March 13, 1945. C. J. RHODES 2,371,315

PRESS FOR CUTTING SHEET METAL

Filed Jan. 6, 1944 2 Sheets-Sheet 1

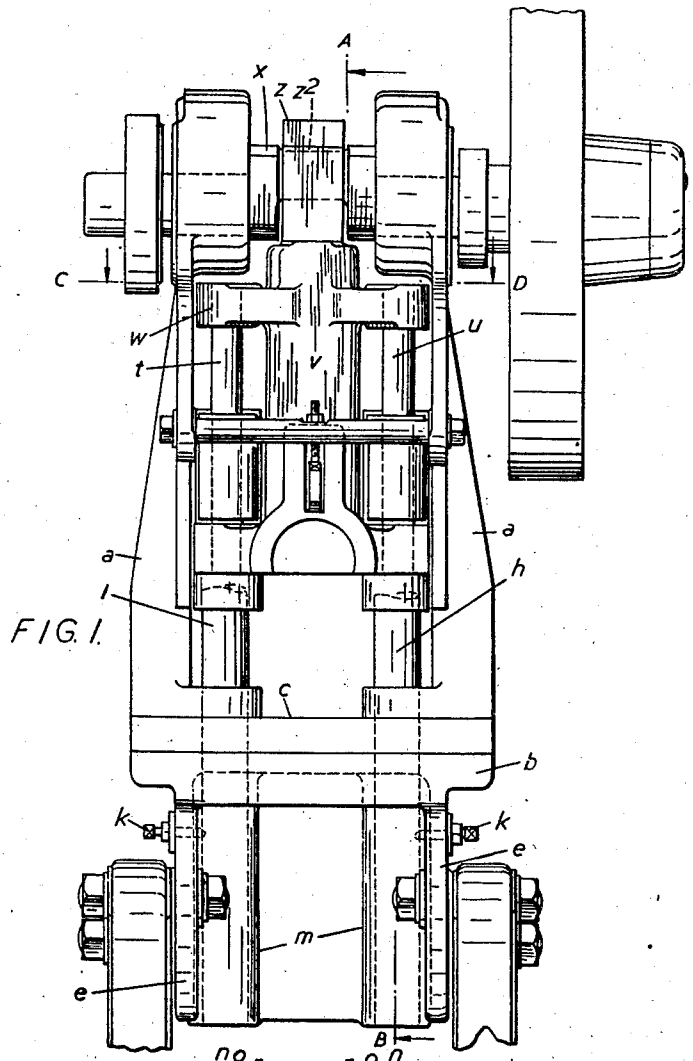

FIG. 1.

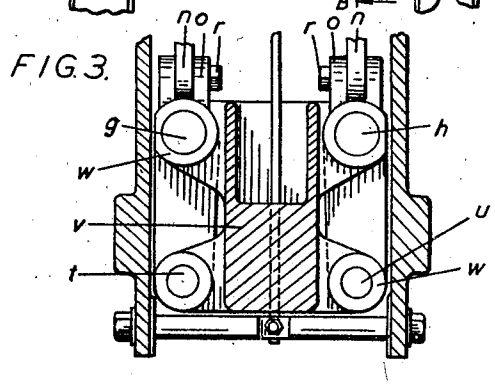

FIG. 3.

