Dec. 17, 1957 E. J. TARSA ET AL 2,816,607

STRIP GUIDES FOR PUNCH PRESSES

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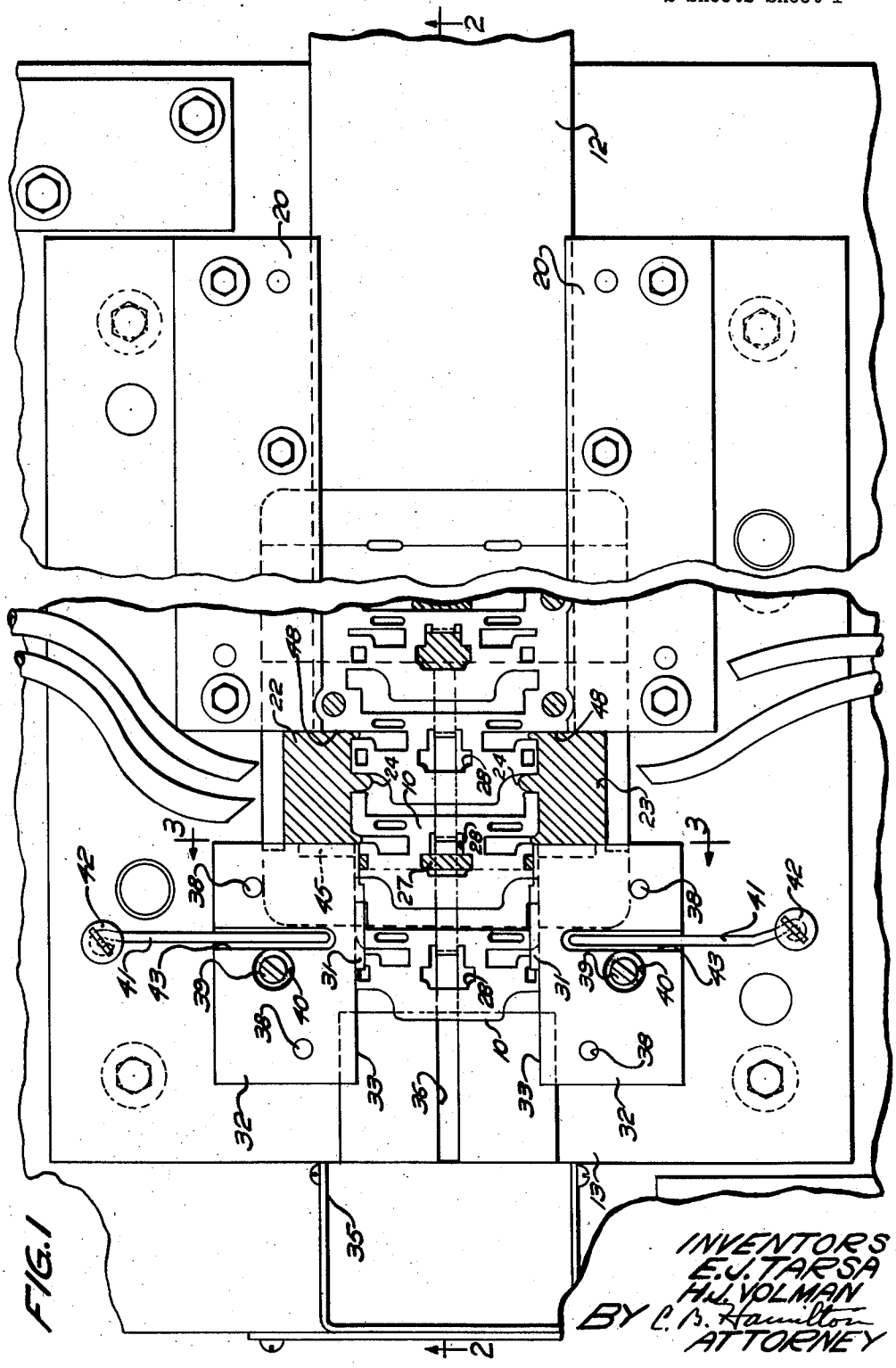


