

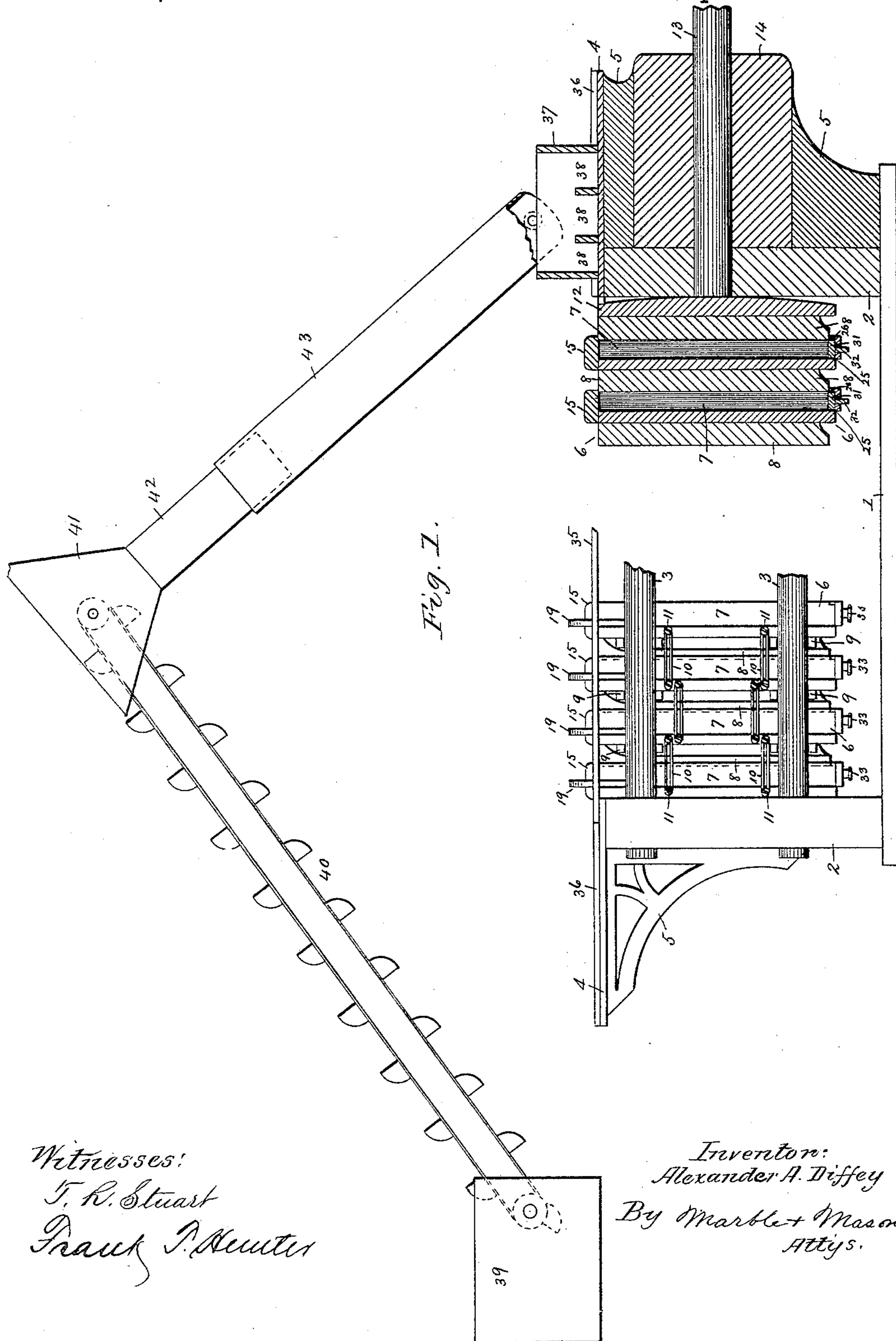
(No Model.)

3 Sheets—Sheet 1.

A. A. DIFFEY.
HORIZONTAL TELESCOPIC PRESS.

No. 424,543.

Patented Apr. 1, 1890.



Witnesses:

T. R. Stuart
Frank J. Hunter

Inventor:

Alexander A. Diffey

By Marble & Mason,
Attys.

