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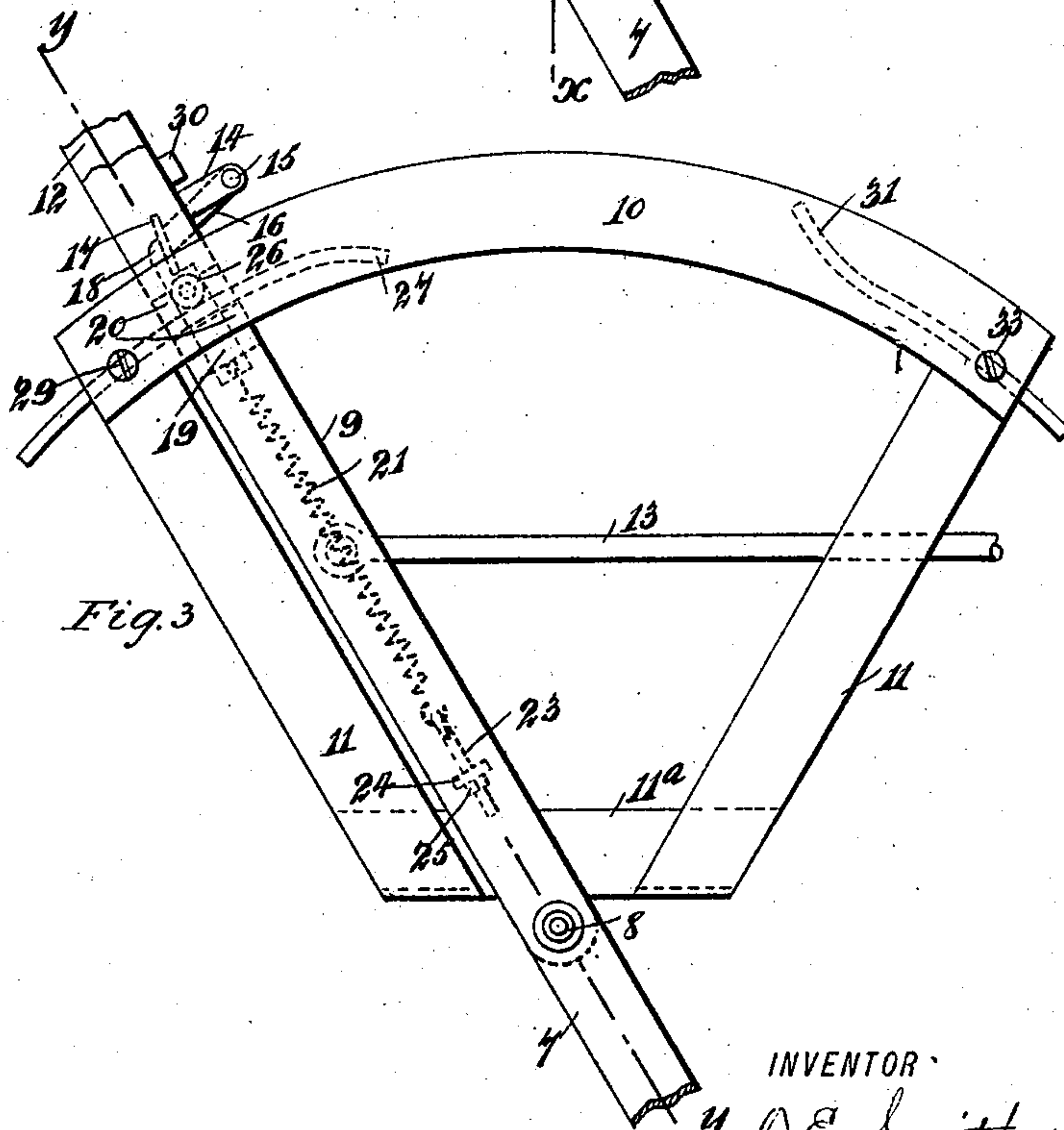
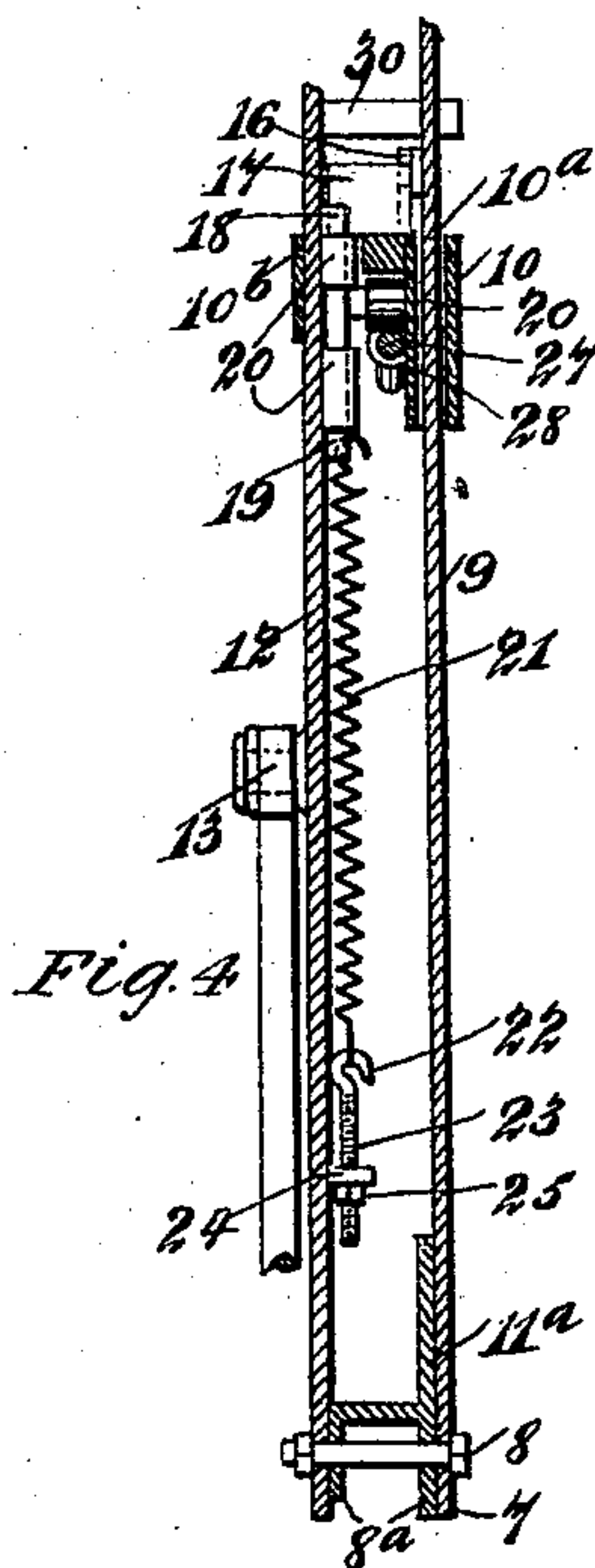
