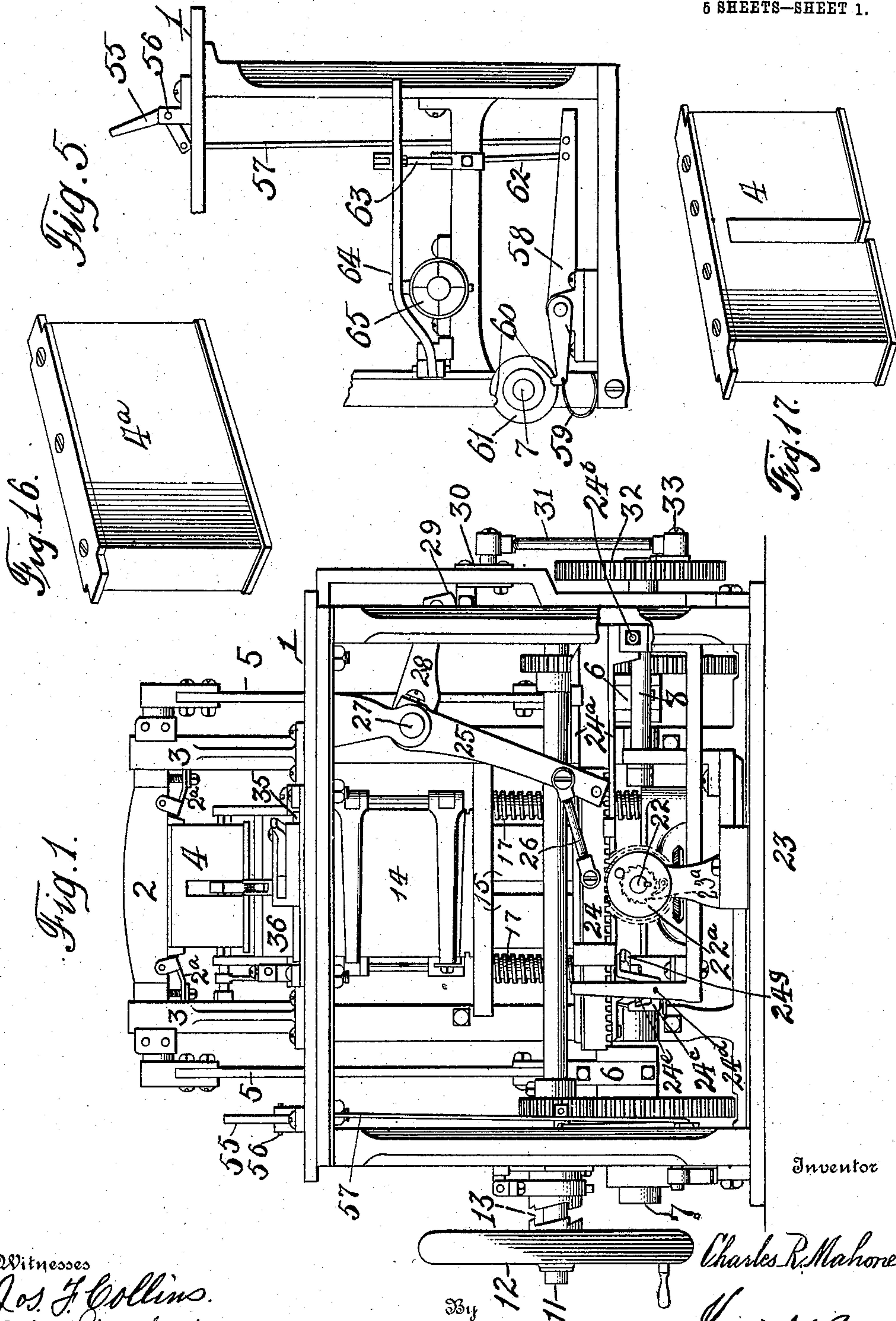


C. R. MAHONE.
PRESS FOR LUMP TOBACCO.
APPLICATION FILED JULY 22, 1907.

911,312.

Patented Feb. 2, 1909.

6 SHEETS—SHEET 1.



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5 SHEETS—SHEET 2.

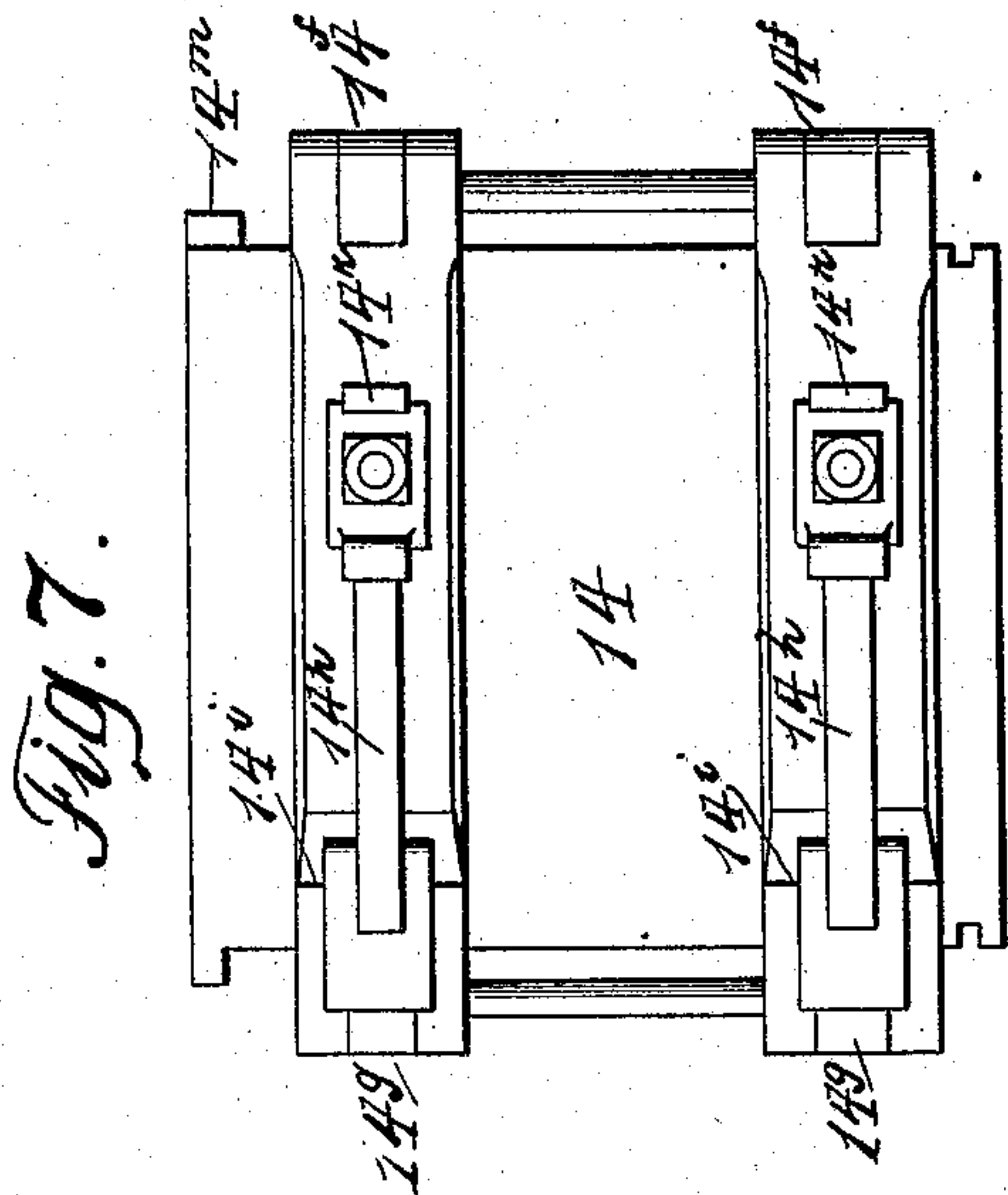


Fig. 8.

