

No. 876,624.

PATENTED JAN. 14, 1908.

R. J. COPELAND.

BINDER.

APPLICATION FILED MAR. 20, 1907.

Fig. 1.

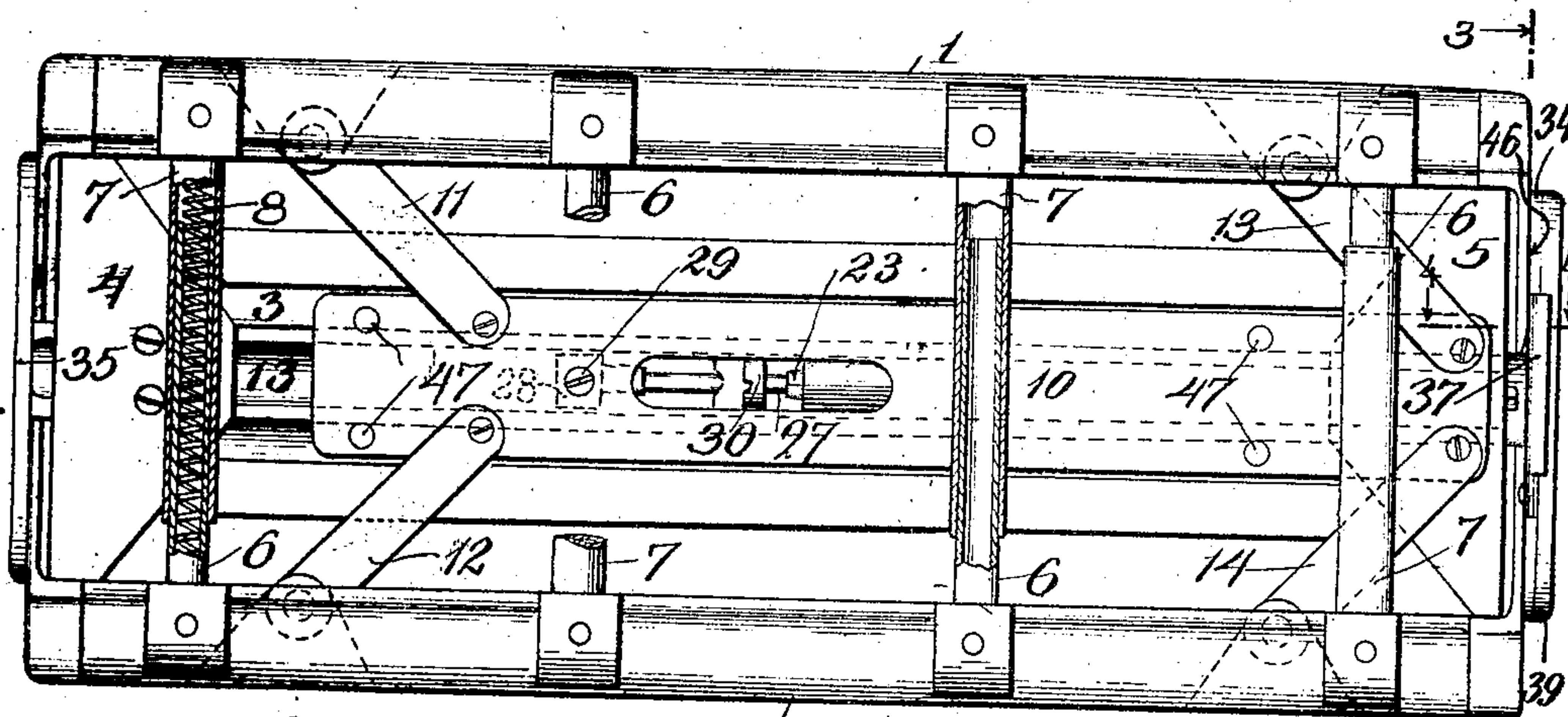


Fig. 2.

