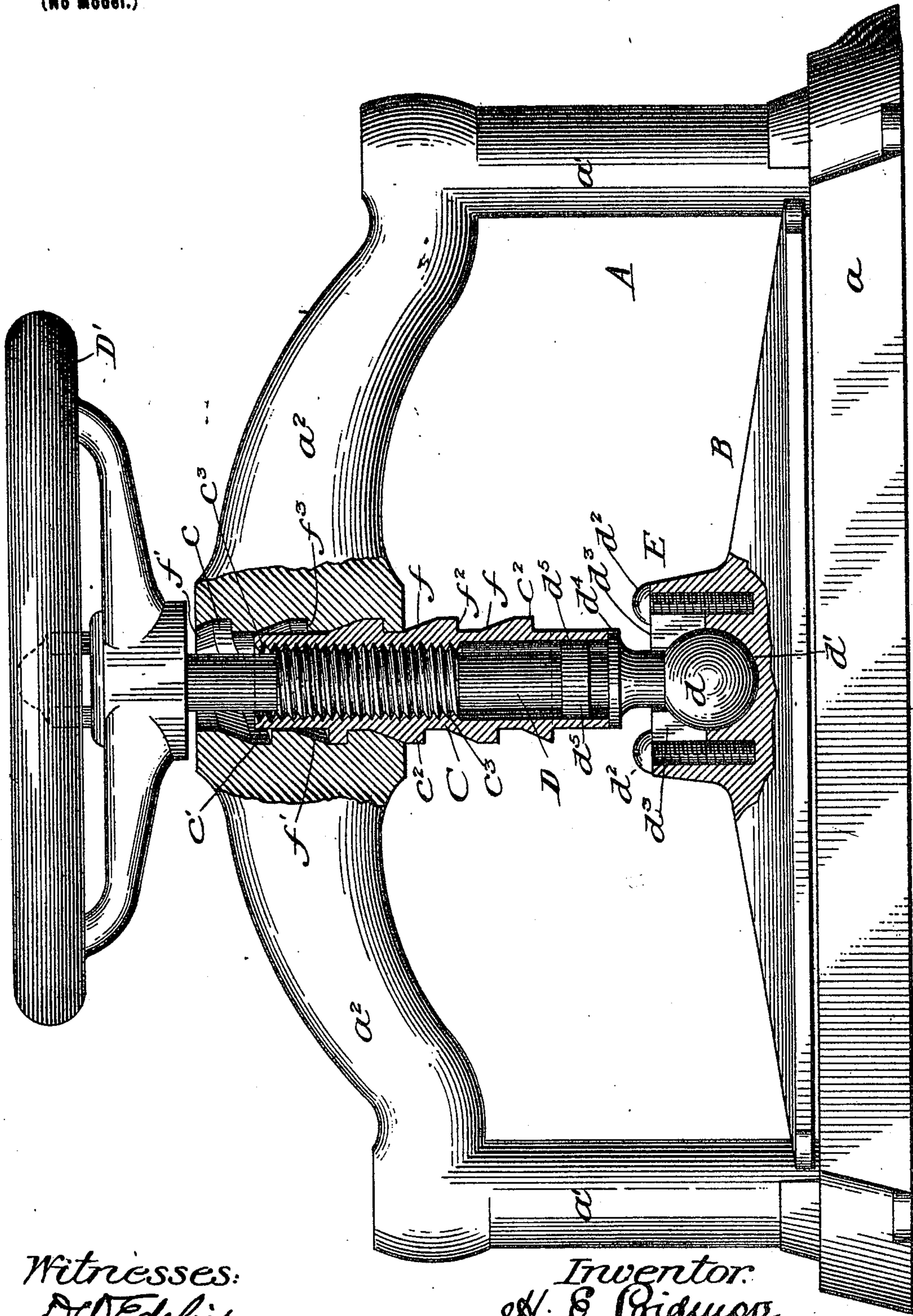


(Application filed Jan. 31, 1900.)

(No Model.)



Witnesses:
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UNITED STATES PATENT OFFICE.

HENRY E. PRIDMORE, OF CHICAGO, ILLINOIS.

PRESS.

SPECIFICATION forming part of Letters Patent No. 658,583, dated September 25, 1900.

Application filed January 31, 1900. Serial No. 3,513. (No model.)

To all whom it may concern:

Be it known that I, HENRY E. PRIDMORE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Presses; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to mechanisms for operating the platens of presses and is herein exemplified in connection with hand-operated copying-presses, though in view of the obvious adaptability of the improvements to other kinds of presses without intention to limit or restrict their application to any kind of press.