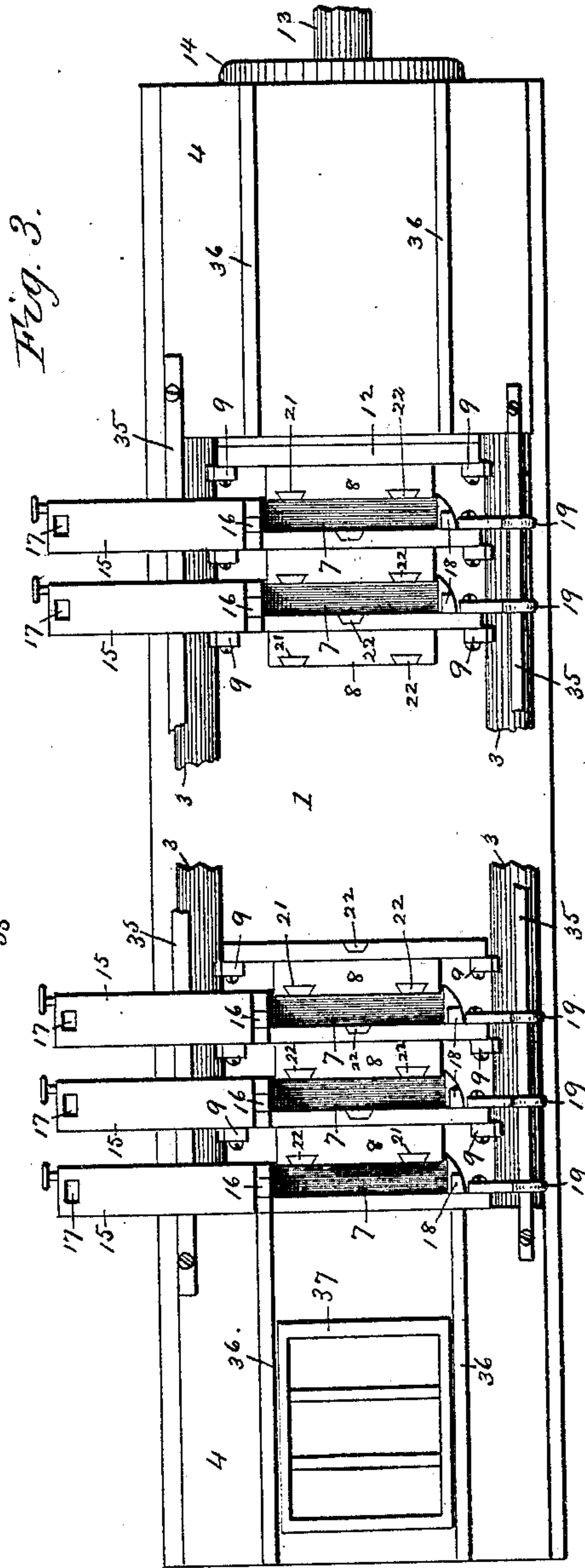
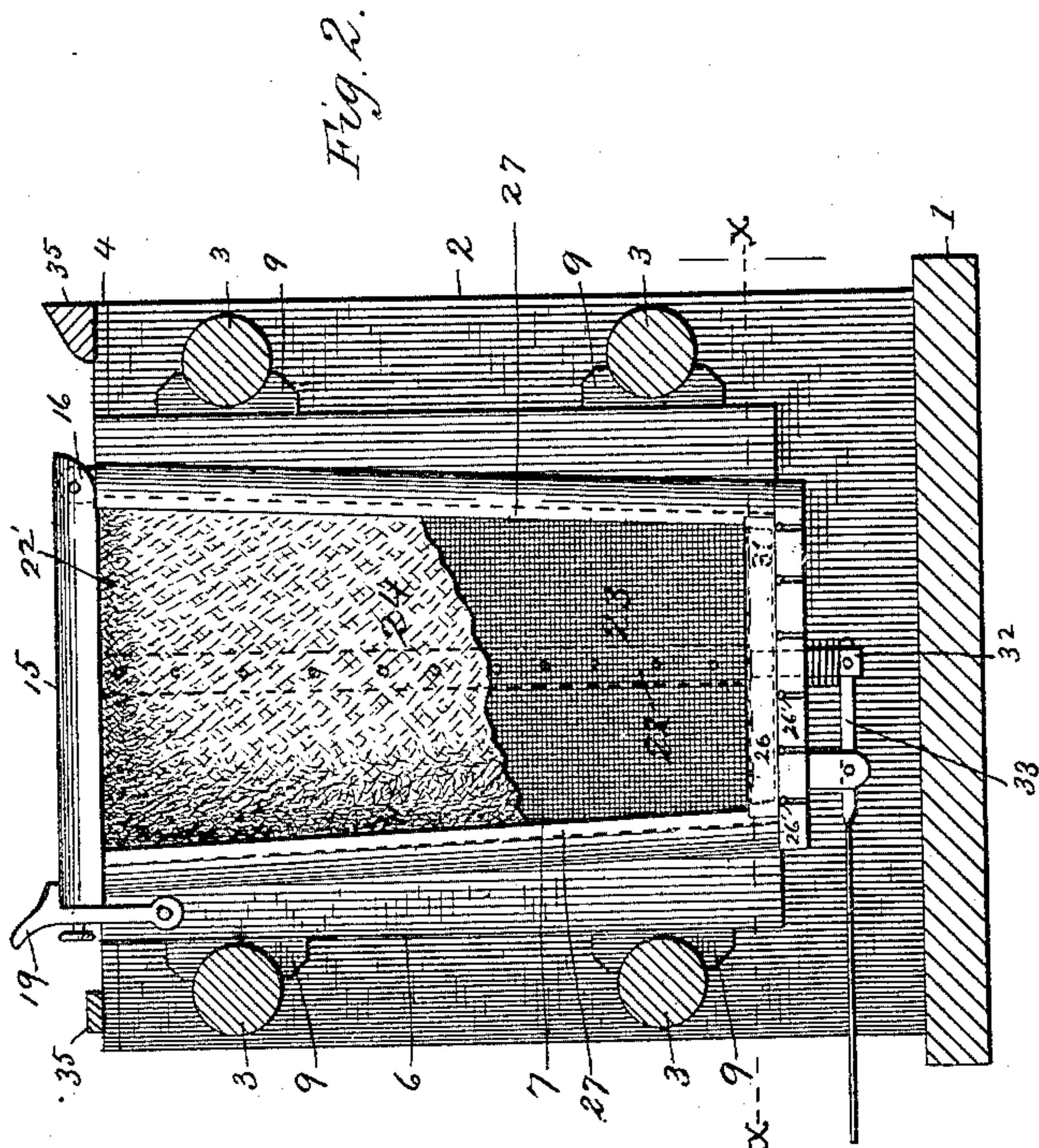
(No Model.)

