

J. C. FORSTER.
DIE.

APPLICATION FILED JUNE 14, 1901.

NO MODEL.

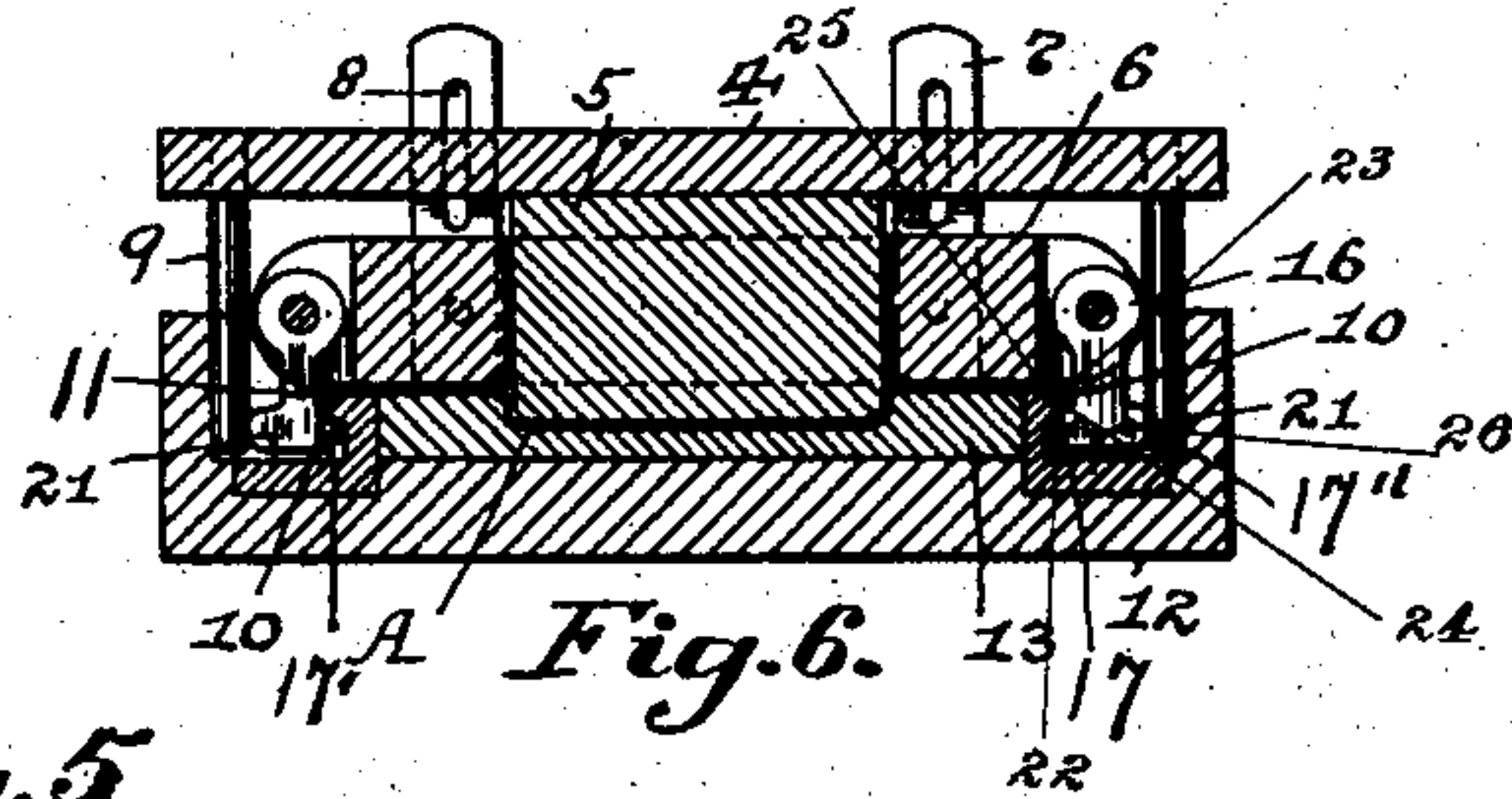
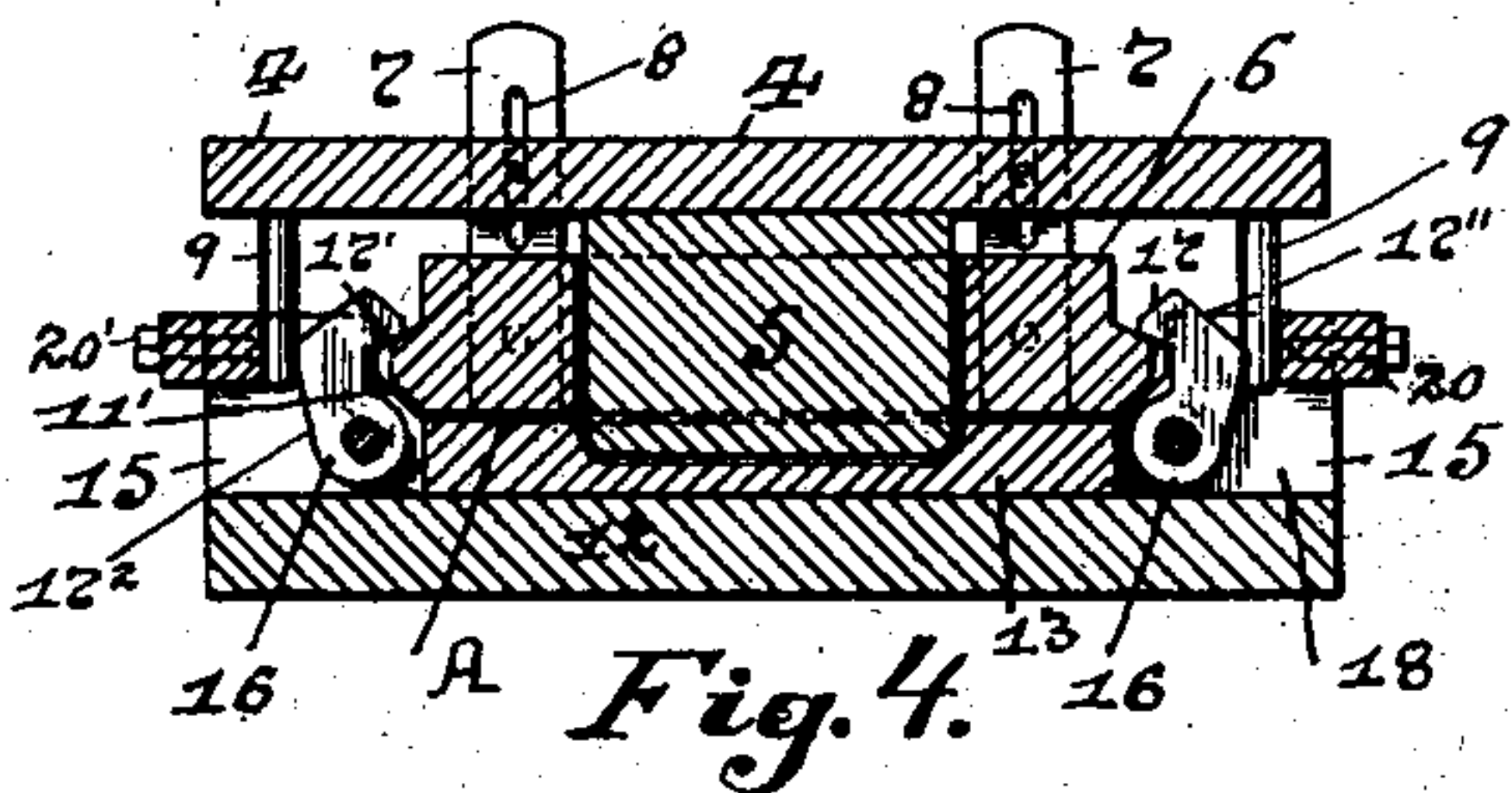