FIG. 1

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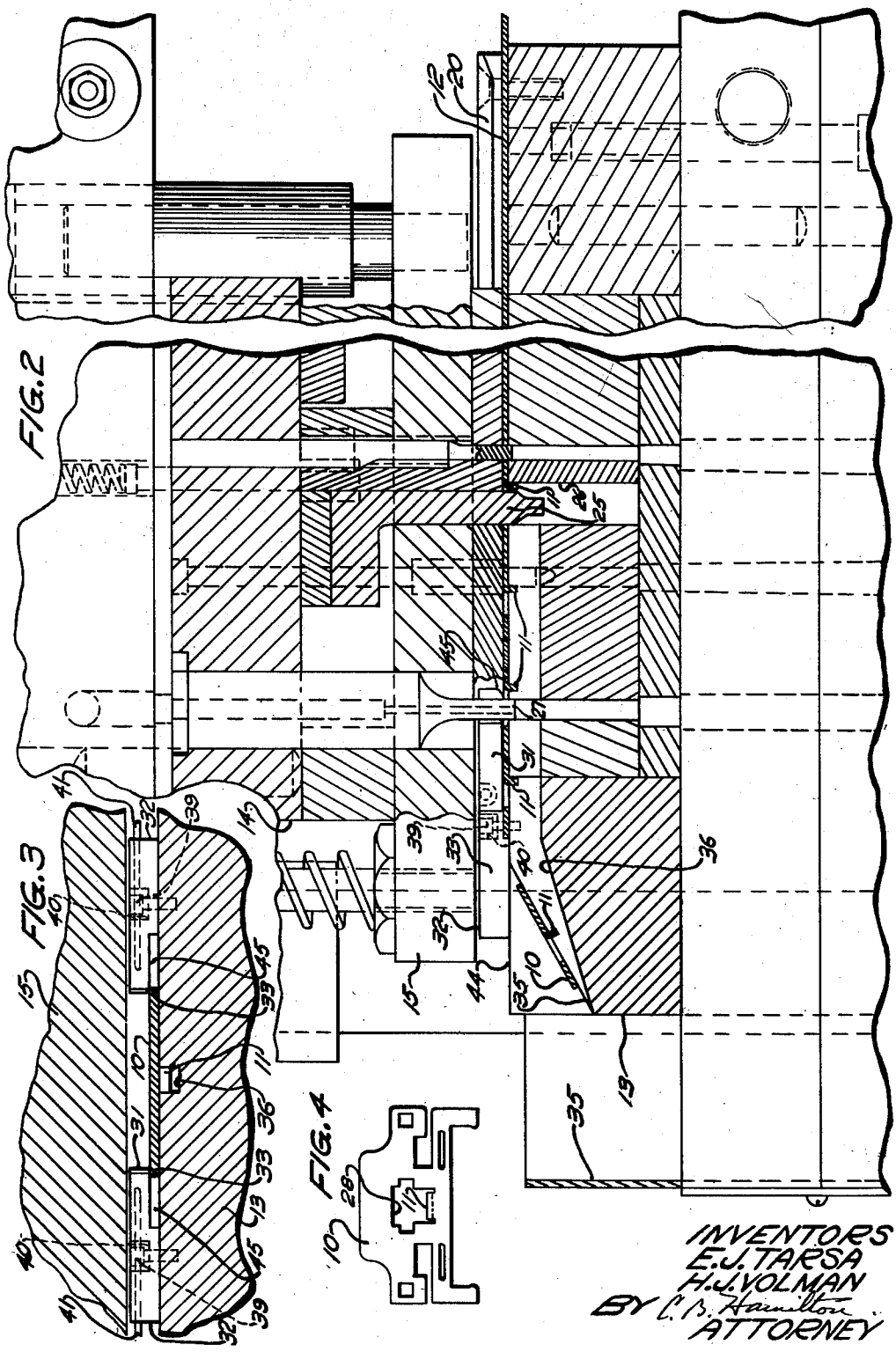


FIG. 2

FIG. 3

FIG. 4

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STRIP GUIDES FOR PUNCH PRESSES

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This invention relates to punch presses, and more particularly to strip guides for punch presses.

In the use of a progressive type punch press having a die to form from a strip of material articles having lugs projecting from the plane of the articles, the strip is fed into the punch press and must be carefully guided throughout the travel of the strip in the die. Where edge portions of the strip are trimmed off as the strip progresses through the die and portions of the strip are bent out of the plane of the strip, it is very difficult to remove short pieces of the strip at the end of punching operations thereon inasmuch as the projections prevent the strip from being pulled back out of the die and guiding means for guiding the edges of the strip are caught by the unnarrowed portions of the strip when it is pushed on through the die.

An object of the invention is to provide new and improved punch presses.

