

G. T. EAMES.
ARBOR PRESS OR RAM.
APPLICATION FILED SEPT. 13, 1911.

1,038,543.

Patented Sept. 17, 1912.

4 SHEETS—SHEET 1.

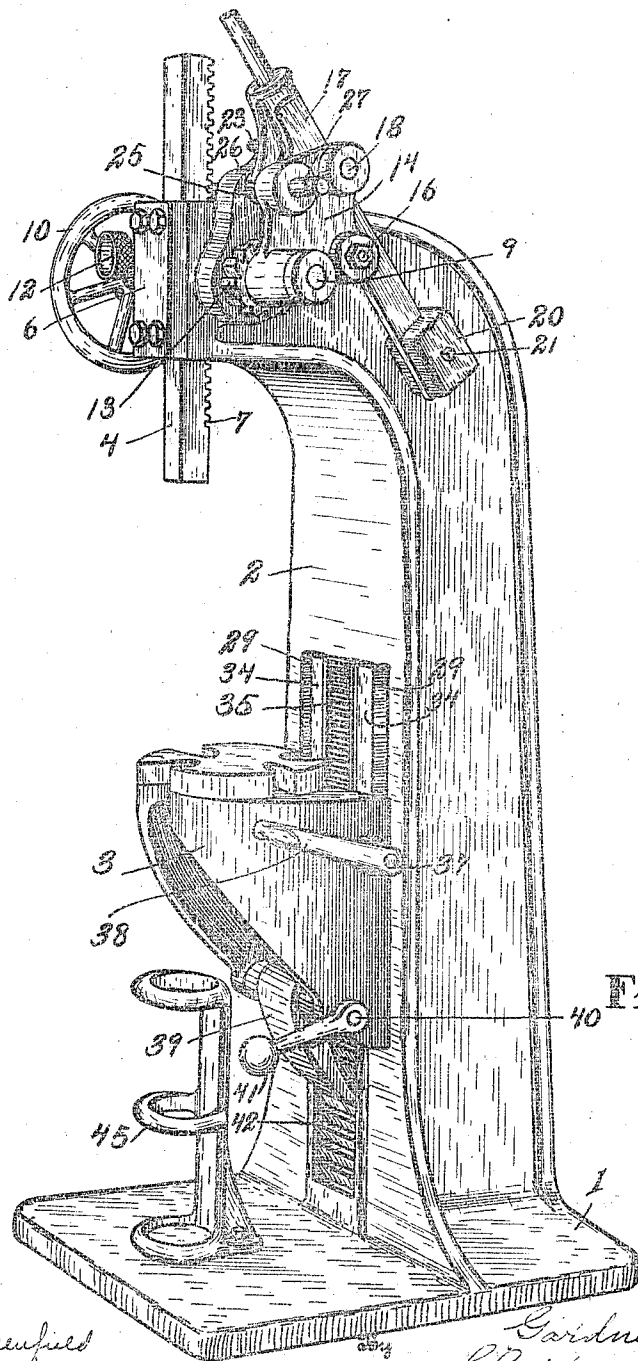


Fig. I.