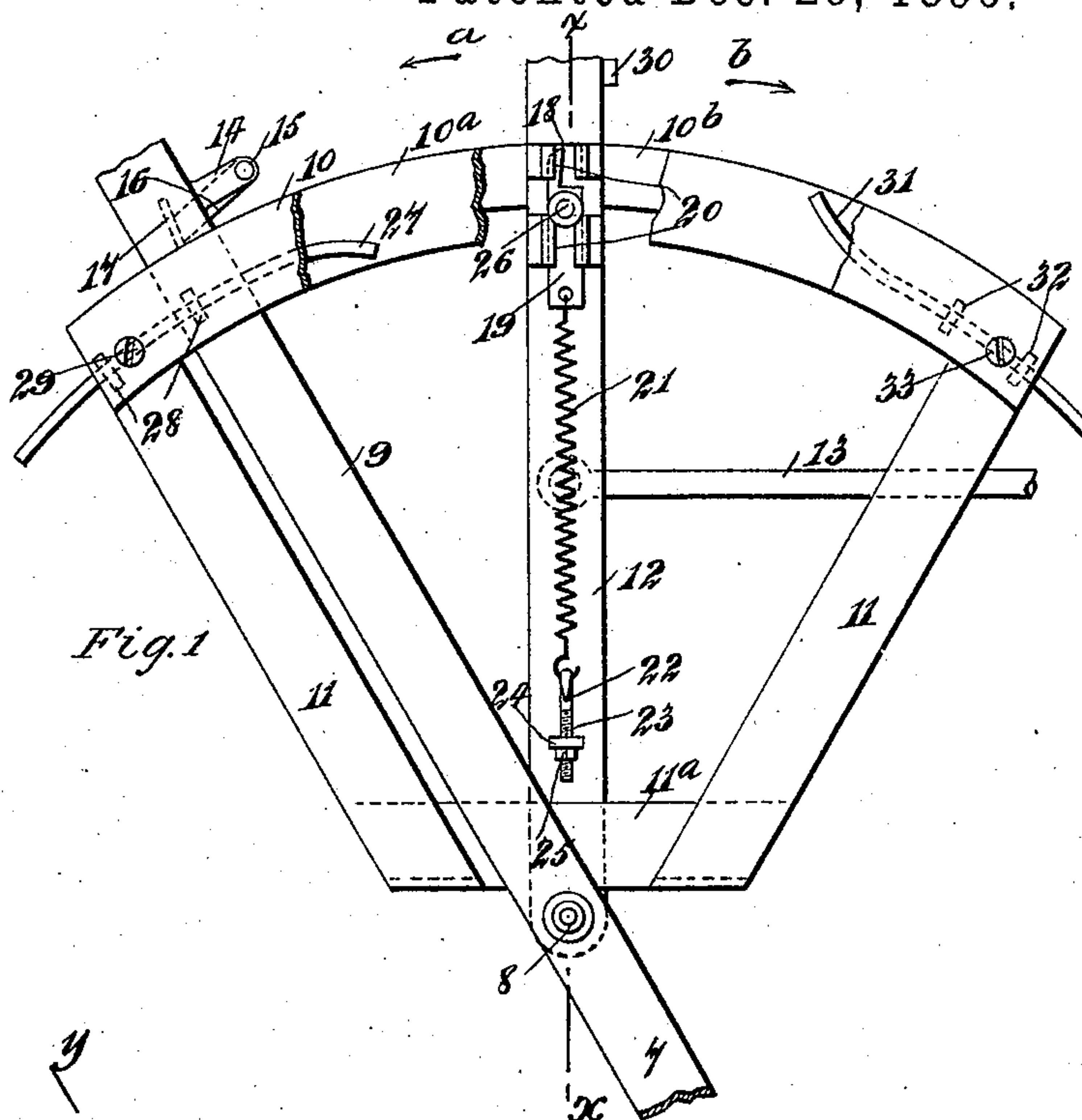
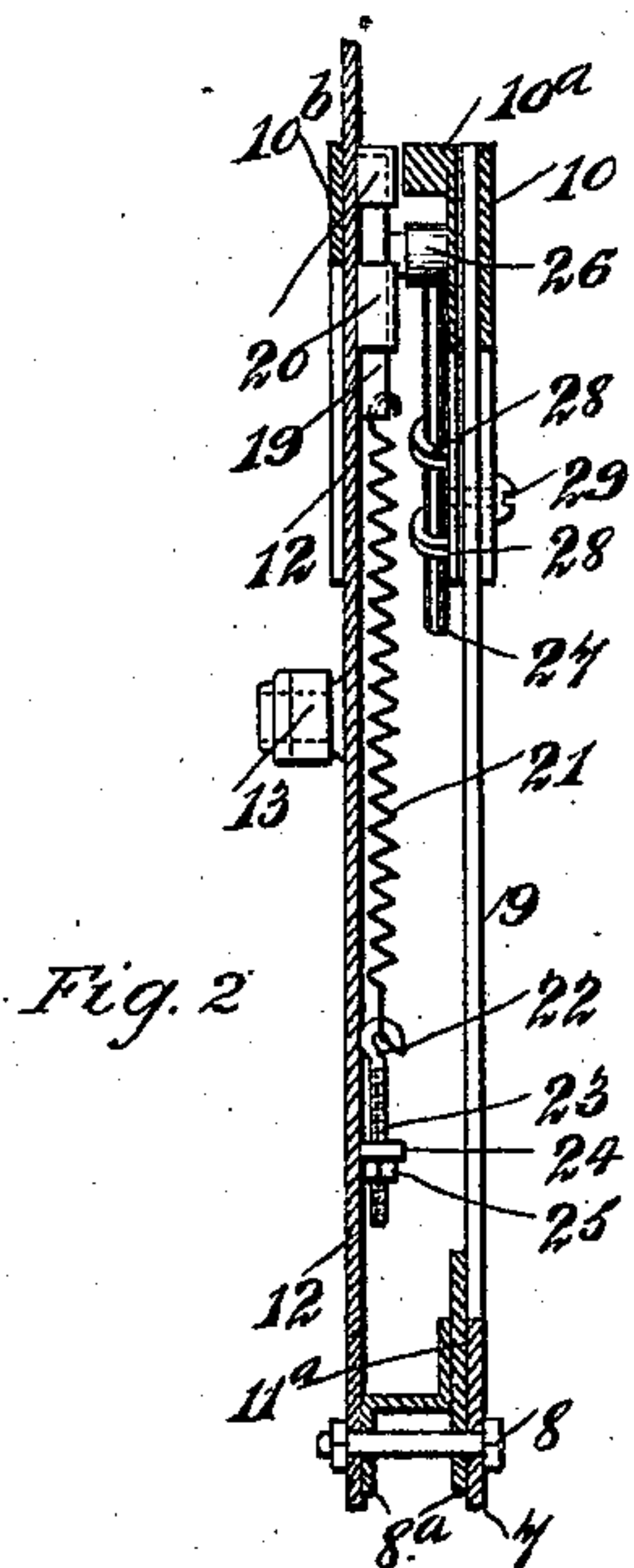
2 Sheets—Sheet 1.