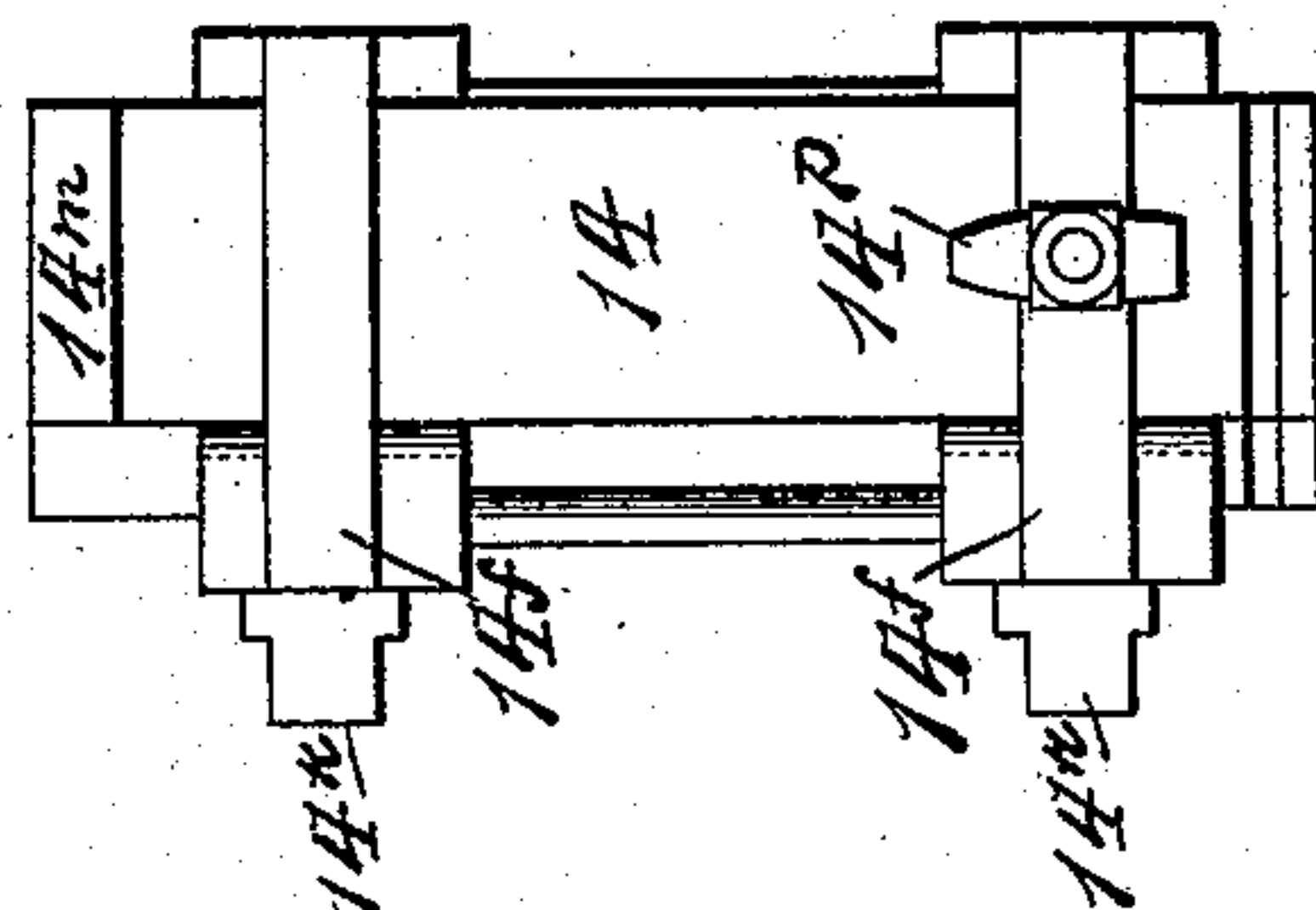
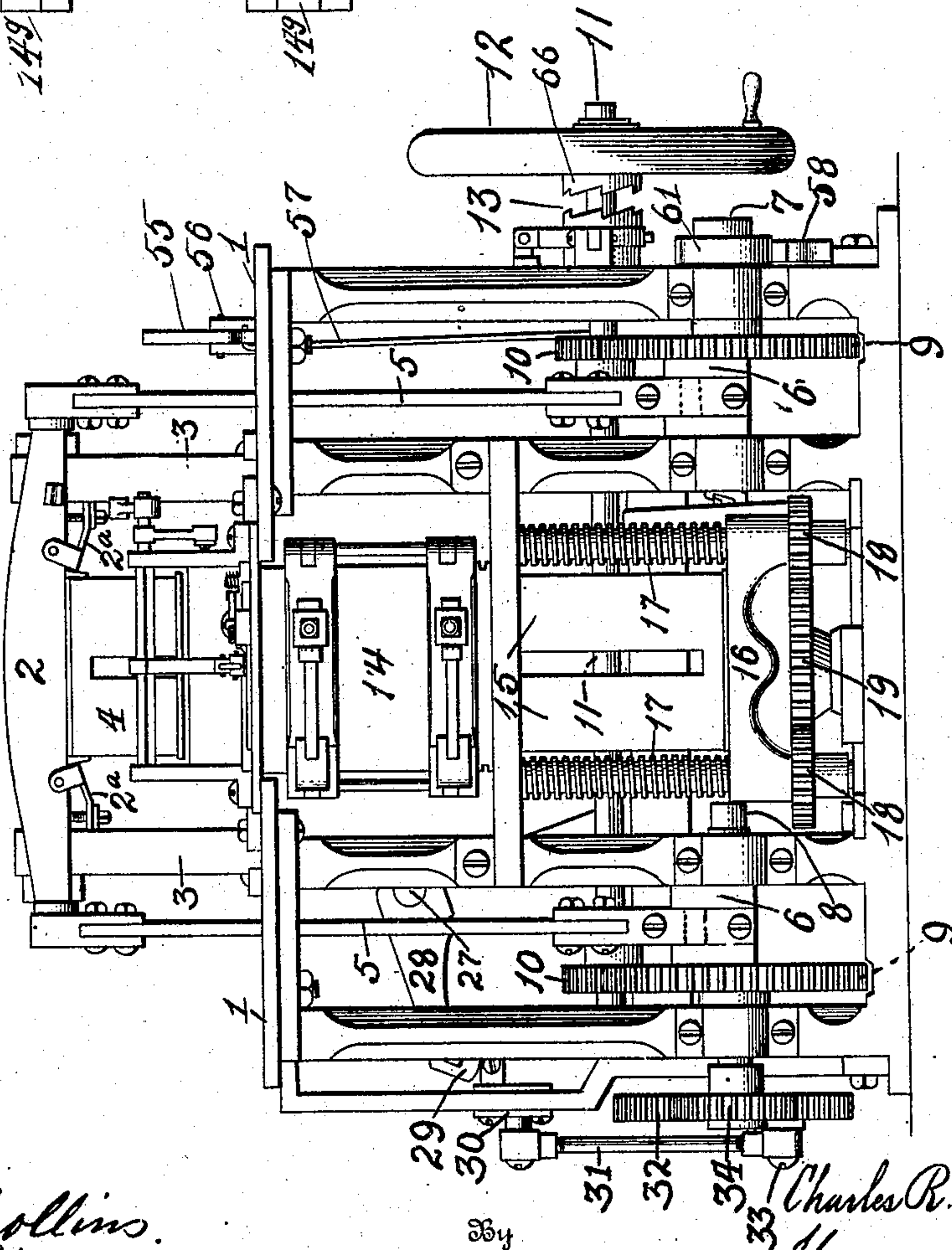


Fig. 9.