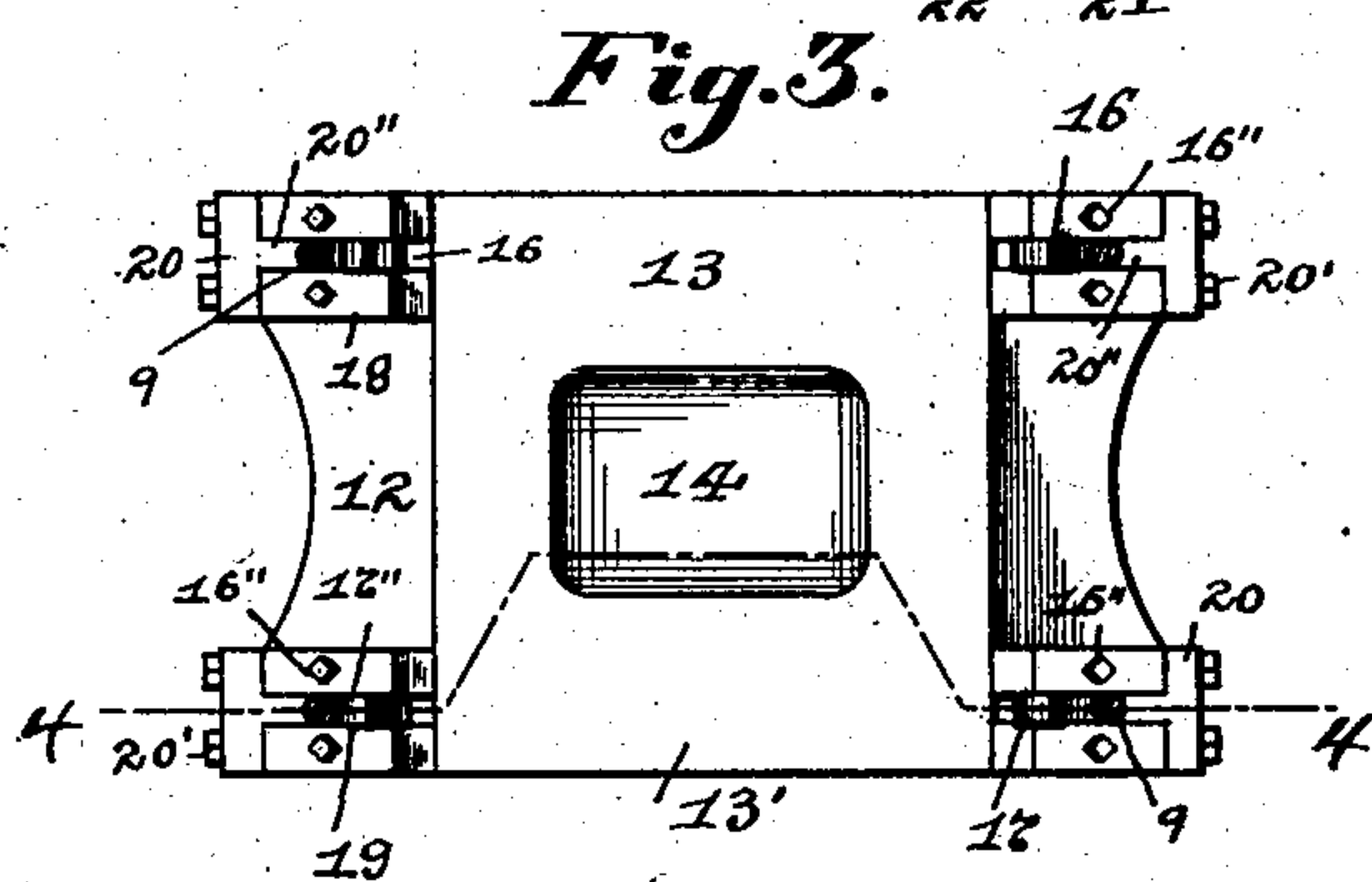
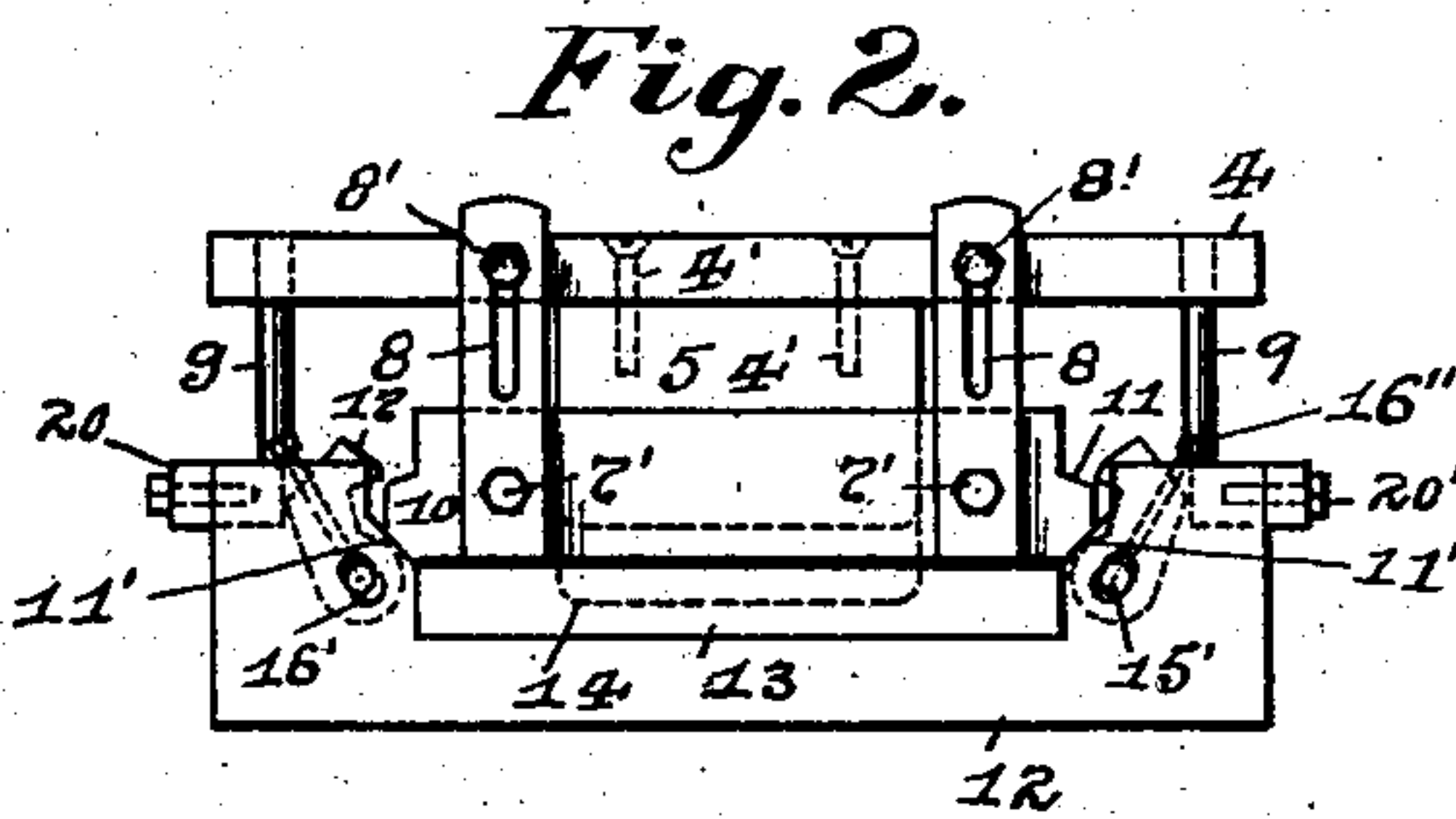