T. E. SMITH.

MEANS FOR OPERATING GATES OF COAL JIGS, &c.

No. 574,228.

Patented Dec. 29, 1896.



WITNESSES:

J. B. Walker
J. B. Langer

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(No Model.)

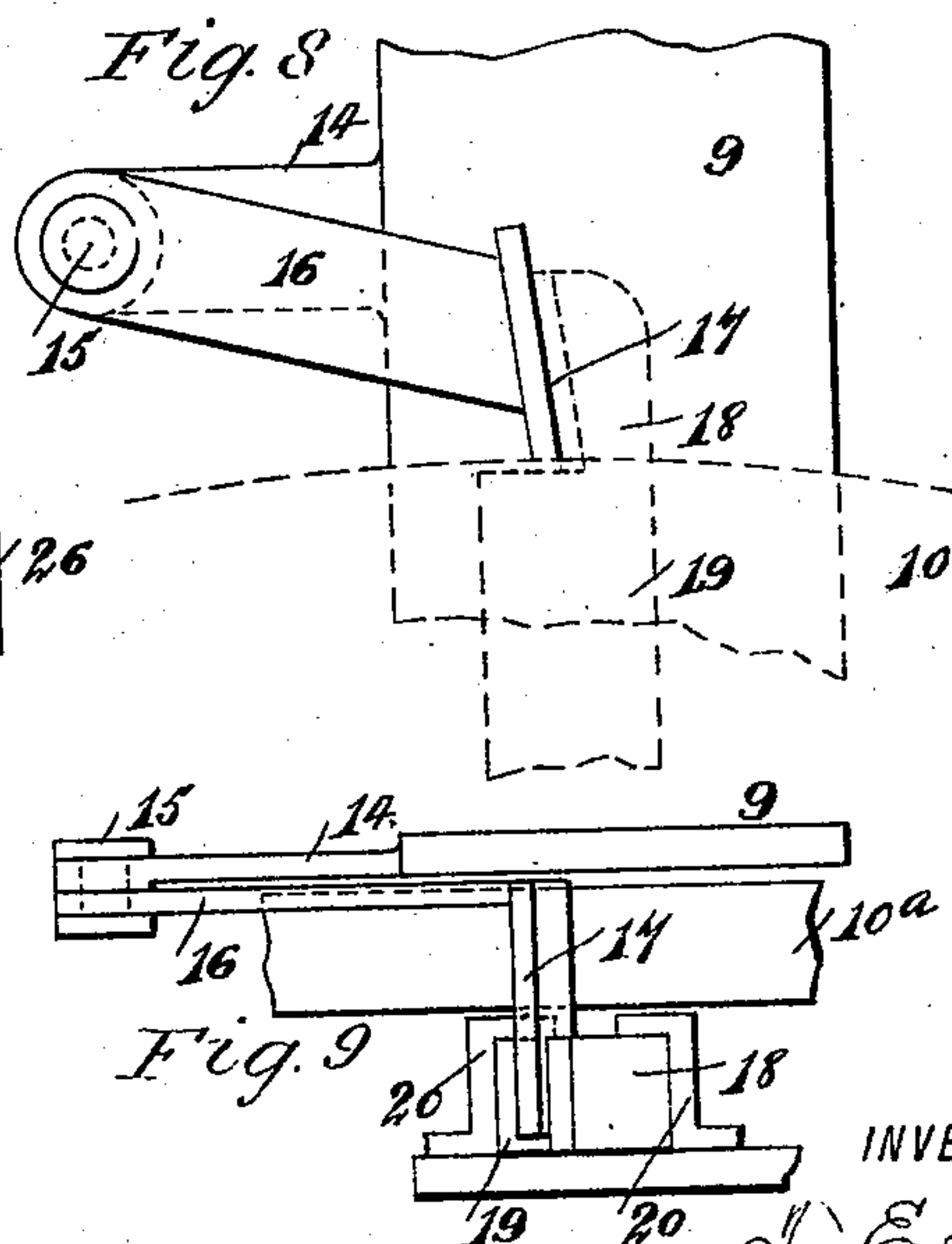