Another object of the invention is to provide strip guides for punch presses which accurately guide a strip of material through a die of a punch press and permit the tail end of the strip to be pulled on through the die.

A further object of the invention is to provide a punch press having a die for punching lugs to positions projecting from a strip of material and for cutting away edge portions of the strip, guiding the strip of material precisely in its travel through the die and permitting the tail end of the strip to be pulled on through the die to clear the die of the strip.

A punch press illustrating certain features of the invention may include a die having a lug-forming opening and a groove extending away from the lug-forming opening to provide clearance for movement of lugs formed on the strip of material and a punch for punching lugs from the strip of material and for cutting away with the die edge portions of the strip to narrow the strip. A guide equal in width to the initial width of the strip may be provided to guide the wide part of the strip between the punch and die, and resiliently mounted guide plates designed to guide the narrowed portions of the strip are provided at the exit end of the punch and die and have camming portions formed thereon against which the narrow portions of the strip push to move the guides from the strip and permit it to be withdrawn from the punch and die.

A complete understanding of the invention may be obtained from the following detailed description of an apparatus forming a specific embodiment thereof, when read in conjunction with the appended drawings, in which

Fig. 1 is a partially sectional, top plan view of an apparatus forming one embodiment of the invention;

Fig. 2 is a fragmentary, vertical section taken along line 2—2 of Fig. 1;

Fig. 3 is a vertical section taken along line 3—3 of Fig. 1, and

Fig. 4 is a top plan view of an article formed by the apparatus shown in Fig. 1.

Referring now in detail to the drawings, there is shown therein a punch press for forming an article 10 having a depending lug 11 projecting out from the plane of the article. The article is formed in progressive steps from a strip 12 of material guided between a stationary lower die 13 and a movable upper die or punch 14 carrying a stripper plate 15 therewith. The strip 12 is guided by overhanging edge guides 20 forming a guideway of a width equal to that of the strip 12 into the dies 13 and 14, and, as the punch 14 and the die 13 operate they cut edge portions from the strip. Punch portions 22 and 23 serve to cut the edge portions and also to sever each of the articles 10 from the strip, as illustrated in Fig. 1 by ribs 24 of the punch portions projecting between the lefthand article 10 and the remaining portion of the strip 12. A punch 25 is provided for cooperating with a forming portion 26 of the die 13 to form the lugs 11 projecting downwardly from the plane of the strip 12 and a shaving punch 27 is provided for shaving openings 28 formed in the strip.

After each of the articles 10 is severed from the remainder of the strip, when the strip is pushed manually to the left, as viewed in Figs. 1 and 2, each article is pushed by the forward end of the strip under guide lugs 31 of guides 32 having guide edges 33 spaced apart the width of the articles 10 so that the articles are precisely guided from the die to a discharge chute portion 35 of the die. A groove 36 is provided in the die to clear the lugs 11 to permit free passage of the articles 10 from the die. The guide plates 32 are mounted slidably on pins 38 with the movement upwardly thereof being limited by heads of shoulder screws 39 fitting into counterbores 40, and wire springs 41 fastened by screws 42 fit into grooves 43 formed in the plates 32 and press the plates 32 toward an upper face 44 of the die 13. The plates 32 are provided with cam surfaces 45, which are engaged by edge portions 48 of the strip 12 when the tail end of the strip is pulled to the left along the die to remove the tail end portion of the strip. The edge portions 48 lift the guide plates 32 out of the plane of the strip so that the tail end or residue of the strip can be pulled therepast. The edge portions 33 of the plates 32 act to precisely guide the articles 10, which are substantially narrower than the strip 12, but still permit the strip 12 to be pulled through the apparatus when the tail end portion thereof is to be removed from the apparatus.

It is to be understood that the above-described arrangements are simply illustrative of the application of the principles of the invention. Numerous other arrangements may be readily devised by those skilled in the art which will embody the principles of the invention and fall within the spirit and scope thereof.

What is claimed is:

1. In a punch press including a stationary bottom die and an upper die reciprocable toward and away from the bottom die, said dies being provided with cooperating elements located intermediate the edges thereof for cutting an edge portion of a strip away to narrow it from an original predetermined width to a second width, the combination therewith of a pair of entrance edge guides fastened to the top of the bottom die on opposite sides of the cooperating elements, said entrance edge guides having spaced apart guiding surfaces for engaging the edges of the strip and said guiding surfaces being located in positions spaced apart a distance as great as said predetermined width for guiding the strip to the dies, a pair of exit edge guides provided with guiding edges and also having camming portions extending laterally from the guiding edges, and means mounting the exit edge guides in positions extending along the bottom die in positions in which the guiding edges of the second guides are spaced

apart a distance equal to said second width, said mounting means permitting movement of the exit edge guides upwardly away from the top of the bottom die when unnarrowed portions of the strip engage the camming portions of the second pair of guides.