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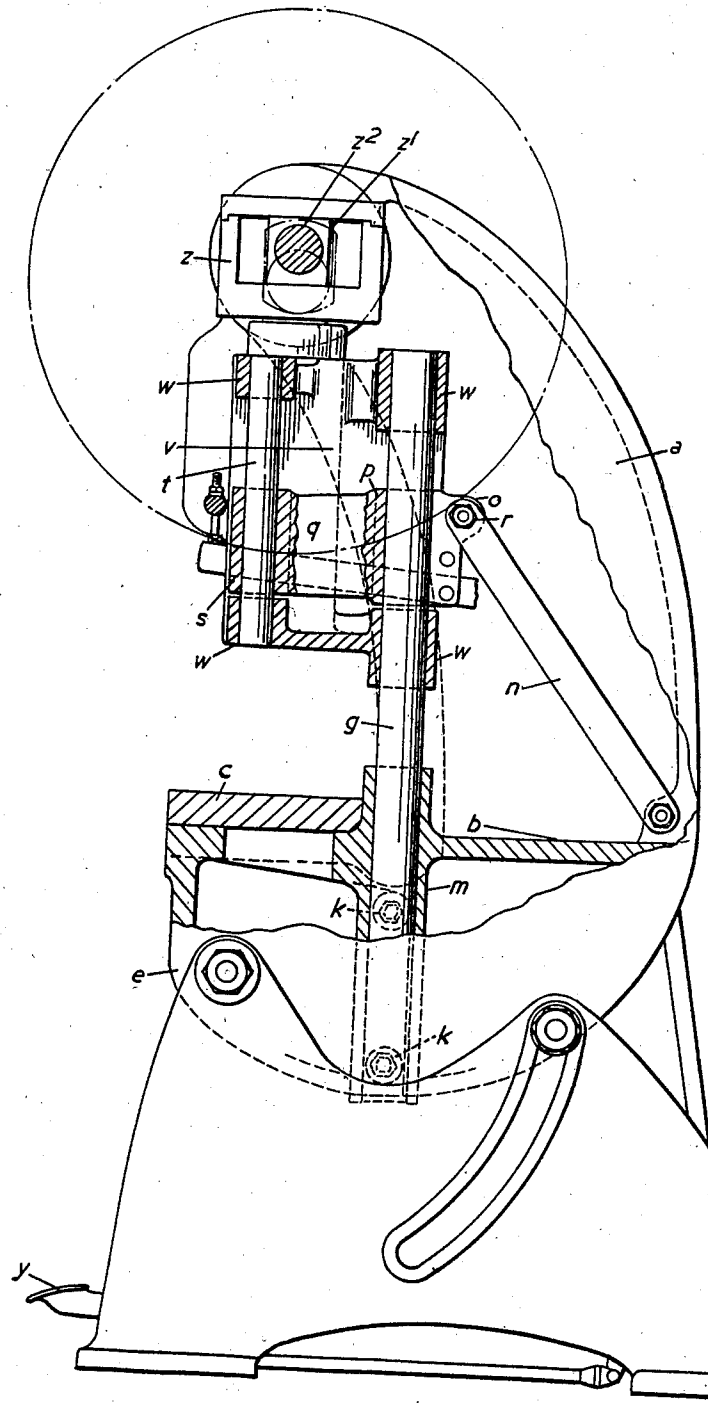

FIG.2.

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2,371,315

PRESS FOR CUTTING SHEET METAL

Charles Joseph Rhodes, Wakefield, England

Application January 6, 1944, Serial No. 517,241
In Great Britain July 26, 1943

10 Claims. (Cl. 164—102)

This invention relates to presses for cutting sheet metal and particularly to presses of the "open gap" or "overhanging" type. In presses of this type, due to the overhang, the frame is liable to "spring" or deflect to an appreciable extent under full load or pressure and to compensate for this deflection it is customary to so construct such presses that the surface of the work table and the face of the ram are slightly out of parallel, so that under full load or pressure the two faces lie in parallel planes. This expedient, however, has a deleterious effect on the cutting edges of the dies causing them to wear rapidly.

The main object of the present invention is to so construct a press of the "overhang" type as to obviate the "spring" or deflection of the frame being transferred to the ram so that the face of the ram and the surface of the table may be disposed absolutely parallel to each other and are so maintained throughout the stroke of the ram.

With this object, according to the invention instead of the ram sliding in the frame, as is the usual practice, it is constructed as an entirely separate unit, and is adapted to slide on supporting and guiding members extending above the work table but rigidly connected to, and supported by, the lower part of the press frame beneath the work table which is not subject to deflection under full load or pressure.

Moreover, as in a press of this type, the ram is operated from a crank by means of a coupling, in order to impart the usual reciprocatory motion to the ram, as a further feature of the invention means are provided for preventing oscillatory movement of the coupling so as to obviate any side thrust on the cylindrical slides guiding the ram during the operative down stroke of the ram.

In the accompanying drawings to which reference will now be made and in which similar reference characters relate to like parts in the three figures thereof:

Fig. 1 is a front elevation,

Fig. 2, a side elevation partly in section on the line A—B Figure 1, and

Fig. 3, a cross section on the line C—D Figure 1.

Referring to the drawings which only illustrate the parts of a press of the "open gap" or "overhanging" type that are necessary for the understanding of the invention, the reference letter *a* indicates the gapped and substantially C-shaped frame, the upper part of which overhangs the lower part *b* having depending wings *e* and supporting the work table *c*.

The lower ends of two vertical rods *g*, *h*, of suitable diameter to ensure rigidity are mounted in, and secured by set screws *k* to deep bosses *m* formed on the wings *e*. To prevent any vibratory movement of the rods *g* and *h* extending above the table *c*, they are supported by struts or stay bars *n*, the lower ends of which are attached to the frame *a* at the rear of the part *b* while their upper ends are secured by set screws *r* to lugs *o* on the bosses *p* of brackets *q* mounted on and fixed to the rods *g* and *h*. The brackets *q* are also provided with deep bosses *s* in which are slidable, two additional vertical rods *t*, *u* disposed parallel to the rods *g* and *h*. The ram *v* is mounted to slide on the two vertical rods *g*, *h* and supports the ends of the two rods *t*, *u* being formed for this purpose with lateral bosses *w* bored to receive the ends of the two rods. The rods *t*, *u* slide up and down in the bosses *s* by which they are guided. Hence both the front and back of the ram *v* are guided parallel to one another.