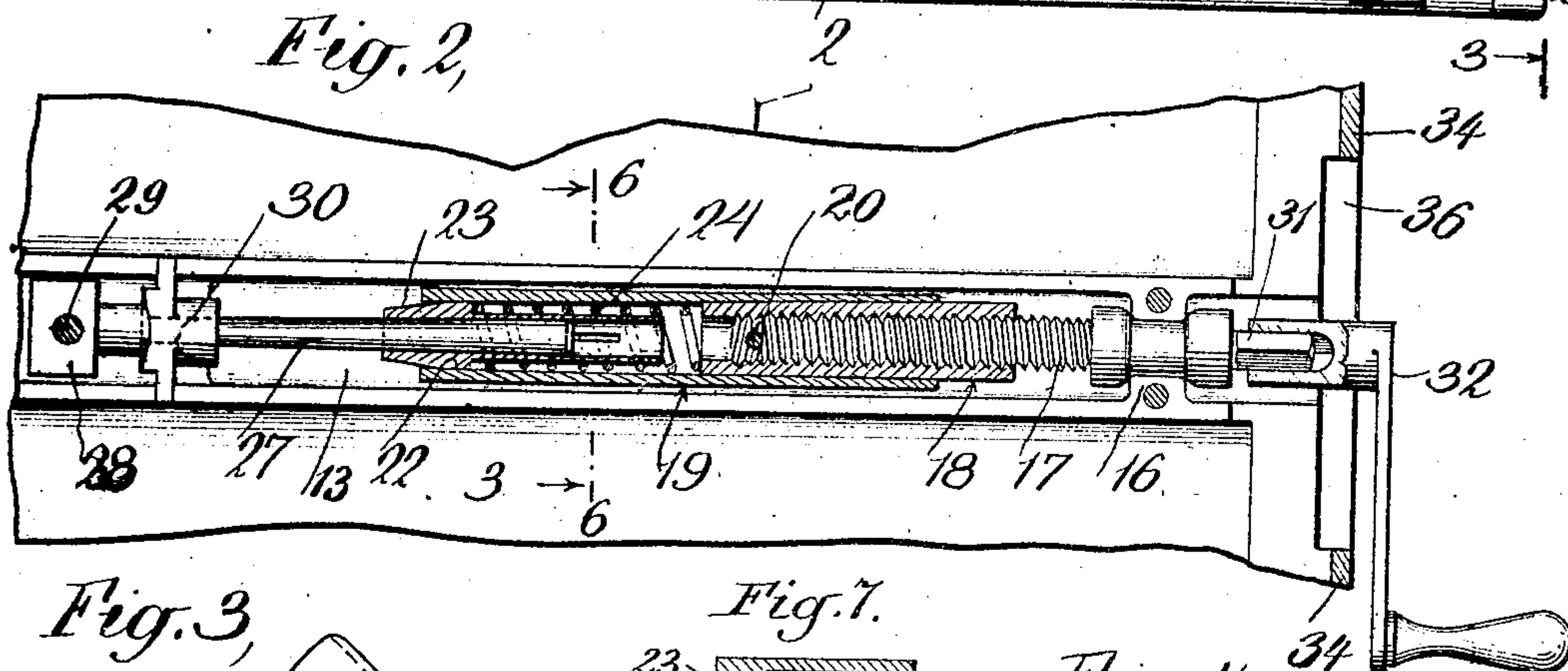


Fig. 3.