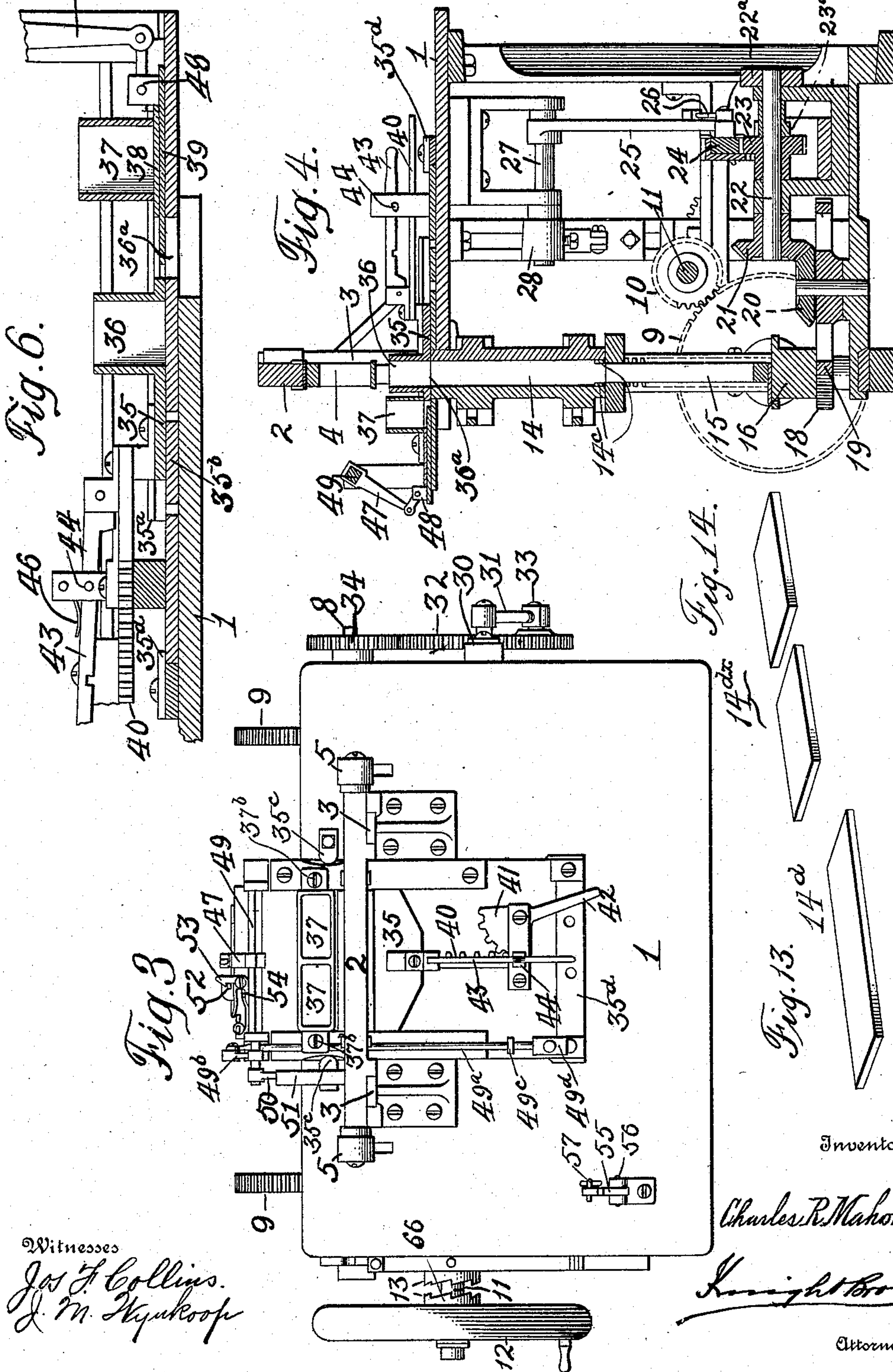


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5 SHEETS—SHEET 3.



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5 SHEETS—SHEET 4.

Fig. 10.

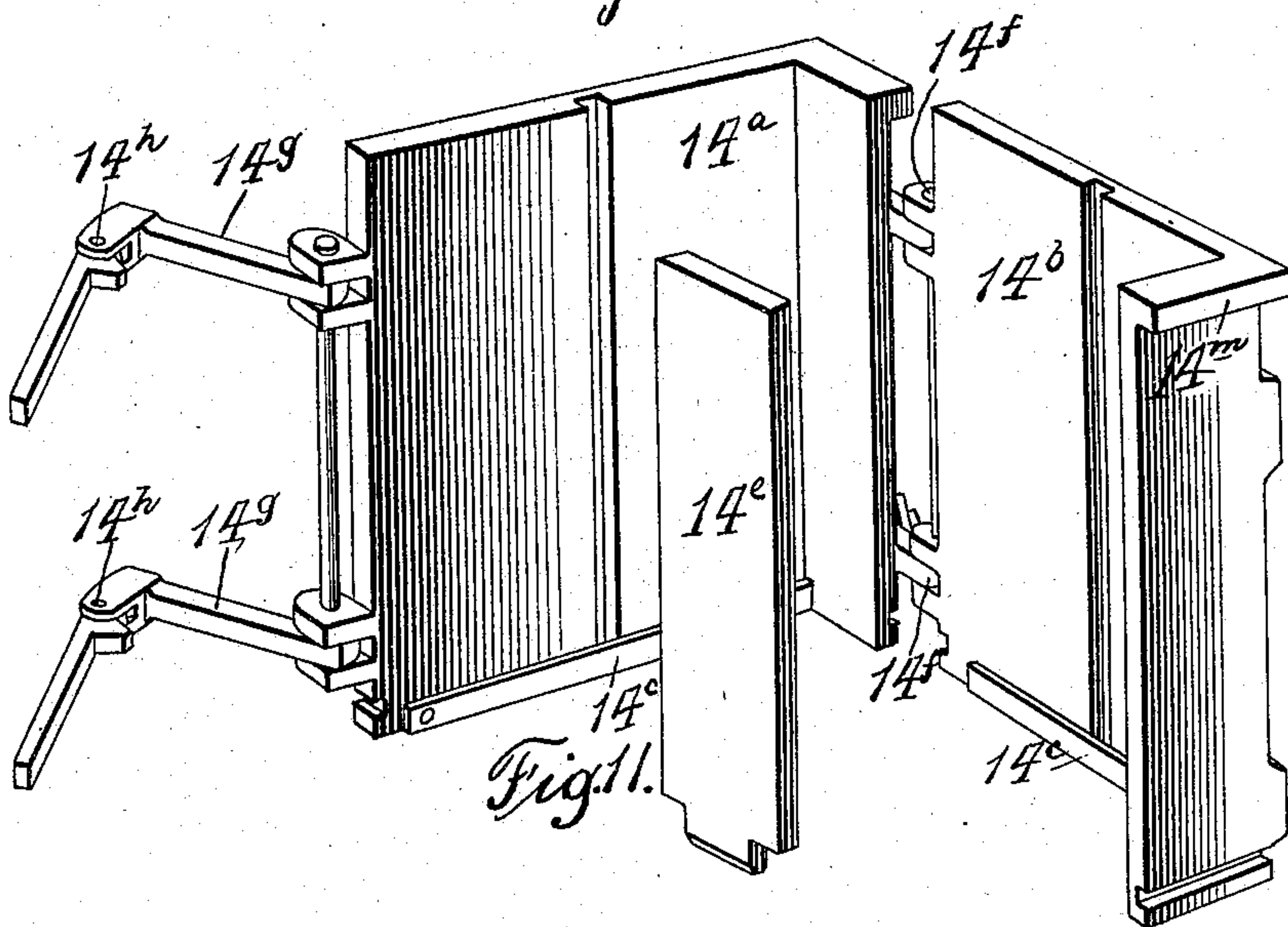


Fig. 11.

Fig. 12.