Inventor

Witnesses

Laura Greenfield
Pearl Giblin

Gardner T. Eames
Charles Carl

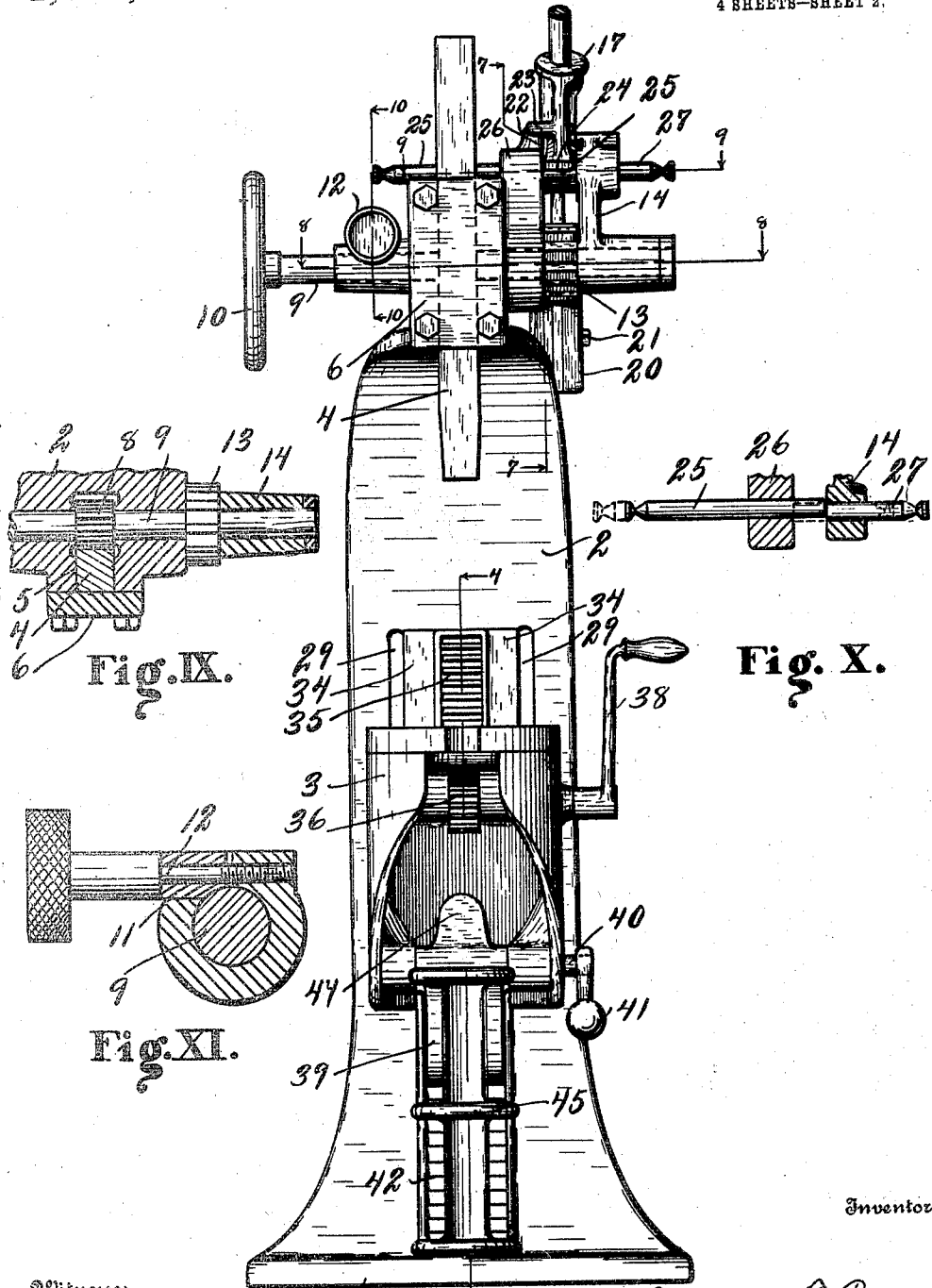
Attorneys

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4 SHEETS—SHEET 2.

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Witnesses
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Fig. II.

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4 SHEETS—SHEET 3.

