

No. 612,408.

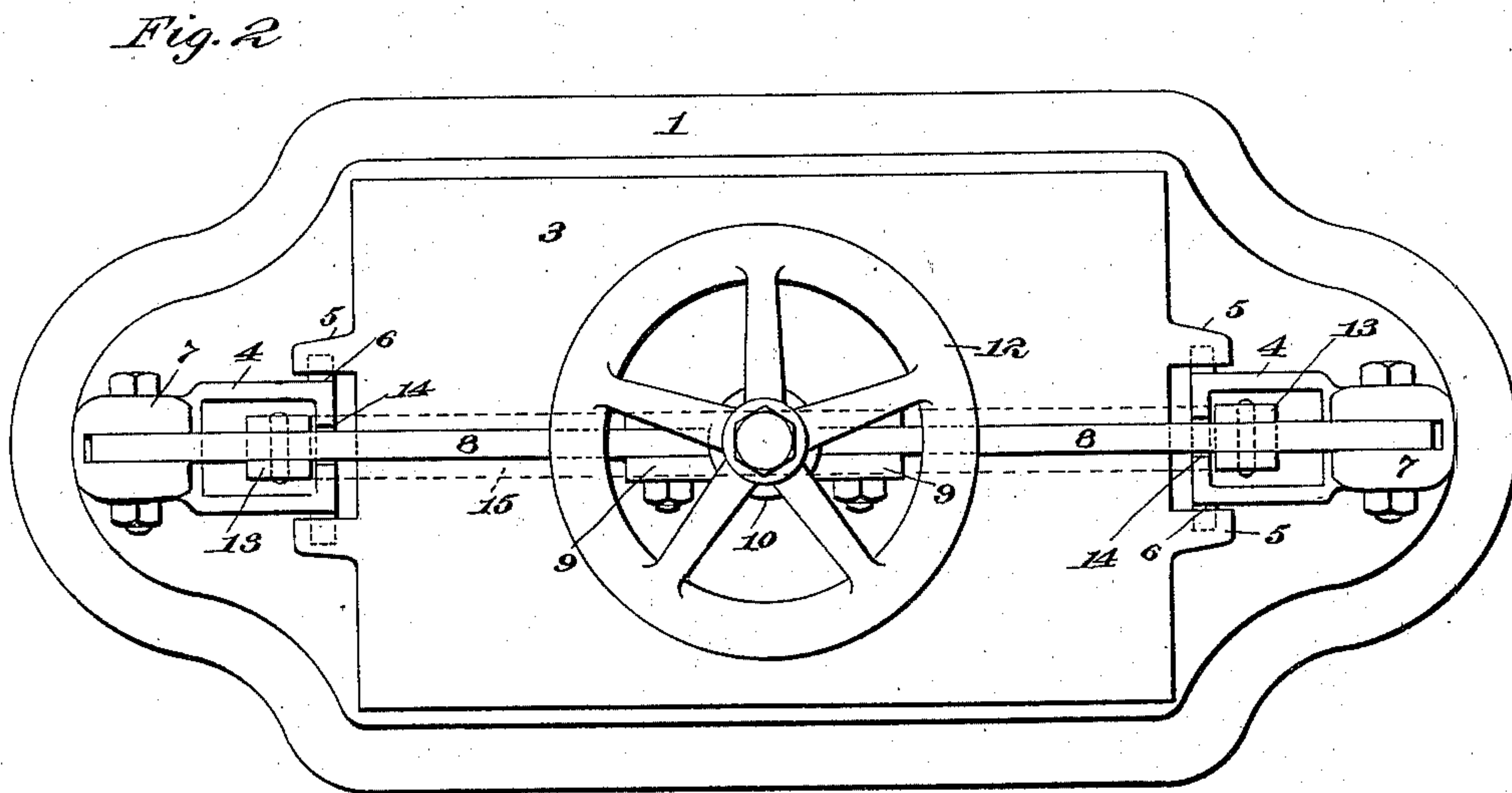