3 Sheets—Sheet 2

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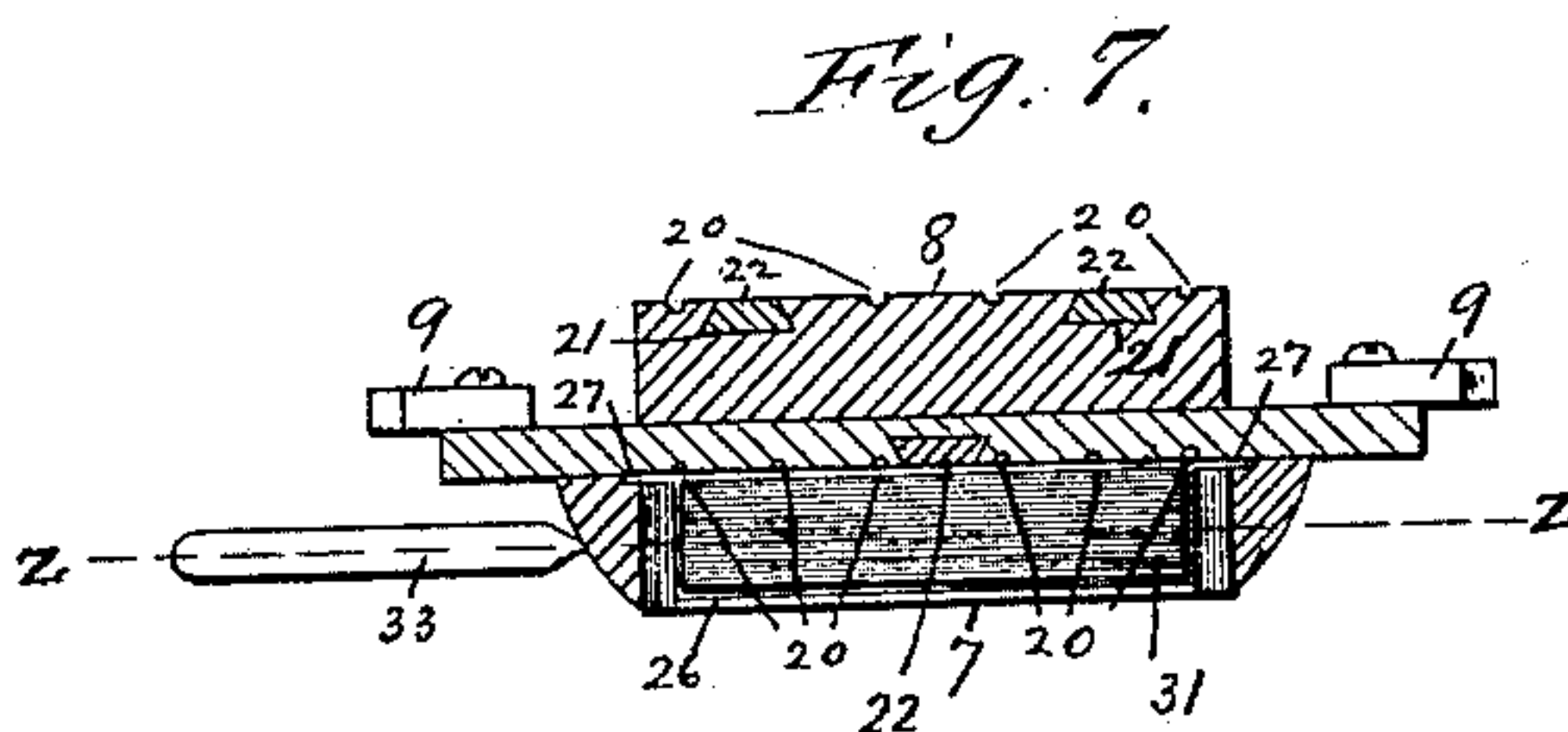
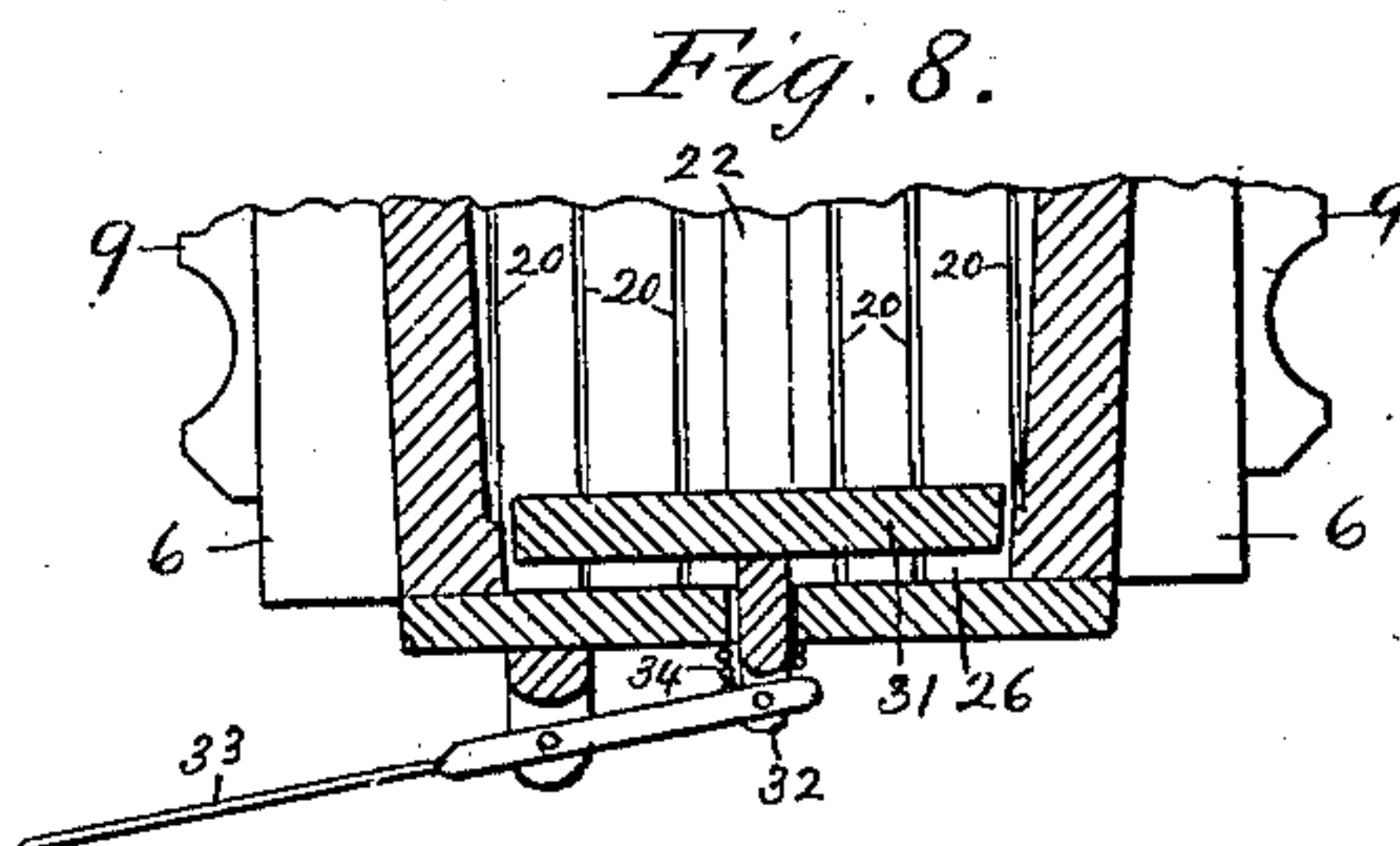
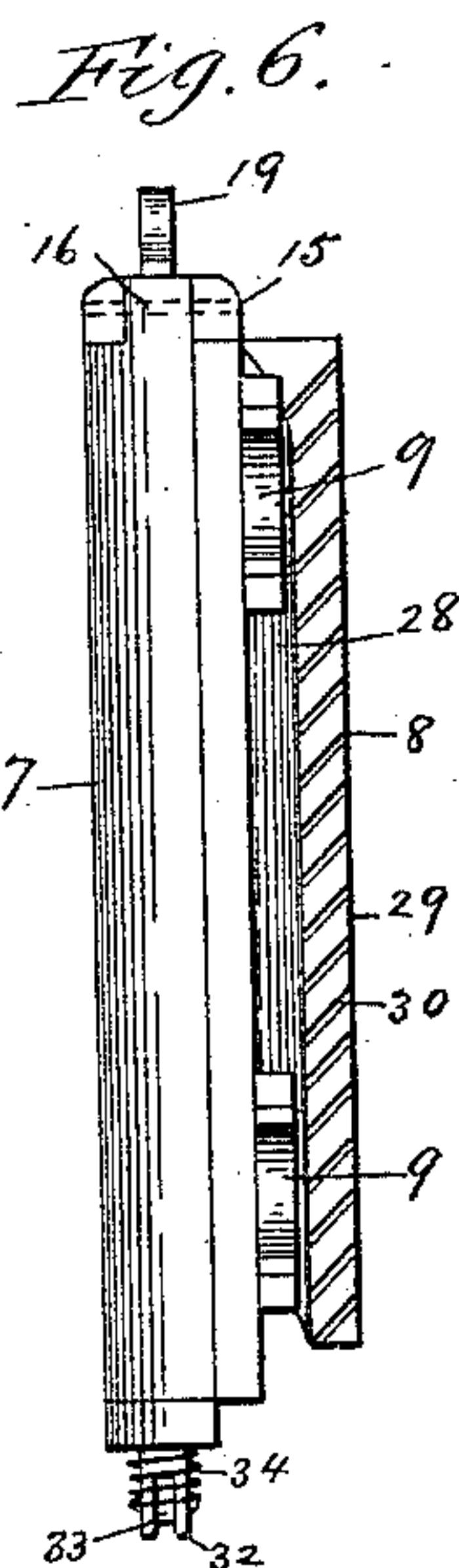