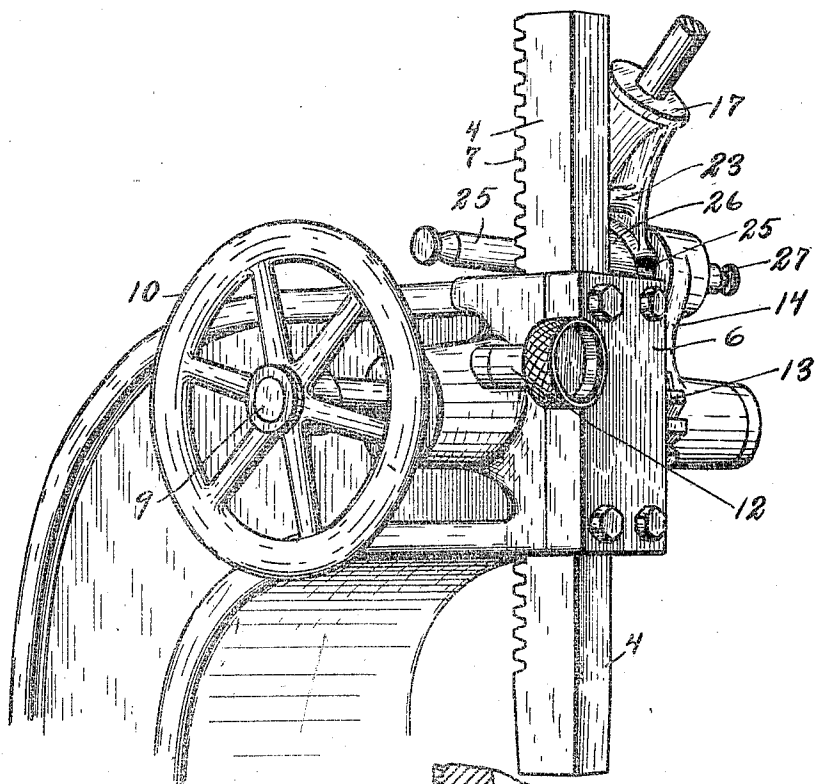


Fig. III.

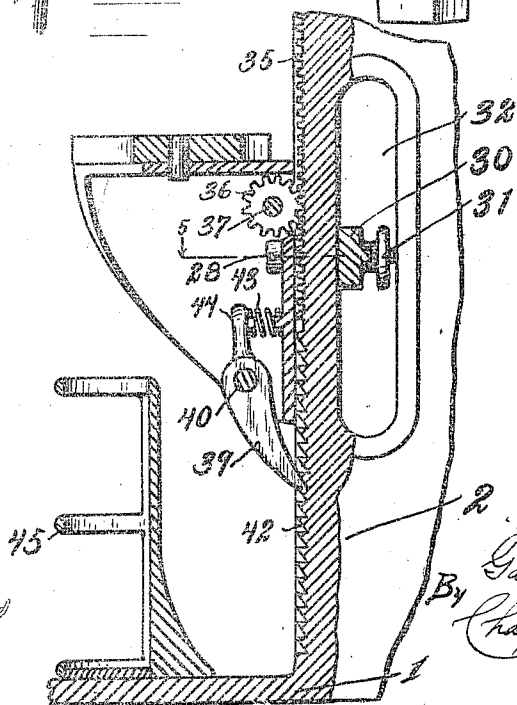


Fig. IV.

Witnesses

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Earl L. Lillie

Inventor

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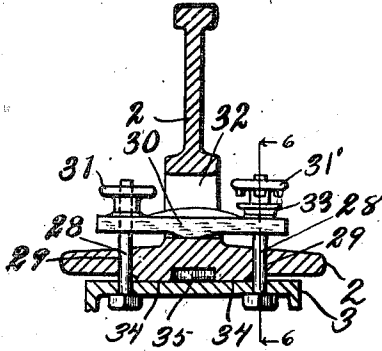


Fig. V.

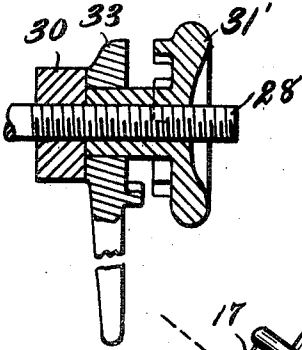


Fig. VI.