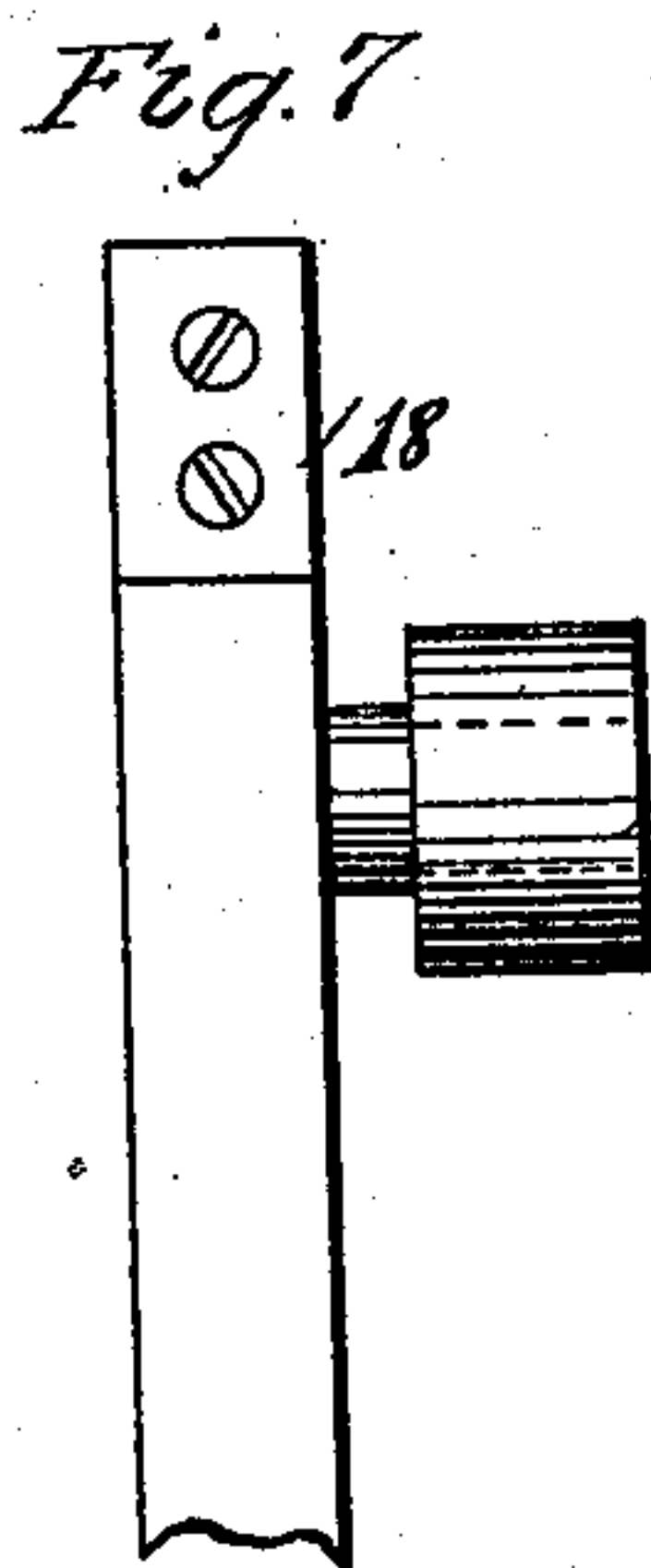
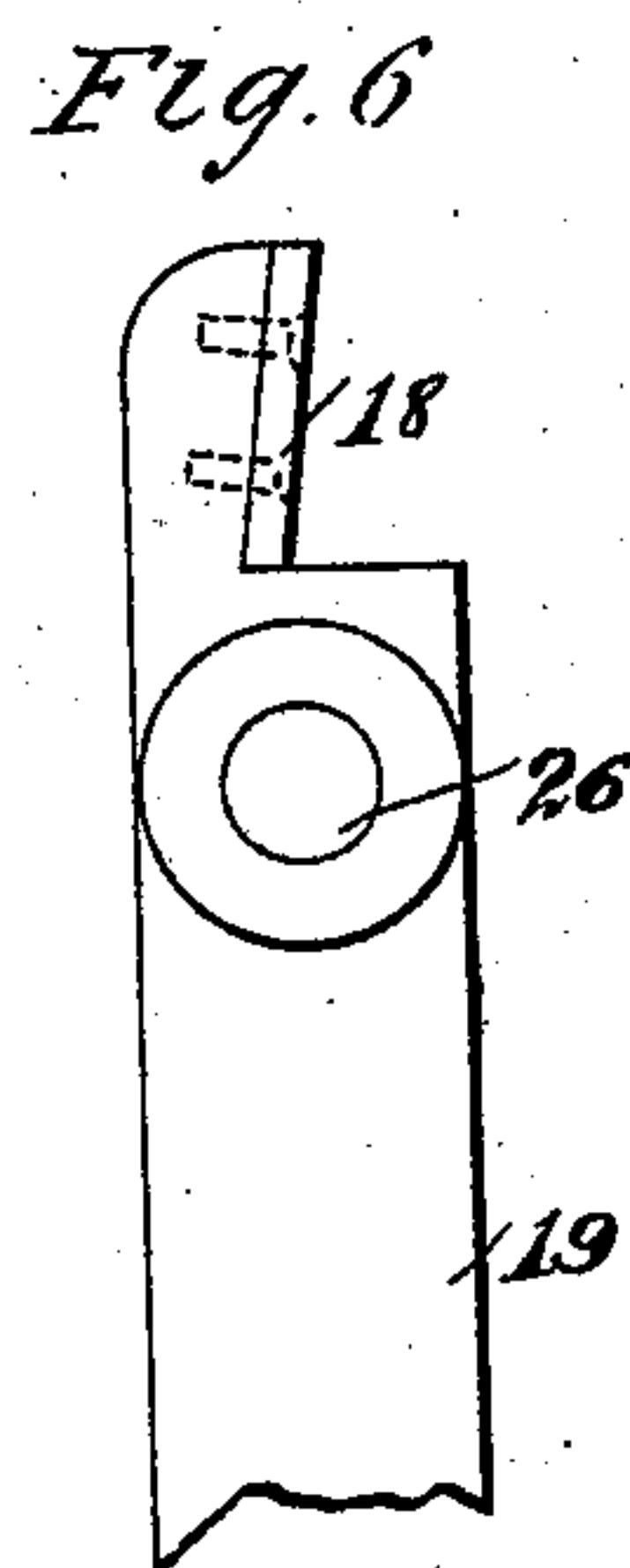
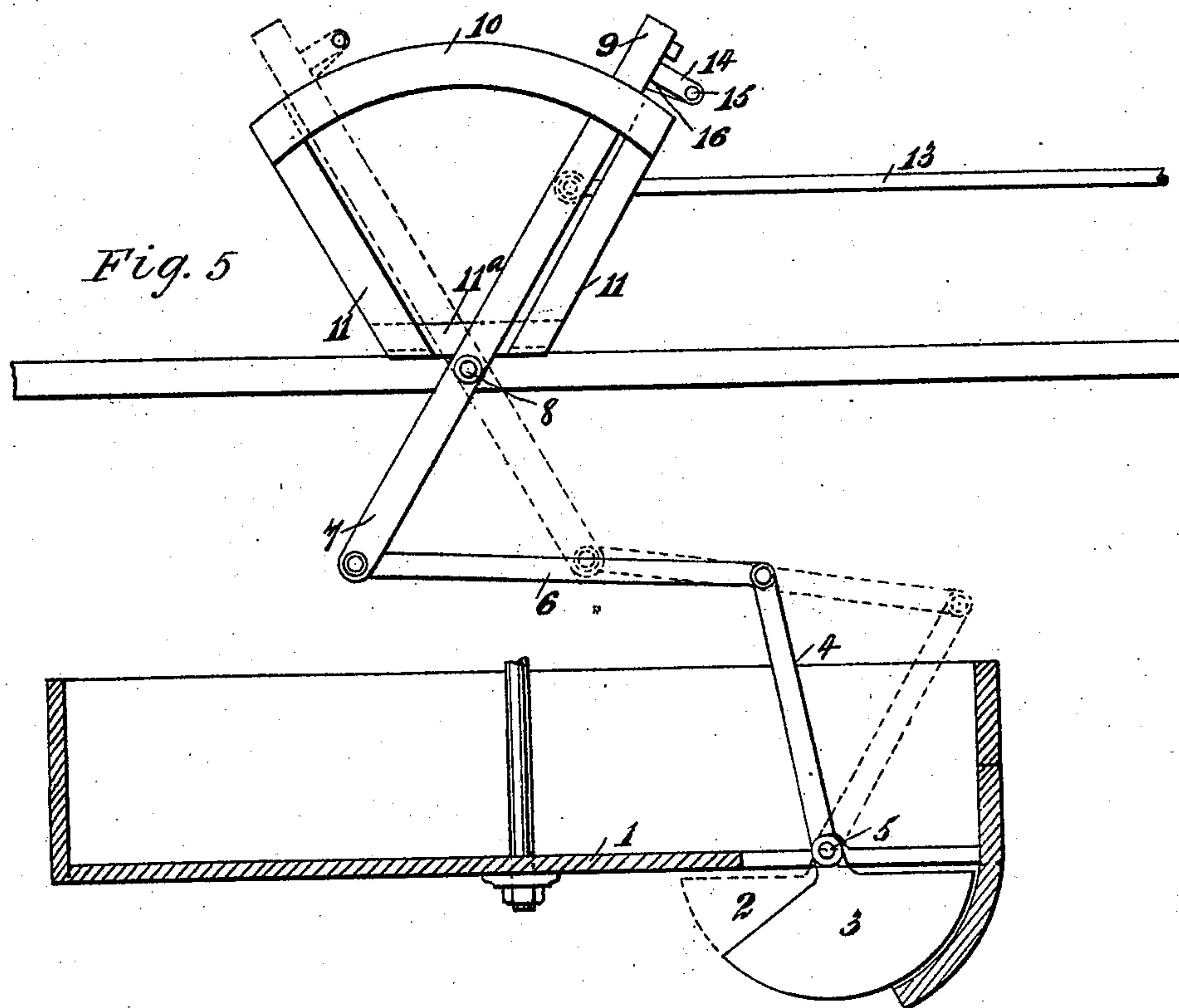
2 Sheets—Sheet 2.