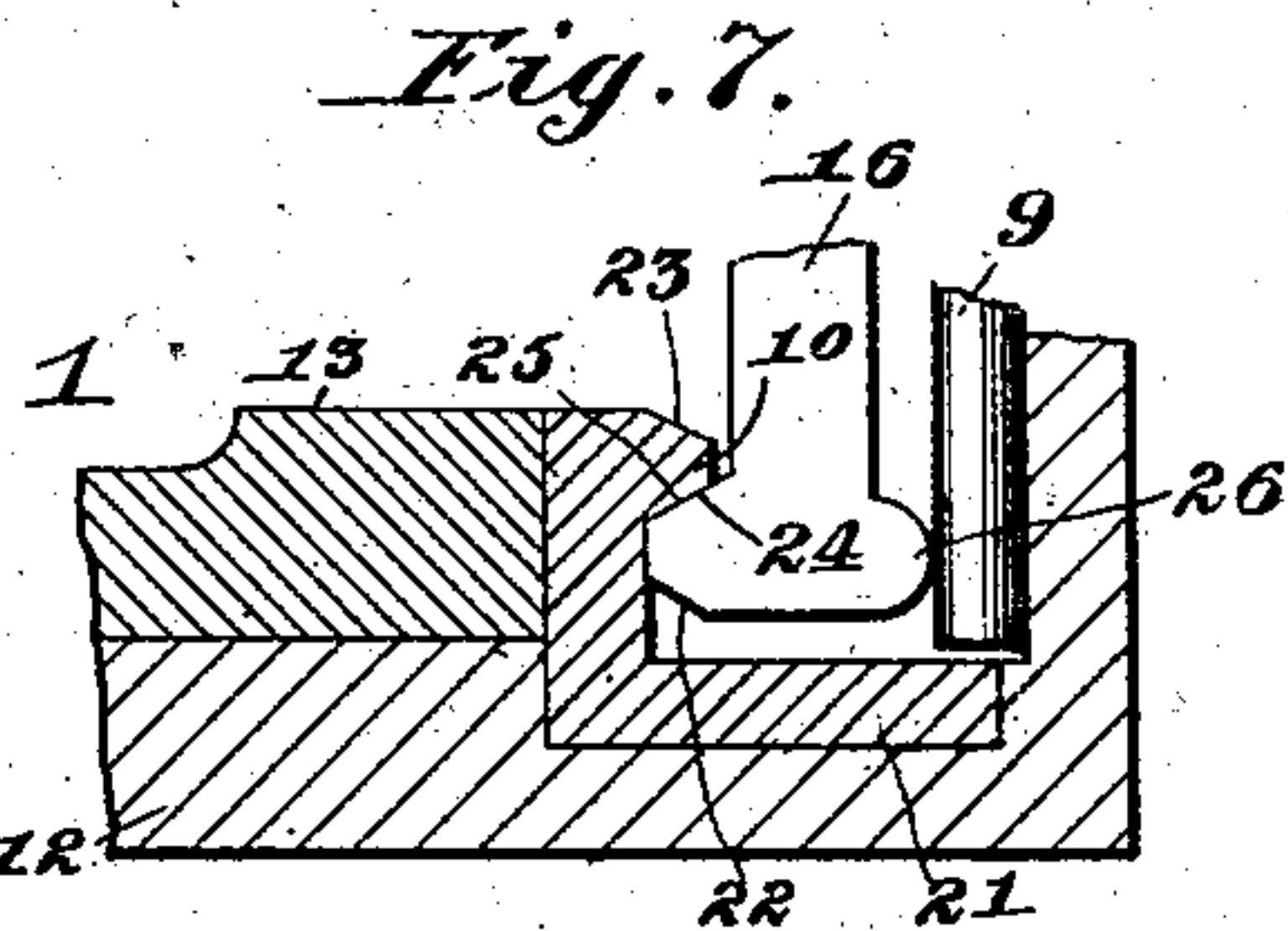