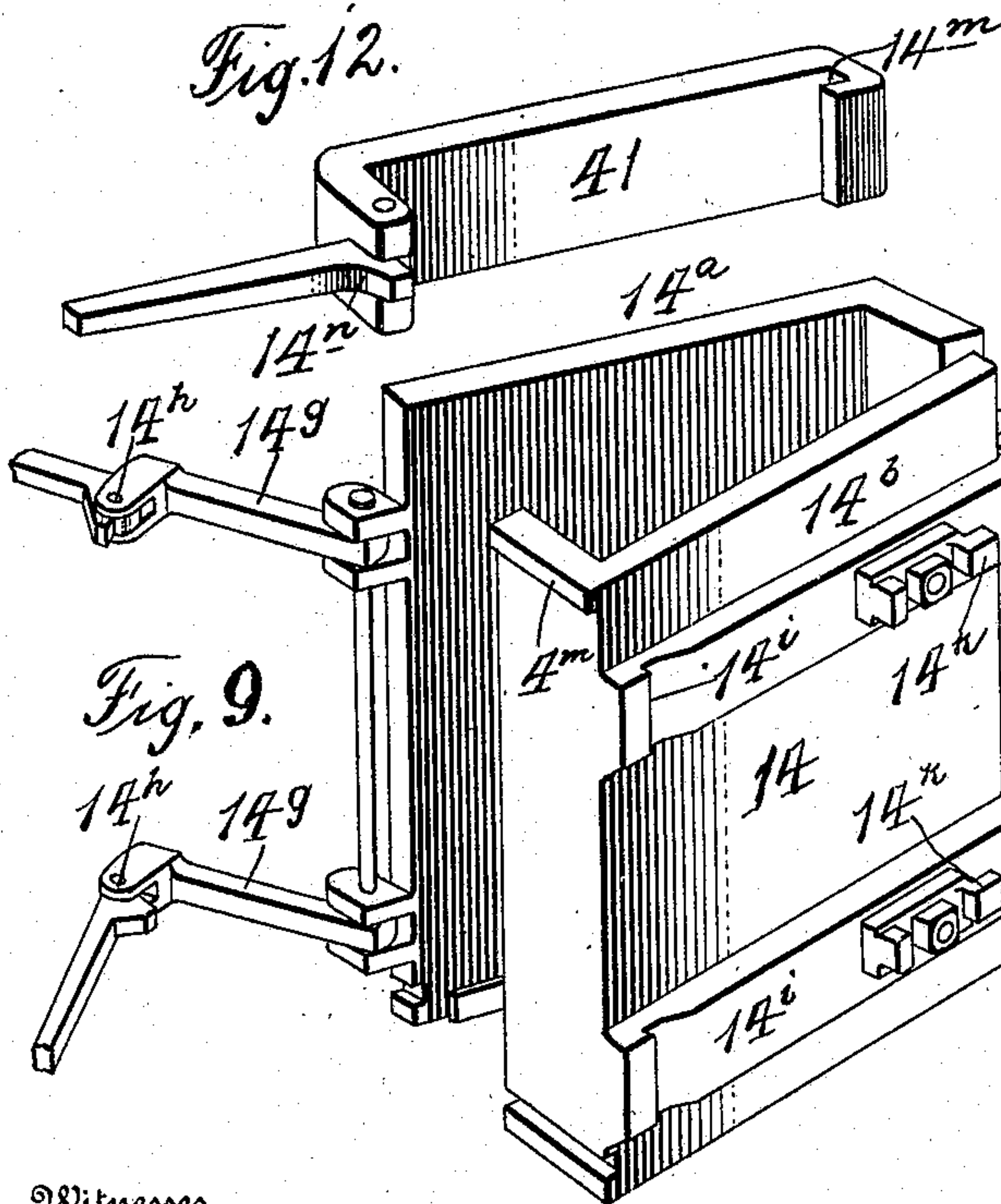


Fig. 9.

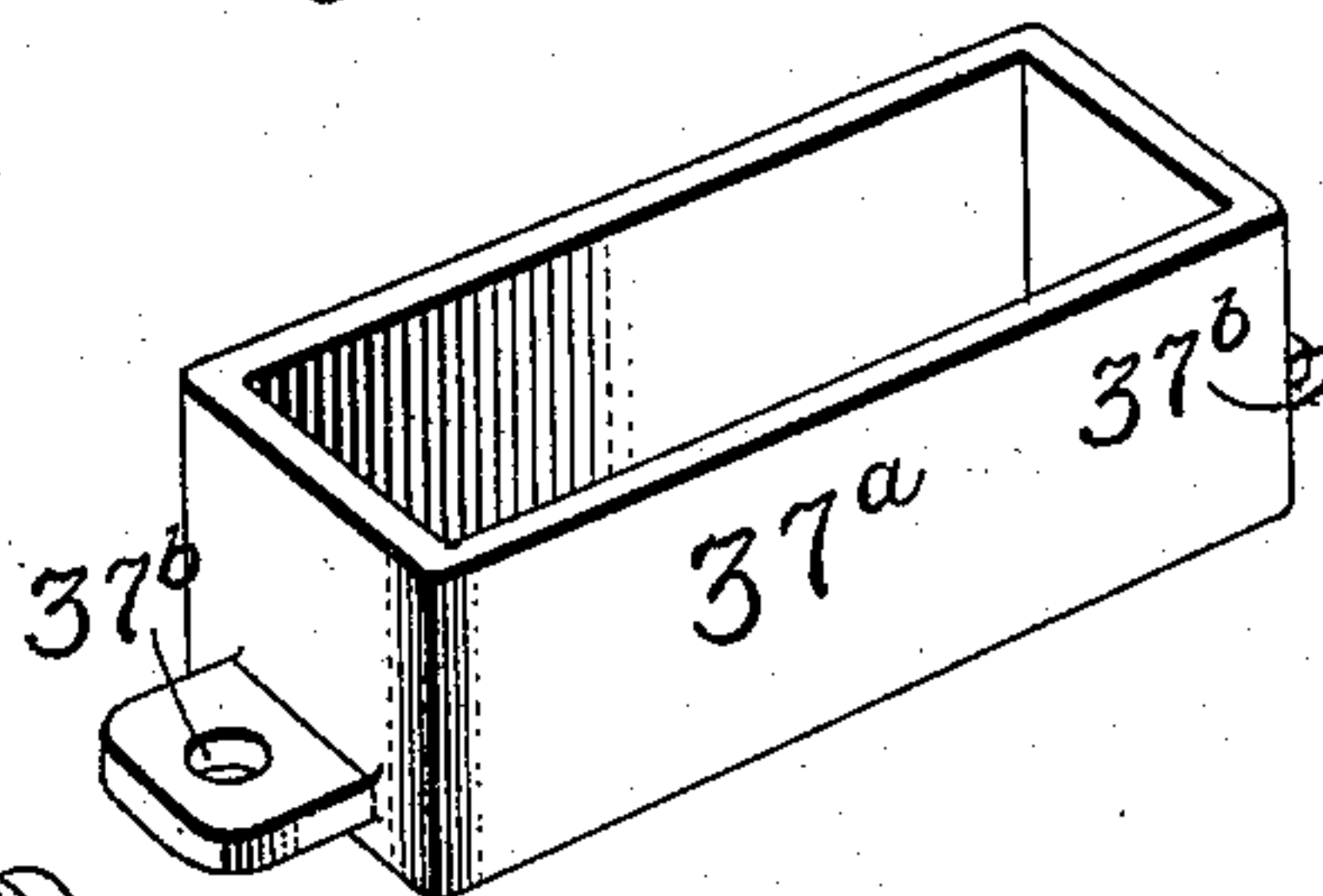
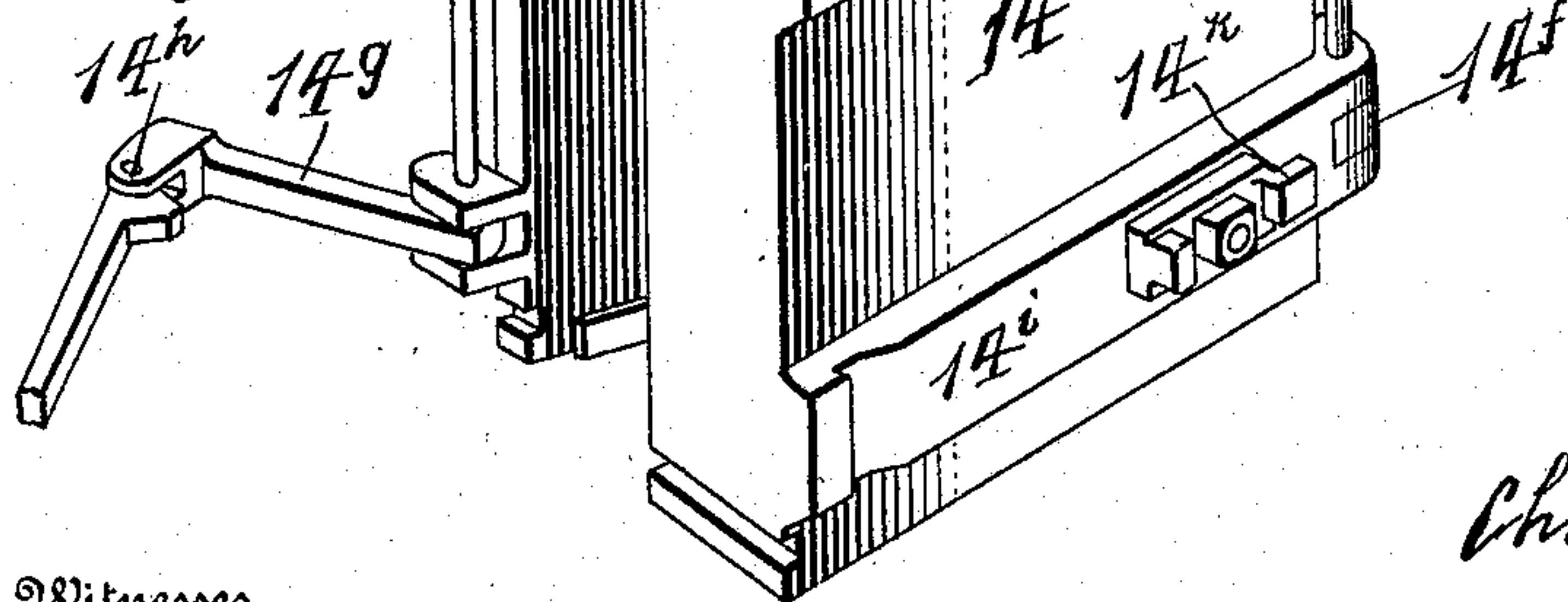


Fig. 15^a.

