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HYDRAULIC PRESS

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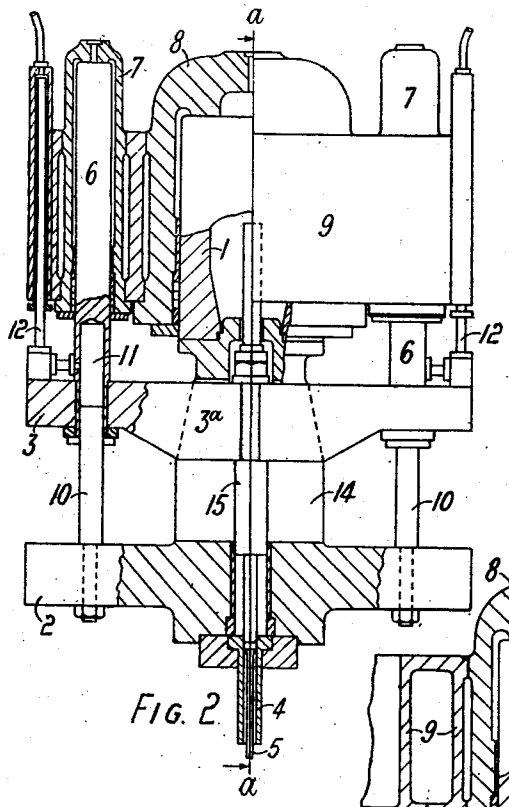


FIG. 2.

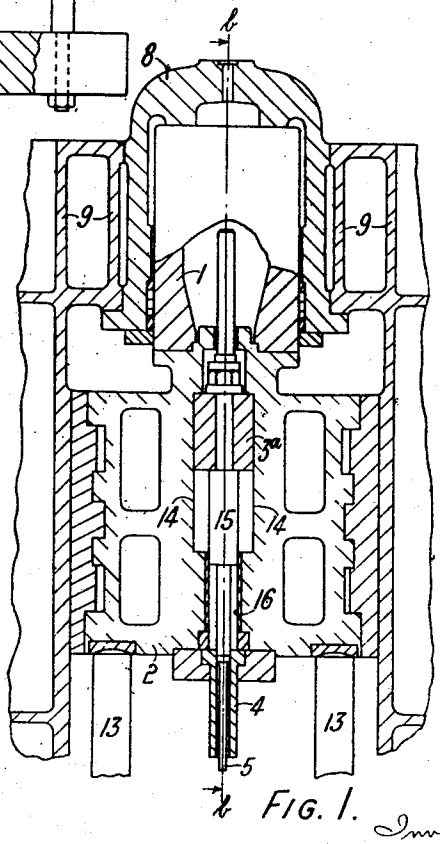


FIG. 1.

Inventors
Henry George Valentine Sentance
George Alexander Vincent Russell
By Pennie Davis Marvin & Edmonds
Attorneys

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HYDRAULIC PRESS

Henry George Valentine Sentance, Glasgow, Scotland, and George Alexander Vincent Russell, London, England

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2 Claims. (Cl. 207—3)

This invention relates to improvements in hydraulic presses of the type including a main tool or punch and an auxiliary tool or mandrel operable independently of the main tool or punch, and particularly to vertical type presses for the extrusion of metal tubes, bars and the like, and has for an object to provide an arrangement whereby a compact construction of press is obtained.

A hydraulic press according to the invention includes a main ram provided with a main crosshead and an independently movable auxiliary crosshead, the auxiliary crosshead being guided within the main crosshead and carrying an auxiliary tool or mandrel which passes through the main crosshead.

In a practical construction, the main crosshead carries a main tool or punch and the auxiliary crosshead carries an auxiliary tool or mandrel which may extend axially of the main tool or punch for the purpose of piercing a billet prior to extrusion thereof through a die-ring or the like, the work being supported below the main crosshead, i. e., on the side remote from the auxiliary crosshead.

A hydraulic press according to the invention is illustrated in the accompanying drawing in which Fig. 1 is a vertical section on the line *a*—*a* of Fig. 2, and Fig. 2 a part elevation part vertical section on the line *b*—*b* of Fig. 1.

The hydraulic press shown includes a main ram 1 provided with a main crosshead 2 in which moves an auxiliary crosshead 3 which is operable independently of the main crosshead 2 by a pair of auxiliary rams 6.

The crosshead 2 carries a main tool or punch 4 and the crosshead 3 carries an auxiliary tool or mandrel 5 which extends axially within the main tool 4 for the purpose of piercing a billet prior to extrusion thereof through a die ring or the like (not shown).

The auxiliary rams 6 work in fixed auxiliary cylinders 7 disposed one on each side of the fixed main overhead cylinder 8 accommodating the main ram 1, the cylinders 7 being carried by the usual frame structure 9 which carries the main cylinder 8. The crosshead 2 carries a pair of return rams 10 for the crosshead 3, said return rams 10 working in barrels constituted by bores 11 within the rams 6 and either directly connected to or valve-operated from a source of uniform pressure, say accumulator pressure, through telescopic supply pipes 12.

A pair of push-back rams 13 reciprocable in cylinders carried by or fixed to the base of the machine (not shown) act upwardly on the crosshead 2.

In operation, when fluid is exhausted from the cylinders (not shown) of the push-back rams 13, the main and auxiliary crossheads 2 and 3, respectively, descend together without relative movement of these crossheads, and the main and auxiliary ram cylinders 8 and 7, respectively, are filled with low pressure fluid from a prefiller or overhead tank. To effect operation of the auxiliary tool or mandrel 5, pressure fluid is admitted to the auxiliary cylinders 7 to act on the auxiliary rams 6, whereby to displace the auxiliary crosshead 3 downwardly relatively to the main crosshead 2, the main ram 1 meanwhile being, or not being, exposed to low pressure or accumulator pressure, as required.

The auxiliary crosshead 3 is unitary with a slipper 3a engaging opposed guide faces 14 within a central cavity in the main crosshead 2. An enlargement 15 of the spindle of the auxiliary tool or mandrel 5 is guided in a guide-forming bore 16 in the main crosshead.

We claim:

1. An hydraulic press comprising a main ram, a main crosshead movable with said main ram, guides for the ends of said main crosshead, a main tool carried by said main crosshead, said main crosshead having a central cavity presenting opposite parallel guide surfaces close to the axis of said main ram, an independently movable auxiliary crosshead including a central slipper portion unitary therewith and bearing on said guide surfaces of the main crosshead, auxiliary rams on opposite sides of said main ram for operating said auxiliary crosshead, return rams for said auxiliary crosshead, said return rams being carried by said main crosshead, and an auxiliary tool carried by said auxiliary crosshead and extending through said main crosshead.

2. An hydraulic press as claimed in claim 1 in which the auxiliary rams have bores, and the return rams carried by the main crosshead are reciprocable in said bores.

HENRY G. V. SENTANCE.
GEORGE A. V. RUSSELL.