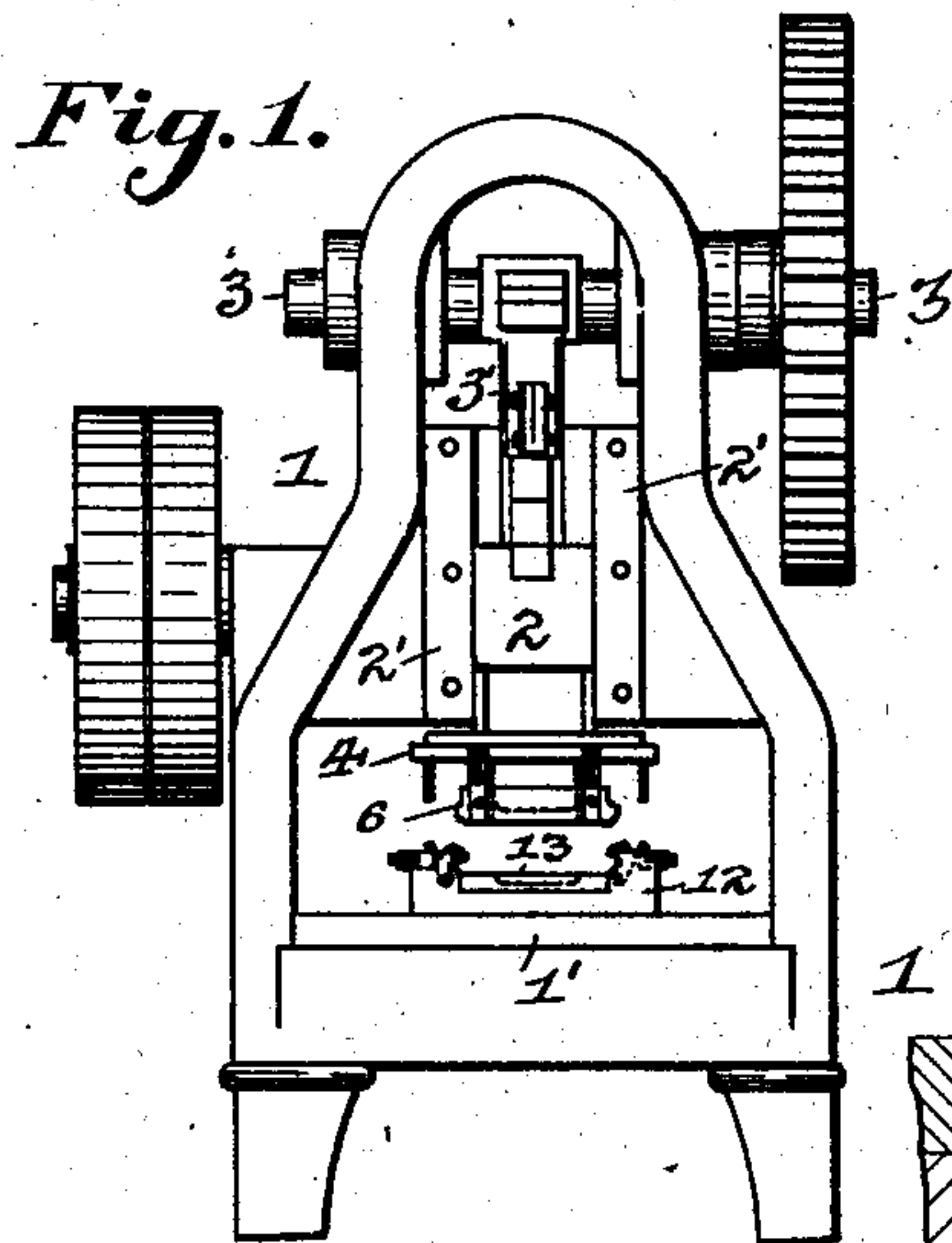
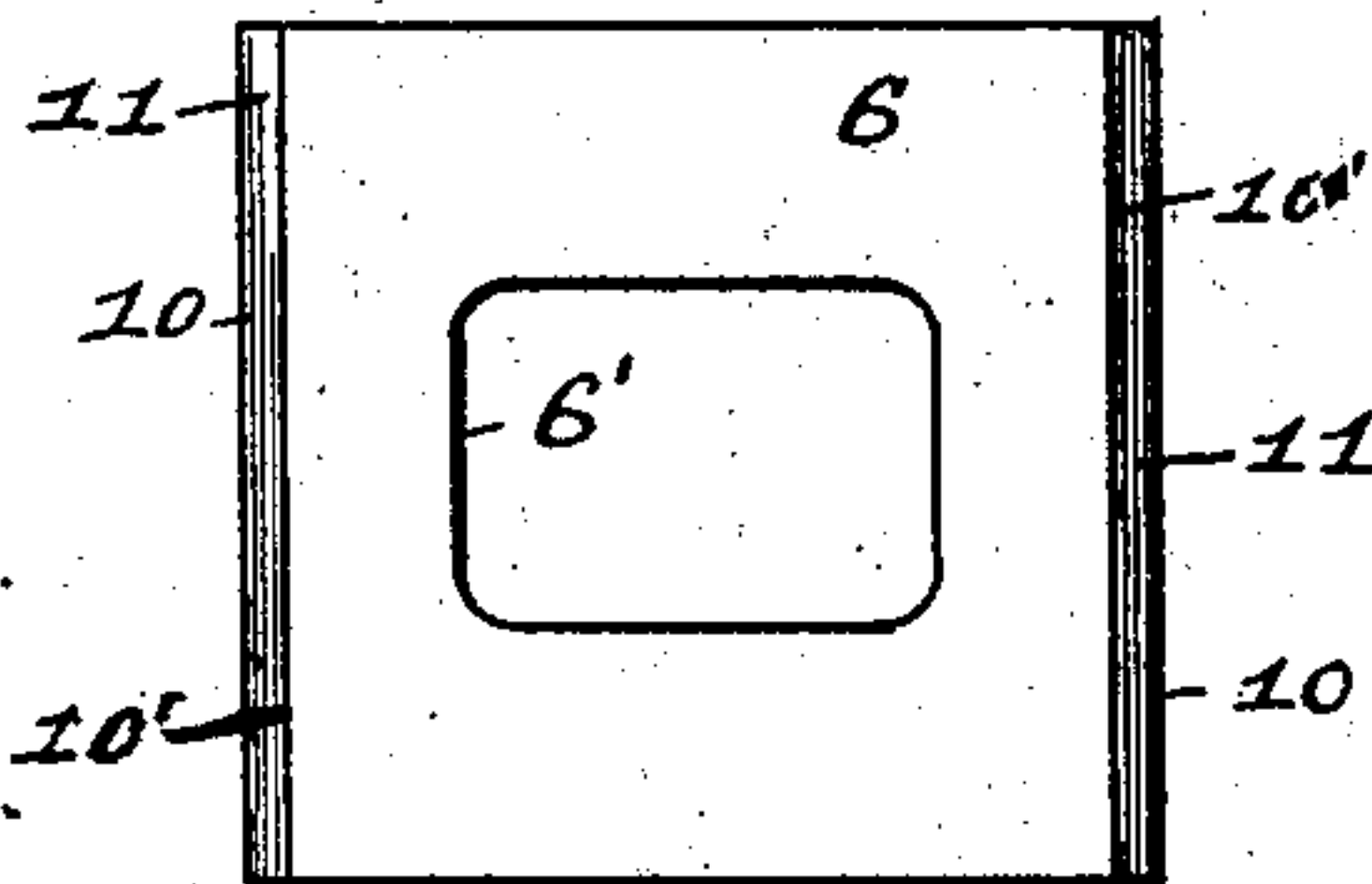