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5 SHEETS—SHEET 5.

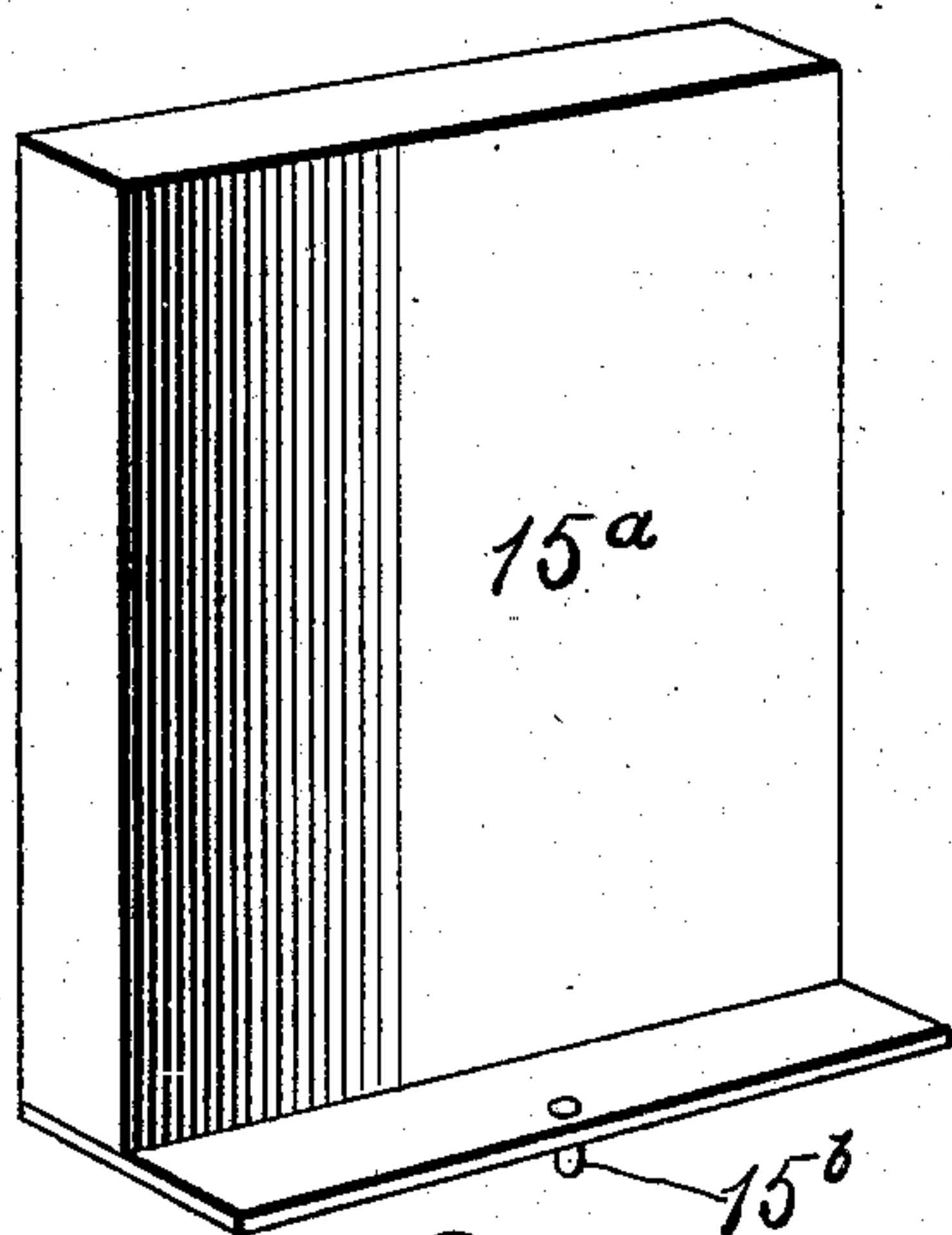


Fig. 18.

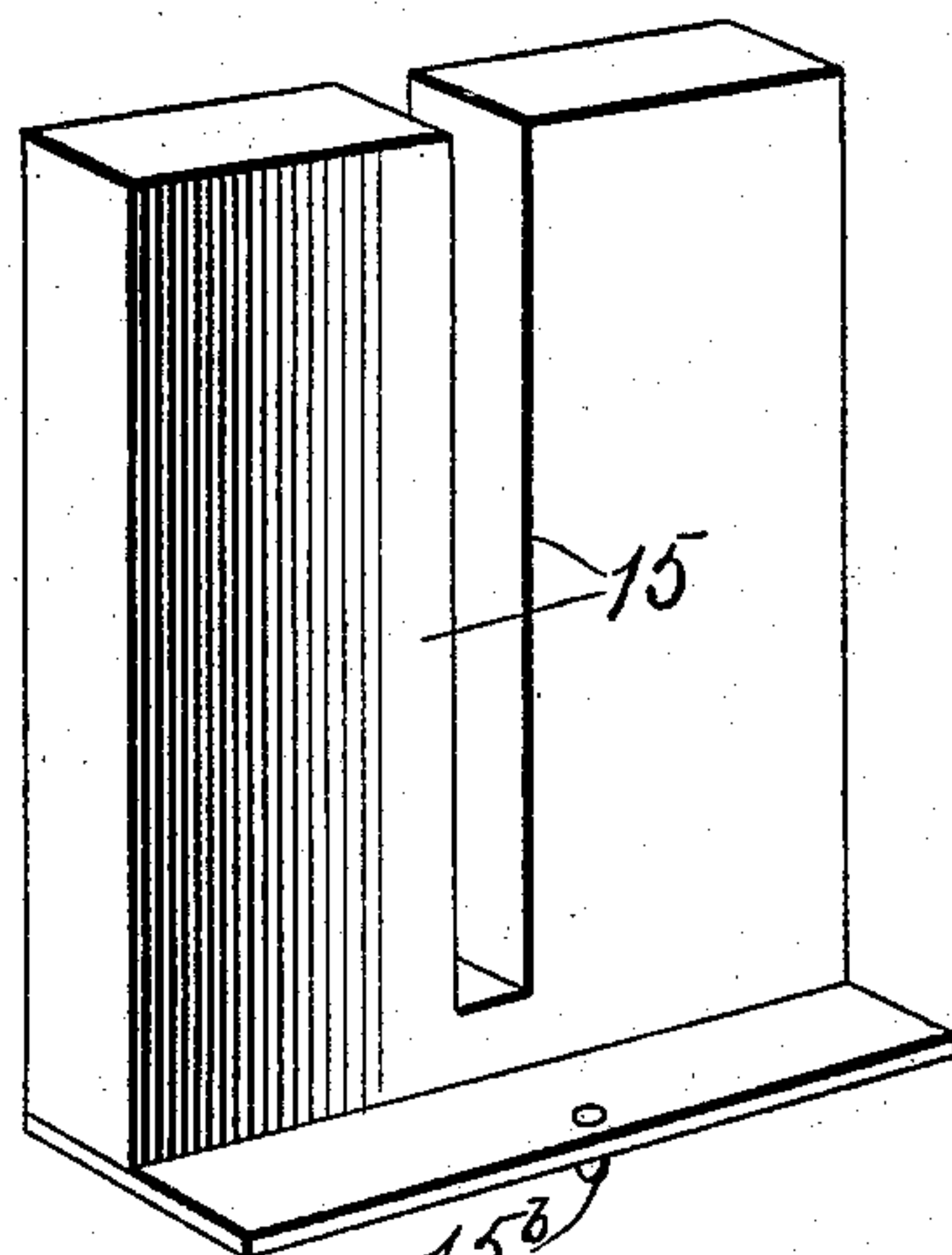


Fig. 19.

