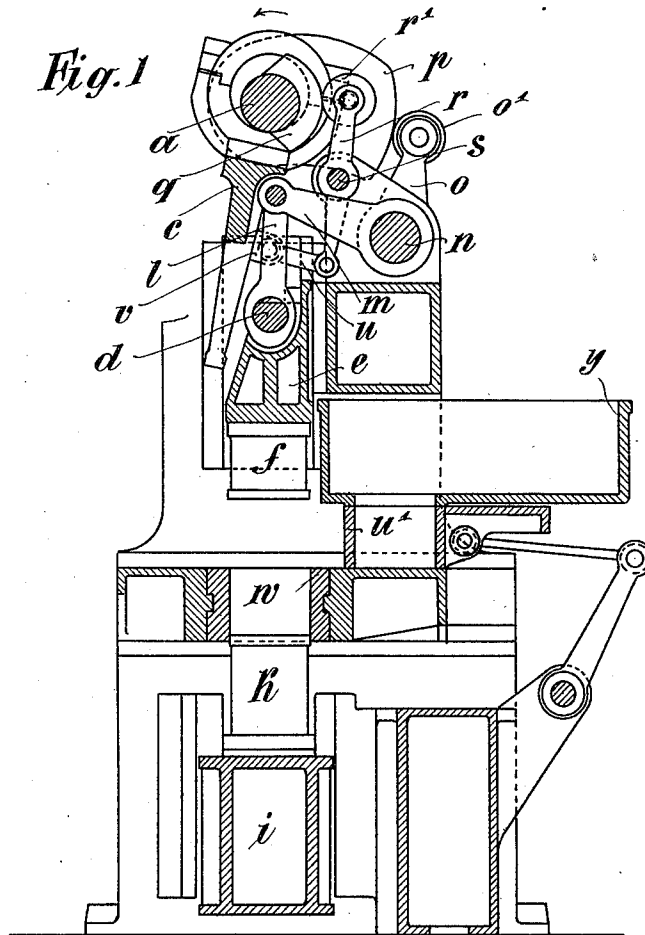


W. MÜLLER.
PRESS FOR MAKING BRIQUETS AND THE LIKE.
APPLICATION FILED JAN. 20, 1909.

1,029,817.

Patented June 18, 1912.

3 SHEETS—SHEET 1.



WITNESSES:

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INVENTOR

Walter Müller

BY

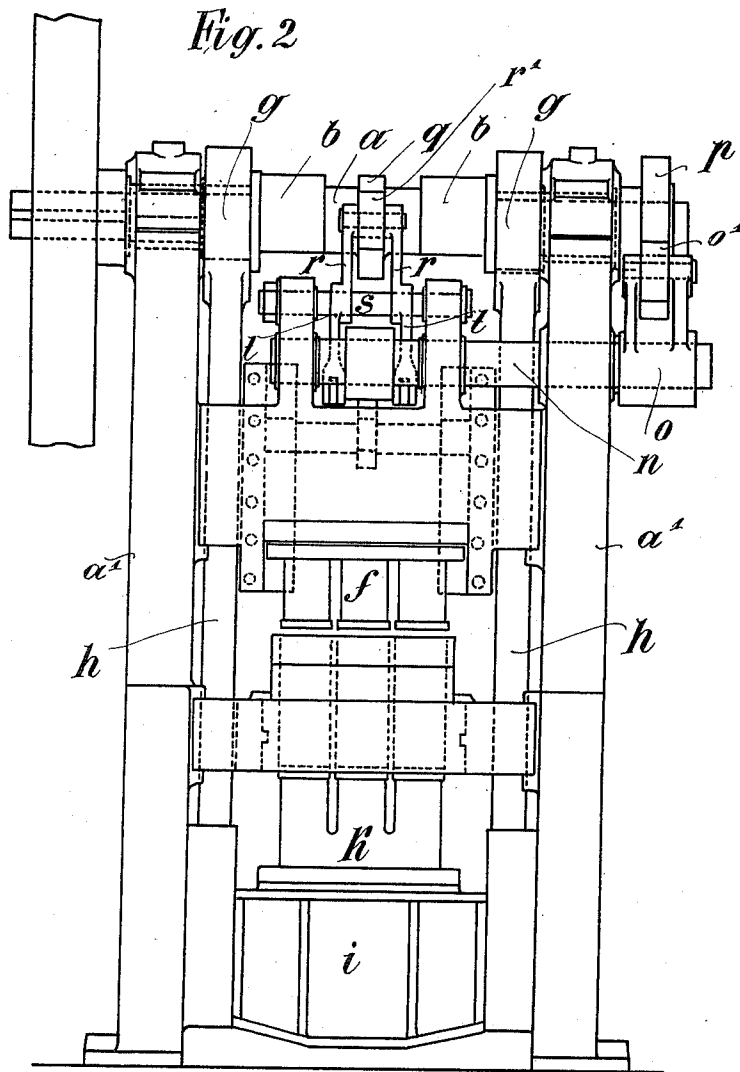
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3 SHEETS-SHEET 2.



