(No Model.) 2 Sheets—Sheet 1.

T. A. DICKS.

HAND GUARD FOR STAMPING PRESSES.

No. 513,093. Patented Jan. 23, 1894.

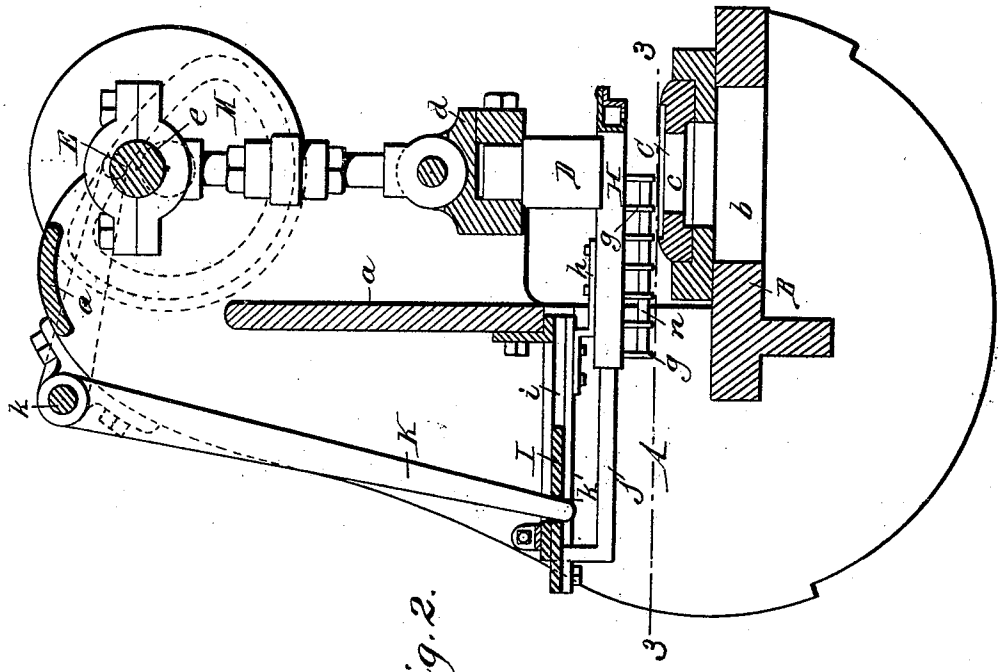

Fig. 2.

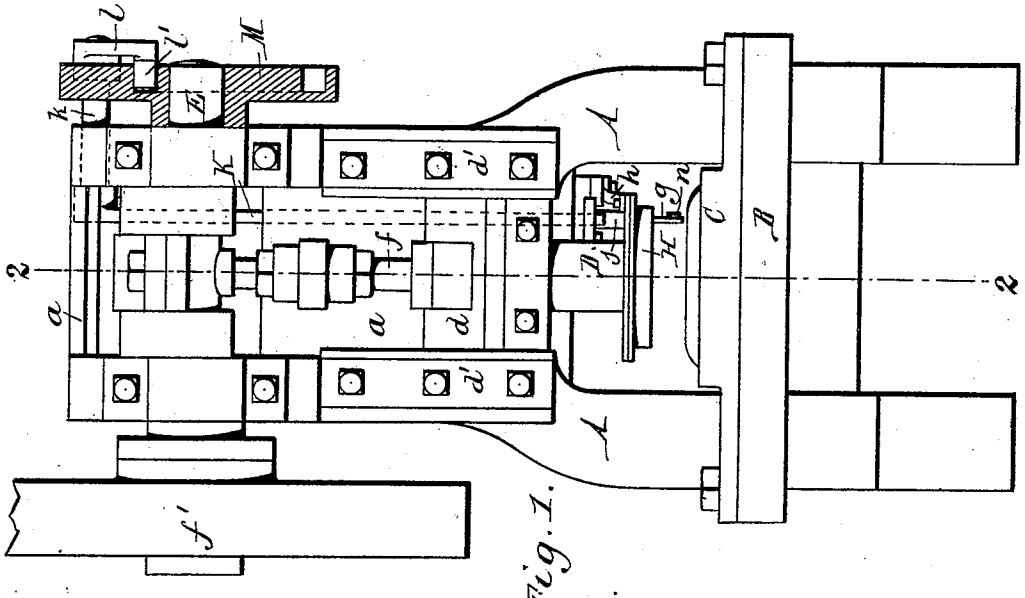

Fig. 1.

Witnesses:
F. C. Geyer.
F. Gustav. Wilhelm.

Thos. A. Dicks Inventor.
By Wilhelm Bonner
Attorneys.