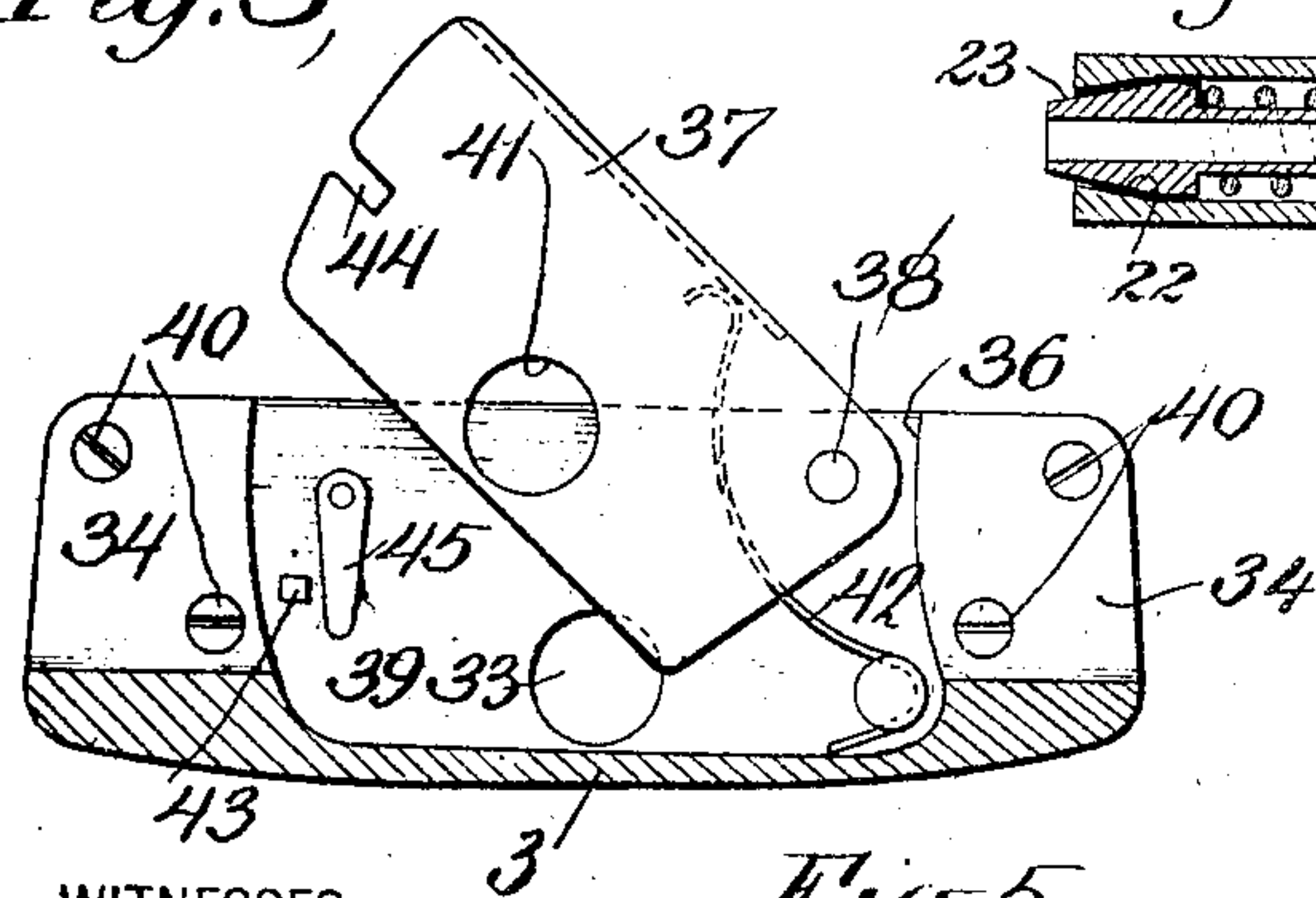


Fig. 7.

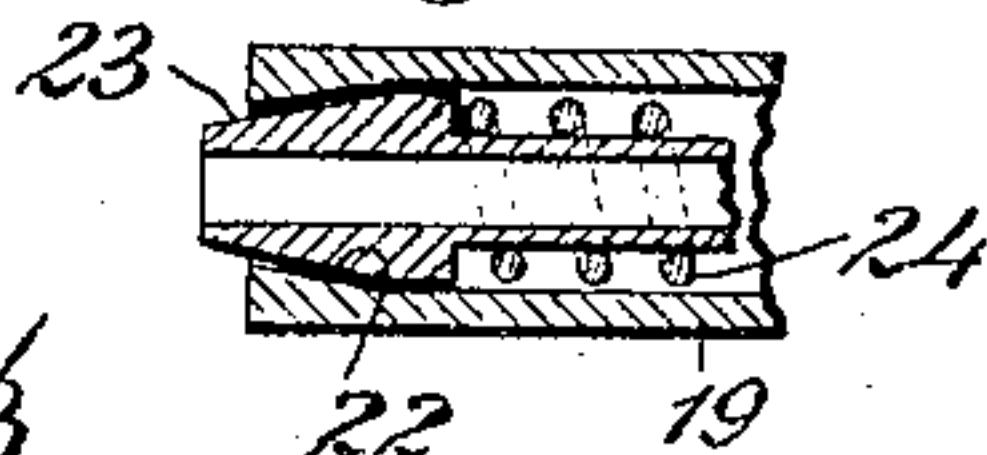


Fig. 4.