2. In a punch press including a stationary bottom die and an upper die reciprocable toward and away from the bottom die, said dies being provided with cooperating elements located intermediate the edges thereof for cutting an edge portion of a strip away to narrow it from an original predetermined width to a second width, the combination therewith of entrance guide means located on the top of the lower die for guiding the strip to said elements, said entrance guide means having spaced apart guiding surfaces for engaging the edges of the strip and said guiding surfaces being spaced apart a distance equal to said predetermined width, a pair of exit edge guides provided with guiding edges spaced apart said second width and also having camming portions extending laterally from the guiding edges, and a plurality of vertical guide pins mounting the edge guides on the top of the bottom die in positions in which the guiding edges are held in their spaced apart positions spaced, a distance equal to said second width, to permit vertical movement upwardly away from the top of the bottom die when unnarrowed portions of the strip engage the camming portions of the guides.

3. A punch press, which comprises a bottom die having an upper face along which a strip of material of a predetermined width may be pushed, a punch mounted above the die and movable toward and away from the die, said punch and die being provided with portions for removing an edge portion of the strip to narrow the strip to a second width, entrance guide means mounted on the upper face of the die at one side of the strip-forming portions for guiding the strip to the removing portions, a pair of exit edge guides, means mounting the exit edge guides on the upper face of the die on the opposite side of the removing portions in positions spaced apart a distance equal to the second width of the strip for guiding the strip from the punch and die, said mounting means preventing movement apart of the exit edge guides and permitting the exit edge guides to be moved upwardly from the die, and means urging the exit edge guides toward the die, at least one of said edge guides being provided with a cam portion engageable by a wider portion of the strip to move the exit edge guide out of the path of the wider portion of the strip and the strip to be moved therepast.

4. A punch press, which comprises a bottom die having an upper face along which a strip of material of a predetermined width may be pushed, a punch mounted above the die and movable toward and away from the die, said punch and die being provided with centrally located strip-cutting portions for removing an edge portion of the strip to narrow the strip to a second width, entrance guide means mounted on the upper face of the die in positions at one side of the strip-cutting portions spaced apart a distance as great as said predetermined width for guiding the strip to the strip-cutting portions, a pair of exit edge guides, and means mounting the exit edge guides on the upper face of the die on the opposite side of the strip-cutting portions in positions spaced apart a distance equal to the second width of the strip for guiding the strip from the punch and die, said mounting means preventing movement apart of the exit edge guides and permitting the exit edge guides to be moved upwardly from the die, at least one of said exit edge guides being provided with cam portions engageable by the wider portion of the strip to move that edge guide out of the path of the wider portion of the strip and the strip to be moved therepast.

5. A punch press, which comprises a bottom die having an upper face along which a strip of material of a predetermined width may be pushed, a punch mounted above the die and movable toward and away from the die, said punch and die being provided with centrally located article-cutting portions for removing edge portions of the strip to narrow the strip to a second width and cutting narrowed portions of strips into articles, a pair of guide members mounted on the upper face of the die in positions at one side of the article-cutting portions spaced apart a distance as great as said predetermined width for guiding the strip to the article-cutting portions, a pair of exit edge guides, means mounting the exit edge guides on the upper face of the die on the opposite side of the strip-cutting portions in positions spaced apart a distance equal to the second width of the strip for guiding the articles from the punch and die, said mounting means preventing movement apart of the exit edge guides and permitting the exit edge guides to be moved upwardly from the die, and means urging the exit edge guides toward the die, said exit edge guides being provided with cam portions engageable by wider portions of the strip to move the exit edge guides out of the paths of the wider portions of the strip and the strip to be moved therepast.

References Cited in the file of this patent

UNITED STATES PATENTS

1,979,413	Seft	Nov. 6, 1943
2,372,499	Kerner	Mar. 27, 1945
2,374,376	Olney	Apr. 24, 1945
2,447,884	Willous	Aug. 24, 1948
2,613,743	Bangerter	Oct. 14, 1952
2,619,172	Flittner	Nov. 25, 1952