(No Model.)

J. H. SHERIDAN.

ARBOR PRESS.

No. 527,731. Patented Oct. 16, 1894.

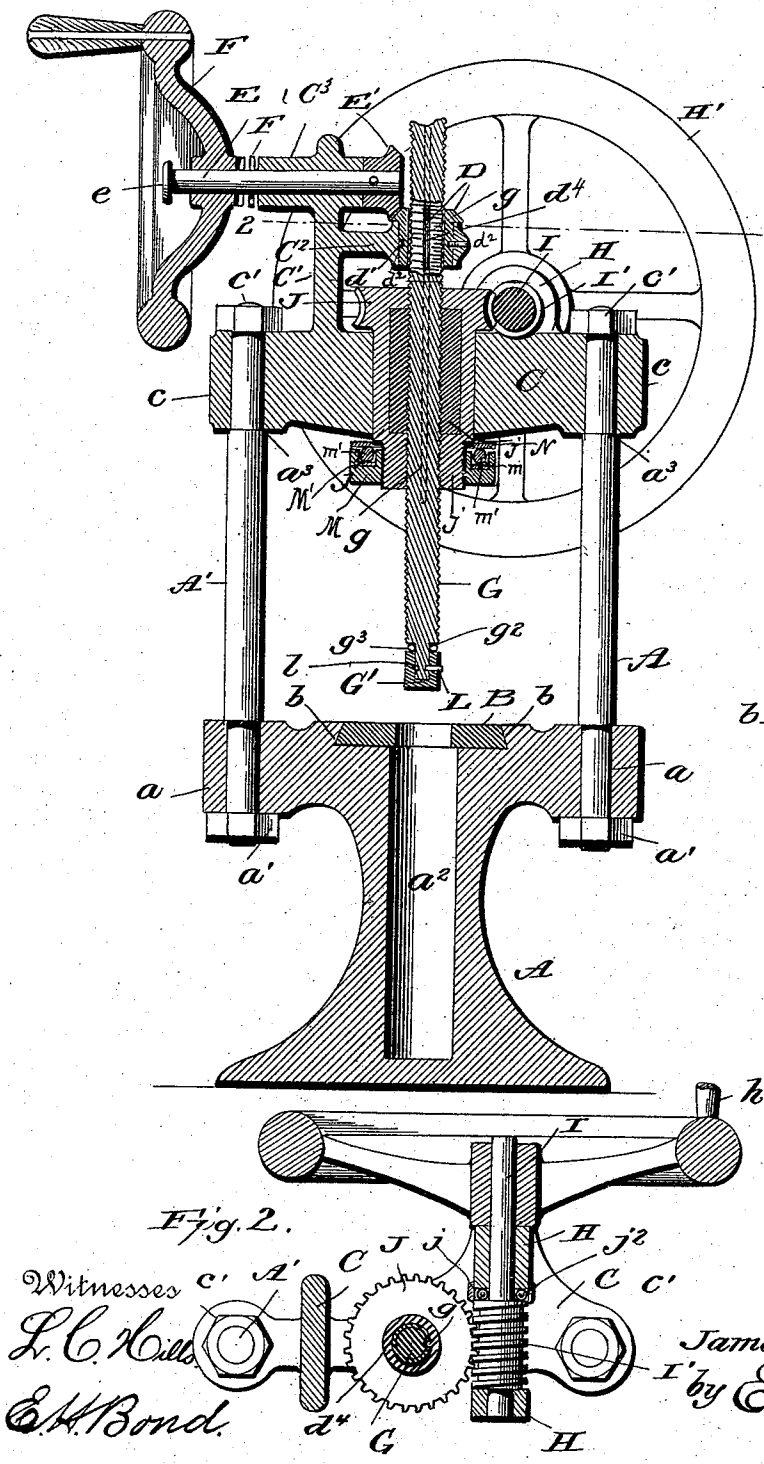

Fig. 1.

Fig. 3.