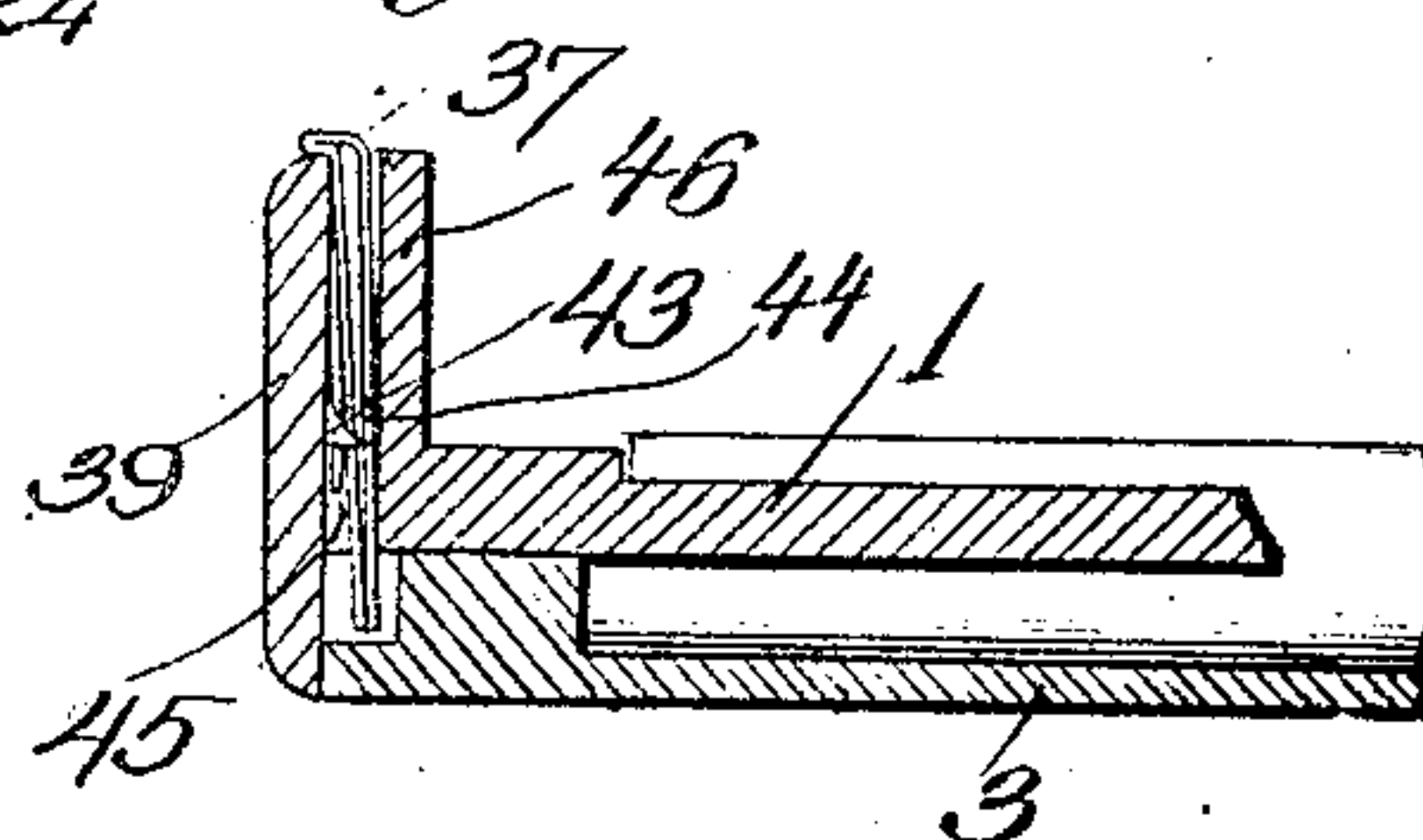


Fig. 5.