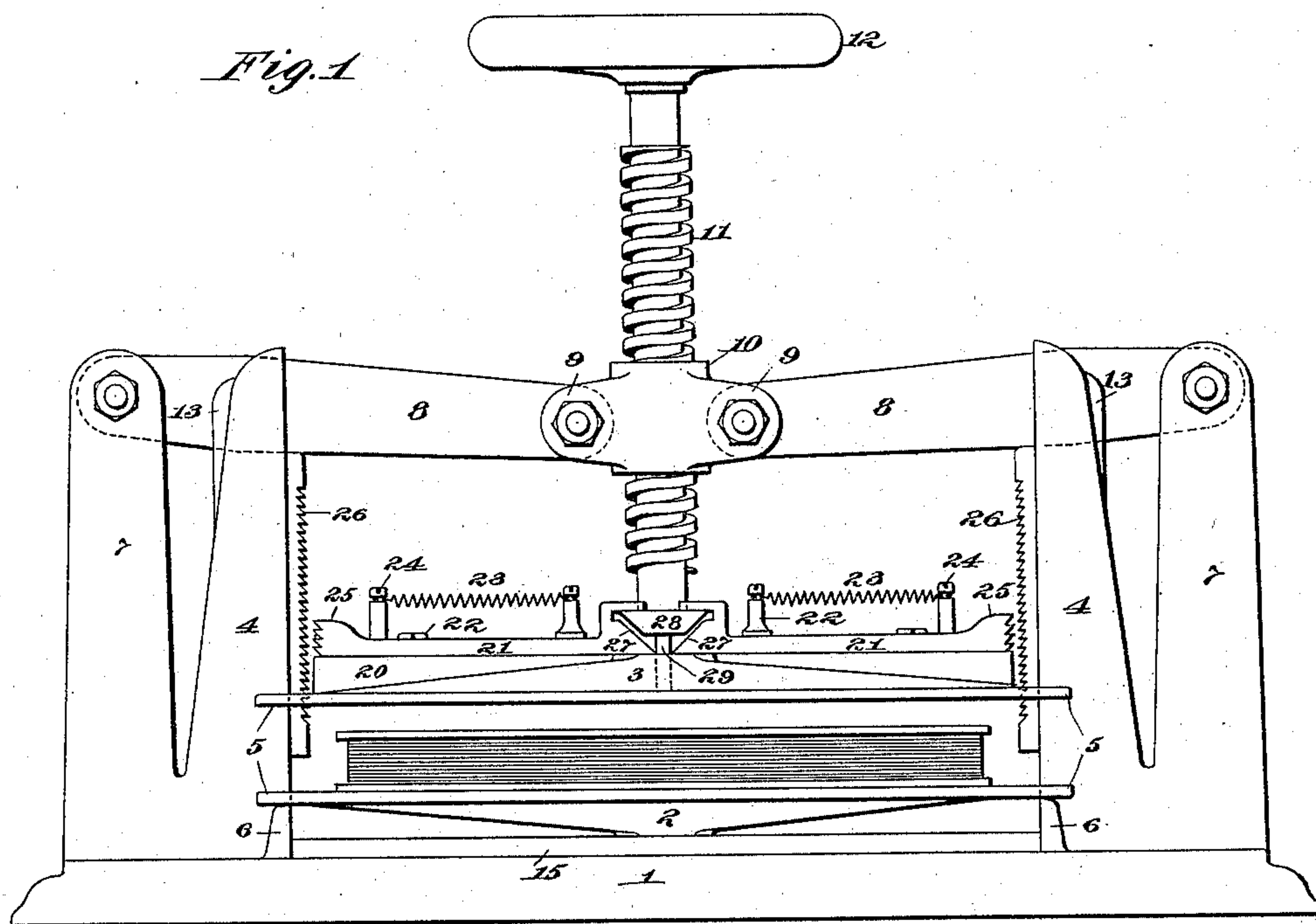
Patented Oct. 18, 1898.

