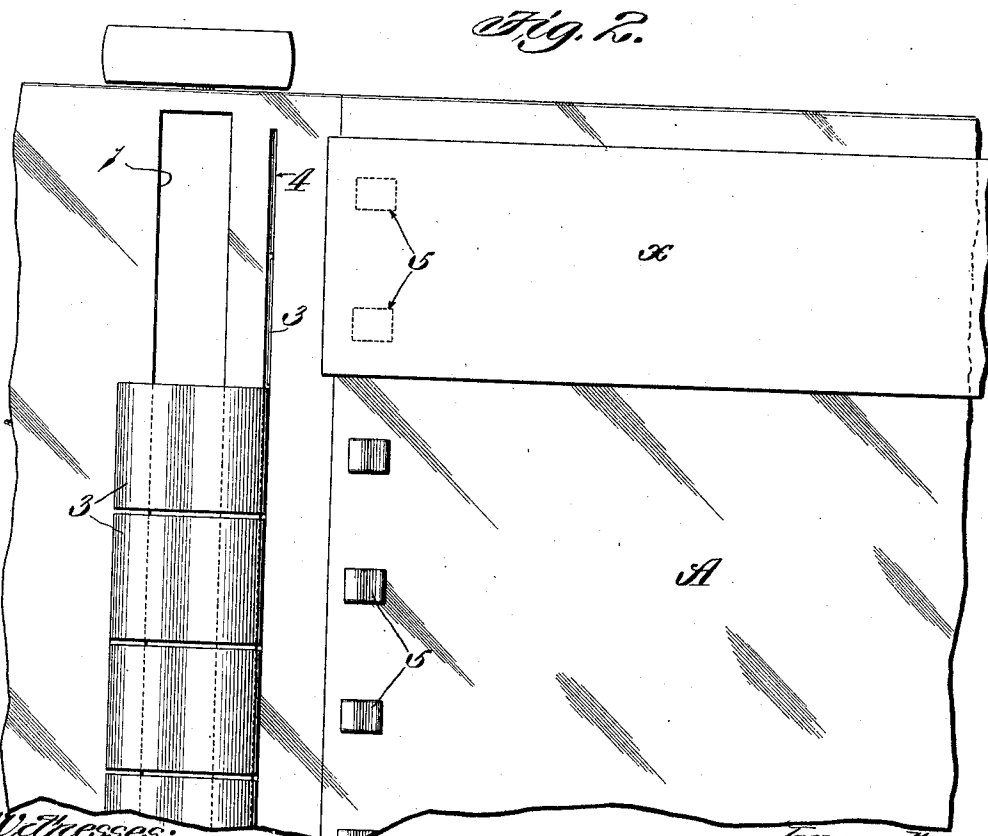
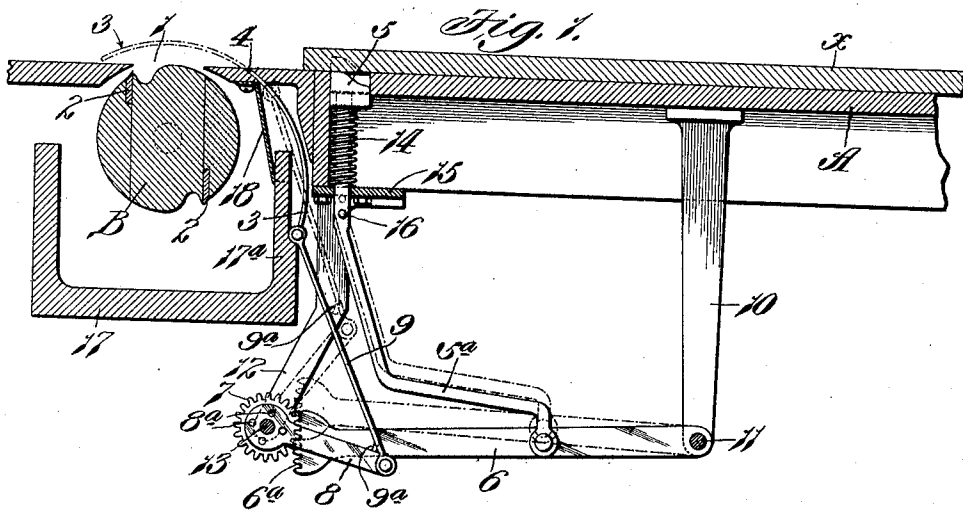


G. W. SMITH.
 PROTECTING HOUSING FOR CUTTING MECHANISMS.
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Patented Apr. 8, 1913.