THE NATIONAL LITHOGRAPHING COMPANY.
WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

T. A. DICKS.

HAND GUARD FOR STAMPING PRESSES.

No. 513,093. Patented Jan. 23, 1894.

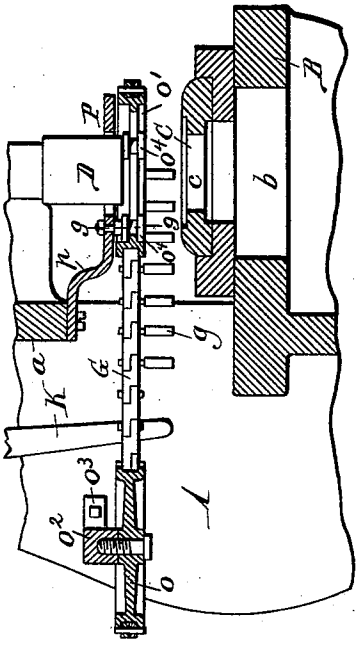

Fig. 7.

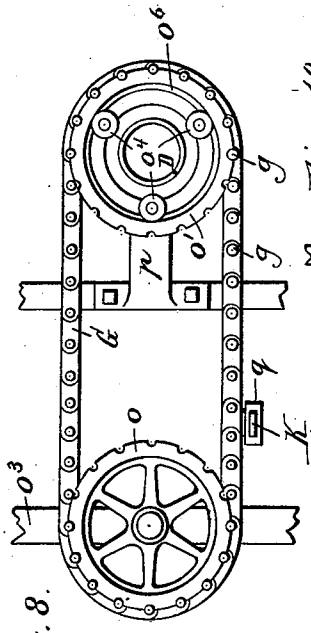

Fig. 8.

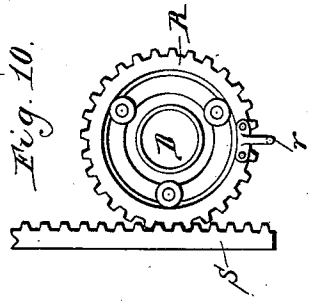

Fig. 10.

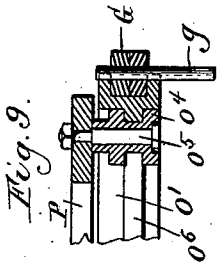

Fig. 9.

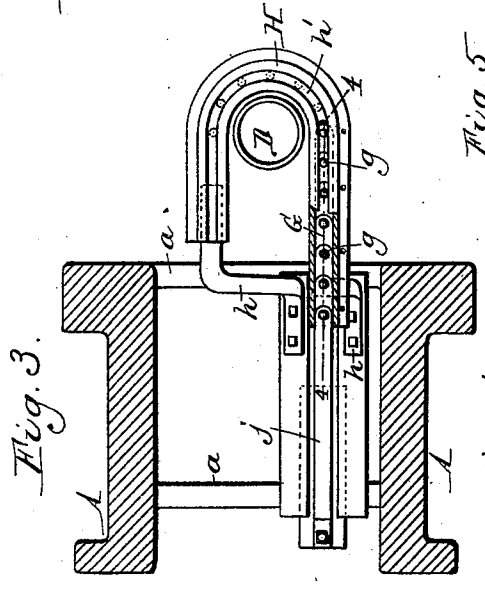

Fig. 3.

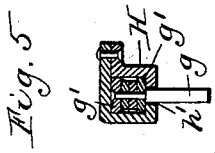

Fig. 5

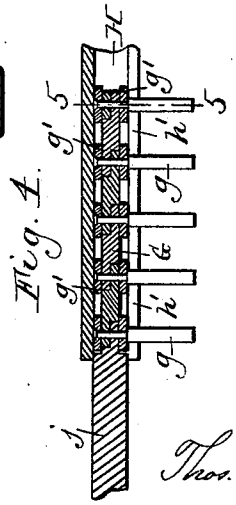

Fig. 4.

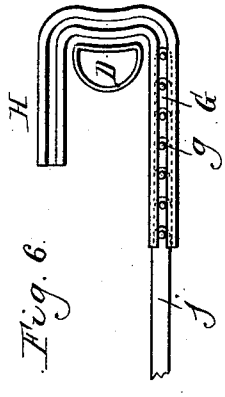

Fig. 6.

Witnesses!
F. Gustav. Wilhelm.
F. C. Geyer.

Thos. A. Dicks Inventor.
By Wilhelm Bonner
Attorneys.

THE NATIONAL LITHOGRAPHING COMPANY.
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

THOMAS A. DICKS, OF BUFFALO, NEW YORK.