A. B. DICK.
COPYING PRESS.

(Application filed Dec. 11, 1897.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses;

*Jas. F. Coleman
 Jno. R. Taylor.*

Inventor

*Albert B. Dick
 by Richard H. Ayer* Att'y.

No. 612,408.

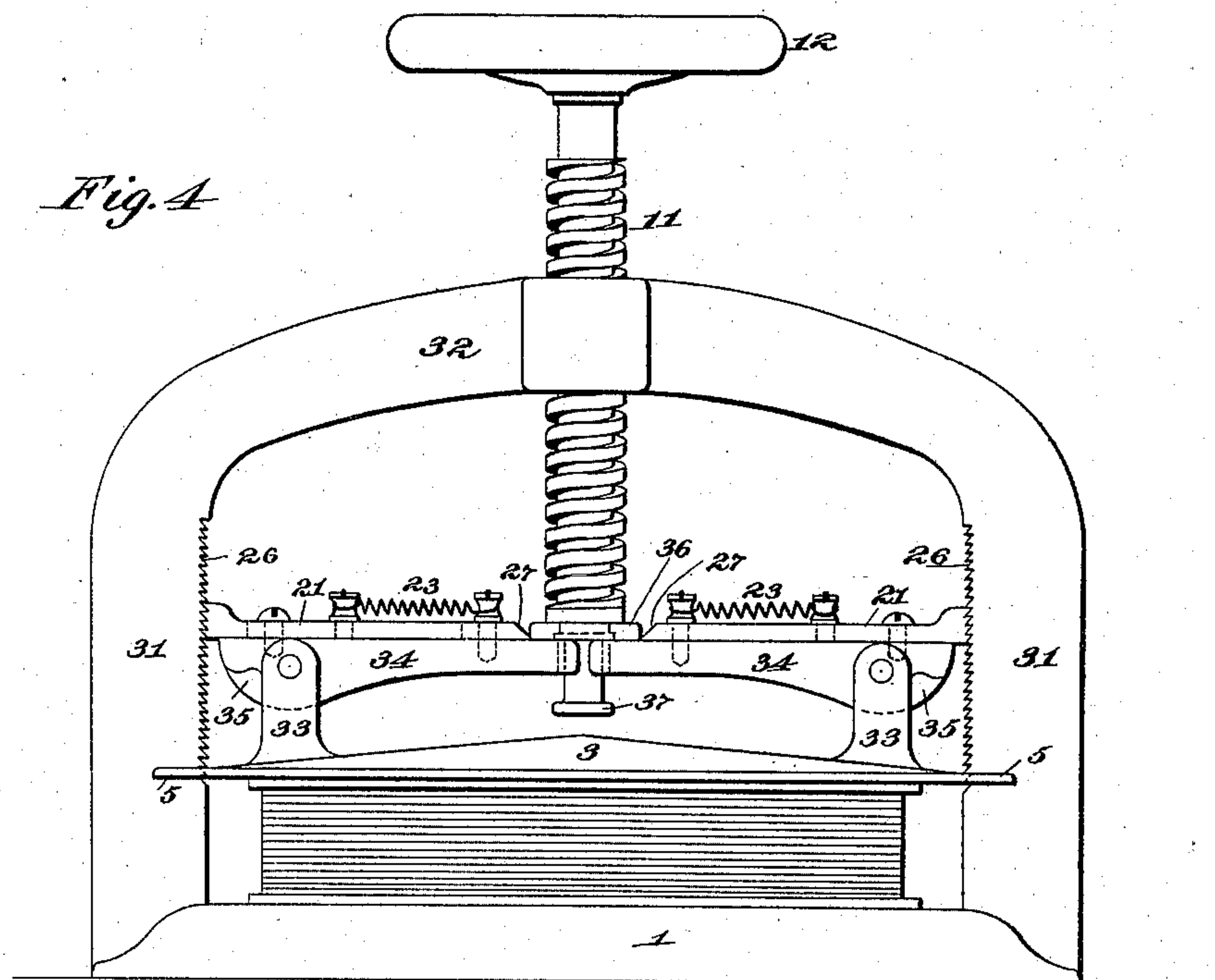
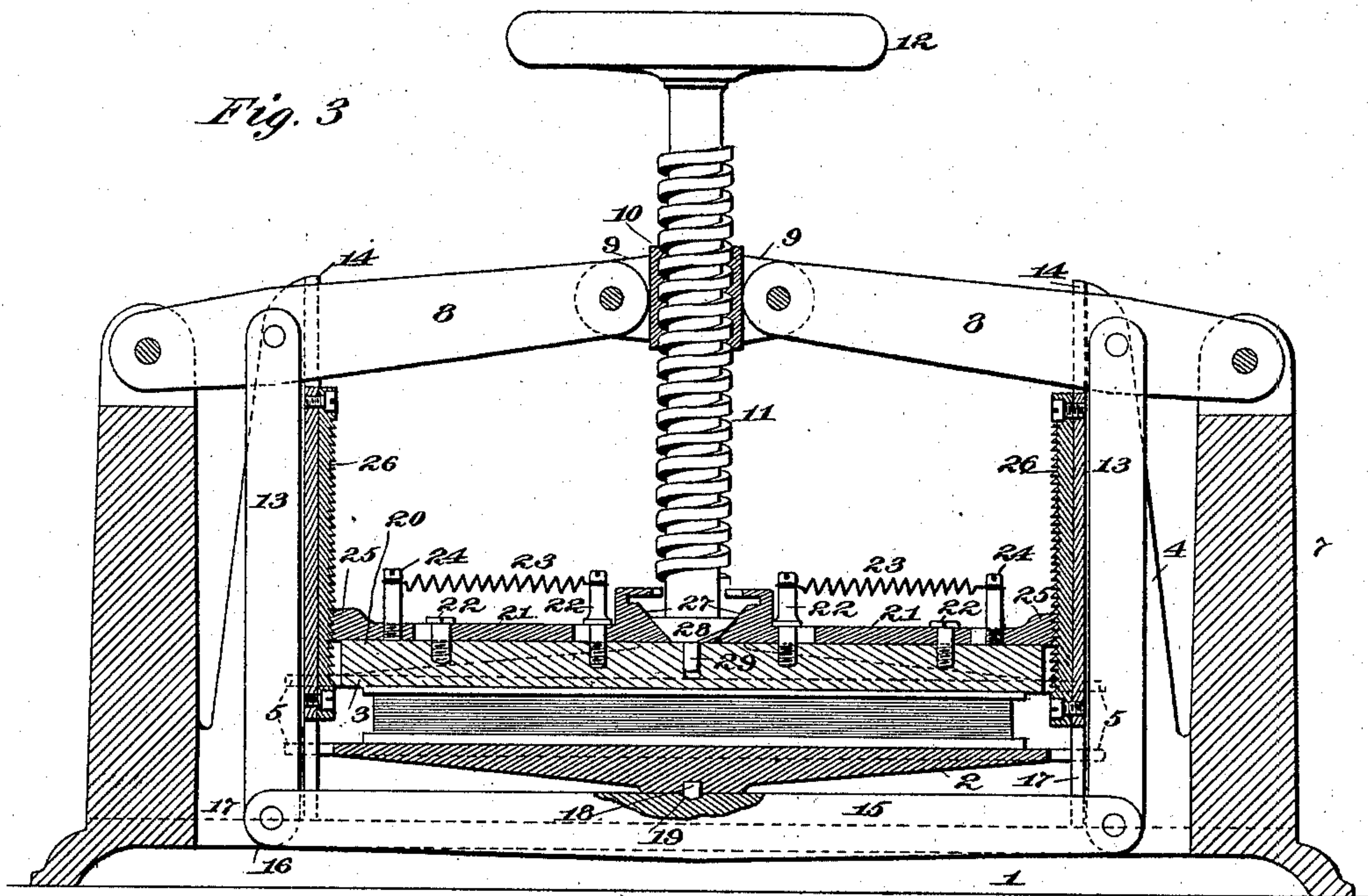
Patented Oct. 18, 1898.