The advantage of having the follower or platen of a press move rapidly to the position where the object to be compressed is engaged and then to have a slower movement with increased power for effecting the compression has heretofore been recognized, and it has been proposed to employ differential screws for this purpose. So far as I am aware, however, the use of such screws has involved the employment of clutches of one kind or another for the purpose of securing the necessary co-operation between the screws to effect the differential movement of the platen. Such clutches are objectionable, for the reasons, among others, that they complicate the mechanism, require care and attention to keep them in proper working condition, and in many instances necessitate separate manipulation.

It is the object of my invention to overcome these objections and to produce a mechanism for operating the platen of presses which when running free of compressing action will travel with the quick flow of a simple screw of high pitch, but which when working against resistance will travel with slower speed and increased power without the use of a clutch; and to this end the invention consists of the parts and combinations to be hereinafter more fully described, and definitely pointed out in the claims.

In the drawing I have shown the invention as applied to a simple hand copying-press, parts of the same being broken away to more

clearly show the construction and relation of the mechanism within.

The press-frame A consists of any usual or suitable form of base a , from which rise the uprights or posts a' , preferably joined by the cross-arm a^2 . Sliding between and preferably guided by the uprights a' is the platen B, between which and the base a the object to be compressed is placed. The cross-arm a^2 is provided with a screw-thread c of high pitch, which is engaged by a corresponding exteriorly-screw-threaded sleeve C free to turn therein. As shown in the drawing, this thread has a pitch of about one to the inch. The exterior threads c^2 of the sleeve C are omitted from the upper portion c' to thereby form a guide in directing the up-and-down movement of the sleeve and prevent wobbling thereof. The interior surface of this sleeve is provided with a screw-thread c^3 of relatively-low pitch, which is engaged by the exterior threads of corresponding pitch on the spindle D, to the upper end of which is secured the hand-wheel D' in any suitable or usual manner, such that turning said hand-wheel will cause a corresponding movement of the spindle D. As herein shown, this thread has a pitch of about eight to the inch. The spindle D is continued beyond the lower end of the sleeve and is secured to the platen B in a manner to permit rotation of said spindle. In the form of connection shown I have provided the spindle with the enlarged head or ball d and the platen with a correspondingly-shaped hemispherical socket d' , in which said ball rests. Secured to the platen by the screws d^2 d^2 are the cap-pieces d^3 d^3 , which serve to retain the ball in the socket of the platen and cause the latter to rise and fall with the spindle, as will be obvious. While I have preferred to illustrate this form of ball and socket-joint between the spindle and platen, any form of connection which will permit the spindle to turn and yet carry the platen in its up-and-down movement may be employed.

Above the connection of the spindle and platen I preferably provide the former with a flange d^4 , which abuts against the sleeve C when the screw is reversed to lift the platen, as will be hereinafter referred to, and above this collar I preferably form on the spindle D a guide ring or collar d^5 to snugly fit the

smooth interior wall of the sleeve below the internal screw-threads c^3 , which may extend over only a portion of the interior of the sleeve. This ring d^5 serves to guide the sleeve and steady the same during manipulation of the screw, as will presently appear.

From the above it will be evident that in the absence of compressing action by the platen turning of the hand-wheel D' will through the threaded connection of spindle D and sleeve C cause the latter to turn and through its high-pitch thread connection with the cross-arm a^2 of the frame effect a rapid travel of the platen up or down, according to the direction of movement of the hand-wheel, the spindle D being meanwhile stationary with respect to the sleeve, and this action being due to the fact that the pitch of the thread c^2 is so much greater than that of the thread c^3 that there is greater friction between the spindle and the sleeve than there is between the sleeve and its bearing in the frame.

When an object is placed beneath the platen to be subjected to great compression, the sleeve is liable to back off by being turned under the wedging action of the high-pitch threads unless some provision is made to counteract this tendency, and I have therefore provided high-pitch threaded connection between the sleeve and arm a^2 of peculiar form. The exterior threads on the sleeve C have the upper portion thereof beveled, as at f , and the threads in the cross-arm a^2 have their upper portions correspondingly beveled, as at f' , the lower surfaces of such threads being of any usual or preferred form—as, for instance, perpendicular to the axis of the sleeve, as at $f^2 f^3$. Therefore when an upward strain is placed on the sleeve during compression the beveled surfaces of the threads are brought forcibly together, causing the wedging action thereby produced to increase the resistance to upward movement between the sleeve and its bearing sufficiently to prevent this without adding to the resistance to the downward movement, which should be as low as possible.