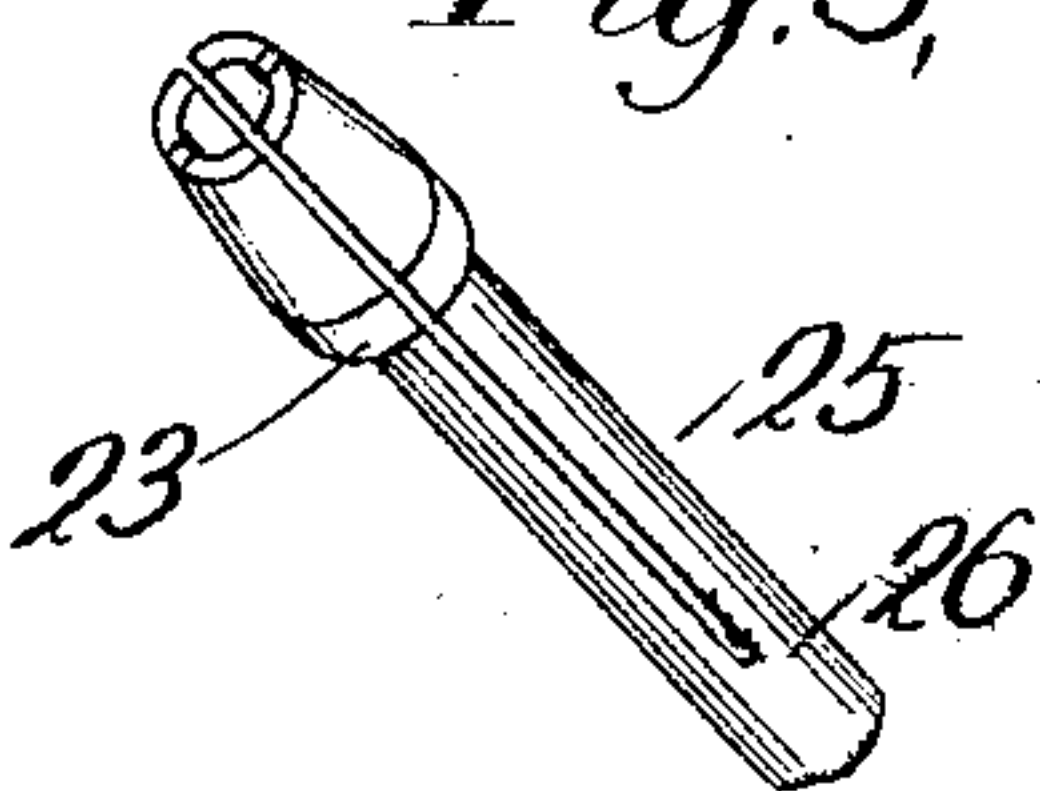
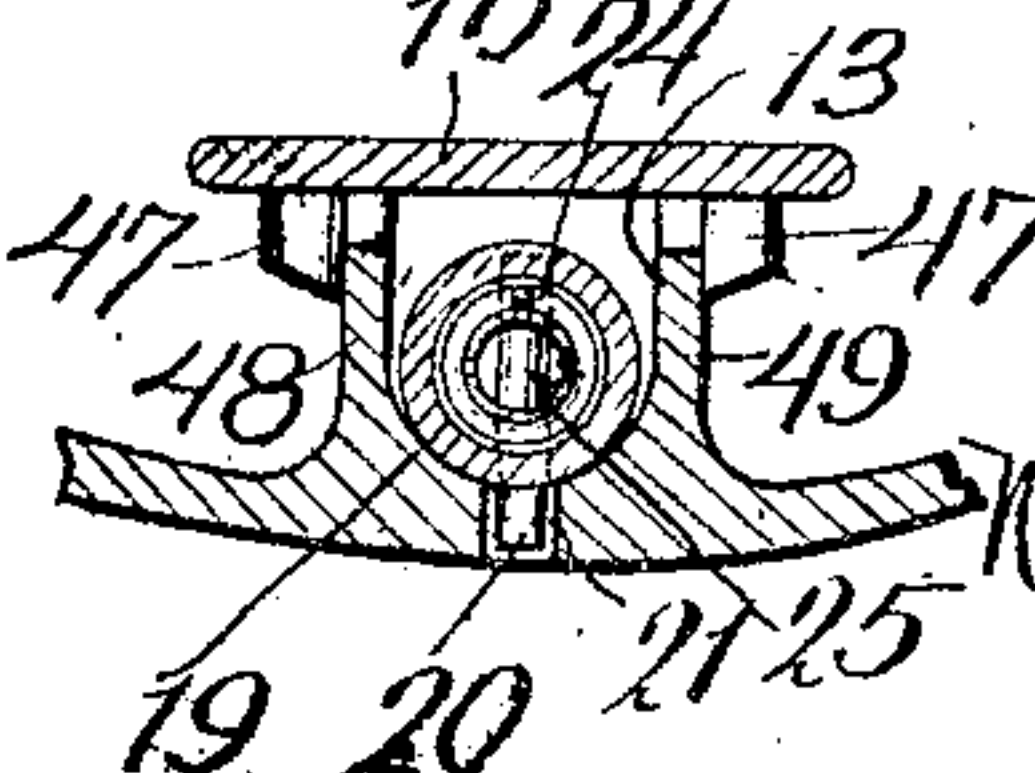


Fig. 6.



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# UNITED STATES PATENT OFFICE.

ROBERT J. COPELAND, OF TORONTO, ONTARIO, CANADA.

BINDER.

No. 876,624.

Specification of Letters Patent.

Patented Jan. 14, 1908.

Application filed March 20, 1907. Serial No. 363,458.

*To all whom it may concern:*

Be it known that I, ROBERT J. COPELAND, a citizen of the United States, and a resident of Toronto, and whose post-office address is 75 Queen street west, Toronto, Dominion of Canada, and now temporarily residing at London, England, have invented certain new and useful Improvements in Binders, of which the following is a specification.

This invention relates to binders of the class adapted to confine a plurality of loose sheets by means of two or more separable members. Two of these members serve to clamp the sheets to be bound and it is a general object of this invention to provide means whereby one of said clamping members may be quickly and conveniently pressed by hand from open to closed position relatively to the second and then positively clamped against the bound sheets by mechanical means such as a mechanical power.

A further object is to provide a releasing means in combination with this mechanical power whereby a quick release of the clamping member or members may be effected.

More specifically, an object of the invention is to combine a suitable grip or clutch mechanism preferably a friction grip co-operating with an untoothed tongue with a mechanical power which is employed to move two members of the binder relatively to each other.

In a preferred form of the invention, this grip mechanism and mechanical power are employed positively to actuate a pair of separable binding strips. It is preferred that these binding strips be confined to move with a parallel motion and always equally separated from a third strip or back member. Any suitable means may be employed to give the binder strips this parallel movement although connecting links may be preferably employed and operate as toggles in combination with a reciprocating plate.