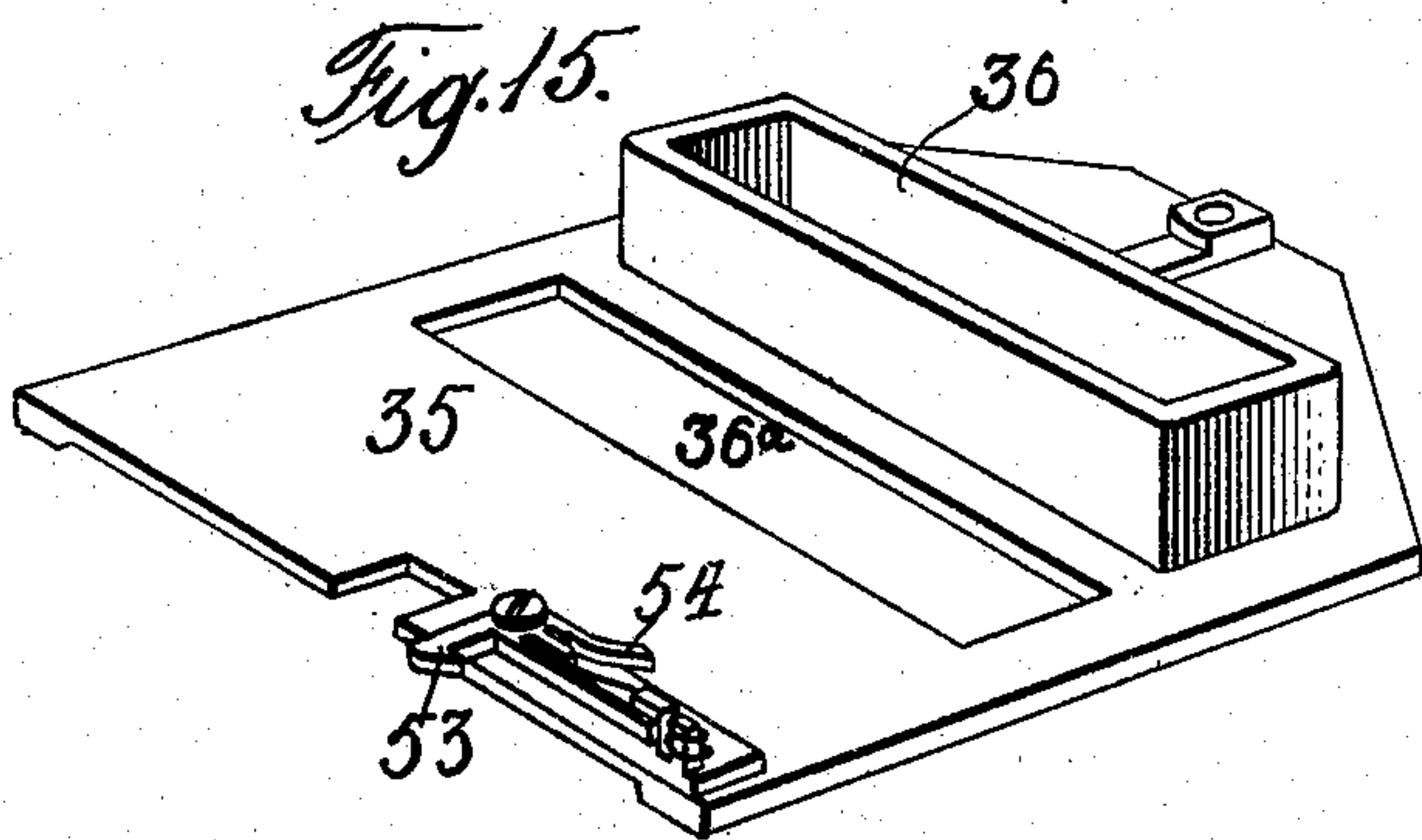


Fig. 15.

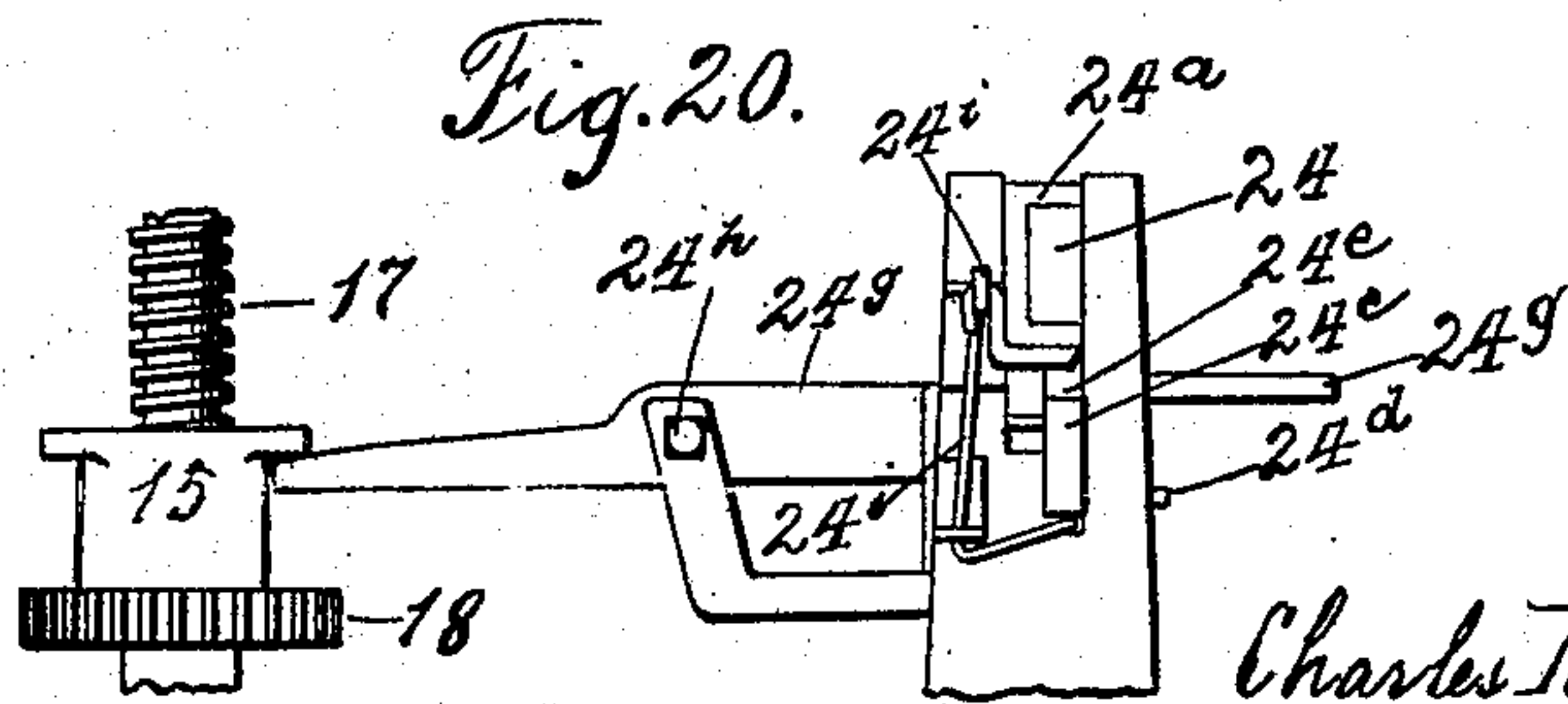


Fig. 20.

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UNITED STATES PATENT OFFICE.

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PRESS FOR LUMP-TOBACCO.

No. 911,312.

Specification of Letters Patent.

Patented Feb. 2, 1909.

Application filed July 22, 1907. Serial No. 384,903.

To all whom it may concern:

Be it known that I, CHARLES R. MAHONE, a citizen of the United States, and resident of Richmond, in the county of Henrico and State of Virginia, have invented certain new and useful Improvements in Presses for Lump-Tobacco, of which the following is a specification.

My invention relates to a machine into which lump tobacco may be fed and by which the tobacco will be packed under heavy pressure in a press box which is removably mounted upon the frame and which when filled may be removed from the machine, closed up to retain the pressure of the tobacco packed therein, and set aside until the tobacco becomes set in its final form ready to be packed for shipping.

The object of my invention is to so construct such a machine that it may be operated by a single operative; that it will treat the product with greater efficiency; and that it will have a greater capacity and a wider range of use; these results being due mainly to the automatic operation of the several parts of the machine under control of the operator, the interchangeability of the press box and cooperating pressing members, and the adjustability of the pressing members.

In carrying out my invention I employ a suitable frame, provided with a table, a series of press boxes of peculiar construction, of different capacity and interchangeability applicable to the machine; vertically reciprocating plungers with cooperating adjustable platens, corresponding in number to the different capacities of press boxes to be charged and adapted to be interchangeably mounted upon the machine; driving means for the plunger constructed to depress it intermittently and bring it to rest at the end of both its upward and downward strokes, in order not only to arrest the plunger while the lumps are being introduced, but to retain it in pressure position to give time for escape of trapped air; a means for automatically retracting the platen which cooperates with the plunger to sustain the tobacco being pressed, said means being adjustable to determine the size of the pressure space and being automatically actuated to withdraw the platen after the pressure of each charge, said withdrawal being regulated according to the thickness of the charge; means automatically throwing the retracting means out

of action when the platen reaches its lower limit; a feeding hopper reciprocating to and from the path of the plunger, to receive the lumps successively and deliver them over the press box, a fixed division plate hopper having a pusher plate adapted to engage the bottommost plate in the plate hopper and deliver it over the press box after each charge has been forced into the box, said pusher plate alternating with the feed hopper into and out of the path of the plunger; a plate support advancing with the pusher as each plate is introduced, but remaining to support the division plate parallel with the face of the plunger, until the latter descends close enough to prevent tipping of the division plate, when the support is automatically withdrawn by a further movement of the plunger; suitable means for manipulating the lump and plate feeding devices; and a clutch mechanism by which the press may be thrown into action at will.