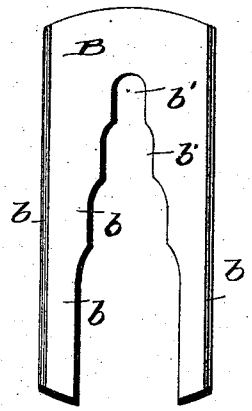

Fig. 2.

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UNITED STATES PATENT OFFICE.

JAMES H. SHERIDAN, OF FITCHBURG, MASSACHUSETTS.

ARBOR-PRESS.

SPECIFICATION forming part of Letters Patent No. 527,731, dated October 16, 1894.

Application filed January 6, 1894. Serial No. 496,003. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. SHERIDAN, a citizen of the United States, residing at Fitchburg, in the county of Worcester, State of Massachusetts, have invented certain new and useful Improvements in Arbor-Presses, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in arbor presses for driving mandrels and the like, and it has for its objects among others to provide a simple and cheap yet powerful press, of few parts, and having provision for the rapid return of the ram or hammer after it has performed its work.

The machine embodies a screw ram or driver operated for pressure by worm gear and a worm shaft, and, for a quick return, by bevel gear which may be readily thrown into or out of operative connection, it being thrown out of operation when it is desired to actuate the ram to produce the required pressure, and by simple clutch mechanism thrown into operative position. A bed plate is fitted in a dovetail recess in the base and is provided with a plurality of holes of different sizes for arbors of different sizes. This plate is adjustable in its groove or recess in the base and is held by frictional engagement. The operative end of the ram is provided with a detachable face which is held to the end thereof by a screw entering a groove in the end of the ram and balls are interposed between a shoulder on the ram and the upper end of the face.

Other objects and advantages of the invention will hereinafter appear and the novel features thereof will be specifically defined by the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a central vertical section through my improved press with portions in elevation. Fig. 2 is a cross section on the line 2—2 of Fig. 1, looking down. Fig. 3 is a top plan of the adjustable plate removed.

Like letters of reference indicate like parts throughout the several views.

Referring now to the details of the drawings by letter, A designates the base which is preferably substantially circular in form and at its upper end provided with the lugs or ears a as seen in Fig. 1 to receive the uprights A′ which are passed therethrough as seen and provided upon their lower ends with nuts a' bearing against the under sides of said lugs. This base is cast or otherwise provided with a central vertical opening a^2 as is shown in Fig. 1 and in the front is open to admit of a person putting in his hand to remove an arbor from the opening in the base. In the upper face of the base is a dovetail recess as seen in Fig. 1 in which is fitted to slide the plate B which is correspondingly beveled upon its edges as seen at b to fit the dovetail recess. This plate is adjustable in this recess, being held in its adjusted positions by friction. It has a plurality of different sized openings b' as seen in Fig. 3 to take in different sized arbors, the openings being always central with the screw or ram soon to be described.

C is a plate or yoke having the lugs c to receive the upper ends of the uprights A′ as seen in Figs. 1 and 2 and which uprights are provided at their upper ends with the nuts c', the lugs of the yoke being held between these nuts and the shoulders a^3 on the uprights. This yoke is formed with a vertical portion C′ which has a lateral portion C^2 which receives the hub d of the bevel gear D which is held therein as seen in Fig. 1, having a surrounding groove d' in which works the pin d^2 held in the said lateral portion, the outer end of which latter is enlarged to form a strong bearing for the gear, all as shown in Fig. 1. Above the lateral portion C^2 the vertical extension is formed with a lateral portion C^3 extending in the opposite direction to the portion C^2 and forming a bearing for the shaft E which, at its inner end, carries a bevel gear E′ which meshes with the bevel gear D as shown in Fig. 1. The outer end of this shaft is provided with a shoulder or head e as seen in Fig. 1 and upon this shaft is slidingly mounted a hand wheel F which is prevented from displacement by this shoulder or cap. A clutch F′ of any suitable construction is provided so that this hand wheel may be made to revolve with the shaft or independent thereof. As seen in Fig. 1 the clutch

is disengaged so that the shaft will revolve independent of the hand-wheel. When it is desired to connect the wheel with the shaft the wheel is pushed inward until the clutch is engaged when the wheel and shaft will be united and revolve together. The gear wheel D is provided with a passage therethrough as seen in Fig. 1 and the screw rod or ram G is passed freely through this passage as seen in Fig. 1, the rod being threaded its entire length and also provided with a longitudinal groove *g* as seen in Figs. 1 and 2 for a purpose which will soon appear.