A preferred embodiment of the invention is shown in the accompanying drawings forming part of this specification and in which,—

Figure 1 is an inside elevation of the assembled binder frame with parts broken away and the covers removed. Fig. 2 is a detail section, enlarged and showing the mechanical power and gripping mechanism, but with plate 39 removed. Fig. 3 is a detail section through line 3—3 of Fig. 1 show-

ing the key seal case. Fig. 4 is a detail view taken through line 4—4 of Fig. 1, with parts omitted. Fig. 5 is a perspective view of the grip jaw member. Fig. 6 is an enlarged detail section through line 6—6 of Fig. 2 but showing the reciprocating slide in position. Fig. 7 is an enlarged detail section showing the constrictor 22.

Referring now more in detail to the drawings,—1 and 2 indicate respectively upper and lower separable members or separable binder strips mounted to slide, in opening and closing, upon a back plate or member 3. The clamps 4 and 5 are secured to the back plate and serve to hold the strips 1 and 2 against the same, while guiding the strips in their opening and closing movement. In addition to this guiding means, there are provided a series of telescopic posts 6, 7 of any desired number. These posts have one member 6 or 7 secured to a strip 1 or 2 and also serve to steady the opening and closing of the binder strips and are provided for filing perforated paper sheets. Some spring means is preferably provided normally tending to separate the binder strips. As illustrated, this spring means 8 may be located in certain of the posts 6, 7, preferably in the outside posts. More springs 8 may be provided in a similar manner, if desired, or spring means for opening the binder may be provided in other localities than in the posts.

10 designates a longitudinally reciprocating member or slide constrained against transverse movement relatively to the back 3. Pivoted to this reciprocating member at their inner ends are a series of links 11, 12, 13 and 14. The other ends of these links are pivoted, 11 and 13 to the upper binder strip 1, and 12 and 14 to the lower binder strip 2.

A trough 13 is formed medially along the inner face of the back member 3 for the reception of the mechanical power and gripping means. Fixed against longitudinal movement in a bearing 16 is a mechanical power in the form of a screw 17. The threaded sleeve 18 operatively engages the screw 17 and has secured thereto a tubular shell 19 by means of a pin 20. This pin 20 extends through both the shell 19 and sleeve 18 and projects into a groove 21 formed longitudinally in the bottom of the trough 13, thus permitting a longitudinal movement of the shell 19 and sleeve 18 but preventing rotation thereof. The inner face of the outer end of the shell 19 is restricted and prefer-



ably formed conically, as shown at 22, so as to provide a constrictor or closing means against which the gripping jaws 23 are normally pressed by the spring 24. As best seen in Fig. 5 the jaws 23 are formed of segments, preferably conical, and having spring shanks 25, which are extensions from the circumferentially continuous portion 26 of the shank. The jaws 23 have a normal tendency to remain slightly spread apart, as illustrated in Fig. 5, but may be forced together by engagement with the conical face 22 of the shell 19 so as to grip a cooperating tongue 27, which is preferably rearwardly tapered, as shown, so as to increase the gripping action of the jaws 23. The tongue 27 extends longitudinally from the block 28 which is secured directly to the reciprocating member or slide 10 by means of a screw 29.

30 is an abutment fixed fast to the walls of the trough 13 to cooperate with the gripping jaws 23, as will hereinafter be described, and also centering the tongue 27 which passes therethrough. The exposed end of the screw 17 is provided with an extension 31 specially formed for the reception and engagement of the key 32. This extension 31 may be squared or otherwise formed for locking engagement with said key. A suitable hole 33 is formed at the end 34 of the binder back through plate 39 to permit the insertion of the key 32.

As shown in detail in Figs. 2 and 3, the end 34 of the back 3 instead of being solid like the opposite end 35, may be cut away at 36 for the reception of a case 37 which is hinged at 38 to an outer plate 39 secured to the end 34 by screws 40 and it is through this plate 39 that the hole 33 extends. The case 37 is pierced to form a hole 41 which will align with the hole 33 when the case 37 is forced down into the position shown in Fig. 4. A paper seal may be inserted within the case 37 to cover the holes 33 and 41 and prevent tampering with the binder actuating mechanism. A spring 42 normally tends to elevate the case 37. When the binder is closed, as shown in Figs. 1 and 4, the case 37 may be pressed down, as shown in Fig. 4, when the catch 43 engages in the slot 44 to hold the case closed as shown in Fig. 4. Although the spring 45 normally tends to force the case 37 away from the plate 39 to disengage the groove 44 from the catch 43, the intumed end 46 of the binder strip 1 maintains the case 37 in position for catch 43 to engage in the groove 44 when the binder is closed but releases the case when the binder is open. The reciprocating member 10 is restrained against movement transverse to the trough 13 by means of depending lugs 47 which straddle the walls or ridges 48 and 49 of the trough 13.