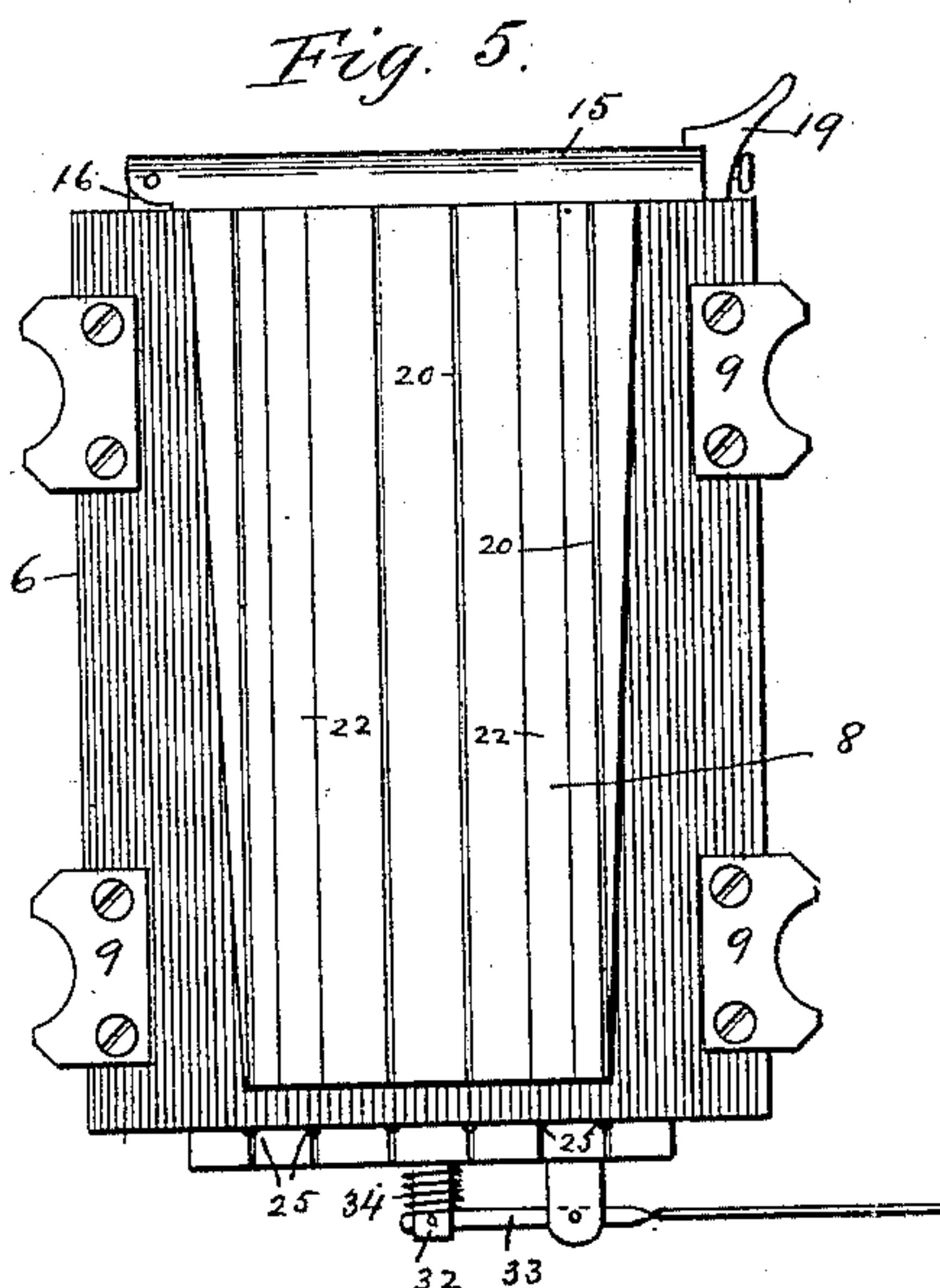
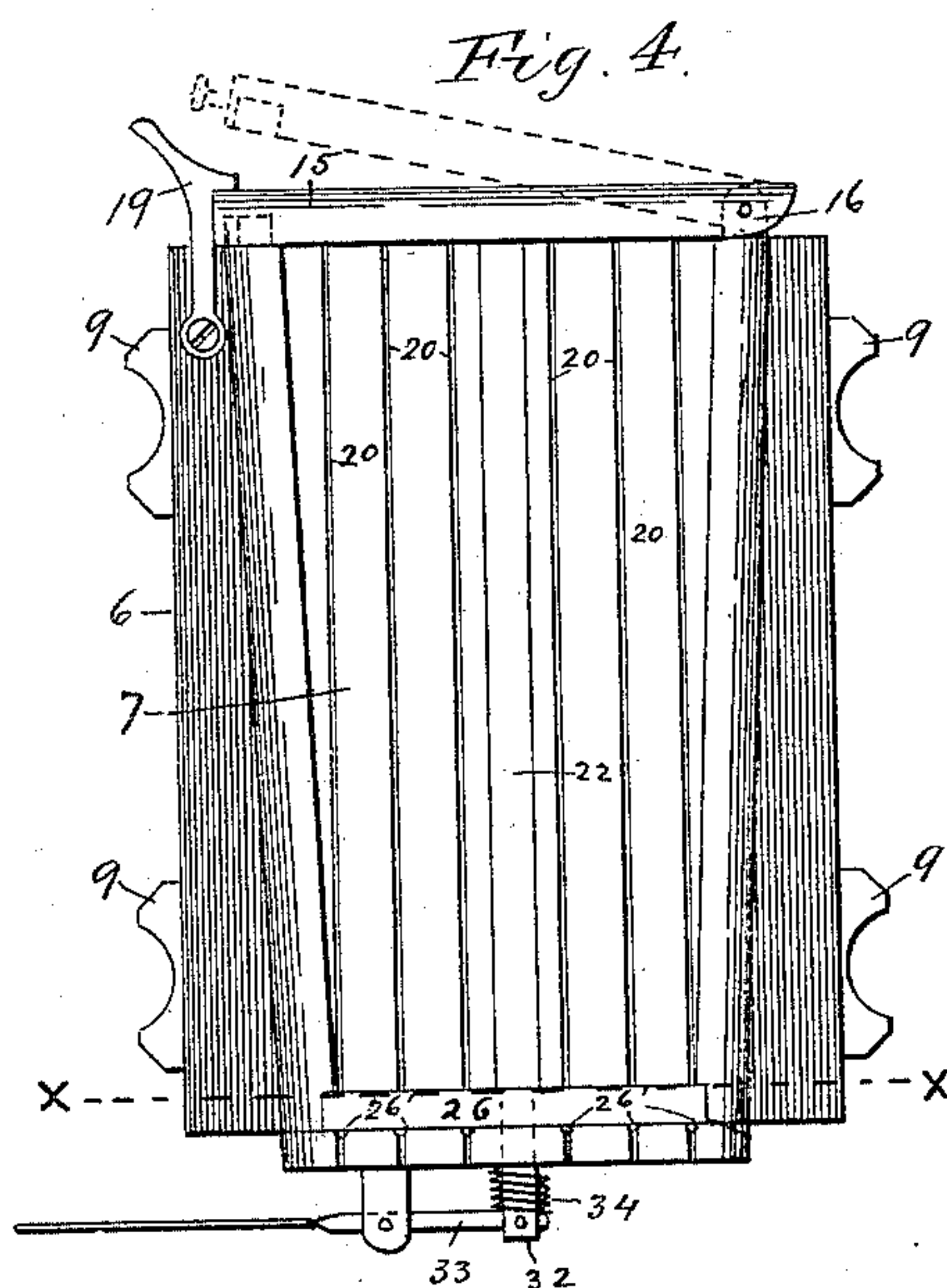
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UNITED STATES PATENT OFFICE.