On the upper face of the yoke C are the lugs or uprights H in which is journaled the worm shaft I carrying the worm I′ as seen best in Fig. 2, and provided at one end which is extended, with a fly wheel H′ provided with a handle *h* as seen in Fig. 2.

J is a worm gear mounted in a central opening in the yoke C and adapted to mesh with the worm I′ as shown in Figs. 1 and 2. It has a depending portion *j* which is filled with Babbitt metal as shown at *j*′ and the screw rod is threaded through this metal as seen in Fig. 1, the nut and worm gear being mounted for rotation but held against longitudinal movement in any suitable manner. The worm on the worm shaft is provided at the end with ball bearing as seen at j^2 in Fig. 2 to receive the end thrust.

The gear D has a key d^4 which fits in the spline of the screw rod or ram so that as it is revolved it runs the screw rod in or out of the nut of the worm gear.

The lower end of the ram or screw rod is provided with a removable face or step G′ as seen in Fig. 1, the end of the screw rod being reduced to form a shoulder g^2, between which and the upper end of the face are arranged balls g^3, the face being held to the reduced end of the screw rod by a small pointed screw L which enters an annular groove *l* in the reduced end as shown in Fig. 1. This allows the screw rod to revolve on the balls while the face remains stationary.

With the parts constructed and arranged substantially as above specified the operation is as follows:—When it is desired to drive the mandrel or arbor the plate B is adjusted to the size of the arbor, and the hand wheel F is moved outward on its shaft into the position in which it is shown in Fig. 1 so as to disengage the clutch, and the wheel H′ is turned to advance the screw rod or ram downward. When it is desired to move the screw rod or ram upward after the arbor or mandrel has been driven, the wheel F is moved inward on its shaft till the clutch is engaged and then the hand wheel is turned which gives motion to the bevel gear E′ and the gear D which moves the screw rod upward rapidly.

Modifications in detail may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages. I may employ a ball bearing for the thrust of the screw rod. I have shown such in Fig. 1 wherein M is a nut on a threaded extension j^4 of the hub portion of the worm gear, and the upper face of this nut is provided with an annular groove or recess *m* in which are located a train of balls *m*′ which rest upon a hardened steel plate M′ in the bottom of said groove or recess in the nut and upon the yoke or resting against the under side thereof is a hardened steel plate N. As the tendency of the screw rod is to raise up with the end strain the friction is overcome by the plate or ring bearing against the under side of the yoke and the train of balls. The wear upon the balls may be compensated for by the adjustment of the nut M.

What I claim as new is—

1. The combination with a base, having vertical opening and plate, of a yoke supported above and by the base, a worm shaft carrying a worm, a worm gear meshing with said worm, and a screw rod passed through the worm gear, in line with the opening in the base, as set forth.

2. The combination with the base having vertical opening and the yoke supported thereon, of the worm gear mounted for rotation in the yoke and having a depending hub recessed to receive Babbitt metal, a screw rod or ram threaded through said metal, in line with and adapted to enter said opening, means on the depending hub of the worm gear for taking end thrust and means for operating the screw rod, as set forth.

3. The combination with the yoke and the worm gear with its depending portion having threaded extension, of the nut engaging the threaded extension and having an annular groove, a plate between said nut and the under side of the yoke and balls in the groove of the nut between the same and said plate, substantially as and for the purpose specified.

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

JAMES H. SHERIDAN.

Witnesses:
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