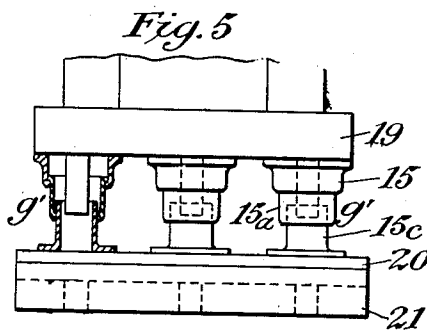
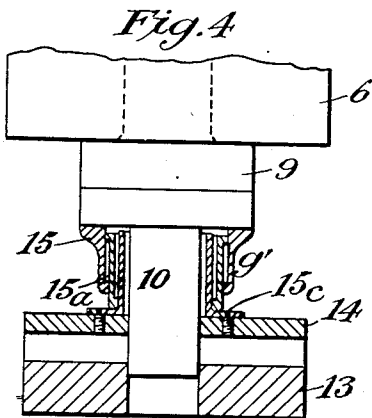
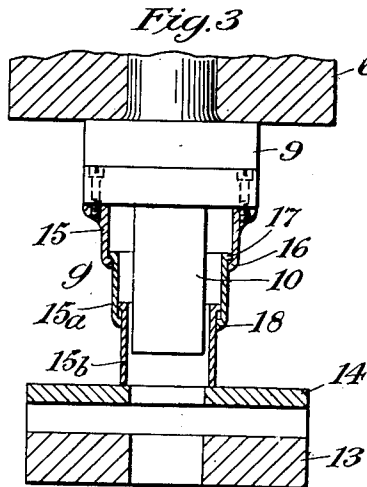
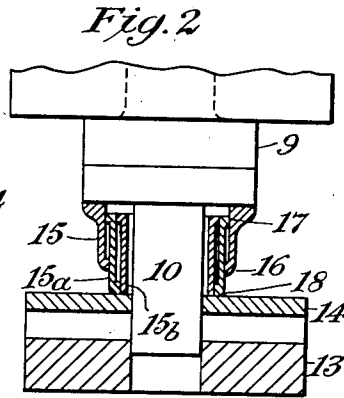
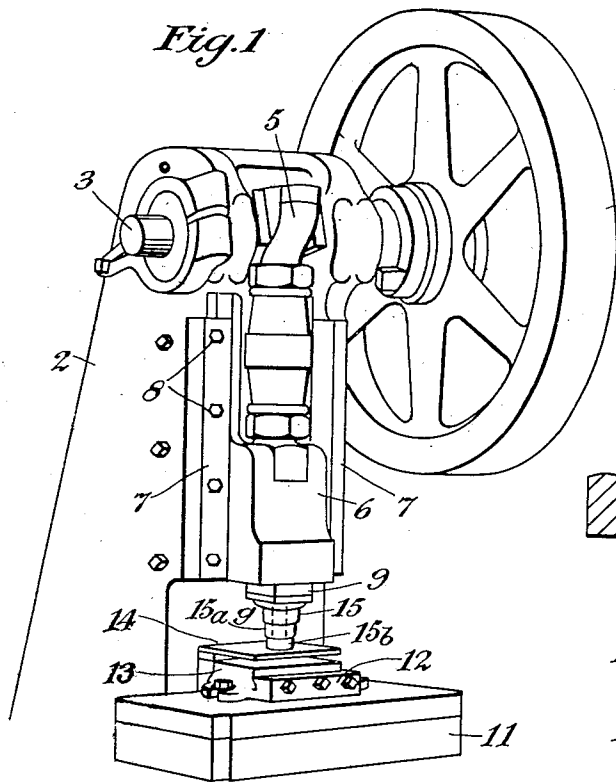


I. L. MILLER.
 PROTECTIVE GUARD FOR THE TOOLS OF CUTTING AND PUNCHING MACHINES, &c.
 APPLICATION FILED FEB. 28, 1920.

1,387,553.

Patented Aug. 16, 1921.



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UNITED STATES PATENT OFFICE.

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PROTECTIVE GUARD FOR THE TOOLS OF CUTTING AND PUNCHING MACHINES, &c.

1,387,553.

Specification of Letters Patent. Patented Aug. 16, 1921.

Application filed February 28, 1920. Serial No. 381,990.

To all whom it may concern:

Be it known that I, ISIDORE LEO MILLER, a citizen of the United States and a resident of New York, in the county of New York

not hereinbefore referred to will be herein- 55
after described and claimed and are illus-
trated in the accompanying drawing, in
which—

Figure 1 is a perspective view of a por- 60
tion of a punch press of well-known con-
struction, having applied to the punch there-
of my improved protective guard, which in
this case is shown as made up of a plurality
of sections and suspended as a whole from
the punch-holder, 65

Fig. 2 is an enlarged detail illustrating in
vertical section and elevation the contracted
position of the guard,

Fig. 3 is a like view showing the extended
position of the same, 70

Fig. 4 is a detail of a modified form of
my device, illustrating in vertical section
and elevation its contracted position, the
lower section of the guard herein being
shown as secured to the stripper plate of 75
the machine, while the remainder of the de-
vice, made up of two telescoping sections,
is attached to the punch-holder and tele-
scopes with the section secured to the plate, 80
and

Fig. 5 is a detail showing in vertical sec-
tion and elevation the device of Fig. 4 ap-
plied to a press having gang or multiple
dies.