ALEXANDER A. DIFFEY, OF BRINKLEY, ARKANSAS, ASSIGNOR OF ONE-HALF
TO ALFRED GOLDIE RYLEY, OF SAME PLACE.

HORIZONTAL TELESCOPIC PRESS.

SPECIFICATION forming part of Letters Patent No. 424,543, dated April 1, 1890.

Application filed May 29, 1889. Serial No. 312,648. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER A. DIFFEY, a citizen of the United States, residing at Brinkley, in the county of Monroe and State of Arkansas, have invented certain new and useful Improvements in Horizontal Telescopic 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.

My invention relates, generally, to presses for extracting liquids from solids, and particularly to that class of presses in which the parts of the press-boxes are constructed and arranged to telescope horizontally, and in which the plungers on the backs of said boxes fit closely into the boxes in front thereof; and it consists in the improved construction and arrangement or combination of parts hereinafter fully disclosed in the description, drawings, and claims.

The objects of my invention are, first, to provide improved means for guiding and supporting the press-boxes during their movement or while in operation; second, to provide press-boxes of an improved shape and construction, whereby they will offer the least possible resistance to the removal of the compressed material or cakes therefrom and necessitate the use of only one door to each box for filling and discharging the same; third, to provide means for starting the cakes from the bottoms of said press-boxes, so that they may be readily and quickly removed from the tops thereof, and thus avoid coming in contact with dripping oil, which occurs with boxes in which the cakes are removed from their bottoms; fourth, to provide improved means for securing the strainers or filters upon the faces of the press-boxes and plungers, and for permitting them to be removed for cleaning, repair, or renewal; fifth, to provide the press-boxes and plungers with a novel and useful arrangement of grooves, holes, and channels for the drainage of the expressed oil or other liquid; sixth, to provide the press with a movable distributing-box for filling the press-boxes with the material to be compressed, and, seventh, to provide improved means for elevating and

conveying said material from a suitable cooking vessel or heater to said distributing-box, whence it is fed into the press-boxes for compression and expulsion of the oil or other liquid therein contained. These objects are attained by the improved construction of press illustrated in the accompanying drawings, forming part of this specification, in which the same reference-numerals indicate the same parts, and in which—

Figure 1 represents a side elevation of a press containing my improvements, with the central portion of said press broken away and with the front or right-hand end thereof in vertical section, the feed elevating and conveying mechanism being mounted above the same; Fig. 2, a vertical transverse section of the press proper, showing an interior or face view of one of the press-boxes, with a portion of its filter-cloth broken away and exposing the wire-netting in rear thereof, and also showing the devices at the bottom of said box for starting the cake of material from the top thereof; Fig. 3, a top plan view of the press, with the central portion thereof broken away, with the door-latches released, with the doors thrown back and the press-boxes open, and with the distributing-box on the table at the left-hand or rear end of the press; Fig. 4, an interior or face view of one of the press-boxes with its filter removed and its door slightly raised; Fig. 5, a face view of one of the plungers, which are on the rear sides of said boxes; Fig. 6, an edge or side view of one of said boxes and the plunger thereon; Fig. 7, a transverse or horizontal section of the same with the filter removed, the section being taken on the dotted line *x x* of Figs. 2 and 4; and Fig. 8, a broken vertical section of the lower end of one of the press-boxes, showing the rectangular chamber formed therein, its bottom, and the movable block raised slightly above the latter.