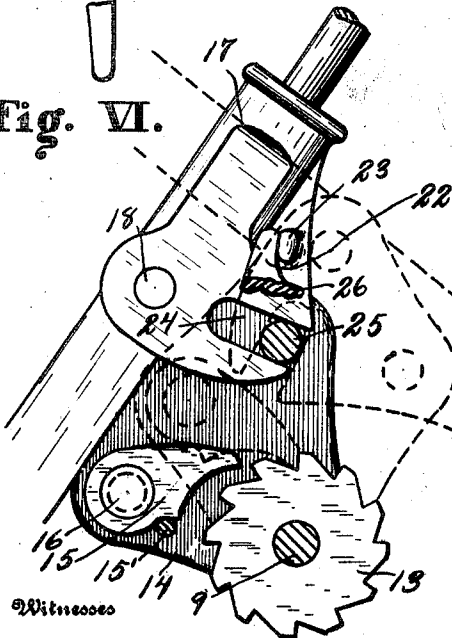


Fig. VII.

Witnesses

Luella Greenfield
Pearl Litch

384

Inventor
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Attorney

UNITED STATES PATENT OFFICE.

GARDNER T. EAMES, OF KALAMAZOO, MICHIGAN, ASSIGNOR, BY DIRECT AND MESSENGER ASSIGNMENTS, TO THE G. T. EAMES COMPANY, OF KALAMAZOO, MICHIGAN, A CORPORATION OF MICHIGAN.

ARBOR PRESS OR RAM.

1,038,543.

Specification of Letters Patent.

Patented Sept. 17, 1912.

Application filed September 13, 1911. Serial No. 649,158.

To all whom it may concern:

Be it known that I, GARDNER T. EAMES, a citizen of the United States, residing at the city of Kalamazoo, county of Kalamazoo, and State of Michigan, have invented certain new and useful Improvements in Arbor Presses or Rams, of which the following is a specification.

This invention relates to improvements in arbor presses.

The main objects of this invention are: First, to provide a quick acting arbor press of the rack and pinion type. Second, to provide an improved pawl and ratchet means for actuating the ram of an arbor press so that it can be operated fast or slow, with a corresponding variation of power. Third, to provide means of adjusting the table or work support for such an arbor press.

Objects pertaining to details and economies of construction will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure constituting an effective and preferred embodiment of my invention is clearly illustrated in the accompanying drawing, forming a part of this specification, in which:

Figure I is a perspective view of an arbor press, part of the operating lever being broken away. Fig. II is an enlarged front elevation view of the press appearing in Fig. I. Fig. III is an enlarged detail perspective view from the left hand side of the structure appearing in Fig. I. Fig. IV is an enlarged detail sectional view on a line corresponding to line 4-4 of Fig. II, showing details of the adjustment for the table and the receiver for the ejected arbor or shaft. Fig. V is a detail perspective view on line 5-5 of Fig. IV, showing details of the table clamp and adjusting means. Fig. VI is a detail sectional view on line 6-6 of Fig. V, showing details of the clamping means. Fig. VII is an enlarged detail elevation view from the right hand side of the ram operating ratchet means appearing in Fig. II, portions being broken away to show the details of construction and the operation of the parts

being indicated by dotted lines and the operation of the parts, etc. Fig. VIII is an enlarged detail sectional view, taken on a line corresponding to the irregular line 7-7 of Fig. II, of the ram operating ratchet means, the operation of the parts appearing by dotted lines. Fig. IX is a detail sectional plan view taken on a line corresponding to line 8-8 of Fig. II, showing the rack and pinion action and the ratchet mechanism. Fig. X is a detail sectional plan view taken on a line corresponding to line 9-9 of Fig. II, showing the adjustable pivot pins for shifting the ratchet from quick to slow, or vice versa. Fig. XI is an enlarged detail sectional view taken on a line corresponding to line 10-10 of Fig. II, showing the locking means for locking the ram in the elevated position, or in any other position desired.

In the drawing, the sectional views are taken looking in the direction of the little arrows at the ends of the section lines; and similar numerals of reference refer to similar parts throughout the several views.