My invention consists in certain novel arrangements, combinations and details of construction of the elements above described, as well as other mechanisms and parts incident to the use thereof, all of which will be hereinafter fully described and particularly pointed out in the claims, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a front elevation of my improved machine with the parts assuming the positions occupied immediately after the raising of the press and a retracting stroke of the receding platen; Fig. 2 is a rear elevation of the same, with the parts in like position; Fig. 3 is a plan view of the machine; Fig. 4 is a vertical section from front to rear in a plane central to Figs. 1, 2 and 3; Fig. 5 is a detail view of the automatically releasing and arresting clutch; Fig. 6 is a detail sectional view of the lump and plate feeding mechanism, said parts being in section in the same plane as in Fig. 4, but being seen from the opposite direction and in different positions; Figs. 7 and 8 are respectively a side and an edge view of one of the interchangeable press boxes; Figs. 9 and 10 are perspective views showing two types of press box, opened up to show their internal construction; Fig. 11 is a perspective view of the division plate employed in the type of press box shown in Fig. 10 for the purpose of dividing it into two press chambers when

it is desired to press two columns of tobacco simultaneously; Fig. 12 is a perspective view of the clamping cover placed over and secured to the press box when it is removed from the press, for the purpose of confining the tobacco therein, and preventing its swelling, while the tobacco is setting; Figs. 13 and 14 are perspective views of two types of division plates employed respectively with the single chamber and double chamber press boxes; Figs. 15 and 15^a are perspective views respectively, of the feed-hopper and pusher plate hopper differing from the construction of the corresponding parts in Fig. 3 in the omission of the transverse partitions in the hoppers, said devices being interchangeable with the devices shown in Fig. 3 in order to adapt the machine for pressing one lump instead of two lumps simultaneously; Figs. 16 and 17 are perspective views showing the two types of plunger adapted to be mounted upon the machine interchangeably for pressing single lumps or two lumps at each stroke of the machine; Figs. 18 and 19 are perspective views of the two types of platen employed respectively with the plunger shown in Figs. 16 and 17; Fig. 20 is a view representing the automatic releasing means for the platen withdrawing means.

1 represents the table, 2 a cross head mounted to reciprocate upon standards 3, and 4, (Figs. 1, 2, 5 and 17) a plunger secured beneath cross head 2 by clamps 2^a. This plunger comprises two members adapted to enter the respective pressure compartments, as hereinafter explained. A single plunger 4^a (Fig. 16) may be substituted however, being constructed in all other respects similarly to the plunger 4.

5 represents pitmen connecting the cross head 2 with cranks 6 carried respectively by shafts 7 and 8, and 9 represents large gear wheels on said shafts, driven by small gear wheels 10 on the through shaft 11 which is adapted to be driven by the loose wheel 12 when coupled with the shaft through the clutch 13.

14 represents the press box, adapted to be mounted beneath the plunger 4, in position to confine lumps of tobacco forced into the box by the plunger. This box, as will be seen upon reference to Figs. 7-10, is constructed of two members 14^a 14^b, each carrying one narrow side of the box. The ends of the box are open, the upper end to permit introduction of the tobacco and the lower end to receive the receding platen. Said lower end is, however, provided with ledges 14^c upon which the first division plate 14^d or 14^{ax} (Figs. 13 and 14) will finally rest when the box is filled and the platen completely withdrawn. The box is adapted to press lumps of size corresponding to the transverse section of the box or to press lumps corresponding in size to half the section of the

box, for which purpose the box will be divided by a partition 14^e (Fig. 11). The members of the box are hinged together at 14^f and provided at their opposite ends with clamping arms 14^g carrying latches 14^h adapted to be secured in engagement with the notches 14ⁱ by the turn buttons 14^k.

41 represents a top closure adapted to engage the top of the box on one side by a tongue and groove joint 14^m and on the other side by a clamp 14ⁿ, said top closure being applied after the box is filled and removed from the press. After a box thus filled and closed has set for a suitable length of time, the box is opened up and the column or columns of tobacco removed therefrom, separated from the division plates and packed in the usual receptacles for shipping.

15 represents a platen which sustains the tobacco at each pressure stroke. This platen may comprise two members, as shown in Figs. 2 and 19, for the purpose of cooperating with a double plunger in the pressing of two columns of tobacco, or it may comprise but a single member 15^a, as shown in Fig. 18 for cooperation with a single plunger 4^a (Fig. 16).

The platen is held in place by pin 15^b upon the lower cross-head 16, threaded upon the vertical screws 17 which have fixed upon their lower ends pinions 18 driven by a common gear wheel 19 (see Figs. 2 and 4). As shown in Fig. 4, wheel 19 is driven by a bevel gear 20 meshing with gear 21 on the forwardly extending shaft 22, provided with a hand adjusting wheel 22^a at its forward end, and with a driving pinion 23 at an intermediate point that rotates the shaft in one direction only, through ratchet 23^a (Figs. 1 and 4). Pinion 23 is driven by a horizontally reciprocating rack 24 (Figs. 1, 4 and 20) mounted in a slide-way 24^a pivoted at 24^b and held normally downward by a latch 24^c. Said latch is pivoted at 24^d, engages a hook 24^e on the guide 24^a and has a tail 24^f engaged by a lever 24^g. Upward movement on the lever 24^g releases the latch 24^c and permits rack 24 to rise out of engagement with pinion 23. When thus released, said pinion is free to turn and consequently shaft 22 can be rotated by wheel 22^a and the platen 15 may be adjusted vertically to regulate the compression space in the box. As will be seen from Fig. 20, the lever 24^g is pivoted at 24^h, is pressed normally upward by a spring 24ⁱ, and has its rearmost end projected at 24^k beneath a portion of the lower cross-head 16. When cross-head 16 reaches its lower limit in retracting the platen, it depresses the rear end of lever 24^g, raising its forward end, releasing the latch 24^c and permitting the rack to withdraw from the pinion which it drives; hence, further movement of the platen is prevented.

Rack 24 is driven by crank arm 25 through

pitman 26, adjustable to and from the center of the crank to vary the throw and consequently the extent of adjustment in the receding platen, so as to make the compression space proportional to the thickness of lump being introduced; said crank arm being mounted upon a shaft 27 which carries a second arm 28 connected through swivel 29 with the sliding head 30, which in turn receives vertical movement through pitman 31 from a wheel 32 having a wrist pin 33. Wheel 32 is driven by a pinion 34 (Figs. 2 and 3) which is mounted on the outer end of the short shaft 8 whose driving connections have already been traced. The proportions and relations of these driving connections for rack 24, are such that one stroke is imparted to the rack for each two strokes of the plunger. That is to say, there is a preliminary pressure stroke of the plunger exerted directly upon each lump of tobacco and a secondary pressure stroke exerted through the division plate introduced after each lump is preliminarily pressed. Since the rack makes but one stroke to each two strokes of the plunger, these two pressures are exerted without adjustment of the platen. As already stated, pinion 23 drives the shaft 22 through the ratchet 23^a and therefore imparts rotation to said shaft only in the direction to cause lowering of the platen.