In the drawings the numeral 1 indicates a base for the press, which may be formed into or support a trough or other suitable receptacle or receptacles for receiving the oil or other liquid passing from the press-boxes. Two end pieces or abutments 2 rise from this base, and are connected by a pair of guide-rods 3 on

each side of the press and extending longitudinally thereof. To the upper ends of these abutments are secured tables 4, which project therefrom and are supported by suitable brackets 5.

Excepting as hereinafter stated, each of the telescoping press-boxes 6 consists of a box portion 7 and a plunger 8 on the rear side or back thereof, which fits closely within the next rear or succeeding box of the series. The projecting sides of the backs of these boxes near their upper and lower ends and on both sides of the press are provided with concaved guide-flanges 9, which support said boxes and permit them to be slid or reciprocated upon the guide-rods 3; also, the projecting sides of the backs of said boxes are connected by open or slotted links 10, which are fitted and adapted to be slid upon the headed studs or pins 11, which are also on the sides of the backs of said boxes. These slotted links and studs or pins connect the boxes, prevent the plungers from being separated therefrom, and hold them in their proper relative positions. As the box at the rear end of the series is fixedly secured to the rear abutment 2, and as the box at the front end of the series is movable and capable of being drawn forwardly, the entire series of boxes can be successively extended or drawn forward, and yet leave the plungers flush with the sides and bottoms of the boxes. The last box at the rear end of the series of boxes is without a plunger on its rear portion, while at the front end of the series a plunger is secured to a platen 12, which is provided with guide-flanges 9, studs or pins 11, and slotted links 10 in the same manner as the other combined plungers and press-boxes. For the mere purpose of illustrating some means for reciprocating the boxes and their plungers, a rod 13 is shown as secured to the center of the front face of said platen and as adapted to be slid back and forth through a suitable bearing or stuffing-box 14 by power applied at its front end; but it is to be understood that steam, hydraulic, or other suitable well-known power is to be employed for operating my press for expressing the oil or other liquid from the material undergoing treatment.

The press-boxes and plungers of my press are formed with downwardly-converging sides, or with their tops wider than their bottoms, whereby very little frictional resistance is offered to starting and moving the cakes upward and outward from the open tops of said boxes. The upper ends of the boxes are open and are provided with doors 15, which are pivoted or hinged at one end upon lugs 16, and formed at their opposite ends on their under sides with recesses 17, which fit over lugs 18, which project upward from the tops of the opposite sides of the boxes. On one side of the press suitable latches 19 are pivoted to the side flanges of the backs of the press-boxes and are adapted to engage and hold closed the free ends of the doors.

The inside or front faces of the press-boxes and the rear faces of the plungers are formed with vertical grooves 20, as shown in Figs. 4, 5, and 7, and with deeper vertical dovetailed grooves 21, as shown in Figs. 3 and 7. Into the latter grooves are fitted vertically slidable and removable dovetailed slats 22, to which are secured the strainers or filters 22' by the screws shown in Fig. 2, said filter being composed of a backing of wire-netting 23 and a facing of cloth 24. The vertical grooves 20 in the front faces of the boxes connect at their lower ends with similar grooves 25, formed on the rear sides of the bottoms of the boxes, as shown in Figs. 2 and 5, and permit a portion of the filtered oil or other liquid to pass out therethrough. The remaining portion of the oil which does not pass therethrough, and the oil which passes through the filters and grooves on the plungers, descends into the open-topped rectangular chambers 26, which are formed with bottoms at the lower ends of the boxes, and passes out of the same through horizontally-extending holes 26', as shown in Figs. 2 and 4. The sides of the boxes are formed with interior vertical grooves 27, as plainly shown in Fig. 7, in which the edges of the filters 22' are removably secured, as shown in dotted lines in Fig. 2.

The sides and bottoms of the plungers 8, as shown in Fig. 6, are recessed to form deep channels 28, which both reduce the bulk and weight of said plungers and form ducts or passages for the downward flow of the expressed liquid; also, the sides 29 of said plungers which overhang said channels are formed with downwardly and forwardly inclined grooves 30, which connect with said channels. The bottom ends of the plungers are also formed with inclined grooves in practice; but they are not shown in the drawings, as they are not indispensable.

The lower ends of the press-boxes, as stated, are provided with rectangular chambers 26, having bottoms. These chambers are of slightly less area interiorly than the lower ends of said press-boxes, and within the same, above their bottoms, are placed loosely-fitting vertically-movable blocks 31, as shown in Figs. 2, 4, 7, and 8, which are provided with pins or studs 32, which project downward through holes in the bottoms of said chambers. A lever 33 is fulcrumed upon the lower end of each box and provided with a foot-rest or treadle upon its outer arm, its inner arm being pivotally connected to the lower end of said pin or stud. A spiral spring 34 is placed around each pin or stud, bears against the bottom of the rectangular chamber 26 and the inner arm of the treadle-lever 33, and holds the movable block 31 normally down upon bottom; but when the outer arm of this treadle-lever is forced downward and the spring is compressed the movable block will be raised, and thus start the cake of material toward the open top of the box, whence it can be readily and quickly removed. If desired,

all of these treadle-levers may be suitably connected for operation or depression at the same time; also, the latches for the doors of the press-boxes and the doors themselves may be so connected as to be operated simultaneously.

To the inner ends of the tables 4 are secured longitudinally-extending rails 35, one from each side of the tables, which serve as rests or stops for holding the latches and the doors when moved outwardly or away from the tops of the press-boxes.

Upon the upper surfaces of the tables 4, which are in the same horizontal plane as the tops of the press-boxes when their doors are open, are secured longitudinally-extending guide cleats or strips 36, which are in direct line with the lugs 16 and 18 upon the tops of the press-boxes, as shown in Fig. 3. Arranged and adapted to be guided by and moved between these strips and lugs is a distributing-box 37, which is provided with a suitable number of compartments 38, which register with the open tops of the press-boxes, and which receive the material and feed or distribute the same into said press-boxes. When this distributing-box is drawn across the open tops of said press-boxes, the ends and partitions forming the compartments of said distributing-box scrape off or remove all surplus material that may remain upon said press-boxes after they have been filled; also, by the employment of these compartments the material is prevented from packing in said distributing-box.