Considering the numerals of reference, the improved mandrel or arbor press is supported on suitable base 1. A column 2 of general T-shaped cross section carries the overhanging head above and the adjustable work table 3 below. A ram 4 which is preferably square in cross section is supported in suitable ways 5, and is retained in position by cap 6. On the back of the ram 4 are rack teeth 7 which mesh with the pinion 8 by which the ram is controlled. The pinion 8 is carried by shaft 9 suitably journaled in the standard on the left hand end of which is a hand wheel 10 for manipulating the same by hand. The shaft 9 may be clamped in position by the clamp 11 controlled by the hand screw 12, to hold the ram in the elevated or any position desired, as clearly appears in Fig. XI. On the opposite end of the shaft 9 is a fixed ratchet wheel 13, controlled and acted upon by suitable ratchet pawl 15. This pawl 15 is carried by a carrier 14, which is journaled to oscillate upon the shaft 9. The pawl 15 is on pivot 16 on the pawl carrier 14. A stop pin 15' on the face plate 26 supports the pawl in the elevated position, when the lever 19 is raised and thrown back, and is de-

signed to throw the pawl out of engagement when the lever is so located. The lever socket or head 17 is pivoted or fulcrumed at 18 on the pawl carrier 14. A lever or handle 19 is adapted to insert into the same, and the socket is provided with a counter balance weight 20, which is adjustably secured in position by set screw 21. A lug 22 is on the face plate 26 on the side of the head, and coöperates as a stop member with the stop 23 on the side of the lever socket. A cam slot 24 is formed in this lever head 17 to coöperate either with the pin 25 or the pin 27 as the case may be, as will be hereafter definitely described.

In the position indicated in the drawing, the pin 25, which extends through a suitable aperture in the face plate 26, is embraced by the cam slot 24, and when the lever 19 is operated, this acts upon the pin 25 and pulls the pawl carrier 14 forward with a powerful pressure for a short distance, namely, the space of a single tooth. In the pawl carrier 14, and so that it abuts against the end of the sliding pin 25, is a sliding pin 27, parallel therewith but slightly offset so that the one pin cannot enter into the bearing hole of the other. When the pin 27 is pushed in, it crowds the pin 25 backwardly out of engagement with the cam slot 24, and as a consequence the lever head 17 is locked rigidly with the pawl carrier 14, and under such circumstances when the lever 19 is pulled forward, the ratchet will be operated on for the space of two or more teeth, making the same very rapid in its operation when compared with the single stop movement above referred to. With this device a detent pawl is not necessary, as the weight of the ram carries it down and thus there is no occasion for such a detent pawl, as there is no tendency to return. The rapid movement is with correspondingly decreased power, and the machine is thus well adapted for light work, which can be performed at high speed. When set for the slower speed, great power is exerted, making the machine efficient for heavy work, but at a lower rate of speed.

The table 3 of my improved mandrel or arbor press is secured adjustably in position against the vertical ways 34—34 by means of the bolts 28—28 which extend through the cross bar 30. The bar 30 is held by nuts 31—31' which clamp the bar against the front face of the slot 32 in the back rib of the standard. The wrench 33 is carried on nut 31', the parts being suitably formed to coact. By this means the parts are locked very securely in position.

A rack gear 35 is formed between the ways 34—34, and a pinion 36 is secured to transverse shaft 37 which is journaled in the table, meshes therewith. The pinion is operated by the crank 38 (see Figs. I and II),

thus making it very convenient to adjust the elevation of the table. A ratchet pawl 39 pointing downward engages the rack teeth 42 in the lower front portion of the standard 2, as clearly appears in Fig. IV. The pawl 39 is secured to the rock shaft 40, which is suitably journaled in the table and is hand operated by the weighted handle 41. A spring 43 is interposed under an extended finger 44 on the said pawl 39, and urges the same yieldingly into engagement with the rack. I provide a receiver 45 for the ejected mandrel or shaft that may be driven from a pulley or other part by the operation of my machine.