HAND-GUARD FOR STAMPING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 513,093, dated January 23, 1894.

Application filed April 29, 1893. Serial No. 472,342. (No model.)

To all whom it may concern:

Be it known that I, THOMAS A. DICKS, a subject of the Queen of Great Britain, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Stamping-Presses, of which the following is a specification.

This invention relates to presses for stamping sheet metal and has for its object to provide such machines with a guard whereby the hands or fingers of the operator are pushed out of the reach of the punch before the latter strikes the die, thus averting the liability of injuring the operator.

In the accompanying drawings consisting of two sheets:—Figure 1 is a front elevation of a stamping press provided with my improvement. Fig. 2 is a sectional elevation of the press, the plane of section being in line 2—2, Fig. 1. Fig. 3 is a horizontal section, in line 3—3, Fig. 2, looking upward. Fig. 4 is a vertical section, on an enlarged scale, in line 4—4, Fig. 3. Fig. 5 is a cross section in line 5—5, Fig. 4. Fig. 6 is a bottom plan of a modified form of the guide in which the finger guard moves. Fig. 7 is a fragmentary sectional elevation of another modification of the invention. Fig. 8 is a bottom plan view of said modification. Fig. 9 is a vertical cross section in line 9—9, Fig. 7. Fig. 10 is a bottom plan view of another modified construction of the invention.

Like letters of reference refer to like parts in the several figures.

The main frame of the stamping press is composed of two parallel standards A A, cross pieces *a* connecting the same, and a table B having a central opening *b*.

C represents the die which is secured upon the table by any suitable means, and which may be solid or provided with a central opening *c*, coinciding with the opening in the table.

D is the punch which is secured to a vertically reciprocating cross head *d* sliding in upright guides *d'* arranged on the front side of the standards.

E represents the horizontal crank shaft, journaled in bearings at the upper ends of the standards and *e* is the crank which is connected with the cross head *d* by a rod *f*. This crank shaft is provided at one end with a driving pulley *f'*.

g represents a series of upright movable guard fingers or pins which are adapted to traverse the front of the die before the punch strikes the same and thereby push aside the hands of the operator so as to avoid injuring the same. These guard fingers are attached at their upper ends to a flexible carrier, consisting preferably of a chain G which moves in a horizontal U-shaped guide H arranged a short distance above the die and having its curved portion arranged concentric with the die, as shown in Fig. 3, so as to permit the punch to pass through it in descending upon the die. This guide is constructed in the form of a flat sided tube and is supported at its rear ends by arms or brackets *h* secured to the adjacent portion of the main frame. The guide is provided in its under side with a longitudinal slot *h'* through which the guard fingers *g* pass. These fingers preferably form the connecting pins of the chain links and each finger is provided above and below the links with guide rollers *g'* which run in contact with the side walls of the guide H, whereby the friction is reduced. The flexible carrier or chain adapts itself to the form of the guide as it is moved back and forth through the same and thus permits the guard fingers to follow the curvature of the guide and pass around the front and sides of the die. The flexible carrier is operated from a reciprocating slide I which is arranged above and in rear of the guide H and is supported in horizontal ways *i* arranged in the inner sides of the standards A, the rear end of the carrier being connected with this slide by a rearwardly extending arm *j* secured at its rear end to the under side of the slide, as shown in Fig. 2.

K is an upright rock arm arranged between the standards A and actuating the slide I. This arm is secured to a horizontal rock shaft *k* arranged in rear of the crank shaft and turning in bearings secured to the upper portions of the standards. The lower free end of the rock arm K engages in an opening *k'* formed in the slide I.

l is an actuating arm secured to the right hand end of the rock shaft *k* and provided at its outer end with an inwardly projecting pin *l'* which enters the groove of a rotary cam M secured to the adjacent end of the crank

shaft, whereby the shaft *k* is rocked and the slide is reciprocated and caused to actuate the chain carrying the guard fingers. The cam M is so formed that when the punch is raised to its highest position, the guard fingers are retracted to one side of the die, where they are out of the way and permit the operator to place the sheet metal blanks upon the die. During the initial portion of the downward stroke of the punch, the guard fingers are moved around the front and side portions of the die, and push aside the hands of the operator if they are still between the die and the punch. At the end of their forward movement, the guard fingers remain at rest for a time, during which the punch passes between the lateral members of the guide H and cuts or stamps the blank. The punch then again rises from the die and during the last portion of its upward stroke, the guard fingers return to their former position in which they leave the space in front of the die unobstructed.

The guard fingers are preferably connected at their lower ends by a flexible band *n* which together with the fingers forms a practically continuous guard which excludes the operator's fingers from the spaces between the guard fingers.