T. E. SMITH.

MEANS FOR OPERATING GATES OF COAL JIGS, &c.

No. 574,228.

Patented Dec. 29, 1896.



WITNESSES:

J. B. Walker
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UNITED STATES PATENT OFFICE.

THEODORE E. SMITH, OF SHAMOKIN, PENNSYLVANIA.

MEANS FOR OPERATING GATES OF COAL-JIGS, &c.

SPECIFICATION forming part of Letters Patent No. 574,228, dated December 29, 1896.

Application filed November 27, 1896. Renewed December 3, 1896. Serial No. 614,381. (No model.)

To all whom it may concern:

Be it known that I, THEODORE E. SMITH, of Shamokin, in the county of Northumberland and State of Pennsylvania, have invented new and Improved Means for Operating the Gates of Coal-Jigs and the Like, of which the following is a full, clear, and exact description.

This invention relates to certain improvements in that class of devices which are adapted for operating the gates of coal-jigs and for similar purposes, and has for its object to provide a device of this character of a simple and inexpensive construction which shall be automatic in its action, the construction being such that the gate is opened whenever there is a sufficient accumulation of slate or other impurities at the bottom of the jig to place a tension upon the movement of the gate.

The invention consists in two parts, one of which is provided with an operating mechanism for moving it, and the other of which is connected to the gate and is provided with means whereby, when an accumulation of slate or the like occurs at the gate, a resistance or pressure will be exerted on said part, which will operate to lock the two parts together and compel them to move in unison, whereby the last-mentioned part will be moved from the first-named part and the gate will be opened to discharge the impurities.

The invention also contemplates certain novel features of the construction, combination, and arrangement of the various parts of the improved device, whereby certain important advantages are attained and the mechanism is made more simple, inexpensive, and otherwise better adapted and more convenient for use, all as will be hereinafter fully set forth.

The novel features of the invention will be carefully defined in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a view showing the lever mechanism of the device, a portion of the guide wherein the levers are arranged to move being broken away for purposes of illustration. Fig. 2 is a vertical section taken through the device as shown in Fig. 1, in the plane indi-

cated by the line $x x$. Fig. 3 is a side elevation somewhat similar to Fig. 1, but showing the levers in a different position. Fig. 4 is a sectional view similar to Fig. 2, being taken in the plane indicated by the line $y y$ in Fig. 3. In these views the upper and lower ends of the levers are broken off. Fig. 5 is a general view drawn to a reduced scale and showing the lever mechanism connected to the gate of a coal-jig in position for use. Figs. 6 and 7 are enlarged fragmentary views showing in side and rear elevation the bolt employed for locking the levers together. Fig. 8 is a fragmentary view showing the catch employed to engage said bolt, and Fig. 9 is a fragmentary plan view showing the bolt and catch in engagement.