As the reciprocal movement of the ram *v* is effected in the usual manner by the crank *x* mounted in the upper part of the frame *a* of the press and operated by means of a coupling on actuation of the treadle *y*, and the ram *v* is not mounted in the frame, it will be obvious that any deflection of the frame is not transferred to the ram.

In order to obviate any side thrust on the four rods *g*, *h*, *t*, *u* during the operative downstroke of the ram *v*, the upper end of the ram *v* is provided with a rectangular frame *z* in which is slidably mounted a slipper *z1* that forms a bearing for the crank pin *z2* and is free for movement in the frame *z* transversely of the press. Thus any tendency of the coupling to oscillate is absorbed by the upper part of the frame and there is no side thrust on the ram guiding rods.

I claim:

1. In a press for cutting sheet metal the combination with a gapped and substantially C-shaped frame, a work table supported by the lower part of said frame and wings depending from said lower part of a slidable ram and means extending above the work table, and carried by said wings, to support and guide said ram in its sliding movement.

2. In a press for cutting sheet metal the combination with a gapped and substantially C-shaped frame and a work table supported by the

lower part of said frame and wings depending from said lower part, of a slidable ram and cylindrical members extending above the work table and carried by said wings to support and guide said ram in its sliding movement.

3. In a press for cutting sheet metal the combination with a gapped and substantially C-shaped frame, a work table supported by the lower part of said frame, and wings depending from said lower part of a slidable ram and a pair of guide rods extending above the work table and carried by said wings, to support and guide said ram in its sliding movement.

4. In a press for cutting sheet metal the combination with a gapped and substantially C-shaped frame and a work table supported by the lower part of said frame, of a slidable ram and a pair of vertical guide rods carried by said lower part below and extending above said table to support and guide said ram in its sliding movement.

5. In a press for cutting sheet metal the combination with a gapped and substantially C-shaped frame and a work table supported by the lower part of said frame, of a pair of vertical guide rods carried by said lower part below and extending above said table, brackets with bosses at one end in which said rods are fixed, a pair of vertical rods parallel to said first-mentioned vertical rods and sliding in bosses at the other ends of said brackets and a ram mounted to slide on the first pair of vertical rods and supporting the ends of the second pair of rods.

6. In a press for cutting sheet metal the combination with a gapped and substantially C-shaped frame and a work table supported by the lower part of said frame, and wings depending from said lower part, of a pair of vertical rods carried by said wings below and extending above said table, brackets with bosses at one end in which said rods are fixed, a pair of vertical rods parallel to said first-mentioned vertical rods and sliding in bosses at the other ends of said brackets and a ram mounted to slide on the first pair of vertical rods and supporting the ends of the second pair of rods.

7. In a press for cutting sheet metal the combination with a gapped and substantially C-shaped frame and a work table supported by the lower part of said frame, of a pair of vertical rods carried by said lower part below and extending above said table, brackets with bosses at one end in which said rods are fixed, means supporting said brackets and secured to the lower part of said frame, a pair of vertical rods parallel to said first-mentioned vertical rods and sliding in bosses at the other ends of said brackets and a ram mounted to slide on the first pair of vertical rods and supporting the ends of the second pair of rods.

8. In a press for cutting sheet metal the combination with a gapped and substantially C-shaped frame, a work table supported by the lower part of said frame and wings depending from said lower part, of a pair of vertical rods carried by said wings below and extending above said table, brackets with bosses at one end in which said rods are fixed, struts secured at one of their ends to said bosses and at their other ends to said lower part, a pair of vertical rods parallel to said first-mentioned vertical rods and mounted in bosses at the other ends of said brackets and a ram sliding to slide on the first pair of vertical rods and supporting the ends of the second pair of rods.

9. A press of the kind set forth comprising in combination a C-shaped frame, a work bed supported by the lower part of said frame, guiding and supporting rods extending above the level of said bed from parts of the frame below said bed, a ram sliding on said rods, and driving means for said ram supported by the upper part of said frame.

10. A press of the kind set forth comprising a main frame having a base portion and an upwardly extending curved arm, a work bed supported by said base portion, cylindrical ram guiding and supporting rods extending above said bed from parts of said base portion below said bed, a ram slidable along said rods towards and away from said bed, and driving means for reciprocating said ram carried by the free end of said curved arm.

CHARLES JOSEPH RHODES.