Similar characters designate like parts in 85
all the figures of the drawing.

My improved guard is adapted for appli-
cation to any type of press suitable for cut-
ting or punching metal, paper, cardboard,
leather, celluloid or other sheet material, 90
and is here shown in connection with a
punch-press of well-known construction. In
the embodiment of my invention illustrated
in Figs. 1, 2 and 3, 2 designates the upper
portion of the frame of a press having jour- 95
naled therein the shaft 3, said shaft carry-
ing the fly-wheel 4 and pitman 5, to the
latter of which is attached the reciprocating
slide 6, guided in gibs 7 bolted at 8 to
the frame of the press. A punch-holder or 100
stem 9 is attached to the slide 6 in any suit-
able manner, and is adapted to receive and
clamp the punch 10. The rigid bed of the
press is designated by 11, and as here shown
has secured thereto the bolster 12, which is 105
grooved to carry the die 13 adapted for co-
operation with the punch 10. I have also
shown herein at 14 a stripper of well-known

5 and State of New York, have invented cer-
tain new and useful Improvements in Pro-
tective Guards for the Tools of Cutting and
Punching Machines, &c., of which the fol-
lowing is a specification.

10 This invention relates to a protective
guard for the tool of cutting and punching
machines, etc., and the main object of the
invention is the provision of a safety device
for such machines which will at all times
15 during operation surround and mask the
path of travel of the tool and thus prevent
injury to an operator.

In carrying my invention into effect I
employ a protective guard that surrounds
20 the tool throughout its path of travel and
which has a suitable relative movement with
respect to said tool and its holder when the
machine is in operation. Preferably the
guard is an extensible device, the preferred
25 construction being one in which the guard
comprises a series of telescopic sections con-
nected at the upper end to the tool holder
and resting at the lower end on the upper
plate of the machine with which the tool
30 coöperates. The construction is such that as
the tool holder rises the guard will be auto-
matically extended by gravity, and as said
holder descends said guard will be automati-
cally shortened, the lower end thereof prefer-
ably remaining at all times in contact
35 with the aforesaid plate. Ordinarily all
the telescopic sections will have positive
means for limiting their relative movement,
and the device as a whole will ordinarily be
attached to the tool holder, and said device
40 may be made up of two, three or more sec-
tions, as may be required for each type of
machine; but the device may be made of but
two sections, one attached to the tool holder
45 and movable therewith and adapted to tele-
scope with a fixed section on the plate of
the machine. In some cases it may be de-
sirable to employ a device having a lower
portion secured to said plate and an upper
50 portion suspended from the tool holder and
made up of two or more telescoping sections,
the lower section adapted to telescope with
the portion secured to the plate.

These and other features of the invention

construction for permitting the punch to be drawn out of the sheet material after a blank (not shown) has been punched, all of the parts hereinbefore described being of a usual, well-known type of construction.

The device of the present invention is intended to surround and inclose the reciprocating tool at all points in its stroke and thus fully protect an operator, and it is preferably co-axial with said tool and so combined with the adjacent parts as to have a relative movement in the direction of travel of the tool. A preferred construction is one in which the lower end of the guard is substantially immovable with respect to the stripper-plate 14 through which the tool passes, but has at its upper end a movement relative to the lower end of said guard. This relative movement may be obtained in any suitable type of extensible guard surrounding the tool, but the preferred construction is one in which the device is tubular, co-axial with the tool and adapted to telescope vertically. The telescopic guard shown is designated generally by *g*, and in the construction illustrated in Figs. 1, 2 and 3 comprises three tubular sections associated in such a manner as to be capable of extension substantially to their maximum length when the tool is at the top of its stroke, as shown in Figs. 1 and 3, and of being drawn in so that the guard has its minimum length when said tool is at the bottom of its stroke, this position being shown in Fig. 2. The three sections of the guard illustrated in said figures are designated respectively by 15, 15^a and 15^b. These sections may be combined in any suitable manner to prevent their separation when extended, while permitting them to telescope one with another. The guard as a whole may be supported in any proper manner, but in this case is fastened to the reciprocating slide 6 so that the major portion of the guard will move up and down with the slide and tool. In the construction illustrated the upper section 15 of the guard is connected directly to the tool-holder or stem 9. This connection may be made in any desired manner. Thus when the sections 15, 15^a and 15^b are properly connected for movement relative to one another without separating, it will be evident that the tool-guard as a whole will be suspended as a unit from the tool-holder. Its movements are intended to be controlled conjointly by the tool-holder and by any suitable element of the machine adjacent to the work. This element in the present case is the stripper 14 through which the tool passes before entering the die. When in operation the tool-guard will rest at its lower end, that is, the under side of the lowermost section 15^b will rest upon the plate 14, and the upper sections 15 and 15^a will move up and down more or less, under

the influence of the movement of the tool-holder.