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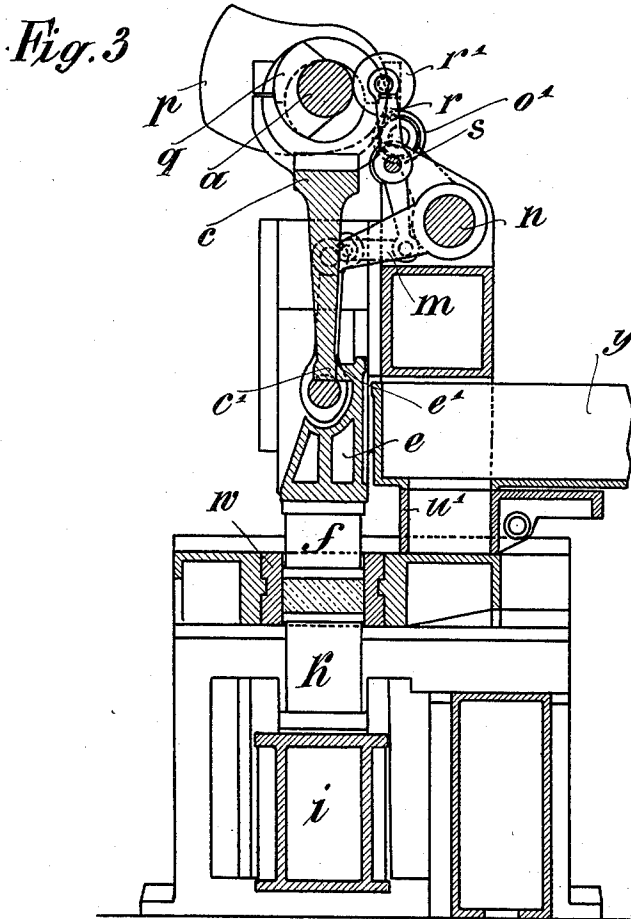
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

WALTER MÜLLER, OF GRUBE ILSE, LAUSITZ, GERMANY.

PRESS FOR MAKING BRIQUETS AND THE LIKE.

1,029,817.

Specification of Letters Patent.

Patented June 18, 1912.

Application filed January 20, 1909. Serial No. 473,312.

To all whom it may concern:

Be it known that I, WALTER MÜLLER, a subject of the German Emperor, and residing at Grube Ilse, Lausitz, Germany, have invented certain new and useful Improvements in Presses for Making Briquets and the Like, of which the following is a specification.

The subject-matter of the present invention is an improved press, for manufacturing briquets and the like, in which pressure is exercised simultaneously from above and below, the top stamp being intermittently disconnected.

Cam-presses and angle-lever presses in which pressure is exercised on the material to be pressed simultaneously from above and below are known in which the top stamp is moved rapidly independently of the motion of the remaining mechanism, in order to be able to throw out the briquets quickly and to re-fill the press-mold rapidly. For this purpose the top stamp slide, which can reciprocate between the two press-standards, is not connected positively with the pressing part of the driving shaft, but an intermediate member is used which, when thrown into gear corresponding to the action of the machine, connects the top stamp firmly with the pressing part of the driving shaft, whereas when it is thrown out of gear it allows the top stamp to rise or fall vertically independently of the pressing part of the driving shaft.

In presses known heretofore the connection between the driving shaft or angle-lever has been arranged in three parts for this purpose. In cam-presses the pressure from the driving shaft is transmitted through the driving head to an intermediate member and from the latter to the top stamp. In angle-lever presses the pressure is produced by the knee-joint or by a slide and is transmitted to an intermediate member and from the latter to the top stamp. In these systems of presses the driving head or top slide is firmly connected with the driving shaft or knee-joint and is therefore driven by the latter, whereas the bottom slide, which is firmly connected with the top stamp, is moved otherwise by a cam and levers. Independently of these two motions the intermediate member is also moved specially by a cam and an appertaining system of levers.

Now the present invention relates particu-

larly to a press, operated by eccentrics or cams, which presses the material from above and below simultaneously, and in which, after the pressure has been exercised, the rigid connection between the driving shaft and top stamp is likewise done away with, in order to lift the top stamp rapidly and to enable the briquets to be removed quickly and to re-fill the mold rapidly. This is not effected however, as heretofore, by an intermediate member being thrown into and out of gear, but by the bottom end of the downwardly lengthened pressing bearing of the driving shaft being caused to rest firmly on the slide which is rigidly connected with the top stamp. When throwing the top stamp out of gear, the bottom end of the pressing bearing is disconnected from the top stamp, said end being arranged revolvable around the driving shaft and being therefore able to rock.