In the views, 1 indicates the jig or receptacle in which the coal is placed, being usually provided in its bottom with a series of perforations for the passage of the water used for cleaning the coal. In operation this jig, which is, as shown, suspended at its central portion, is reciprocated vertically, and at one end of the jig an opening or outlet 2 is formed in the bottom thereof to permit the escape of the slate and other impurities contained in the coal, said outlet being controlled by a gate of parti-circular form, as clearly seen in Fig. 5.

The gate 3 is carried on the end of a lever 4, pivoted at 5 adjacent to the bottom of the jig, and connected at its upper end, by means of a link 6, with the lower end of the part 7, in the form of a lever pivoted at 8 to a suitable support, and having its upper end 9 guided in a frame comprising a guide of parti-circular form, and a supporting-frame comprising two inclined sides 11, connected at their lower ends by a tie 11^a. The parti-circular guide carried on said frame comprises three guide-strips 10, 10^a, and 10^b, concentric with one another and spaced apart to form between them two guide-ways.

The upper end 9 of the part or lever 7 plays between the guide-strips 10 and 10^a, and, as shown in Figs. 1 to 4, said lever or part 7 is pivoted on a bolt 8, carried in lugs 8^a, projecting from the lower side of the tie 11^a of the frame. At the opposite side of the frame a part or lever 12 is similarly pivoted to the opposite end of the bolt 8 and is arranged to play

at its upper end in the guideway formed between the guide-strips 10^a and 10^b , and said part or lever 12 is coupled with a connecting-rod 13, whereby it may be operated from any
 5 suitable source, as, for example, from the mechanism employed to operate the jig.

The upper end of the lever or part 7 above the curved guide is provided with an arm or extension 14, projecting from one side or edge
 10 thereof, as clearly seen in Figs. 1, 3, 5, and 8, and at the end of said projection 14 is pivoted, as indicated at 15, a catch 16, having its end 17 bent laterally, as seen in Fig. 9, and adapted to be engaged by the jaw 18 of a bolt
 15 19, mounted to slide longitudinally in guides 20 on the side of the lever or part 12 adjacent to the lever 7, said bolt being connected at its lower end to a spring 21, the opposite extremity of which is connected to a hook 22,
 20 having a screw-threaded shank 23, passing through a lug 24 on the part or lever 12, and provided with an adjusting-nut 25, whereby the tension of the spring may be regulated at will. The spring 21 serves to hold the bolt
 25 19 with its jaw 18 normally out of position to engage the bent end 17 of the catch 16, and said catch is normally supported and prevented from dropping to a vertical position by the central guide-strip 10^a , on the upper
 30 face of which it rests, as indicated in Fig. 9.

On the inner side of the bolt 19, or that side thereof which is adjacent to the part or lever 7, is mounted to turn a roller 26, adapted to engage, when the part or lever 12 is reciprocated, the downwardly-bent end of a bar or strip 27, mounted in the guideway wherein
 35 said lever 12 reciprocates, being held adjustably at its end in perforated lugs 28, projecting from the inner side of the guide-strip 10^a , and adapted to be set fast, when adjusted, by means of a screw 29.

On the opposite end of the curved guideway wherein the lever or part 12 reciprocates is arranged a similar strip or bar 31, having
 45 an upwardly-bent end adapted to engage the roller 26 on the bolt 19, and this bolt or strip 31 is held adjustably in lugs 32 and is adapted to be set fast in position by means of a set-screw 33.

In operation the lever or part 12 is continuously reciprocated by means of its connection with the bar 13, and when said part is moved in the direction indicated by the arrow *a* in
 50 Fig. 1 it will be evident that the roller 26 will engage the bent end of the bar or strip 27, so that the bolt 19 will be raised and the roller 26 ride up the inclined or bent end of said bar or strip. The jaw 18 of the bolt 19 is somewhat rounded on its forward side, so that
 55 when said bolt is raised said rounded face will strike against the bent end 17 of the catch-plate 16 and lift the same on its pivot 15, permitting the bolt 19 to pass under said plate, which will thereupon drop down into an engagement with the opposite side of the jaw
 60 18, as indicated in Fig. 3. The opposite side

of the jaw 18 is slightly beveled or inclined to the direction of movement of the bolt, and the bent end 17 of the catch-plate 16 is similarly inclined. 70

During the operation of the device the part or lever 7 will normally stand in the position shown in Figs. 1 to 3 and in dotted lines in Fig. 5, the gate 3 being then closed, and when
 75 the part or lever 12 is moved in the direction of the arrow *a* in Fig. 1 the bolt 19 thereon will be thrown up into engagement with the catch 16 on the part or lever 7, so as to cause the parts 7 and 12 to move back, or in the direction indicated by the arrow *b* in Fig. 1, 80 locked together.