A. B. DICK.
COPYING PRESS.

(Application filed Dec. 11, 1897.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses

Jas. S. Coleman
Jno. R. Taylor

Inventor

Albert B. Dick
by *Richard A. Ayer*
Atty.

UNITED STATES PATENT OFFICE.

ALBERT B. DICK, OF CHICAGO, ILLINOIS.

COPYING-PRESS.

SPECIFICATION forming part of Letters Patent No. 612,408, dated October 18, 1898.

Application filed December 11, 1897. Serial No. 661,509. (No model.)

To all whom it may concern:

Be it known that I, ALBERT B. DICK, 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 Copying-Presses, of which the following is a specification.

My invention relates to various new and useful improvements in copying-presses, and the particular type of such presses to which the invention refers is that employing a relatively stationary lower plate, an upper plate movable toward and away from said lower plate, and a hand-operated screw-shaft for effecting such movement of the upper plate.

The principal object of my invention is to improve the efficiency of copying-presses of this type by providing mechanism operated by a single hand-controlled element, such as the ordinary hand-wheel, and by means of which two distinct rates of movement of the plates relatively to each other may be provided for, the plates being approached toward each other at a relatively rapid rate of movement until the object to be compressed, such as the ordinary copying-book, is firmly engaged between said plates, and the plates being subsequently approached toward each other to compress said object at a relatively slow rate of movement, whereby a very much greater compressive effect may be produced upon said object with the same expenditure of energy, or the same compressive effect may be exerted upon said object with a very much smaller expenditure of energy, than is possible in those presses of the type referred to at present on the market.

Broadly stated, the invention consists of a copying-press of the type referred to having an upper and a lower plate movable relatively toward and away from each other and provided with means under the control of a single hand-operated element by which two distinct rates of relative movement of said plates may be obtained.

This broad invention is capable of being carried out by numerous mechanical arrangements of parts. Preferably, however, I provide for the relatively fast initial movement by operating the upper plate by the direct effect of the ordinary screw-threaded shaft, and I provide for the relatively slow rate of move-

ment by connecting the bottom plate with a sleeve operated by said shaft, said connection consisting of any suitable arrangement of levers by which the movement of said sleeve may be converted into a much smaller movement of the bottom plate, whereby a corresponding increase in the power communicated to said bottom plate will be effected. With this illustrative embodiment of my invention the parts will be so arranged that after the upper plate has been moved so as to engage the object to be compressed firmly between the two plates said upper plate will be automatically locked against upward movement, and the relatively slow upward movement of the bottom plate toward the upper plate will then be brought about. This locking of the upper plate, which may and preferably does take place automatically when the object is firmly engaged, can be conveniently effected by devices actuated from the single hand-operated screw-threaded shaft. This locking mechanism in the preferred type of my invention consists of a pair of dogs carried by the upper plate, each adapted to be moved outward into engagement with a toothed rack with respect to which the upper plate moves, said dogs being normally retracted from such engagement by means of springs and adapted to be engaged with said toothed racks by a cam-surface carried by the hand-operated screw-shaft and operating said locking-dogs when the resistance of the object to be compressed to the actuating effect of said screw-threaded shaft exceeds the resistance of said springs. Instead of communicating to the upper plate the relatively fast rate of movement and to the lower plate the relatively slow rate of movement it is possible to so construct the press that these two distinct rates of movement may be communicated to one of said plates, and in order that the scope of my invention may be understood I shall describe a modification thereof wherein this result is effected.

In order that the invention may be better understood, attention is directed to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a side elevation of the preferred form of copying-press; Fig. 2, a plan view thereof; Fig. 3, a longitudinal sectional view,

and Fig. 4 a side elevation of a modified arrangement wherein the two distinct rates of movement are communicated to the upper plate.

5 In all of the above views corresponding parts are represented by the same numerals of reference.

Referring to Fig. 1, 1 represents the ordinary bed-plate of a copying-press, made generally of a single casting and adapted to be screwed or otherwise secured to the top of a table or stand.

2 is the lower plate, and 3 the upper plate. Ordinarily the lower plate is stationary; but in the present form of my invention this plate is capable of a slow rate of movement relatively to the upper plate when the object to be compressed is firmly grasped between said plates and the upper plate has been locked against upward movement, as I shall explain.

4 4 are guides for both the upper and lower plates, said guides being either cast with the bed 1 or secured to the same in any convenient way. The upper and lower plates are provided with ears 5 5, which bear on each side of the guides 4 and by means of which both plates will be allowed to move vertically with respect to said guides. Normally the ears 5 of the lower plate rest upon supports 6, cast with the guides 4; but in operation the lower plate is adapted to be moved out of engagement with said supports and to approach the upper plate, as will be explained.

7 7 are standards which are cast with the bed-plate 1, but which may be separate elements secured to the same in any suitable way. Manifestly these standards may be dispensed with and be replaced by ears cast with the guides 4 4, as will be understood.

8 8 are levers pivoted at one extremity in the upper ends of the standards 7 7 and connected at their other extremities to lugs 9 9, cast with a collar 10. This collar is screw-threaded, and working within the same is the ordinary screw-threaded shaft 11, adapted to be operated by hand in any suitable way. I illustrate a hand-wheel 12, secured to the upper end of said screw-threaded shaft and by which it may be rotated.