I have described my machine in the preferred form. I am aware that it can be considerably varied in its details without departing from my invention. I wish to claim the same broadly, and also specifically, as indicated in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In an arbor press, the combination of a suitable base and standard; ways in an overhanging head of such standard; a ram in said ways, with suitable rack teeth on one side; a pinion meshing with said rack; a pinion shaft journaled in the same frame; a hand wheel at one end of said shaft; a clamp for clamping the said shaft; a face plate on the standard; a ratchet wheel on the said shaft in proximity to the face plate; a pawl carrier journaled on said shaft; a pawl pivoted on the said carrier; a stop on the said face plate disposed to act upon the said pawl and throw it out of engaging position when the pawl carrier is thrown back; a lever fulcrumed on the pawl carrier, having a suitable slotted extension to one side; a pivot pin slidable in a suitable aperture in the face plate, disposed to be moved into the slot of the said lever for compounding the same in the actuation of the pawl carrier; a slidable pin parallel with the said pivot pin in the said pawl carrier, disposed to act against the end of the same to drive the said pivot pin out of position and to enter said slot for locking the lever in fixed relation to said pawl carrier; and a suitable adjustable table secured to the said column in position to coact with the said ram, substantially as described.

2. In an arbor press, the combination of a suitable base and standard; ways in an overhanging head of such standard; a ram in said ways, with suitable rack teeth on one side; a pinion meshing with said rack; a pinion shaft journaled in the same frame; a clamp for clamping the said shaft; a face plate on the standard; a ratchet wheel on the said shaft in proximity to the face plate; a pawl pivoted on the said carrier; means to disengage said pawl; a lever fulcrumed

on the pawl carrier, having a suitable slotted extension to one side; a pivot pin slidable in a suitable aperture in the face plate, disposed to be moved into the slot of the said lever for compounding the same in the actuation of the pawl carrier; a slidable pin parallel with the said pivot pin in the said pawl carrier, disposed to act against the end of the same to drive the said pivot pin out of position and to enter said slot for locking the lever in fixed relation to said pawl carrier; and a suitable adjustable table secured to the said column in position to coact with the said ram, substantially as described.

3. In an arbor press, the combination of a suitable base and standard; ways in an overhanging head of such standard; a ram in said ways, with suitable rack teeth on one side; a pinion meshing with said rack; a pinion shaft journaled in the same frame; a face plate on the standard; a ratchet wheel on the said shaft in proximity to the face plate; a pawl carrier journaled on said shaft; a pawl pivoted on the said carrier; means to disengage said pivot; a lever fulcrumed on the pawl carrier, having a suitable slotted extension to one side; a pivot pin slidable in a suitable aperture in the face plate, disposed to be moved into the slot of the said lever for compounding the same in actuation of the pawl carrier; a slidable pin parallel with the said pivot pin in the said

pawl carrier, disposed to act against the end of the same to drive the said pivot pin out of position and to enter said slot for locking the lever in fixed relation to said pawl carrier; and a suitable adjustable table secured to the said column in position to coact with the said ram, substantially as described.

4. In an arbor press, the combination of a suitable base and standard; ways in an overhanging head of such standard; a ram in said ways, with suitable rack teeth at one side; a pinion meshing with said rack; a pinion shaft journaled in the same frame; a face plate on the standard; a ratchet wheel on the said shaft in proximity to the face plate; a pawl carrier journaled on said shaft; a pawl pivoted on said carrier; means to disengage said pawl; a lever fulcrumed on the pawl carrier; means for locking said lever to said carrier; slidable contact means for said lever on said face plate and means for throwing it into and out of engagement with said lever; and a table disposed to cooperate with said ram.

In witness whereof, I have hereunto set my hand and seal in the presence of two witnesses.

GARDNER T. EAMES. [L. E.]

Witnesses:

LUELLA G. GREENFIELD,
MARGARET L. GLASGOW.