For feeding or conveying the material into the distributing-box from a suitable cooking vessel or heater 39, an elevator 40 is connected to said heater and arranged to incline upwardly therefrom and communicate with a pivoted hopper 41, which is arranged about centrally over the press. The lower end of this hopper is provided with a short discharge-spout 42, over which is fitted a sliding or telescoping feed-spout 43, which extends downwardly and is pivoted at its lower end to the distributing-box for feeding the material into the compartments thereof. By thus attaching the feed-spout to the bottom of the pivoted hopper by means of a sliding or telescopic joint, and by pivoting said feed-spout to the distributing-box, the latter can be drawn across the upper surfaces of the press-boxes for feeding the same without liability of said spout dropping out of said telescopic joint. After the press has been charged the distributing-box may rest upon either table until the press is ready to be charged again. This distributing-box, with the feed-spout pivoted thereto, as stated, can be drawn across the upper surfaces of the press-boxes when open by hand or any suitable mechanical devices.

The operation and advantages of the several parts of my improved press, in addition to those hereinbefore specified, are as follows: The meal or other material to be pressed is

first taken from the cooking vessel or heater and conveyed by the elevator into the hopper. Thence it passes by gravity through the feed-spout and into the compartments of the distributing-box, which in the meantime is slid or drawn by hand or otherwise from one end of the series of open-top press-boxes to the other. Then after all of said boxes have been filled the doors are closed and then locked by the latches. Then by the application of hydraulic or other suitable power the plungers and press-boxes are started rearwardly, the latter being tightly closed by the former, the plungers at the start being just within the open fronts of their corresponding boxes, so as to confine the meal or other material between their faces. Then on their further movement rearwardly the plungers slide into the boxes and reduce the material in bulk, said plungers and boxes during this movement being supported and guided by their concaved flanges resting upon the two pairs of guide-rods on each side of the press, and are thus prevented from being canted or tilted out of their true line, always remaining in their true relative positions. While the material is being reduced in bulk or compressed into cakes a portion of the oil or other liquid expressed therefrom will pass through the strainers or filters, down the vertical grooves on the front faces of the boxes and rear faces of the plungers, and then out of the press, while the remaining portion of the oil will descend into the rectangular chambers formed in the bottoms of the boxes, and thence out through the horizontal holes leading from said chambers. After the oil or other liquid has been fully extracted, the press is moved forward to its starting-point by the same power which moved it backward. Then the doors of the press-boxes are opened, then the treadle-levers are depressed to operate the movable blocks in the chambers in the bottoms of said press-boxes and slightly raise the upper ends of the cakes above the open tops of said boxes, and then said cakes may be readily and quickly lifted out of the press. Owing to the downward convergence of the sides of my press-boxes the material that is fed into the latter and subsequently compressed meets with but slight resistance in being moved upward, and also permits the cakes to be pressed to uniform density at all points, whereas in filling boxes of the ordinary rectangular form from their tops the material becomes tightly packed in their bottoms from the weight of the material above; also, owing to the attachment of the cloth and wire-netting filters to the rear faces of the plungers and to the front faces of the press-boxes by means of the dovetailed slats fitted into correspondingly-shaped grooves, said filters can be easily and quickly removed for cleaning, repair, or renewal, the vertical grooves in the sides of the boxes also contributing to the support and ease of removal of the side edges of the filters resting therein; also, by constructing the press-boxes

with their feed and discharge openings and doors only at their tops, said boxes are stronger and less liable to be broken or injured than those which have feed and discharge openings and doors at their upper and lower ends; also, as above stated, my boxes having no openings or doors at their lower ends, the cakes removed from their tops are prevented from contact with the oil flowing from their lower ends, and are thus removed in a dry state; also, by the employment of the slotted links for connecting the boxes and plungers, no obstruction is offered to the free movement of the latter within the former, and at the same time said plungers are prevented from being entirely withdrawn from said boxes, as the ends of the slots in said links come in contact with the headed studs or pins on the sides of said boxes, or, in other words, the telescopic action of the boxes and plungers is perfect and without jamming or binding of any kind; also, as pressure is consecutively applied to the plungers and boxes from the front to the rear of the series, gradually telescoping them, it follows that the liquid is extracted from the material being treated in the same manner or order by each of the respective plungers and boxes, and that when the press is again expanded or moved forward the cakes in all the boxes are ready for removal.

It will be obvious from the foregoing that my press can be charged and discharged very easily and rapidly, and that under slight modification it can be used vertically as well as horizontally and changed to suit the materials to be pressed.

Having thus fully described the construction and arrangement or combination of the several parts of my improved press, its operation and advantages, what I claim as new is—

1. In a horizontal telescopic press, the combination, with the base, the vertical stationary abutments, and a pair of guide-rods on each side of said press, of a series of press-boxes having movable doors at their tops and chambers and movable blocks at their bottoms and plungers mounted upon and slidable between said guide-rods, the rear box of the series being stationary, and means for connecting and reciprocating the other boxes and their plungers and telescoping the same, substantially as described.

2. In a horizontal telescopic press, the combination, with the base, the vertical stationary abutments, and a pair of guide-rods on each side of said press, of press-boxes having movable doors at their tops and chambers and movable blocks at their bottoms, and plungers, said press-boxes and plungers being mounted upon and slidable between said guide-rods, and provided with guide-flanges for sliding upon said rods and with slotted links for connecting and limiting the throw of said boxes and plungers and for permitting of their being telescoped, substantially as described.

3. In a horizontal telescopic press, the combination, with a base, vertical stationary abutments, and a pair of guide-rods on each side of said press, of a series of press-boxes having movable doors and latches at their tops and rectangular chambers and movable blocks at their bottoms, and plungers, said press-boxes and plungers being mounted upon and slidable between said guide-rods, the rear box being rigidly secured at the rear end of the series, means for connecting said boxes and plungers and for permitting of their being telescoped, and a movable plate provided with a plunger upon its rear face at the front end of said series of boxes and plungers, substantially as described.

4. In a horizontal telescopic press, the combination, with a series of movable press-boxes and plungers, a series of hinged or pivoted doors for covering the open tops of said boxes, and a series of pivoted latches for said doors, of a rail extending along each side of the tops of said boxes, and serving as rests or stops for said doors and latches when opened or moved outwardly, substantially as described.

5. The combination, in a horizontal telescopic press, with a press-box having an open top, a closed bottom, and a hinged door, of a movable block arranged in the bottom of said box and provided with a pin or stud, a lever pivoted to said stud and also to the bottom of said box, and a spring arranged to bear against said lever and also against the bottom of said box, substantially as and for the purpose described.