Fig. 5



Witnesses:

J. L. Kefauver, Jr.
James L. Wehn.

Inventor:

John C. Forster.
By J. M. Bookley
Attorney.

UNITED STATES PATENT OFFICE.

JOHN C. FORSTER, OF PITTSBURG, PENNSYLVANIA.

DIE.

SPECIFICATION forming part of Letters Patent No. 721,172, dated February 24, 1903.

Application filed June 14, 1901. Serial No. 64,586. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. FORSTER, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Dies; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to dies, and has special reference to dies for what is known as a "single-acting" press.

The object of my invention is to provide dies which can be applied to any such single-acting press which will hold the metal to be pressed and do away with the springs usually employed in connection with such dies.

A further object of my invention is to provide means on said dies for holding the metal, so as to overcome the wrinkling of the metal during pressing.

My invention consists, generally stated, in the novel arrangement, construction, and combination of parts, as hereinafter more specifically set forth and described, and particularly pointed out in the claims.

To enable others skilled in the art to which my invention appertains to construct and use my improved dies, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a face view of a single-acting press, showing my improved dies applied thereto. Fig. 2 is an enlarged face view of said dies. Fig. 3 is an enlarged top view of the lower die. Fig. 4 is a cross-section of the dies on the line 4-4, Fig. 3. Fig. 5 is a top view of the upper die. Fig. 6 is a cross-section showing another form of my improved dies, and Fig. 7 is an enlarged detail section of the locking device shown in Fig. 6.

Like symbols of reference herein indicate like parts in each of the figures of the drawings.

The press is shown at 1 and is of the ordinary approved single-acting form, having the head 2 therein, which travels in guides 2' and is raised and lowered in any suitable manner by connections 3' from the shaft 3. Rigidly connected to the head 2 is the plate 4, which carries the plunger 5 and is secured to said plate by bolts 4'. Fitting around said plunger 5 by its opening 6' is the holder 6, which is supported from said plate 4 by uprights 7,

rigidly secured to said holder 6 by bolts 7' and provided with slots 8 therein for engaging with pins or bolts 8' on said plates 4, while pins 9 extend or project down from the plate 4, and the holder 6 is provided with lugs 10 on each side 10' thereof, which have their upper and lower faces thereof inclined, as at 11 and 11', respectively.

The die 12 is secured to and supported by the bed 1' of the press 1 and is provided with the die-plate 13 thereon, having the cavity 14, formed in the upper face 13' thereof. Recesses 15 are formed on each side of the die 12 for the reception of the dogs 16, which are pivoted in said recesses 15 by pins 15' therein, engaging with slots 16' in the projections 18, while screw-bolts 16'' pass through the projections 18 and slots 16' therein and are adapted to engage with said pins 15' to adjust said dogs 16 when worn or for different-size metal plates. The dogs 16 are provided with upper and lower inclined faces 17 and 17' thereon, and the dogs 16 are also provided with an inclined face 17'' on their rear faces 17². The recesses 15 are closed on each side by the projections 18, having an opening 19 between them for the dogs 16 and closed at their sides by a plate 20, secured to said projections 18 by bolts 20', which also form guides for the pins 9 by the lugs 20'' thereon.