To feed tobacco into the press, I provide a plate 35 sliding in guides 35^a on a base plate 35^b, which is releasably mounted on the table 1, by clamps 35^c and a plate 35^a (Figs. 3, 4 and 6), which plate 35 carries the hopper 36 movable to and from the feed opening 36^a beneath the plunger 4. Fixedly mounted over the rear end of the plate, is a division plate hopper 37 in which are placed the division plates in suitable number to separate the lumps required to fill the box. Carried by the plate 35 is a pusher plate 38 working beneath the open bottom of hopper 37 and engaging the bottommost plate in the latter to pass it over the opening 36^a each time the hopper 36 with a lump or lumps therein is moved forward over the opening 36^a. The pusher 38 passes beyond the hopper 37 and allows a division plate to drop in front of the pusher; then when the hopper 36 is again drawn forward, the bottommost plate in hopper 37 is moved forward to a position over the opening 36^a, after which the plunger descends to force the plate down upon the column of tobacco as a preliminary to the introduction of the next lump or layer of lumps. In order to prevent the plate overturning, a support 39 moves forward with the pusher 38 and remains beneath the division plate until the plunger descends nearly upon the plate, when the support 39 is withdrawn by an arm 47 connected to the support at 48 and mounted upon a rock

shaft 49 (Figs. 4 and 6), which also carries an arm 50 extending beneath a projection 51 on cross head 2 (see Fig. 3). As cross head 2 descends, it engages parts 51, 50, rocks the shaft 49 and withdraws the support 39 so that the plate drops upon the lump last introduced. A slide rod 49^a connected to shaft 49 through crank arm 49^b, works in a guide 49^c and carries an enlargement 49^d to limit the rocking movement of shaft 49, and also to bring the said shaft under manual control of the operator. In order that the support 39 may be drawn forward with the pusher 38, the former carries a post 52 (Fig. 3) engaged by a spring pressed latch 53, (Figs. 3 and 15), which also carries a tail 54. As the pusher approaches the forward limit of its movement, tail 54 strikes the plate hopper 37 and releases the latch 53 so that the support is then free to be withdrawn automatically by the descending cross head. Hoppers 36 and 37 are constructed either with single compartments, or each with a double compartment, according to whether one large lump is being handled in the machine or two smaller lumps, for each layer. The plate 35 with hopper 36 and pusher 38 integral therewith, is interchangeable with corresponding parts, differing only in the construction of the hopper 36, while the hopper 37 may be taken off and replaced by another hopper appropriate to the work to be done.

In order to manipulate the hopper 36 and pusher 38, plate 35 on which said parts are carried, is provided with a rack 40 engaged by segment 41 having controlling lever 42; the parts being locked at their respective limits by a notched lever 43 pressed into engagement with cross pin 44 by spring 46.

The clutch control comprises a bell crank lever 55 pivoted at 56 upon table 1, connected by rod 57 with the two armed rocking lever 58, one end of which is pressed by spring 59 into engagement with the diametrically opposite seats 60 in disk 61 on the short shaft 7 (Figs. 2 and 5). Lever 58 is also connected, through rod 62 with bell crank lever 63 adapted to push the lever 64 and clutch member 65 into engagement with corresponding clutch member 66 on wheel 12. Wheel 12 is shown with a handle merely for the purpose of suggesting that the power for driving the machine is received at that point; obviously in practice the machine will be suitably connected up to some constantly running prime mover.

The notches 60 are so positioned in disk 61 as to be engaged by the end of lever 58 only when the cross-head 2 is at the extreme upper or lower end of its travel. In consequence, after each tripping of the lever 58, the machine is again brought to rest with the cross-head 2 in the extreme upper position.

The operation of the machine is briefly as follows: The cross-head 16 having been adjusted to such height as will bring the top of platen 15 within the press box and at such distance from the lowest position of plunger 4 as to correspond with the desired thickness of the plugs to be produced, the lump tobacco is emptied into the hopper 36. Upon falling into the press box in the manner already indicated, the plunger 4 descends and compresses it to the desired thickness. Thereupon a plate is deposited upon the plug as described in the foregoing specification and the operation repeated until the press box becomes filled with the plugs thus produced. It is during the interims between the downward movements of the plunger, that the cross-head 16 and with it the platen 15 is successively lowered to a degree corresponding with the thickness of the plug produced.

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

1. In a tobacco press the combination of the press box, a reciprocating plunger and reciprocating means feeding the lump tobacco and division plates alternately in position to be introduced by the plunger into the press box.

2. In a tobacco press, the combination of the press box, a reciprocating plunger, the division plate hopper, reciprocating means moving a plate from said hopper into the path of the plunger and a tobacco hopper introducing lumps of tobacco into the path of the plunger alternately with the introduction of the division plates.

3. In a tobacco press the combination of the press box, the reciprocating plunger, a plate carrying a tobacco hopper and a plate pusher, and a plate hopper beneath which the plate pusher works; said plate pusher and tobacco hopper acting alternately to bring plates and tobacco into the path of the plunger.

4. In a tobacco press the combination of the press box, the reciprocating plunger, suitable means for feeding tobacco, a plate pusher, means for supplying plates to the plate pusher and a plate support supporting the division plate in the path of the plunger until the latter descends.

5. In a tobacco press the combination of the press box, means for feeding tobacco, the reciprocating plunger, the plate pusher, the plate support, and means whereby the descending plunger automatically withdraws the plate support.

6. In a tobacco press the combination of the press box, the reciprocating plunger, the plate pusher, the plate support, means whereby the pusher engages the support to move it forward simultaneously with the introduction of the plate, means releasing

the said engaging means to permit the pusher to return independently, and means withdrawing the plate support as the plunger descends.

7. In a tobacco lump machine, the combination of a press box constructed to contain a plurality of charges of tobacco, means for feeding successive charges of tobacco to the press box, the reciprocating plunger imparting successive compressions to the tobacco in the press box as the charges accumulate therein, and means for arresting the movement of said reciprocating plunger in its pressure position at successive strokes, and prolonging the pressure on the tobacco to reduce recoil of the charge as pressure is removed therefrom.

8. In a tobacco press the combination of the interchangeably adapted press boxes, the corresponding series of interchangeably adapted division plate hoppers and the corresponding series of interchangeably adapted tobacco hoppers.

9. In a tobacco press, the combination of the press box, the reciprocating plunger, the reciprocating tobacco hopper, and the means for reciprocating said tobacco hopper into and out of the path of the plunger, consisting of the rack bar and the toothed segment.

10. In a tobacco press the combination of the press box, the reciprocating plunger, the tobacco hopper, and means for moving the tobacco hopper into and out of the path of the plunger and retaining it at its limits of movement, consisting in the notched bar adapted to engage a suitable stop at either limit of its movement, the rack bar connected with the hopper, and the toothed segment engaging the rack bar.

11. In a tobacco press, the combination of the press box, the reciprocating plunger, and the platen automatically operated to recede through the press box after each stroke of the plunger.

12. In a tobacco press the combination of a plurality of interchangeably adapted press boxes, corresponding reciprocating plungers also interchangeably adapted to the machine and corresponding platens also interchangeably adapted to the machine and working through the bottom of the press box.

13. In a tobacco press, the combination of a plurality of interchangeably adapted press boxes adjustable vertically, and a plurality of corresponding interchangeably adapted plungers.

14. In a tobacco press the combination of the press box, the reciprocating plunger, the automatically receding platen working in the press box, and means causing two strokes of the plunger to one receding stroke of the platen.

15. In a tobacco press the combination of the press box, the reciprocating plunger, the automatically receding platen working in

the press box, means for feeding division plates alternately with the tobacco, and means causing two pressure strokes of the plunger to one receding stroke of the platen; one of said plunger strokes being exerted after the introduction of the tobacco and the other after the introduction of the plate.

16. In a tobacco press the combination of a press box, the reciprocating plunger, the platen working through the bottom of the press box and means automatically withdrawing the platen through the press box as the tobacco accumulates therein.

17. In a tobacco press the combination of a press box, the reciprocating plunger, the platen working through the bottom of the press box and means automatically withdrawing the platen through the press box as the tobacco accumulates therein, consisting of step by step mechanism operated in the interim between the pressure strokes of the plunger.

18. In a tobacco press the combination of the press box, the reciprocating plunger, the automatically receding platen and means through which said platen may be adjusted relatively to its receding movements.

19. In a tobacco press the combination of the press box, the reciprocating plunger, the automatically receding platen and the driving means for said platen; said driving means being adjustable for the purpose of

varying the compression space provided by each adjustment of the platen.

20. In a tobacco press the combination of the press box, the reciprocating plunger, the receding platen having suitable driving mechanism and means through which said driving mechanism may be thrown out of gear to release the platen therefrom.

21. In a tobacco press the combination of the press box, the reciprocating plunger, the receding platen, means imparting movement to the platen and an automatic release for said movement imparting means, actuated upon the arrival of the platen at the limit of its movement.

22. In a tobacco press, a press box having open ends and separable sides; one end being provided with ledges to support the division plate to close the end.

23. In a tobacco press, a press box having open ends and an end closure having means through which it engages the press box at one of its ends through a tongue and groove joint and at its other end through a suitable clamping device.

The foregoing specification signed at Richmond, Henrico Co., Virginia, this twenty-fifth day of April, 1907.

CHARLES R. MAHONE.

In presence of two witnesses—

LELIA L. LACY,
MABEL MORRIS.