The springs 8 within the posts exert a normal tendency to separate the strips 1 and 2,

while the links 11, 12, 13 and 14, pivoted to the reciprocating member 10, always maintain the binder strips 1 and 2 at equal distances from the back member 3 and likewise maintain said strips always parallel to one another and to said back member,

If a slight left handed movement is given to the screw 17 with the binder mechanism as shown in Fig. 1, the jaws 23 will be forced against the abutment 30. The jaws 23 will be forced away from the closing means 22 against the action of the spring 24 and will spread apart due to the spring action of the shanks 25 so as to release the tongue 27, which may then slip freely therebetween. Then the binder strips 1 and 2 will fly apart quickly in response to the action of the separating springs 8. When the jaws 23 are abutted against the abutment 30, the binder strips 1 and 2 may be manipulated manually, freely into open and closed positions. The abutment 30 is therefore means independent of the tongue 27 for releasing or disengaging the grip. Thus, when the binder is open, the desired number of sheets to be bound may be inserted within the binder about the posts 6, 7 and the slack between the binder strips 1 and 2 and the sheets may be quickly taken up manually by pressing the binder strips together. It has been found, however, that the mere manual pressing together of the strips will not always firmly clamp the bound sheets. Firm clamping of the sheets may be accomplished with satisfaction by imparting a right handed movement to the screw 17, so that the jaws 23 leave the abutment 30. Then the spring 24 forces the jaws 23 against the constrictor or closing means 22 which wedges them together so as to grip the tongue 27.

24 is means for rendering the constrictor operative to cause the grip to grip the tongue. A continued movement of the screw 17 to the right will cause the grip 23 to drag along the tongue and the resistance of the tongue to this dragging along will cause the grip 23 to grip it the tighter by increasing the wedging action of the closing means 22 on the grip 23. This gripping is increased by the wedging action of the tongue 27 when it is tapered as shown. As the tongue 27 is dragged to the right, it carries with it the block 28 and the reciprocating member 10 secured thereto by a screw 29. This member 10 exerts a positive mechanical clamping action upon the binder strips 1 and 2 by means of the links 11, 12, 13 and 14, which action is, of course, in addition to and separate from any clamping action which may be manually exerted directly upon the strips 1 and 2. It is also obvious that, even when the gripping jaws 23 are clear of the abutment 30 and are pressed into engagement with the tongue 27, that the tongue 27 has a free movement in one direction, viz. to the



right, independent of the mechanical movement or screw 17, and the untoothed tongue 27 will be gripped frictionally against backward movement in all positions and not merely at spaced steps as would be the case with a toothed ratchet mechanism. Its reliability and cheapness are further advantages of this untoothed tongue and cooperating friction grip. Although the spring 24 and the constrictor 22 are forcing the jaws 23 against the tongue 27, if the binder strips 1 and 2 are manually pressed towards each other, the links 11, etc. and member 10 will tend to force the tongue 27 to the right. Its frictional contact with the jaws 23 will tend to force them back to the right against the action of spring 24. Any slight movement of the jaws 23 to the right relative to the constrictor or closing means 22 will relieve the closing action of 22 and the jaws will open sufficiently to allow the tongue 27 to slip therebetween freely to the right but they would effectively check any return movement of the tongue 27 to the left. Thus, even when the position of the grip is such that the binder strips 1 and 2 are not permitted to be moved freely into both open and closed positions independently of the mechanical clamping means 17, 18, etc., they do have a free movement into closed position which may be accomplished manually because of the free movement of tongue 27 in a right hand direction, as just described. Of course, if desired, the strips may be closed together entirely by the action of the screw means 17 etc. without being manually closed but this takes more time.

A preferred embodiment of this invention has been illustrated and described but it is to be understood that various modifications within the scope and spirit of this invention are contemplated.

What is claimed and what is desired to be secured by Letters Patent is:—

1. In a binder in combination, two separable members; mechanical means for positively clamping said members towards one another; and a cooperating releasable friction clutch for permitting the quick release and separation of said members.

2. In a binder, two separable binding strips; a reciprocating member; means movably connecting said strips with said reciprocating member whereby said strips may be moved in opposite directions with the reciprocation of said reciprocating member; means for actuating said reciprocating member; and a releasable friction clutch for operatively connecting said means and said reciprocating member.

3. In a binder, two separable binding strips; a reciprocating member; means movably connecting said strips with said reciprocating member whereby said strips may be moved in opposite directions with the recip-

rocation of said reciprocating member; screw means for actuating said reciprocating member; and a releasable friction clutch for operatively connecting said screw means and said reciprocating member.