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GEORGE W. SMITH, OF ST. LOUIS, MISSOURI.

PROTECTING-HOUSING FOR CUTTING MECHANISMS.

1,058,339.

Specification of Letters Patent.

Patented Apr. 8, 1913.

Application filed July 10, 1912. Serial No. 708,667.

To all whom it may concern:

Be it known that I, GEORGE W. SMITH, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Protecting-Housing for Cutting Mechanisms, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to safety devices such as are used on machines provided with cutting devices, for protecting the operator from injury by said cutting devices.

The main object of my invention is to provide an efficient and inexpensive safety device of the character referred to that can be applied easily to various types of machines that comprise a feed table and a revolving cutter-head arranged in an opening in said table.

Another object is to provide a safety device which is so constructed that ships from the cutter-head cannot lodge on the guard members when they are retracted and thus prevent them from moving automatically into operative position when they are released.

I have herein illustrated my invention in combination with a wood-working machine for planing boards but I do not wish it to be understood that my invention is limited to use in such machines for my broad idea consists in a housing combined with a cutting mechanism and means for causing said entire housing or a portion of same to move automatically into an inoperative position and thus expose the cutting mechanism when the article being operated on is presented to the cutting mechanism.

Figure 1 of the drawings is a vertical sectional view illustrating my improved safety device applied to a wood-working machine; and Fig. 2 is a top plan view of the mechanism illustrated in Fig. 1.

Referring to the drawings which illustrate the preferred form of my invention, A designates the table of the machine over which the material is fed by some suitable mechanism not shown, and B designates a revolving cutter-head arranged under the table in alinement with a transversely extending opening 1 in the table and provided with one or more cutters 2 that engage the article α being operated on when it passes over the opening 1 in the table.

My invention consists in a safety device for protecting the operator from injury by the knives or cutters in the cutter-head B, and in the embodiment of my invention herein shown, said safety device comprises a housing or shield that normally extends over the cutter-head opening 1 in the table and an operating mechanism for said housing which causes the housing to move automatically into an inoperative position when the board or other article α being operated on is fed over the table A. I prefer to form said shield or housing from a number of substantially arc-shaped members 3 that are arranged in a transverse slot 4 in the table A and which normally extend over the cutter-head opening 1 in the table, as shown in full lines in Fig. 2 and in broken lines in Fig. 1, thus forming a sectional housing or shield for the cutter-head.

The mechanism that I prefer to use for operating said housing so as to retract it or move it into an inoperative position consists of a plurality of spring-actuated plungers 5 arranged in openings in the table A in advance of the cutter-head, and means coöperating with said plungers for retracting the housing members 3 or drawing them downwardly through the slot 4 in the table when said plungers are depressed by the board or article that is being fed through the machine. One plunger or actuating device 5 is provided for each section 3 of the housing, and a separate and distinct means is employed for transmitting movement from each plunger to its coöperating housing section, thereby permitting one or more sections of the housing to remain in operative position when a different section of the housing is retracted or moved into an inoperative position so as to expose the cutter-head. As shown in Fig. 1, each of the plungers 5 is provided at its lower end with an angular arm 5^a that is pivotally connected to a lever 6, which lever is provided at its front end with a rack 6^a that meshes with a pinion 7. An arm 8 is rigidly connected to the pinion 7 by pins 8^a, or in any other suitable manner, and a link 9 is pivotally connected at its lower end to the arm 8 and at its upper end to the coöperating housing section 3.

A bracket 10 which is arranged on the under side of the table supports a horizontally disposed countershaft 11 on which all of the levers 6 are fulcrumed, and a

second bracket 12 is also arranged on the under side of the table to support a shaft 13 on which all of the pinions 7 are loosely mounted. The downward pressure which the board x exerts on the plunger 5 when said board is traveling over the table A depresses said plunger and thus automatically retracts the housing section 3 that co-operates with same, and after said board has passed beyond the slot 4 the housing section 3 is moved automatically back to its former operative position by means of a coiled expansion spring 14 that is arranged on the shank of the plunger 5 between the head thereof and a spring-supporting plate 15 that extends transversely under the table A, the upward movement of said plunger being limited by a stop 16 thereon that strikes against the under side of the plate 15, as shown in Fig. 1.