The use and operation of my improved dies are as follows: The plunger 5 and holder 6, connected to the plate 4 on the head 2 of the press 1, being raised by the shaft 3, the metal plate A to be pressed is placed upon the upper face 13' of the die-plate 13 in the die 12, and as such head 2, carrying the plate 4, plunger 5, and holder 6, is lowered by said shaft 3 the lower inclined faces 11' on the lugs 10 of the holder 6 will come in contact with the upper inclined faces 17 on the dogs 16 and force said dogs 16 outward on their pivot-pins 15' to the positions shown in Fig. 2. As these dogs 16 are thus forced out by the lugs 10 the holder 6 will be lowered down onto the metal plate A, resting on the face 13' of the die-plate 13, and after the holder 6 is thus lowered down onto the plate A the plunger 5, connected to the plate 4 on the head 2, is further lowered down by the said head 2 and shaft 3, connected thereto through the opening 6' of the holder 6 and through the

medium of the pins or bolts 8' on the plate 4, sliding in the slots 8 on the uprights 7, secured to the holder 6. After the holder 6 is thus lowered against the plate A and the plunger 5 on the plate 4 has started to be lowered through said holder 6, as above described, the pins 9 on the plate 4 will be lowered with said plate 4 and plunger 5 and will enter the openings 19, and as the pins 9 travel through the openings 19 they will strike against the inclined faces 17'' on the dogs 16 and force said dogs 16 inwardly, so that the lower inclined faces 17' on said dogs 16 will engage with the upper inclined faces 11 on the lugs 10 of the holder 6 and hold said holder 6 down on the metal plate A while the plunger 5 is pressing the plate A, as shown in Fig. 4. As the holder 6 is thus held down upon the metal plate A by the dogs 16 the said dogs are held in place or position on the lugs 10 of the die 6 by the pins 9 engaging with the rear faces 17² on said dogs 16, and the metal plate A is permitted to move or be drawn inwardly between the holder 6 and die 12 while the plunger 5 is pressing the plate A to the form shown in Fig. 4, so enabling the die 12 and holder 6 to act to form sectional dies when so operating together and in holding and shaping the metal. After the plate A has been pressed the plunger 5 and plate 4 are raised by the head 2 from the shaft 3, which will withdraw the pins 9 on said plate 4 from the openings 19 and engagement with the dogs 16, so causing said dogs 16 to drop outwardly from the lugs 10 to the position shown in Fig. 2, and when the pins or bolts 8' on the plate 4 reach the upper ends of the slots 8 in the uprights 7 during the raising of the plunger 5 and plate 4 the holder 6 will be raised from the pressed plate A to the position shown in Fig. 1. After this is done the pressed plate A can be removed from the upper face 13' of the die-plate 13 on the die 12 and another plate placed thereon, so that the operations before described can be repeated during the raising and lowering of the plunger and upper die 6 by the shaft 3 on the press 1.

In Fig. 6 there is shown another form of my invention which consists in mounting and pivoting the dogs 16 on the holder instead of on the die and the lugs 10 for engaging with said dogs on a support 21 in the die instead of on the holder, so that the lower inclined faces 22 on the dogs will engage with the upper inclined faces 23 on the lugs when the holder is lowered to force out said dogs and the upper inclined faces 24 on the dogs will engage under the lower inclined faces 25 on the lugs, while the pins 9 on the plate 4 will engage with projections 26 on said dogs opposite the inclined faces 22 and 24 thereon.

It will be evident that other forms of dogs, levers, or cams can be placed on said dies for holding and locking said dies together during the pressing of the metal and that various other modifications in the construction, de-

sign, and operation of the various parts may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

It will thus be seen that my improved dies are cheap and simple in their construction and operation and by their use the metal will be held firmly between the dies during pressing, so as to prevent all liability of the metal wrinkling during pressing, but at the same time allowing such metal to move inwardly under the dies while being pressed. It will also be obvious that the dies are locked and unlocked automatically in the raising and lowering operations, and the use of the springs and other parts employed therewith is done away with. The device is positive in its movement and can easily and quickly be repaired or adjusted when worn or broken.

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

1. In a press, the combination of a plunger, die-sections, and means carried on one of said sections and movable relatively thereto for locking the die-sections together by a direct movement of the plunger.

2. In a press, the combination of a plunger, die-sections, and means carried on one of said sections and movable relatively thereto for locking the die-sections together and unlocking them by a direct movement of the plunger.

3. In a press, the combination of a plunger, die-sections, and means carried on one of said sections and movable relatively thereto for automatically locking the die-sections together by a direct movement of the plunger.

4. In a press, the combination of a plunger, die-sections, and means carried on one of said sections and movable relatively thereto for automatically locking the die-sections together and unlocking them by a direct movement of the plunger.