13 13 are links which are connected to the levers 8 8 near the fulcrums of said levers in the standards 7, and in the preferred type of the invention illustrated these links are practically concealed by the guides 4 4, which are hollowed out for their reception. Said guides 4 4 are provided with slots 14 at their upper ends, within which work the levers 8 and by means of which also said levers will in a measure be guided in their plane of vertical movement. The lower ends of the links 13 are connected by a heavy connecting-bar 15, which extends beneath the lower plate 2, said connecting-bar working in a slot 16, formed in the bed-plate, said slot extending up into the guides 4 4, as at 17, to allow for vertical movement of said connecting-bar.

The lower plate 2 is provided at its central

bottom portion with a shallow lug 18, engaging a socket 19 in the connecting-bar, by reason of which when the lower plate has been elevated above the supports 6 said lower plate will be capable of a limited tilting movement to provide for any inequalities in the copying-book or other object to be compressed.

In order that the upper plate 3 may be locked against upward movement when the object to be compressed has been firmly engaged between the two plates, suitable means are to be provided, operated, preferably, automatically, but capable of being operated by hand. With automatic devices for this purpose they may be brought into operation by the screw-threaded shaft 11, and such devices are illustrated in the drawings. The upper plate 3 is provided on its upper surface with a flat horizontal guide 20, on which are mounted the two locking-dogs 21 21. These locking-dogs are secured in place by means of screws 22 22, engaging the upper plate 3 and working in slots in said locking-dogs, by which a limited movement of the latter may be allowed. One of said screws 22 for each locking-dog is provided with an upward extension, which extension is connected by a spring 23 with a stud 24, carried on each dog near its outer end. These springs 23 will normally keep the locking-dogs 21 in their retracted positions. The outer end of each locking-dog is formed with an enlarged head 25, having a plurality of teeth thereon, which teeth are adapted to engage with a toothed rack 26, rigidly secured to or formed integral with each of the guides 4. The inner end of each locking-dog is provided with an inclined cam-surface 27, these surfaces of the two dogs being therefore arranged relatively close together. Engaging these surfaces is a cone-shaped cam 28, carried near the lower end of the screw-threaded shaft 11. The extreme lower end of said shaft is formed into a cylindrical stud 29, which engages an opening in the upper plate and by which the said screw-threaded shaft will be kept in its proper vertical position.

In order that return movement of the vertical shaft may elevate the upper plate, the two locking-dogs are provided with overhanging lips, which normally are arranged directly above the upper surface of the cone-shaped cam 28, and which will be engaged by said cone-shaped cam when the movement of the screw-threaded shaft 11 is reversed to elevate the lower plate.

The operation of this the preferred form of my invention is as follows: Normally the lower plate 2 is stationary, the ears 5 5 thereof resting upon the supports 6. The upper plate is moved out of engagement with the lower plate and is supported by the lips 30, engaging the upper surface of the cone-shaped cam 28. The copying-book or other object to be compressed is now inserted between the two plates and rests upon the lower plate.

The hand-wheel 12 is now rotated, the screw-threaded shaft 11 working relatively to the collar 10 and allowing the upper plate to be moved downward until it engages with the copying-book or other object. Further rotation of the screw-shaft 11 serves to engage the cone-shaped cam 28 with the cam-surfaces 27 to force the upper plate into closer engagement with the object. When the resistance of the object to this actuating effect of the screw-threaded shaft 11 is greater than the resistance of the springs 23, the engagement between the cone-shaped cam 28 and the cam-surfaces 27 will cause the locking-dogs 21 to be moved outward, so that the teeth carried by said locking-dogs will engage racks 26. When this engagement takes place, upward movement of the upper plate will be prevented, said plate being firmly locked in its position. If, therefore, the shaft 11 is still rotated, the collar 10 is caused to be moved upward with respect to said shaft, thereby moving the levers 8 out of their normal horizontal position and, through the links 13, carrying the connecting-bar 15 upward, so as to move the lower plate toward the now stationary upper plate. Owing to the fact that the links 13 are connected to the levers 8 near the fulcrum of said levers, this movement of the collar 10 with respect to the screw-threaded shaft 11 will be correspondingly reduced upon the connecting-bar and the pressure applied to said connecting-bar will be correspondingly increased. In this way it will be seen that I provide for two distinct relative rates of movement of the two plates, which movements are effected by a single hand-operated device and preferably entirely automatically. It will be understood, however, although it will, of course, not be so convenient, that the locking of the upper plate in this form of my invention may be effected by hand—for instance, by moving the locking-dogs into engagement with the racks 26 by a small hand-lever when the upper plate has been brought into engagement with the copying-book or other object to be compressed.