The front sides or edges of the heads of the plungers 5 are preferably inclined or beveled, as shown in Figs. 1 and 2, so that they will not interfere with the forward movement of the article x that is being fed over the table A, and the links 9 that connect the arms 8 to their coöperating housing sections 3 are preferably provided at their lower ends with laterally projecting lugs or stops 9^a that strike against the arms 8 and thus reduce the tendency of said links to bend when the arms 8 move upwardly so as to restore the housing to normal position. The transversely extending slot 4 in the table in which the housing sections 3 are arranged, is inclined, as shown in Fig. 1, so that it will act as a guide for the members 3, and a stationary member 17 which is arranged under the table underneath the cutter-head, is provided with a vertically disposed portion 17^a that acts as a guide for the upper ends of the links 9, thereby causing the housing sections to move in an arc into and out of operative position. A guard 18 is preferably arranged on the under side of the table adjacent the cutter-head, as shown in Fig. 1, so as to prevent the chips from flying into the space that the housing members 3 occupy when they are retracted.

Normally, the members 3 that form the housing or shield for the cutter-head are arranged in operative position over the cutter-head opening 1 in the table A, as shown in broken lines in Fig. 1 and in full lines in Fig. 2. When an article x is fed over said table the front end of the article strikes against the plungers 5 arranged in the line of travel of said article and thus depresses said plunger, thereby causing the housing member or members 3 that coöperate with said plungers to be retracted automatically or moved into an inoperative position so as to expose the cutter-head, the number of housing members that are retracted of course, depending upon the width of the

article x being operated on. As soon as said article passes beyond the slot 4 the housing members 3 that were retracted are restored automatically to normal position over the cutter-head.

A safety device of the construction above-described eliminates the possibility of the operator being injured by the cutter-head of the machine because it comprises a housing or shield which is always arranged in operative position over the cutter-head except just before the front end of the article reaches the cutter-head, the mechanism that operates the shield or housing being so designed and arranged that the housing follows the article as it passes over the cutter-head. The fact that the housing is moved automatically both into and out of operative position eliminates the possibility of a careless workman forgetting to restore the housing to operative position over the cutter-head after an article has been fed through the machine. Another desirable feature of such a safety device is that only a portion of the cutter-head is exposed when a narrow article or article of less width than the entire cutter-head is fed through the machine. The device comprises only a few parts which are of such simple construction that they are not liable to get out of order; and still another desirable feature of such a device is that it can be applied easily to machines without materially modifying or re-designing the machine so as to permit the device to be attached.

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

1. In a machine of the character described, a table, a cutter-head arranged in an opening in said table, a shield or housing for protecting said cutter-head, a spring-actuated plunger arranged in said table in advance of said cutter-head, a lever arranged on the under side of the table and connected by a link to said plunger, a pinion meshing with a rack on said lever, a rigid arm on said pinion operatively connected to said housing by means of a link, a guideway on the under side of the table for receiving said housing when it is in an inoperative position, and a chip guard arranged between said guideway and the cutter-head.

2. In a machine of the character described, a table, a cutter-head arranged in a transverse opening in said table, a plurality of arc-shaped housing members arranged in an inclined slot in said table in front of the cutter-head, spring-actuated plungers arranged in said table in advance of said guideway, levers arranged on the under side of the table and operatively connected to said plungers, racks on the ends of said levers, pinions coöperating with said racks and provided with arms, a link connecting

each of said arms to the guard member with
which it coöperates, a vertically disposed
guideway on the under side of the table
against which said links bear, and a chip
5 guard on the under side of the table for
preventing chips from entering said guide-
way.

In testimony whereof I hereunto affix my
signature in the presence of two witnesses,
this six day of July, 1912.

GEORGE W. SMITH.

Witnesses:

JOSEPH A. RIORDON,
HENRY F. GILL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