For the purpose of maintaining the sections of the telescopic guard in proper working relation and permitting the proper relative movement thereof without the use of additional devices for maintaining them in assembled condition, the various sections 15, 15^a and 15^b, here shown as cylindrical, are preferably shouldered to prevent separation one from another. Thus the section 15 has an internal shoulder or rim 16 at its lower end adapted to co-act with the external shoulder 17 at the upper end of the section 15^a to limit relative movement of these sections; while the internal shoulder 18 at the bottom of the section 15^a coacts with the external shoulder 19 of the section 15^b to limit relative movement of these sections. The various sections being loosely nested for free movement and positively stopped by said shoulders the device is entirely responsive to the movements of the tool-holder and masks the tool throughout its length at all speeds of operation of the machine.

In Fig. 4 I have shown the contracted position of a modified form of the device, this embodiment of my invention being designated generally by *g'* and shown as of three sections, the upper two of which are nested and operate as in Figs. 1, 2 and 3, but in which the lower section, designated by 15^c, is secured to the stripper 14. The construction is such that the sections surround the tool at all points of its stroke, as in the device of Figs. 1, 2 and 3. It will be obvious that a guard of this type may have but one section secured to the tool-holder and moving with the tool, this moving section being adapted to telescope with the fixed section on the plate throughout the path of movement of the tool; or the reciprocating portion of the guard may be made up of three, four or more sections, as the particular machine and tool may require.

In Fig. 5 there is shown a tool-holder or stem 19 carrying multiple dies *g'* of the same type as that shown in Fig. 4. The stripper 20 and die 21 thereof instead of being adapted for use with a single cutting tool are intended for coöperation with a gang of tools, all of like form or of dissimilar forms.

The manner of operation of the device will, it is believed, be obvious from the foregoing description. When in place with the machine in operation the co-axial sections of the telescopic guard will be projected by gravity and drawn in by the descent of the tool-holder as the latter ascends and descends, as the weight of the sections is sufficient to maintain the sections 15^a and 15^b normally at the lower limit of movement thereof, and they will be positively raised

in the normal operation of the device only when the upper section 15 connected thereto is drawn up positively by the tool-holder. When a guard having but one moving section and one fixed section is used these sections will be adapted to telescope throughout the path of movement of the tool and will mask it at all times during operation of the machine.

10 As shown in Figs. 1, 2 and 3, the whole of the guard is detachable as a unit from the remainder of the mechanism of the machine; and in Figs. 4 and 5 the reciprocating portion is removable in the same manner. Also
15 the section fixed to the plate is readily detachable. Obviously such a guard may be secured in operative relation with the other parts of the machine in various ways other than that shown in the drawings herein, as
20 may be desired. Moreover, though shown herein as made up of three sections, the guard may be made up of any desired number of sections required to mask the moving tool throughout its stroke.

25 What I claim is:

1. In a machine of the class described, the combination with a tool-holder and tool and with a plate adapted for the passage of the tool therethrough, of a sheath inclosing said
30 tool from the tool-holder to the plate.

2. In a machine of the class described, the combination with a tool-holder and tool and with a plate adapted for the passage of the tool therethrough, of a sheath attached to
35 said tool-holder and inclosing said tool from the tool-holder to the plate.

3. In a machine of the class described, the combination with a tool-holder and tool and with a plate adapted for the passage of the
40 tool therethrough, of a tubular sheath inclosing said tool from the tool-holder to the plate.

4. In a machine of the class described, the combination with a tool-holder and tool and with a plate adapted for the passage of the
45 tool therethrough, of a sheath of telescopic sections attached to the tool-holder and inclosing said tool from the tool-holder to the plate, and means for limiting the relative longitudinal movement of said sections. 50

5. In a machine of the class described, the combination with a tool-holder and tool and with a plate adapted for the passage of the tool therethrough, of a sheath of telescopic
55 cylindrical sections attached to the tool-holder and inclosing said tool from the tool-holder to the plate, and means for limiting the relative longitudinal movement of said sections.

6. In a machine of the class described, the combination with a tool-holder and tool and with a plate adapted for the passage of the tool therethrough, of a telescopic guard
60 made up of cylindrical sections and attached at its upper end to the tool-holder and having its lower section resting upon said plate, and coöperative collars on said sections for
65 limiting their relative longitudinal movement.

7. In a machine of the class described, the combination with a tool-holder and tool and with a plate adapted for the passage of the tool therethrough, of a tool guard attached
70 to said tool-holder and inclosing said tool and adapted to be contracted upon the descent of the tool-holder and to be extended by gravity on its ascent. 75

Signed at New York, in the county of New York, and State of New York, this 13th day of February, A. D. 1920.

ISIDORE LEO MILLER.

Witnesses:

L. GREENBERG,
F. B. HARRIS.