While I prefer to provide for the relatively rapid movement of the compressing-plates by operating the upper plate with respect to the lower plate and to provide for the relatively slow movement of said plates by operating the lower plate relatively to the upper plate, it is possible to effect these two rates of movements in connection with a single one of said plates, and it is also possible to automatically provide for the relatively slow movement of said plate when the object to be compressed has been firmly engaged between the plates. In Fig. 4 I illustrate a form of device wherein these operations take place. With this modification the lower plate may be formed integral with the bed-plate 1, or, if it is desired that the lower plate should be capable of play to provide for inequalities in the object to be compressed, the said lower

plate may be supported on the bed-plate 1 by a lug similar to the lug 18. Extending up from the bed-plate 1 are the usual standards 31, which are connected across their upper ends by a bridge-piece 32, which may be integral with said standards. The standards 31 are provided with toothed racks 26, as in the preferred form of my invention. The upper plate 3 is provided with ears 55, by which it will be guided in its vertical movements. Carried by said upper plate are brackets 33, to which are pivoted the levers 34. Said levers are provided with stops 35, which engage with said brackets when the levers are in a horizontal position and by which the said levers will be prevented from moving upward out of that position, while they will be free to move downward. The said levers 34 carry locking-dogs 21 on their upper surfaces, which locking-dogs are mounted on said levers identically like the locking-dogs of the preferred construction, being normally retracted by springs 23. The screw-threaded shaft 11 is provided near its lower end with a collar 36, which is adapted to engage the cam-surfaces 27 of the locking-dogs and force said locking-dogs into engagement with the racks 26, as will be understood. The extreme lower end of the screw-shaft 11 is provided with an enlarged head 37, which engages, upon the return movement of said shaft, with the lower ends of the levers 34 to thereby elevate the upper plate 3. The operation of this modification will be readily understood. In the position shown the object to be compressed has been engaged by the upper plate 3, and the continued downward movement of the screw-shaft 11 has engaged the collar 36 with the cam-surfaces 27 to force the dogs 21 into engagement with the toothed racks 26. Further movement of the screw-shaft 11 causes the levers 34 to force the upper plate 3 downward with a very much increased pressure owing to the pivoting of said levers on the brackets 33 near their outer ends. Upon reversing the movement of the screw-shaft 11 the enlarged head 37 engages the lower ends of the levers and moves them to their horizontal position until the lugs 35 engage with said brackets. Further reversed movement of the screw-shaft withdraws the collar 36 from the cam-surfaces 27, allowing the locking-dogs to be retracted from their engagement with the toothed racks 26, whereupon the upper plate 3 may be further elevated from the object to be compressed by the engagement of the enlarged head 37 with the under side of the levers 34.

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

1. In a copying-press, the combination of the two plates for compressing the object, said plates being relatively movable toward and away from each other, a hand-operated element, connections between said hand-operated element for moving one of said plates

with a relatively rapid rate of movement, and means actuated by said hand-operated element for subsequently effecting a relatively slow movement of the other plate, substantially as set forth.

2. In a copying-press, the combination of the two plates for compressing the object, said plates being movable relatively, a hand-operated element, means actuated by said hand-operated element for effecting a relatively rapid movement of one plate, means actuated by said hand-operated element for effecting a relatively slow movement of the other plate, and means for automatically causing the slow rate of movement to be effected when the object to be compressed has been engaged by the two plates, substantially as set forth.

3. In a copying-press, the combination of the two plates for compressing the object, said plates being movable relatively, a hand-operated element, means actuated by said hand-operated element for moving one of said plates with a relatively rapid movement, means for locking said plates when the object to be compressed has been firmly engaged between the two plates, and means actuated by said hand-operated element for moving the other plate at a relatively slow rate of movement when the first plate has been locked, substantially as set forth.