5. In a press, the combination of a plunger, die-sections, dogs carried on one of said die-sections and movable relatively thereto, and means engaging with said dogs for locking the die-sections together by a direct movement of the plunger.

6. In a press, the combination of a plunger, die-sections, dogs carried on one of said die-sections and movable relatively thereto, and means for engaging with said dogs for automatically locking the die-sections together by a direct movement of the plunger.

7. In a press, the combination of a plunger, die-sections, dogs carried on one of said die-sections and movable relatively thereto, and means for engaging with said dogs for automatically locking the die-sections together and unlocking them by a direct movement of the plunger.

8. In a press, the combination of a plunger, dies, dogs pivoted to one of said dies, and means for engaging with said dogs for locking the dies together during the pressing of the metal therein by the plunger.

9. In a press, the combination of a plunger, dies, dogs pivoted to one of said dies, and means for engaging with said dogs for automatically locking the dies together during the pressing of the metal therein.

10. In a press, the combination of a plunger, dies, dogs pivoted to one of said dies, and means engaging with said dogs for automatically locking the dies together during the pressing of the metal by the plunger and unlocking them after the metal is pressed.

11. In a press, the combination of a plunger, dies, lugs on one of said dies, dogs pivoted to the other one of said dies for engaging with said lugs, and means engaging with said dogs for locking said dies together during the pressing of the metal therein by the plunger.

12. In a press, the combination of a plunger, dies, lugs on one of said dies, dogs pivoted to the other one of said dies for engaging with said lugs, and means engaging with said dogs for automatically locking said dies together during the pressing of the metal therein by the plunger.

13. In a press, the combination of a plunger, dies, lugs on one of said dies, dogs pivoted to the other one of said dies for engaging with said lugs, and means engaging with said dogs for automatically locking said dies together during the pressing of the metal by the plunger and unlocking them after the metal is pressed.

14. In a press, the combination of a plunger, dies, lugs on one of said dies having inclined faces thereon, dogs on the other one of said dies having inclined faces thereon for engaging with the inclined faces on the lugs, and means engaging with said dogs for locking said dies together during the pressing of the metal therein by the plunger.

15. In a press, the combination of a plunger, dies, lugs on one of said dies having inclined faces thereon, dogs on the other one of said dies having inclined faces thereon for engaging with the inclined faces on the lugs, and means engaging with said dogs for automatically locking said dies together during the pressing of the metal therein by the plunger.

16. In a press, the combination of a plunger, dies, lugs on one of said dies having inclined faces thereon, dogs on the other of said dies having inclined faces thereon for engaging with the inclined faces on the lugs, and means engaging with said dogs for automatically locking said dies together during the pressing of the metal by the plunger and unlocking them after the metal is pressed.

17. In a press, the combination of a plunger, die-sections, means carried on one of said die-sections and movable relatively thereto for locking the die-sections together by a direct movement of the plunger, and means for permitting said plunger to pass through one of said die-sections to press the metal and free itself while the die-sections are locked.

18. In a press, the combination of a plunger,

a plate connected to said plunger, die-sections, means carried on one of said die-sections and movable relatively thereto for locking the die-sections together by a direct movement of the plunger, and connections between one of said die-sections and the plate for permitting the plunger to pass through one of said die-sections to press the metal and free itself while the die-sections are locked.

19. In a press, the combination of a plunger, a plate connected to said plunger, dies, means on said dies for locking them together, and slotted plates secured to one of said dies and engaging with pins on the plunger-plate for permitting the plunger to pass through said die to press the metal and free itself while the dies are locked.

20. In a press, the combination of a plunger, a plate connected to said plunger, die-sections, dogs carried on one of said die-sections and movable relatively thereto for locking the die-sections together by a direct movement of the plunger, means for permitting said plunger to pass through one of said die-sections to press the metal and free itself while the die-sections are locked, and connections between said plunger-plate and the dogs for locking and unlocking the same.

21. In a press, the combination of a plunger, a plate connected to said plunger, dies, dogs on said dies for locking them together, means for permitting said plunger to pass through one of said dies to press the metal and free itself while the dies are locked, and bars extending from said plunger-plate for engaging with said dogs to lock and release the same.

22. In a press, the combination of a plunger, a plate connected to said plunger, dies, pivoted dogs on said dies for locking them together, and connections between said plunger-plate and dogs for locking and releasing the same.

23. In a press, the combination of a plunger, a plate connected to said plunger, dies, dogs on said dies for locking them together, and bars extending from said plunger-plate for engaging with said dogs to lock and release the same.

24. In a press, the combination of a plunger, dies, pivoted dogs on said dies for locking them together during the pressing of the metal by the plunger, and means for adjusting said dogs.

25. In a press, the combination of a plunger, dies, pins mounted in slots on said dies, dogs mounted on said pins for locking the dies together during the pressing of the metal by the plunger, and bolts passing through said dies and slots for engaging with said pins to adjust said dogs.

In testimony whereof I, the said JOHN C. FORSTER, have hereunto set my hand.

JOHN C. FORSTER.

Witnesses:

LAWRENCE F. ROBERTS,
J. N. COOKE.