In the modification of the invention shown in Fig. 6, the guard fingers are shown in connection with a die having a concave front side. In this case, the guide in which the finger carrier slides is depressed in its front portion to follow the curve of the die, whereby the guard fingers are caused to move in sufficiently close proximity to the die to push aside the hands of the operator, if they lag too long in adjusting the blank on the die.

Instead of arranging the finger-carrying chain to slide in a tubular U-shaped guide, it may be made endless and guided upon horizontal sprocket wheels *o o'*, as shown in Figs. 7, 8, and 9. The rear sprocket wheel *o* is mounted on a vertical stud o^2 carried by an arm or bracket o^3 secured to one of the standards A. The front sprocket wheel consists of a sprocket ring or rim having no spider or central portion, but supported by depending horizontal rollers o^4 which turn upon vertical studs o^5 secured to the under side of an open circular frame P arranged horizontally over the die and supported at its rear portion by an arm *p* projecting forwardly from the main frame of the press. The sprocket rim *o'* is provided on its inner side with a projecting annular rib o^6 which engages in annular grooves formed in the supporting rollers o^4, as shown in Figs. 8 and 9. The sprocket rim is thus supported and at the same time free to turn. The guard fingers are attached to one strand of the endless carrier chain so as to move across the front of the die when the plunger descends and the chain is moved back and forth by the rock arm K, which in this case engages in an upright loop *q* secured to the chain. In descending upon the die the plunger passes through the central opening of the sprocket rim *o'*.

In the modified construction of the invention shown in Fig. 10, a single guard finger *r* is employed which is secured to the peripheral portion of a horizontal gear wheel R, arranged over the die and constructed and supported in the same manner as the front sprocket wheel of the foregoing modification, so as to permit the plunger to pass through it. This gear wheel is alternately turned in opposite directions, to cause the guard finger to pass before the die or clear the same by a rock bar S which may be suitably guided on the main frame and reciprocated by the rock arm K. It is obvious that a number of guard fingers could be arranged on the gear wheel R if desired.

It will be observed that in all of the several forms of my invention herein shown and described the guard finger or fingers traverse the front portion of the die during the descent of the punch and recede to one side thereof during its ascent, so that they afford the operator free access to the die for placing the blank upon the die when the punch is raised, but push away his hands when the punch descends, thus avoiding all danger of maiming or otherwise injuring the operator's hands.

I do not desire to claim broadly in this application, a guard for pushing aside the hands of the operator, moving adjacent to the die, as that forms the subject of another application for patent filed by me March 13, 1893, Serial No. 465,708.

I claim as my invention—

1. The combination with the die and the punch, of a guard arranged to move in front of the die before the punch descends upon the die, and means for operating said guard, substantially as set forth.

2. The combination with the die and the punch, of a flexible carrier arranged to traverse the die and a guard attached to said flexible carrier, substantially as set forth.

3. The combination with the die and the punch, of a guide arranged around the die, a flexible carrier moving in said guide, and a guard finger attached to said carrier, substantially as set forth.

4. The combination with the die and the punch, of a guide arranged around the die, a flexible carrier moving in said guide and carrying a guard finger, and a reciprocating slide whereby said carrier is operated, substantially as set forth.

5. The combination with the die and the punch, of a guide arranged around the die, a flexible carrier moving in said guide and carrying a guard finger, a reciprocating slide connected with said flexible carrier, and a cam whereby said slide is actuated, substantially as set forth.

6. The combination with the die and the punch, of a guide arranged around the die, a flexible carrier moving in said guide and carrying a guard finger, a reciprocating slide

connected with said flexible carrier, a rotary cam, a rock shaft actuated from said cam and a rock arm mounted on said shaft and engaging with said slide, substantially as set forth.

7. The combination with the die and the punch, of a horizontal tubular guide extending around the die and provided on its under side with a slot, a chain sliding in said guide, a guard finger secured to said chain and passing through the slot of the guide, and means for operating said chain, substantially as set forth.

8. The combination with the die and the punch, of a tubular U-shaped guide extending around the die, and provided in its under side with a slot, a chain sliding in said guide, a guard finger secured to said chain, extending through said slot and provided within the guide with anti-friction rollers, and means for operating said chain, substantially as set forth.

9. The combination with the die and the punch, of a guide extending around the die a chain sliding in said guide and carrying a number of guard fingers and a flexible band connecting said fingers, substantially as set forth.

Witness my hand this 10th day of April, 1893.

THOMAS A. DICKS.

Witnesses:
FRED. C. GEYER,
EMIL NEUHART.