4. In a copying-press, the combination of a lower plate, an upper plate, a screw-shaft for actuating the upper plate, a collar on said shaft, and connections between said collar and the lower plate whereby the lower plate will be moved at a relatively slow rate, substantially as set forth.

5. In a copying-press, the combination of a lower plate, an upper plate, a screw-threaded shaft for moving said upper plate, a collar on said shaft, connections between said collar and the lower plate for moving the latter at a relatively slow rate, and means for locking the upper plate against return movement, substantially as set forth.

6. In a copying-press, the combination of a lower plate, an upper plate, a screw-threaded shaft for moving said upper plate, a collar on said shaft, connections between said collar and the lower plate for moving the latter at a relatively slow rate, and means for automatically locking the upper plate against return movement when the object to be compressed has been engaged by said plates, substantially as set forth.

7. In a copying-press, the combination of a lower plate, an upper plate, a screw-threaded shaft for moving said upper plate, a collar on said shaft, connections between said collar and the lower plate for moving the latter at a relatively slow rate, and means for automatically locking the upper plate through the instrumentality of said screw-threaded shaft, substantially as set forth.

8. In a copying-press, the combination of a lower plate, an upper plate, a screw-threaded

shaft for operating said upper plate, a collar on said shaft, connections between said collar and the lower plate for moving the latter at a relatively slow rate, locking-dogs on the upper plate, and means for operating said locking-dogs, substantially as set forth.

9. In a copying-press, the combination of a lower plate, an upper plate, a screw-threaded shaft for operating said upper plate, a collar on said shaft, connections between said collar and the lower plate for moving the latter at a relatively slow rate, locking-dogs on the upper plate, and means for automatically operating said locking-dogs when the object to be compressed has been engaged by said plates, substantially as set forth.

10. In a copying-press, the combination of the lower plate, the upper plate, a screw-threaded shaft for operating said upper plate, a collar on said shaft, connections between said collar and the lower plate for operating the latter at a relatively slow rate, locking-dogs on the upper plate, and a cam on said screw-threaded shaft for actuating said locking-dogs when the object to be compressed has been engaged by said plates, substantially as set forth.

11. In a copying-press, the combination of the lower plate, the upper plate, a screw-threaded shaft for operating said upper plate, a collar on said shaft, a pair of levers connected to said collar, links depending from said levers near the fulcrums thereof, and a connecting-bar connecting the lower ends of said links and engaging beneath the lower plate, substantially as set forth.

12. In a copying-press, the combination of the upper plate, a lower plate adapted to tilt relatively to the upper plate, a hand-operated element, connections between said hand-operated element for moving one of said plates with a relatively rapid rate of movement, and means actuated by said hand-operated element for subsequently effecting a relatively slow movement of the other plate.

13. In a copying-press, the combination of the bed-plate 1, the lower plate, the upper plate, a screw-threaded shaft for operating said upper plate, a collar on said shaft, a pair of levers connected to said collar, links depending from said levers near the fulcrums thereof, a connecting-bar at the lower ends of said links, said connecting-bar engaging the lower plate, a pair of locking-dogs on the upper plate, springs for normally retracting the said locking-dogs, and a cam on the screw-threaded shaft for engaging said locking-dogs when the object to be compressed is engaged between said plates, substantially as set forth.

14. In a copying-press, the combination of the bed-plate 1, the lower plate, the upper plate, a screw-threaded shaft for operating said upper plate, a collar on said shaft, a pair of levers connected to said collar, links depending from said levers near the fulcrums thereof, a connecting-bar at the lower ends

of said links, said connecting-bar engaging
the lower plate, a pair of locking-dogs on the
upper plate, springs for normally retracting
the said locking-dogs, a cam on the screw-
5 threaded shaft for engaging said locking-dogs
when the object to be compressed is engaged
between said plates, and intumed lips on said
locking-dogs with which said cam engages

upon the return movement of said screw-
threaded shaft, substantially as set forth. 10

This specification signed and witnessed this
20th day of November, 1897.

ALBERT B. DICK.

Witnesses:

FRANK L. DYER,
EUGENE CONRAN.