6. The combination, in a horizontal telescopic press, with a press-box provided with downwardly-converging sides, with an open top, with a closed bottom formed with a chamber, and with a movable cover for said top, of a movable block arranged in said bottom and provided with a pin or stud, a lever fulcrumed upon said bottom and pivoted to said pin or stud, and a spring bearing against said bottom and also against said lever, substantially as described.

7. In a horizontal telescopic press, the combination, with a plunger provided with downwardly-converging sides and a press-box provided with downwardly-converging sides, with an open top, with a closed bottom formed with a chamber, and with a movable cover for said top, of a movable block arranged in said bottom and provided with a pin or stud, a lever fulcrumed upon said bottom and pivoted to said pin or stud, and a spring bearing against said bottom and also against said lever, substantially as described.

8. In a horizontal telescopic press, a press-box and plunger formed with dovetailed grooves in their faces, in combination with strainers or filters provided with dovetailed slats which are fitted in said grooves, substantially as described.

9. In a horizontal telescopic press, a press-box and plunger formed with dovetailed

grooves in their faces, in combination with strainers or filters consisting of cloth faces and wire-netting backs provided with dovetailed slats which are fitted in said grooves, substantially as described.

10. In a horizontal telescopic press, a press-box and a plunger formed with vertical and dovetailed grooves in their faces, in combination with strainers or filters consisting of cloth faces and wire-netting backs provided with dovetailed slats which are fitted in said dovetailed grooves, substantially as described.

11. In a horizontal telescopic press, a press-box and a plunger formed with vertical and dovetailed grooves in their faces, said press-box being also formed with vertical grooves in the interior of its sides, in combination with strainers or filters consisting of cloth faces and wire-netting backs provided with dovetailed slats which are fitted in said dovetailed grooves, substantially as described.

12. In a horizontal telescopic press, the combination of a press-box and a plunger provided, respectively, with filters on their front and rear faces and formed with vertical grooves 20, said box being also formed with a chamber 26, having horizontal holes 26', and said plunger being also formed with downwardly and forwardly inclined grooves 30 in its sides, substantially as described.

13. In a horizontal telescopic press, the combination of a press-box and a plunger provided, respectively, with filters on their front and rear faces and formed with vertical grooves 20, said box being also formed with a chamber 26, having horizontal holes 26', and said plunger being also formed with channels 28 in rear of its overhanging sides and bottom, and with inclined grooves 30 in said sides leading to said channels, substantially as described.

14. In a horizontal telescopic press, the combination, with a press-box formed with the vertical grooves 20, with the dovetailed grooves 21, with the grooves 25 on the rear side of the bottom thereof, and with the chamber 26, having the horizontal holes 26', of a plunger also formed with the vertical grooves 20, with the dovetailed grooves 21, and with the inclined grooves 30 in its sides, and the strainers or filters 22', provided with the dovetailed slats 22, which are fitted in said dovetailed grooves, substantially as described.

15. In a horizontal telescopic press, the combination, with a press-box formed with the vertical grooves 20, with the dovetailed grooves 21, with the grooves 25 on the rear side of the bottom thereof, and with the chamber 26, having the horizontal holes 26', of a plunger also formed with the vertical grooves 20, with the dovetailed grooves 21, with the channels 28 in rear of its overhanging sides and bottom, and with the inclined grooves 30 in its sides, and the strainers or filters 22', provided with the dovetailed slats 22, which are fitted in said dovetailed grooves, substantially as described.

16. In a horizontal telescopic press, the com-

bination, with a series of press-boxes open at their tops, of a longitudinally-movable distributing-box formed with compartments which are constructed and arranged to register with and to be drawn longitudinally over the open tops of said boxes, substantially as described.

17. In a horizontal telescopic press, the combination, with a series of press-boxes provided with lugs at the opposite sides of their open tops, of a movable distributing-box which is constructed and arranged for being longitudinally moved between and guided by said lugs, and which is provided with compartments registering with the open tops of said press-boxes, substantially as described.

18. In a horizontal telescopic press, the combination, with a series of press-boxes provided with lugs at the opposite sides of their open tops, and a table at each end of said series of press-boxes provided with guide cleats or strips which are arranged in direct line with said lugs, of a movable distributing-box arranged and adapted to be moved and guided between said lugs and cleats or strips, and provided with compartments registering with the open tops of said press-boxes, substantially as described.

19. In a horizontal telescopic press, the combination, with a series of press-boxes having open tops, of a distributing-box which is movable thereover, a feed-spout pivoted to and communicating with said box, and means for feeding material to said spout and box, substantially as described.

20. In a horizontal telescopic press, the combination, with a series of press-boxes having open tops, of a distributing-box which is movable thereover and provided with compartments registering therewith, a telescopic feed-spout pivoted to and communicating with said distributing-box, and means for conveying or feeding material to said feed-spout and distributing-box, substantially as described.

21. In a horizontal telescopic press, the combination, with a series of press-boxes having open tops, of a distributing-box which is movable thereover and provided with compartments registering therewith, a telescopic feed-spout pivoted to and communicating with said distributing-box, a pivoted hopper also communicating with said spout, and means for conveying material to said hopper and spout, substantially as described.

22. In a horizontal telescopic press, the combination, with a series of press-boxes having open tops, of a distributing-box which is movable thereover and provided with compartments registering therewith, a telescopic feed-spout pivoted to and communicating with said distributing-box, a pivoted hopper having a short discharge-spout which is adapted to slide within the upper end of said feed-spout, and an elevator for conveying material to said hopper and spout, substantially as described.

23. In a horizontal telescopic press, the combination, with a series of press-boxes having open tops, of a distributing-box which is movable thereover and provided with compartments registering therewith, a feed-spout pivoted to said box, a pivoted hopper arranged at the upper end of said feed-spout and provided with a discharge-spout which is adapted to slide within the upper end of said feed-spout, and an elevator for conveying material to said hopper and feed-spout, substantially as described.

24. In a horizontal telescopic press, the combination, with a series of press-boxes having

open tops, of a distributing-box which is movable thereover and provided with compartments registering therewith, a telescopic feed-spout pivoted to said distributing-box, a pivoted hopper, an elevator, and a vessel for cooking or heating the material, all constructed and arranged substantially as described.

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

ALEXANDER A. DIFFEY.

Witnesses:

TOM R. STUART,
FRANK T. HUNTER.