When a sufficient quantity of slate has accumulated at the bottom of the jig to make the gate work hard, it will be evident a considerable resistance will be offered by the lever or part 7 to the movement of the part or
 85 lever 12, so that the beveled face of the catch 16 will wedge against the beveled end of the bolt 19, so as to cause the two parts or levers to be locked together during a whole stroke, or nearly so, but ordinarily when there is little resistance to the movement of the gate the spring 21 will act to disengage the bolt 19
 90 from the catch as soon as the part or lever 7 has been moved far enough to disengage the roller 26 on said bolt from the bar or strip 27. The said bar or strip 27 is made adjustable, so that the degree of opening of the gate under ordinary circumstances may be conveniently regulated, and to move the lever or part
 95 7 back to its normal position the part 12 is provided with a lug 30, engaging said lever 7 when the lever 12 moves in the direction of the arrow *a* in Fig. 1.

To regulate the length of the stroke of the part or lever 7, and thereby shorten or increase
 105 the extent of opening of the gate of the jig, the strip 31 is provided, the upwardly-bent end of which engages over the roller 26 on the bolt 19 and draws said bolt down out of engagement with the catch 16. By means of the set-screw 33 the position of this strip 31 may be conveniently adjusted. 110

The device constructed as above described is extremely simple and inexpensive in its nature and is substantially automatic in its
 115 action, being arranged to operate the gate in a substantially uniform manner under normal conditions and to open the gate to a greater extent when this becomes necessary owing to excessive accumulation of slate, and it will
 120 also be evident that by means of the adjusting means the device may be conveniently set for use in cleaning coal of various grades. It will also be obvious that the device is susceptible of considerable modification without
 125 material departure from the principles and spirit of the invention, and for this reason I do not wish to be understood as limiting myself to the precise embodiment of the invention herein set forth, nor to its use in connection with coal-jigs. 130

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a device of the character described, the combination with a gate-operating lever, of a continuously-reciprocating lever, means for automatically locking the levers together, whereby the gate-operating lever will move with and in the same direction as the reciprocating lever to open the gate, and means for controlling the locking means by the resistance offered to the said levers by the weight of the material on the gate, whereby the gate will be opened in proportion to the amount of material thereon, substantially as described.

2. In a device of the character described, the combination with a gate-operating lever, of a continuously-reciprocating lever, a bolt and latch for locking the levers together, the said bolt and latch having their engaging faces similarly beveled or inclined, whereby the levers will be held locked together for a greater or less time according to the resistance offered by the material, substantially as and for the purpose set forth.

3. In a device of the character described, the combination with a pivoted gate-operating lever, of a pivoted and continuously-reciprocating lever, a spring-actuated bolt carried by one lever, a latch carried by the other lever and adapted to be engaged by the bolt to lock the levers together, and means for automatically disconnecting the levers, substantially as described.

4. In a device of the character described, the combination with a gate-operating lever, of a reciprocating lever, a spring-actuated bolt carried by one lever, a pivoted latch carried by the other lever and means for raising and lowering the bolt to engage and disengage it from the latch, substantially as described.

5. In a device of the character described, the combination with a gate-operating lever, of a reciprocating lever, a spring-actuated bolt carried by the reciprocating lever and provided with a projection, a pivoted latch carried by the gate-operating lever, and bars for alternately engaging opposite sides of the said projection of the bolt to raise and lower it, substantially as described.

6. In a device of the character described, the combination with guideways, and a pivoted gate-operating lever working in one of said guideways, of a pivoted and reciprocating lever working in the other guideway, a

spring-actuated bolt on the reciprocating lever, and provided with a projection, a pivoted latch on the gate-operating lever, and bars arranged at opposite ends of the guideways, said bars having their ends oppositely curved to alternately engage opposite sides of the projection of the bolt, substantially as described.

7. In a device of the character described, the combination with a receptacle, a gate therein, a pivoted lever, and a connection between the lower end of the lever and the valve, for operating the latter from the former, of a pivoted and reciprocating lever, a spring-actuated bolt carried by the reciprocating lever, and provided with a roller, a pivoted latch carried by the lever connected with the gate, and oppositely-arranged bars having their ends bent in opposite directions, substantially as described.

8. In a device of the character described, the combination with a jig, and a pivoted gate in the bottom of the jig, of a frame above the jig and provided with guideways, a lever pivoted in the frame and having its lower end connected with the gate, the upper end of the lever working in one of the guideways, a second lever pivoted in the frame and working in the other guideway thereof, said lever being adapted to be reciprocated from the jig, a pivoted latch carried by the first lever, a spring-actuated bolt carried by the second lever and provided with a laterally-projecting roller, and bars having oppositely-bent ends secured at opposite ends of the said guideways, substantially as described.

9. In a device of the character described, the combination with a frame provided with guideways, of two pivoted levers working in the said guideways, one of said levers being continuously reciprocated, a sliding and spring-actuated bolt carried by one lever, said bolt having a jaw at its upper end, and provided with a roller projecting laterally therefrom, a pivoted latch on the upper end of the other lever, and having its end bent laterally, and an adjustable bar at each side of the frame, said bars having their ends oppositely bent, substantially as herein shown and described.

THEODORE E. SMITH.

Witnesses:

WILLIAM J. THOMAS,
WILLIAM WOOLCOCK.