It will be noted that the sleeve C is of less length than the shaft D , which extends entirely through the sleeve, and that when the sleeve has carried the platen to the point of compressing action, and consequently becomes stationary the shaft projects a sufficient distance above the sleeve and cross-arm a^2 to permit movement of the shaft within the sleeve sufficient to accomplish the necessary compression without coming in contact with the upper end of the sleeve or cross-arm a^2 .

The operation of the device is as follows: An article to be compressed having been placed upon the base a beneath the platen the hand-wheel is turned. Owing to the fact that more force is required to turn the spindle in the sleeve than to turn the sleeve in its bearing, the sleeve begins to turn first and continues turning until the platen strikes the

article in the press, when the reaction of the platen increases the frictional resistance of the sleeve in its bearing to a point above that between the spindle and the threads on the interior of the sleeve. The sleeve then stops and the spindle begins to turn with respect to the sleeve, and any desired degree of compression may be exerted upon the article in the press. In this compressing movement the spindle has traveled lengthwise of the sleeve to some extent, bringing the flange d^4 some distance below the lower end of the sleeve. On turning the hand-wheel in the opposite direction to release the compression the sleeve is still held stationary by the wedging action of the bevel-faced threads and the spindle moves upward through the sleeve until the flange d^4 abuts against the lower end of the sleeve, when the latter is turned backwardly and caused to rise with the spindle.

Although I have herein shown the relation between the pitches of the sleeve and the spindle as one to eight, I do not desire to be limited to such proportion, it being only necessary that the pitch on the outer threads on the sleeve shall be so far greater than that of the threads on the spindle that the resistance between the spindle and the sleeve will be so far superior to that between the sleeve and its bearing as to cause the sleeve to turn first when the hand-wheel is revolved to lower the platen.

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

1. In a differential screw mechanism for presses, the combination of a screw-spindle having an operating-handle and revolubly connected with the press-platen, and a sleeve through which said spindle is threaded with a low pitch, the sleeve working with a high pitch in a correspondingly-threaded bearing in the press-frame, and the threads of the sleeve and its bearing in the frame having beveled upper surfaces.

2. In a differential screw mechanism for presses, the combination of a screw-spindle having an operating-handle and revolubly connected with the press-platen, and a screw through which said spindle is threaded with a low pitch, the sleeve working with a high pitch in a threaded bearing in the press-frame, and the threads of the sleeve being at such angle to the sleeve's axis as to present a greater bearing-surface on their upper sides.

3. In a differential screw mechanism for presses, the combination of a frame having a screw-thread of high pitch, a sleeve having an external thread of like pitch working therein, and provided with an internal thread of relatively-low pitch, a spindle having an operating-handle and an exterior thread corresponding to the internal thread of the sleeve and working therein, a platen to which said spindle is revolubly connected, and a flange on the spindle adapted to engage the lower end of the sleeve.

4. In a differential screw mechanism for presses, the combination of a frame having a screw-thread of high pitch, a sleeve having an external thread of like pitch working therein, and provided with an internal thread of relatively-low pitch, a spindle having an exterior thread corresponding to the internal thread of the sleeve and working therein, a platen to which said spindle is connected, and a guide ring or collar on the spindle within the sleeve, said sleeve having a plain unthreaded upper exterior portion.

5. In a differential screw mechanism for presses, the combination of a frame having a cross-bar provided with a screw-thread of high pitch, a sleeve having an external thread of like pitch working therein, and provided with an internal thread of relatively-low pitch, a spindle having a hand-wheel on its upper end above the cross-bar and provided with an exterior thread corresponding to the internal thread of the sleeve, and a platen to which said spindle is connected, said spindle

being of greater length than the sleeve and extending beyond the latter at both ends a distance sufficient to permit compressing movement of the spindle without contact of the hand-wheel with the frame or sleeve. 25

6. In a differential screw mechanism for presses, the combination of a sleeve having an external thread of high pitch working in a threaded bearing in a cross-bar of the press-frame, a spindle having an operating-handle above the cross-bar and revolubly connected to the press-platen below the bar, said spindle having an exterior thread of low pitch working through the threaded interior of the sleeve, and an abutment on the spindle with which the sleeve contacts when the spindle is reversed to raise the platen. 30 35 40

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

HENRY E. PRIDMORE.

Witnesses:

WM. H. FERGUSON,
CHAS. W. ALLEN.