In order that the invention may be clearly understood reference will be made to the accompanying drawings in which one constructional form of a press according to the invention is represented by way of example, and in which:

Figure 1 is a vertical section, Fig. 2 a rear elevation of the machine, whereas Fig. 3 is a vertical section showing the position of the mechanism in the normal working position.

Referring to the drawings the doubly cranked driving shaft *a* journaled in the press standards *a'* transmits the pressure for the top stamp *f* by means of the two eccentric pivots *b* to the forcing bar *c* and through the latter to the revolvable forcing pin *d* which is journaled in the slide *e* of the top stamp.

For the sake of clearness the forcing bar *c* is not shown mounted on its journals *b*, *b* in Fig. 2.

The bottom stamp *k* is pressed by the eccentric pivot *g* by means of the two connecting rods *h* and the bottom yoke *i* on which the bottom stamp is mounted, the eccentrics *b* and *g* being displaced 180° relatively to one another. The top stamp *f* and the slide *e* are reciprocated by the cam *p* by means of a system of levers comprising the connecting rod *l*, the bottom eye of which grasps the center of the pin *d*, the lever *m* connected with the rod *l* and fixed on the horizontally mounted axle *n*, and the lever *o* provided with a roller *o'* fixed on the axle

n, as clearly shown in the drawings. The forcing bar *c* which can rock around the two eccentrics *b* is driven by the tappet *g* arranged between the two bearings of the forcing bar *c* by means of a system of levers comprising the lever *rt* carrying the roller *r'*, the axle *s* carrying the latter lever, the two connecting rods *u* which connect the arms *t* with eyes *v* provided on the forcing bar *c*.

Now when material is being pressed the bottom end of the forcing bar rests on the round pin or bolt *d* which is journaled revolutely in the slide *e* and which is suitably flattened on the top, and thus transmits pressure from the driving shaft to the top stamp. By this construction, a proper engagement of the forcing bar *c* with a surface of material extent is insured. Should the lower end of the forcing bar at first engage one of the edges at the ends of the flattened surface, the pressure will turn the bolt or pin *d* about its axis until the entire flat surface of such pin engages the lower end of the forcing bar. Pressure will therefore be exerted upon this entire surface, and not along a single line. After the material has been pressed the forcing bar is rocked around the shaft to the front in a direction opposite to the direction of rotation of the driving shaft by means of the tappet *g* arranged on the shaft between the two bearings of the forcing bar and by the system of levers appertaining to the tappet, so that the bottom face of the forcing bar is disengaged from the face of the bolt in the slide *e* of the top stamp. The top stamp *f* is then raised by a system of levers by means of the cam *p* arranged outside the press-standards, so that the filling box *u'* can pass over the mold *w* to the front, firstly in order to push forward the briquets which have previously been raised and lifted out by the bottom stamp, and secondly in order to fill the mold with fresh material. When this has been done the filling box is pushed back again under the mixing box *y* for receiving fresh material, and the top stamp falls down freely as soon as the cam *p* and its system of levers allow of it, so that the top stamp compresses the material in the mold to a certain extent. Then as soon as the appertaining tappet admits of it, the forcing bar moves in the direction of rotation of the shaft in consequence of gravity and aided by the friction between the shaft and the bearings of the bar *c*, until the bottom rear shoulder *c'* at the end of the bar *c* abuts against the projection *e'* of the slide *e*. In this position the pressing face of the forcing bar *c* and that of the bolt or pin *d* are situated exactly one over the other and pressure can be transmitted from the eccentrics *b* to the top stamp. This arrangement has the advantage that no

part of the press can be fractured in the event of the top stamp not penetrating far enough into the mold when it falls freely, whether the mold is filled with too dry and therefore non-yielding material or whether a piece of iron or wood has got between the top stamp and the mold. If the top stamp has not penetrated at all or not deep enough into the mold, the bottom end of the forcing bar will not come onto the pressing face of the pin in the slide but will remain hanging in front of the slide. Neither pressure on nor a fracture of any part of the press will take place. On the other hand, if the forcing bar is not thrown into gear by its own weight aided by the friction in its bearings, but positively by cams and a system of levers, in the event of the bottom end of the forcing bar remaining suspended in front of the slide a fracture would inevitably take place. It is therefore disadvantageous to throw the forcing bar into gear positively.

What I claim as my invention and desire to secure by Letters Patent is:

1. The combination of a stamp-carrying slide, means for lifting the slide, a forcing bar, extraneous to said lifting means and movable into and out of engagement with the slide, means for actuating the forcing bar to exert downward pressure on the slide, and means for controlling the engagement of the forcing bar with the slide.