4. In a binder, two separable binding strips; a reciprocating member, means movably connecting said strips with said reciprocating member whereby said strips may be moved in opposite directions with the reciprocation of said reciprocating member; screw means for actuating said reciprocating member; a releasable friction clutch for operatively connecting said screw means and said reciprocating member; and means cooperating with said clutch whereby a predetermined movement of said screw means will release said clutch to permit a free opening and closing of said binder strips independently of said screw means.

5. In a clamping mechanism for binders, the combination of a mechanical power and a one way friction grip whereby slack may be taken up independently of said mechanical power.

6. In a clamping mechanism for binders, the combination of a mechanical power and a one way grip whereby slack may be taken up independently of said mechanical power; said grip comprising jaws normally spring pressed into engagement with a closing means, said closing means operating to force said jaws into and to hold the same in gripping position.

7. In a clamping mechanism for binders, the combination of a mechanical power and a one way grip whereby slack may be taken up independently of said mechanical power; said grip comprising jaws normally spring pressed into engagement with a constrictor, said constrictor operating to force said jaws into and to hold the same in gripping position; and a tongue to be gripped by said jaws.

8. In a clamping mechanism for binders, the combination of a screw and a threaded sleeve fixed against rotation; a tongue to be dragged along by the turning of said screw; and a tubular grip fixed to said sleeve and normally engaging said tongue but permitting the free movement of said tongue in one direction.

9. In a clamping mechanism for binders, the combination of a screw and a threaded sleeve fixed against rotation; a tongue to be dragged along by the turning of said screw; a tubular grip comprising jaws and fixed to said sleeve and normally engaging said tongue but permitting the free movement of said tongue in one direction; and an abutment for disengaging said jaws upon a predetermined movement of said tubular grip.

10. In a binder lock, a friction grip; an untoothed tongue locked by said grip against movement in one direction and free to move



in the opposite direction; and means engageable with said grip and independent of said tongue for releasing the grip.

11. In a binder lock, a constrictor; a releasable friction grip normally held in cooperative engagement with said constrictor, an untoothed tongue capable of moving freely through the grip in one direction and restrained by the grip against movement in the other direction; and means to release the grip.

12. In a binder lock, a constrictor; a releasable grip normally held in cooperative engagement with said constrictor; a tongue capable of moving freely through the grip in one direction and restrained by the grip against movement in the other direction; and means for disengaging the grip from the constrictor to release the tongue.

13. In a binder lock, a constrictor; a tongue; a grip cooperating with said constrictor to grip the tongue and lock it against movement in one direction, said tongue having a free movement by the grip in the opposite direction; and means for rendering the constrictor operative to cause the grip to grip and to release the tongue.

14. In a binder lock, a friction grip; an untoothed tongue locked by said grip against movement in one direction and free to move in the opposite direction; and means engageable with said grip and independent of said tongue for releasing the grip.

15. In a binder lock, a friction grip; a tapered untoothed tongue locked by said grip against movement in one direction and free to move in the opposite direction; and means engageable with said grip and independent of said tongue for releasing the grip.

16. In a binder lock, an untoothed tongue; friction gripping jaws for said tongue; means normally holding said jaws in operative engagement with said tongue, preventing the movement of said tongue in one direction but permitting its movement in the other direction; and means for engaging said jaws to release said tongue and permit its free movement in said first direction.

17. In a binder, a plurality of separable binder strips, a friction locking mechanism to prevent the separation of said strips comprising a tongue, a sleeve and jaws for frictionally securing said tongue against movement in one direction relatively to said sleeve but permitting a free movement of said tongue relatively to said sleeve in the other direction.

18. In a binder, a plurality of separable binder strips, a friction locking mechanism to prevent the separation of said strips comprising a tongue, a sleeve and jaws for frictionally securing said tongue against movement in one direction relatively to said sleeve but permitting a free movement of said tongue relatively to said sleeve in the other direction.

19. In a binder lock, a tongue, gripping jaws therefor, a member provided with closing means; a spring cooperating with said member and normally forcing said jaws against said closing means to hold said tongue against movement in one direction while permitting a movement of said tongue in the opposite direction.

20. In a binder lock, a rearwardly tapered untoothed tongue, friction gripping jaws therefor, a member provided with closing means; a spring cooperating with said member and normally forcing said jaws against said closing means to hold said tongue against movement in one direction while permitting a movement of said tongue in the opposite direction.

21. In a binder lock, a tongue, gripping jaws therefor, a member provided with closing means; a spring cooperating with said member and normally forcing said jaws against said closing means to hold said tongue against movement in one direction while permitting a movement of said tongue in the opposite direction; and operative means for causing said jaws to release said tongue.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

ROBERT J. COPELAND.

Witnesses:

NICHOLAS M. GOODLETT, JR.  
LEONARD DAY.