2. In a press of the character described, the combination, with the press-standards, and a shaft having eccentric portions journaled therein, of a slide carrying a stamp able to reciprocate vertically between said standards, a forcing member journaled on the eccentric portions of said shaft and adapted to rest on said slide, a tappet on said shaft, and a system of levers connected with said forcing member and adapted to be actuated by said tappet for removing said forcing member from said slide once for each revolution of the shaft which carries the forcing member.

3. The combination of a stamp-carrying slide, an operating shaft, a forcing bar movable into and out of engagement with the slide, mechanism operated by the said shaft and extraneous to said forcing bar, for lifting the slide, means operated by the shaft, for exerting a downward pressure on the slide through the forcing bar, and means, operated by the shaft, for controlling the engagement of the forcing bar with the slide.

4. In a press of the character described, the combination, with the press-standards and a shaft having eccentric portions journaled therein, of a slide carrying a stamp able to reciprocate vertically between said standards, a forcing bar journaled on the eccentric portions of said shaft and adapted to rest on said slide, means actuated by said shaft and connected with said forcing bar

for removing the latter from said slide, a cam on said shaft, and a system of levers, independent of said forcing bar connected with said slide and adapted to be actuated by said cam for reciprocating said stamp.

5 5. In a press of the character described, the combination, with the press-standards, and a shaft having eccentric portions journaled therein, of a slide carrying a stamp able to reciprocate vertically between said standards, a flat-topped pin journaled in said slide, a forcing member journaled on the eccentric portions of said shaft and adapted to rest on said pin, and means actuated by said shaft and connected with said forcing member for positively removing the latter from said pin.

6. The combination of an operating shaft, a lower stamp-carrying slide reciprocated positively by said shaft, an upper stamp-carrying slide, a forcing bar movable into and out of engagement with the upper slide, mechanism operated by said shaft and extraneous to said forcing bar, for lifting the upper slide, means, operated by the shaft, for exerting a downward pressure on the upper slide through the forcing bar, and means, operated by the shaft, for controlling the engagement of the forcing bar with the upper slide.

7. The combination of a lower stamp-carrying slide, mechanism for reciprocating it positively, an upper stamp-carrying slide, a forcing bar movable into and out of engagement with the upper slide, mechanism extraneous to said forcing bar, for lifting the upper slide, means for exerting a downward pressure on the upper slide through the forcing bar, and means for controlling the engagement of the forcing bar with the upper slide.

8. The combination of a stamp-carrying slide, means for lifting the slide, a forcing bar extraneous to said lifting means and movable into and out of engagement with the slide, means for actuating the forcing bar to exert downward pressure on the slide, means for controlling the engagement of the forcing bar with the slide, and operating members for the three aforesaid means, said members being connected to rotate at the same angular speed so that said means will be operated with equal frequency.

9. The combination of a stamp-carrying slide, a forcing bar mounted to rock into and out of engagement with the slide, means for actuating the forcing bar to exert downward pressure on the slide, mechanism, extraneous to said bar, for lifting the slide

means for rocking the forcing bar to control its engagement with the slide, and a shaft provided with individual operating members for the three aforesaid means, whereby each of said means will be operated once for each revolution of the shaft.

10. The combination of an operating shaft, a lower stamp-carrying slide reciprocated positively by said shaft, an upper stamp-carrying slide, a forcing bar loosely mounted on said shaft and adapted to move into and out of engagement with the said upper slide, means connected with the shaft for actuating the forcing bar to exert downward pressure on the said upper slide and lever mechanism operated by said shaft for swinging the forcing bar away from the upper slide after pressure has been exerted on the latter.

11. The combination of an operating shaft having an eccentric portion, a lower stamp-carrying slide reciprocated positively by said shaft, an upper stamp-carrying slide, a forcing bar mounted loosely on the said eccentric portion of the shaft and movable into and out of engagement with the said upper slide, lever mechanism operated by the said shaft for periodically swinging the forcing bar away from the upper slide and mechanism operated by the said shaft for periodically raising the upper slide at the time it is disengaged from the forcing bar and then allowing said slide to drop.

12. The combination of an operating shaft, a lower stamp-carrying slide operated thereby, an upper stamp-carrying slide, a forcing bar movable into and out of engagement with said upper slide, means operated by the said shaft for swinging the forcing bar away from the upper slide at a certain point of each revolution of said shaft, means operated by the said shaft for pressing the upper slide downward through the medium of said forcing bar and means, likewise operated by the said shaft, for lifting the upper slide at the time the forcing bar is disengaged from it.

13. The combination of a stamp-carrying slide, a flat-surfaced pin journaled in said slide, a forcing member adapted to engage the flat surface of said pin, and means for operating the forcing member.

In testimony whereof I affix my signature in the presence of two witnesses.

WALTER MÜLLER.

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT.