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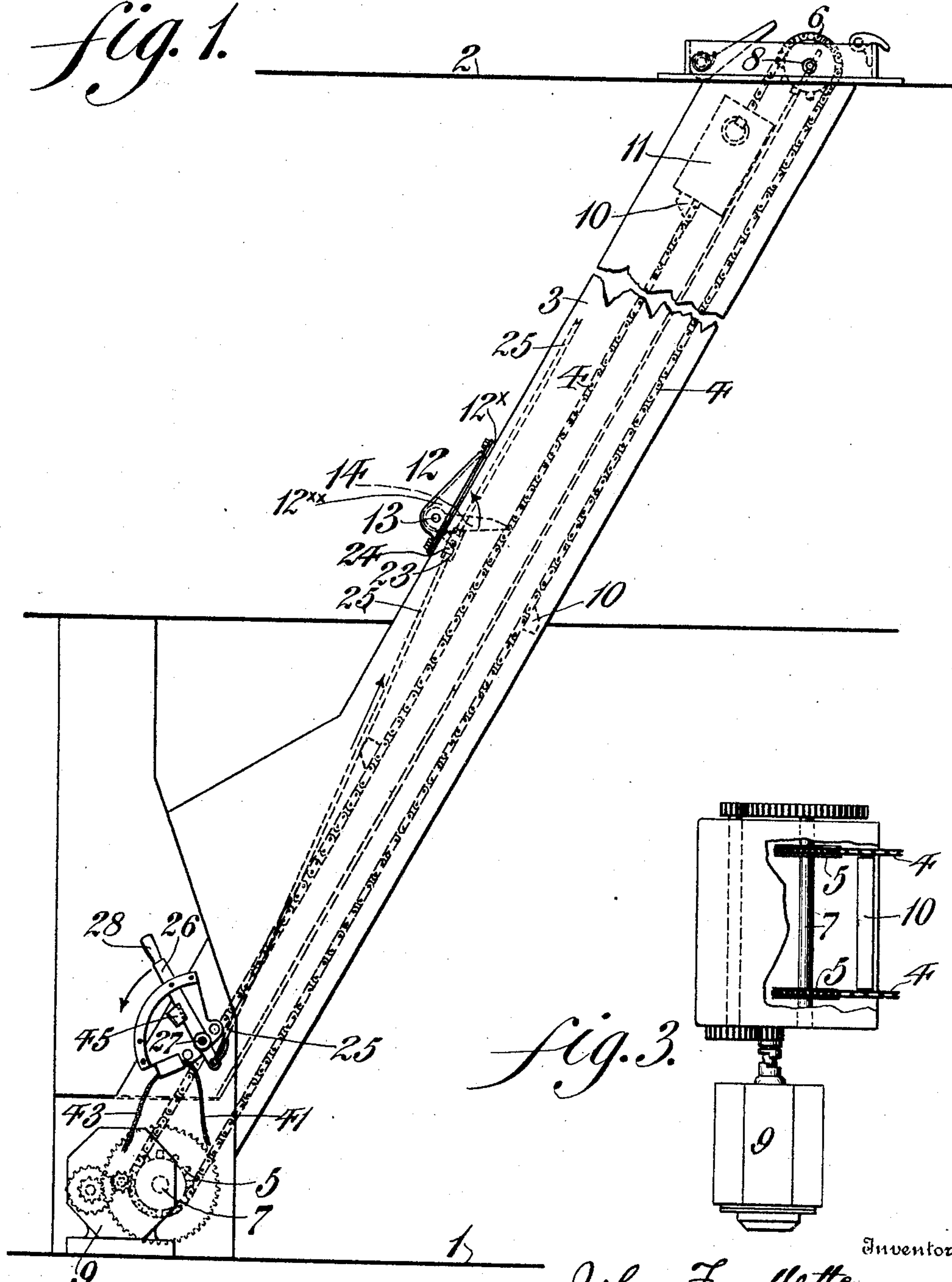
PATENTED JAN. 17, 1905.

J. F. METTEN.  
SAFETY CATCH FOR AMMUNITION HOISTS.

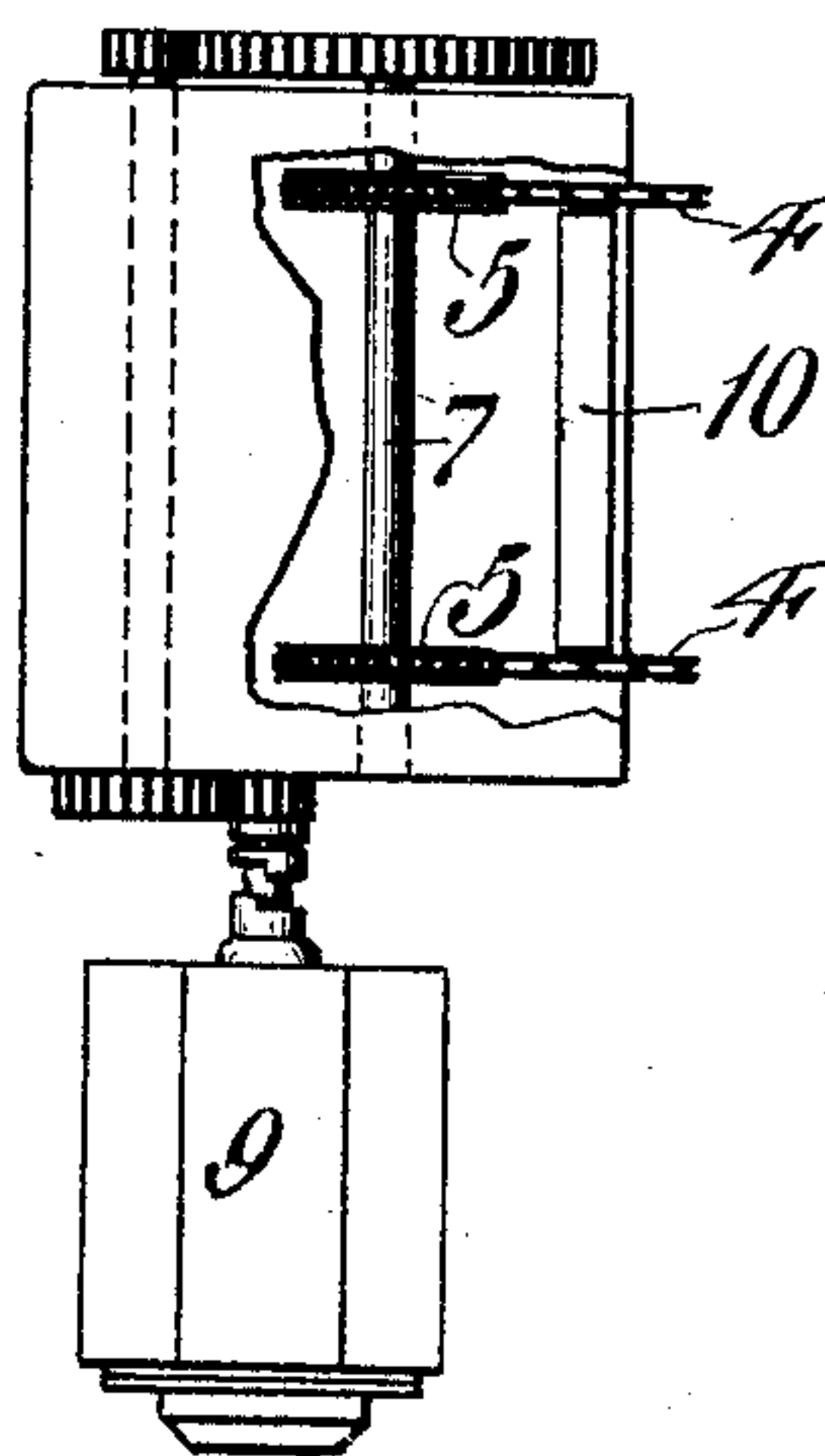
APPLICATION FILED MAY 28, 1904.

4 SHEETS—SHEET 1.

*fig. 1.*



*fig. 3.*



Witnesses

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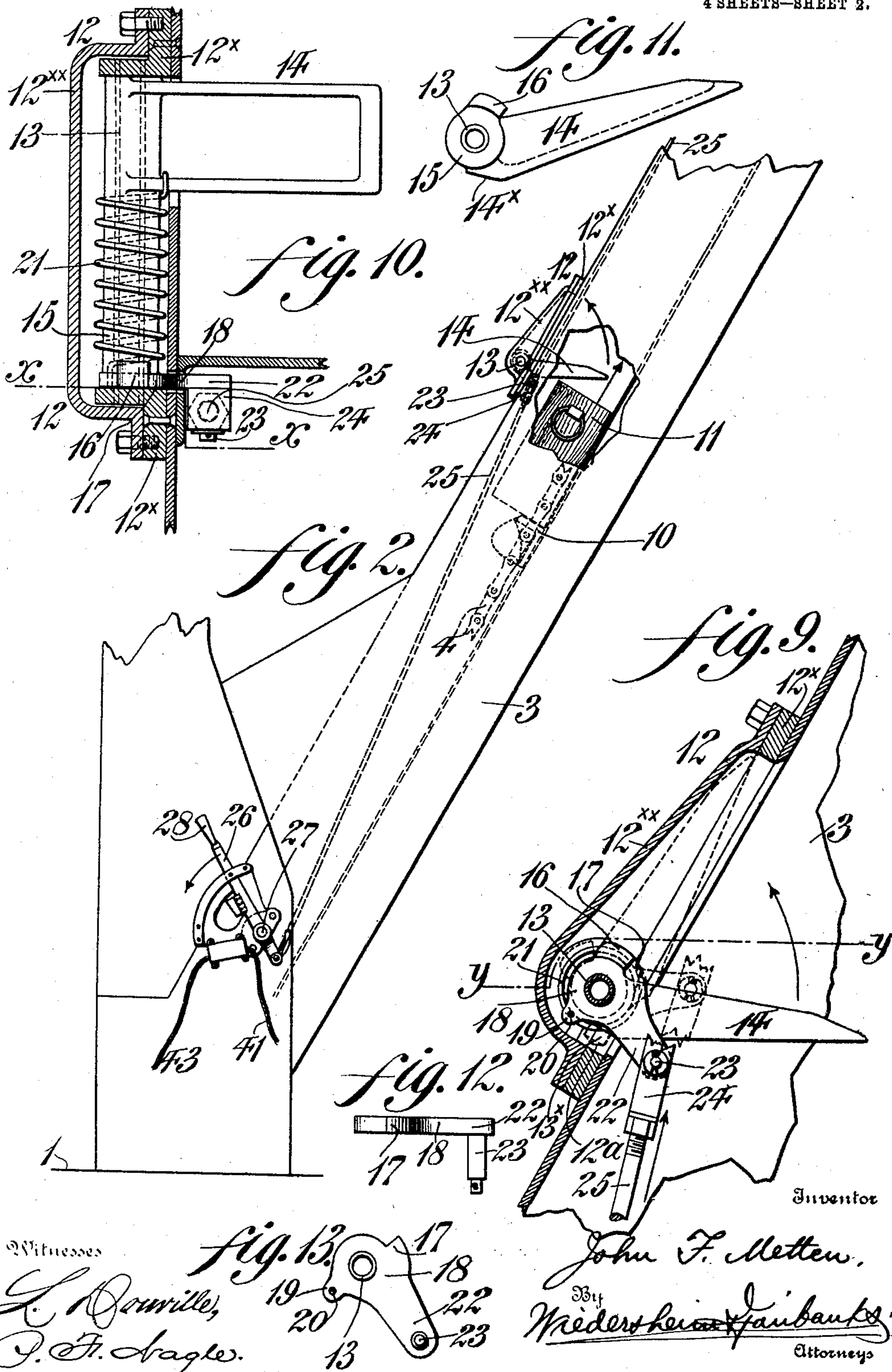
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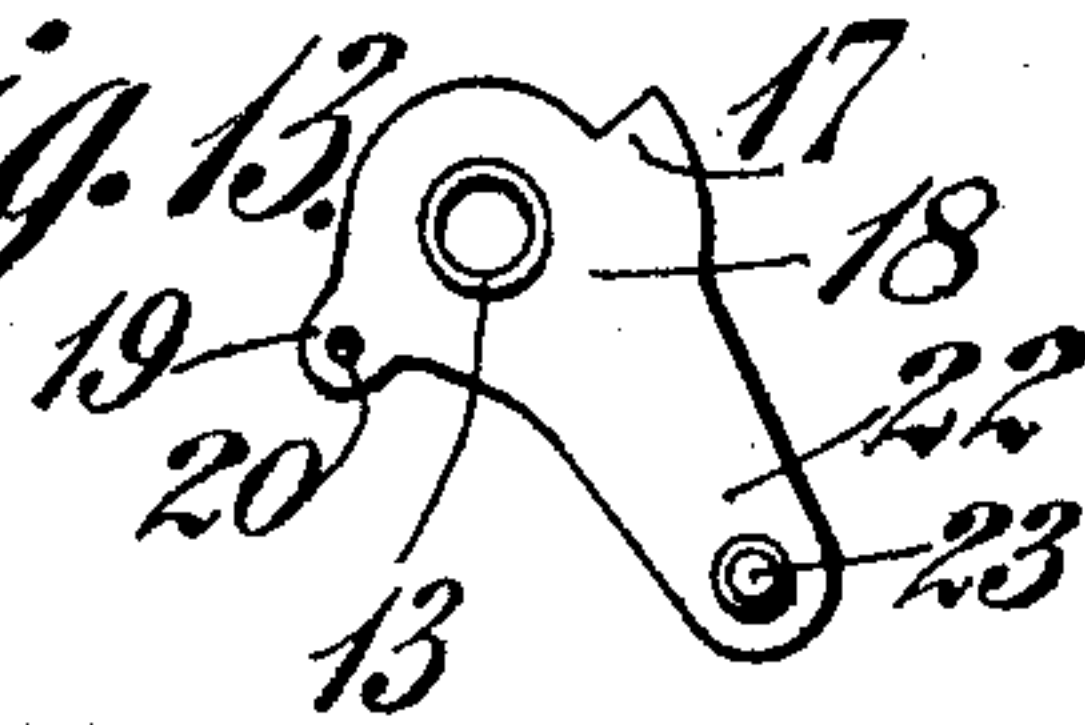
4 SHEETS—SHEET 2.



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fig. 13.



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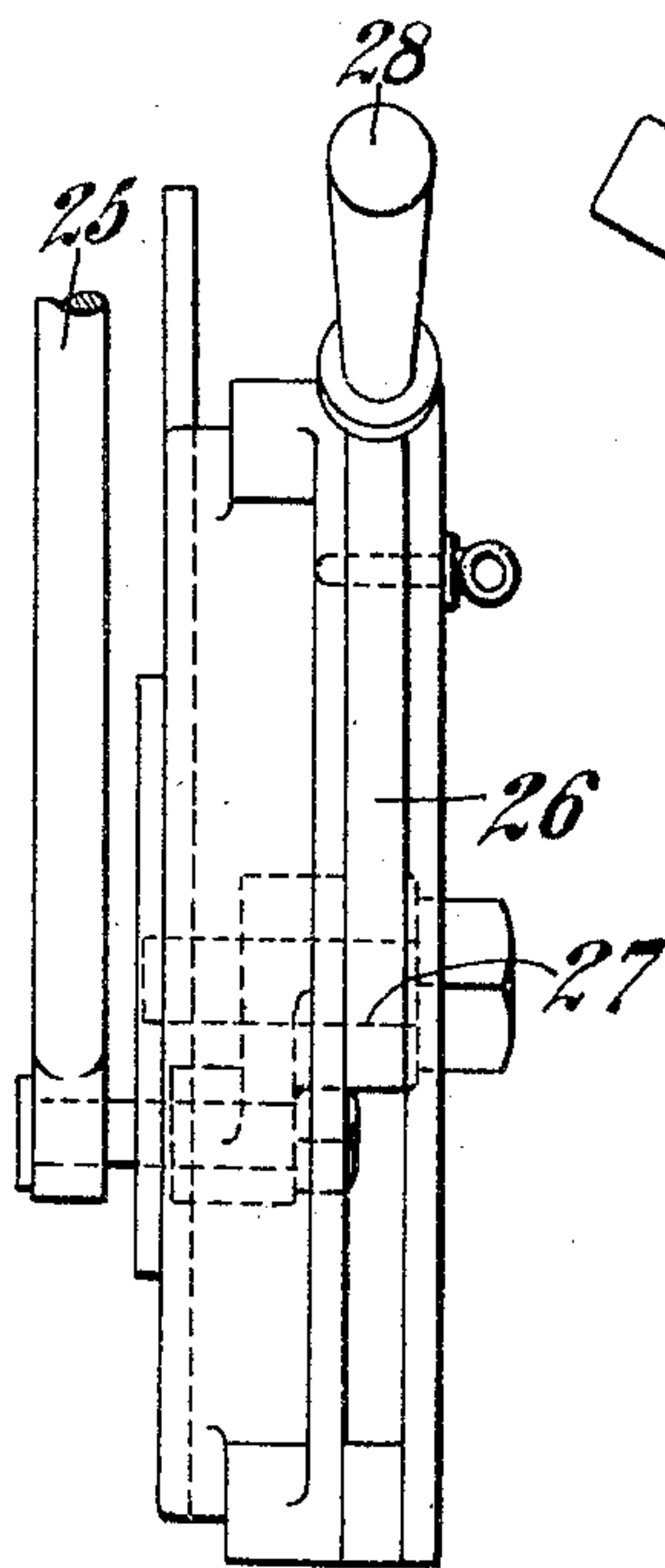
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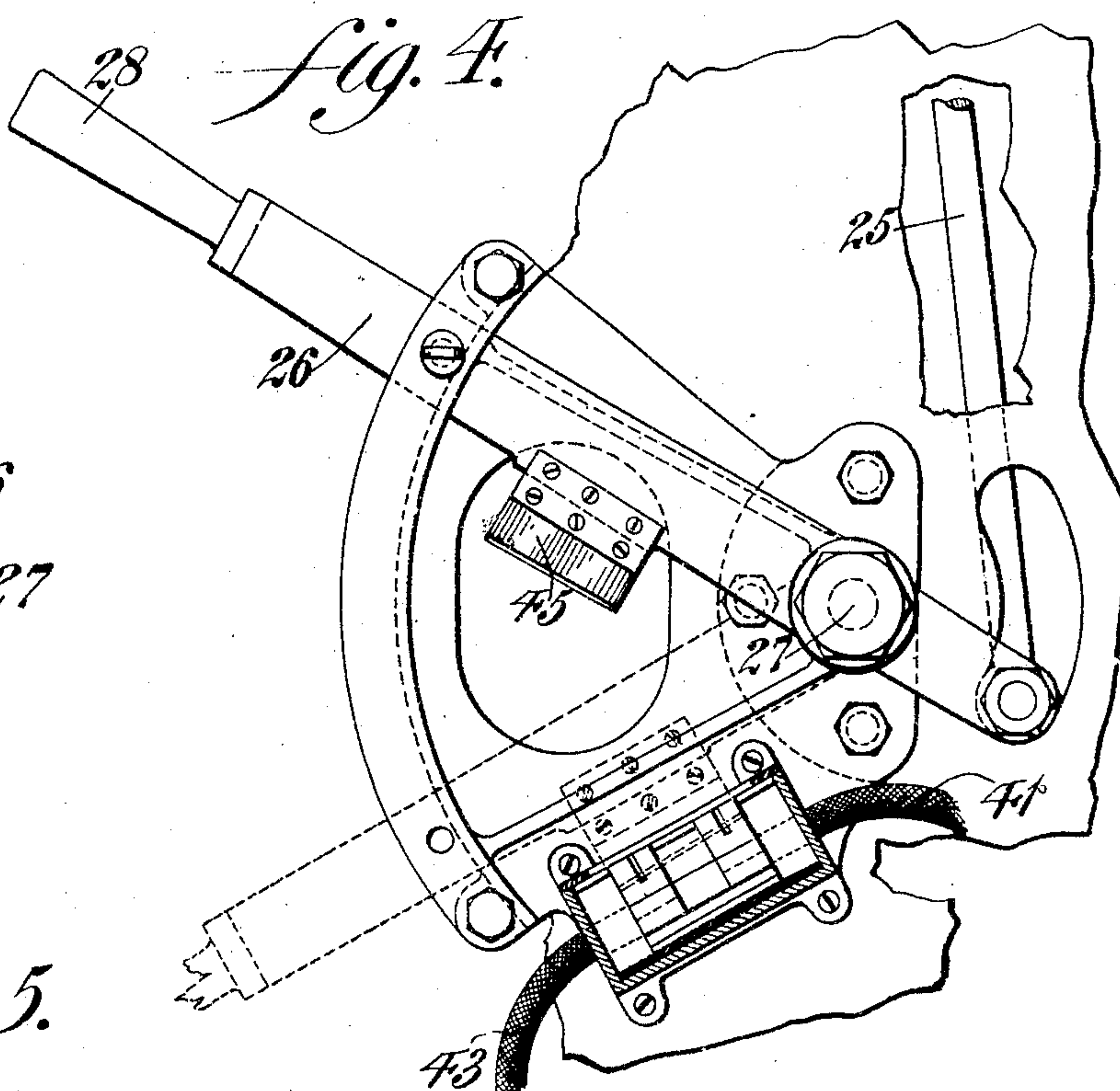
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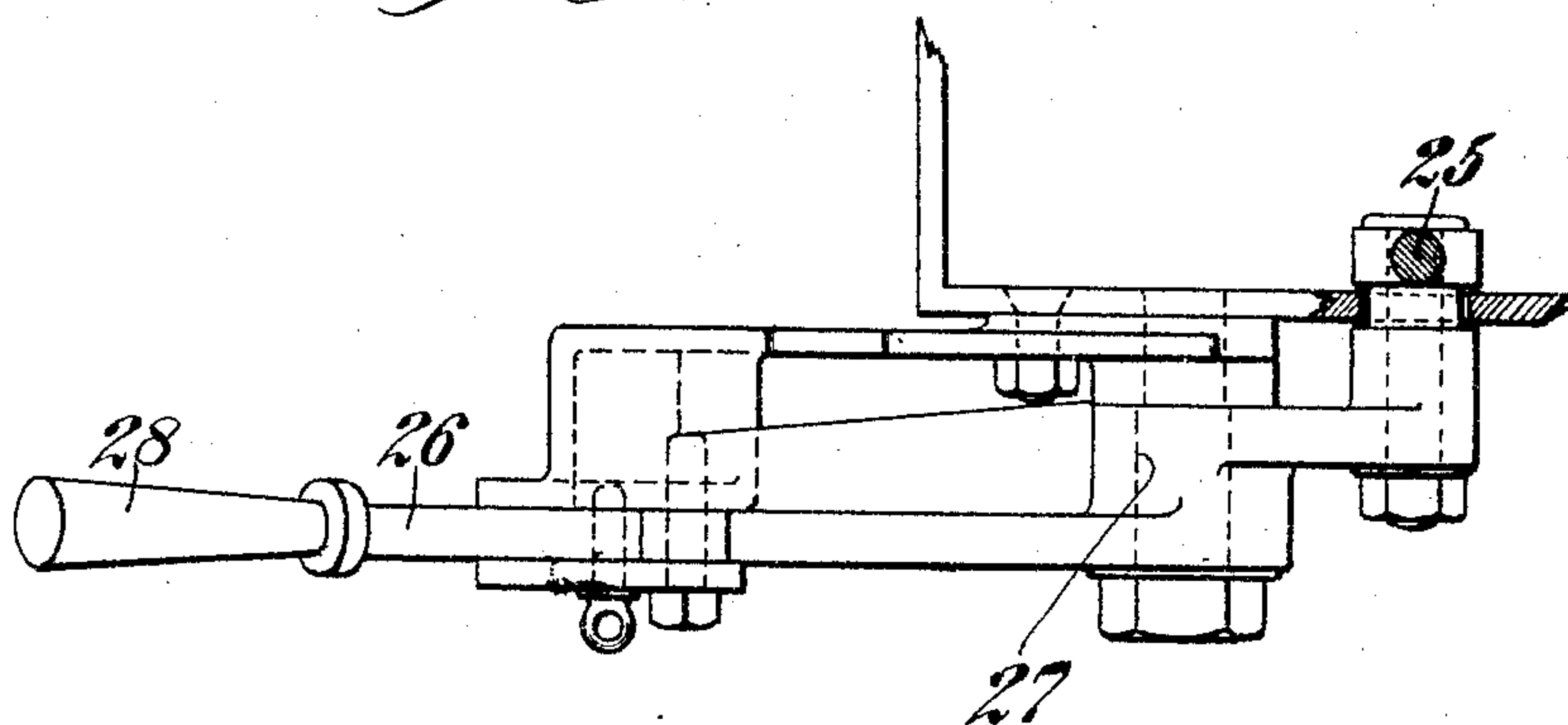
4 SHEETS—SHEET 3.



*fig. 5.*



*fig. 6.*



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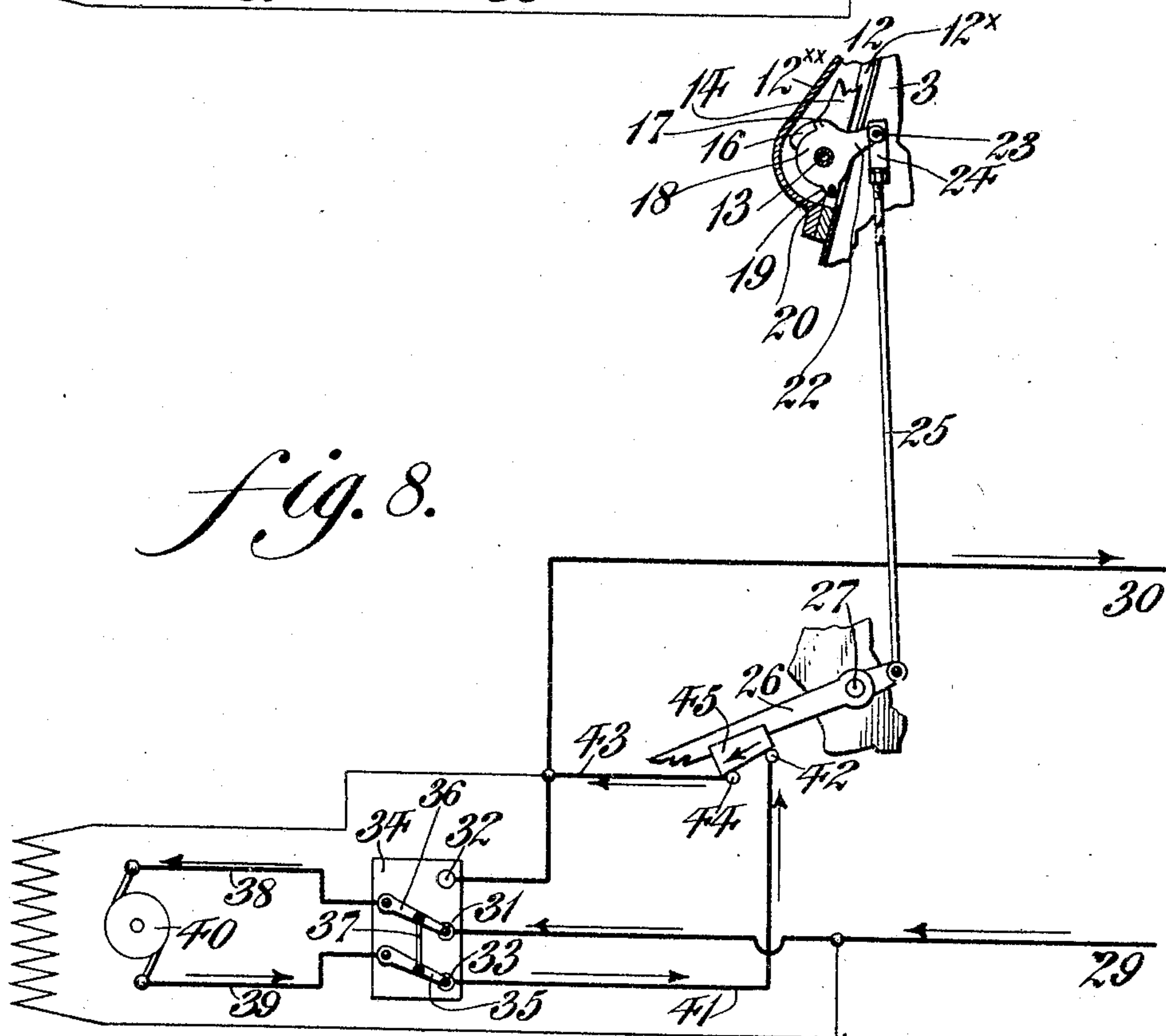
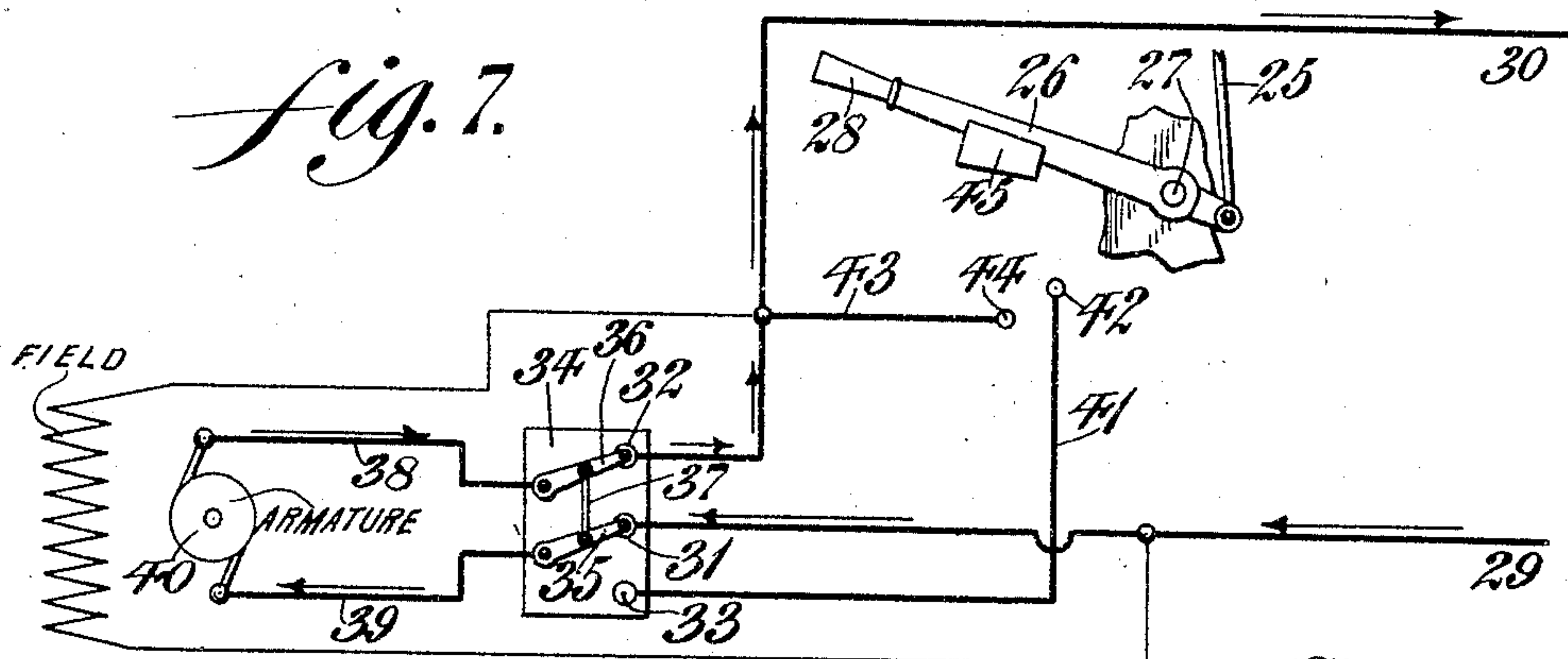
PATENTED JAN. 17, 1905.

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## SAFETY CATCH FOR AMMUNITION HOISTS.

APPLICATION FILED MAY 28, 1904.

4 SHEETS—SHEET 4.



Witnesses

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# UNITED STATES PATENT OFFICE.

JOHN F. METTEN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE WILLIAM CRAMP & SONS SHIP AND ENGINE BUILDING COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

## SAFETY-CATCH FOR AMMUNITION-HOISTS.

SPECIFICATION forming part of Letters Patent No. 780,366, dated January 17, 1905.

Application filed May 28, 1904. Serial No. 210,194.

*To all whom it may concern:*

Be it known that I, JOHN F. METTEN, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Safety-Catches for Ammunition-Hoists, of which the following is a specification.

My invention relates to ammunition-hoists such as are used on battle-ships and the like, although it is evident that they may be used under various conditions and for many different forms of service.

Heretofore trunk-hoists have been provided with pawls or safety-catches connected together by an operating-rod which extended to a lever located adjacent the trunk, so that they might be raised out of the path of a descending article. These pawls have been provided with stiff springs adapted to force them into their depressed or operative position, and it has been necessary in raising the pawls by means of the lever to move them against the springs. In long hoists, where a number of pawls are used, this has proved a serious objection. It has also been customary to mount the operating-rod in brackets within the trunk and provided with lugs adapted to engage with and raise the pawl. To erect the device, it has heretofore been necessary for a workman to pass through the trunk and to secure the brackets and the rods therein.

My present invention is designed to obviate the defects of the prior art structures; and it consists, broadly, in the construction of a concrete unitary device whereby a more compact and efficient device has been produced than heretofore.

My invention provides for the use of casings of standard sizes containing the safety-pawls and all the operative parts connected therewith, so that these are integrally securable within or removable from the trunk.

It also provides for connecting together levers by which the safety-pawls are moved by means of rods supported in the trunk without brackets or other connection, so that the whole

device may be erected from the exterior of the trunk.

It also provides, with any desired means for reversing the direction of movement of the carrier, an operative connection between such reversing means and the safety-pawls, so that the latter are necessarily raised out of their operative position when the direction of movement of the carrier is reversed for lowering an article through the trunk.

It further consists of novel features of construction, all as will be hereinafter fully set forth.

Figure 1 represents in side elevation an ammunition-hoist embodying my invention. Fig. 2 represents a fragmentary side elevation of the same, showing the operation of the device. Fig. 3 represents a rear view of the lower portion of the device. Figs. 4, 5, and 6 are respectively side and front elevations and a plan view of the controlling portion of the device. Figs. 7 and 8 represent diagrammatic views of the electric connections, showing their different positions. Fig. 9 represents a vertical section of the safety-catch portion of the device, taken on the line *xx*, Fig. 10. Fig. 10 represents a horizontal section of the same, taken on line *yy*, Fig. 9. Fig. 11 represents an elevation of the pawl or catch detached from the rest of the device. Figs. 12 and 13 represent, respectively, a plan view and an elevation of a pawl-lever detached from the device.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings, 1 and 2 designate different decks of a ship, which may be described as the magazine-deck and the gun-deck, respectively.

3 designates a trunk shown as slightly inclined. Within the trunk 3 is carried a pair of endless chains 4 4, shown as sprocket-chains and mounted on sprocket-wheels 5 6, located, respectively, at the lower and upper ends of the trunk 3. While it is evident that the power may be applied to either of the shafts 7 and 8, on which the wheels 5 6 are



respectively mounted, I have shown a motor 9 as connected by suitable gearing to the lower shaft 7, it being understood that the motor 9 is reversible by means of a switch mechanism 5 to be described. Mounted on the chains 4 4 are carriers or platforms 10, shown as connecting the chains and adapted to carry a box containing ammunition or the like.

The device thus far described is known in the art and forms no part of my present invention.

Mounted upon the upper side of the trunk 3 is a casing 12, in which is mounted a transverse shaft 13, carrying a pawl or safety catch 14, adapted to be interposed in the path of the platform 10 or of the box 11, carried thereby. It is obvious that any desired number of these safety catches or pawls may be provided and that they may be set at any desired distances from each other.

I have shown the casing 12 as consisting of a frame 12<sup>x</sup>, riveted to the trunk, and a cover 12<sup>xx</sup>, bolted to the frame so as to be removable therefrom for convenience of repairing or replacing a broken part or the like. This is clearly non-essential to my invention.

Secured to or forming part of the tubular bearing 15 of the pawl 14 is a laterally-projecting lug 16, adapted to engage with a shoulder 17 on a pawl-lever 18, also rotatable on the shaft 13. A lug 19 on the lever 18 is pierced at 20 to engage one end of a spring 21, the other end of which engages with the pawl 14 adjacent the tubular bearing 15. The spring 21 tends to maintain the pawl in its operative position, as shown in dotted lines, Fig. 1, and in full lines, Fig. 9.

Projecting laterally from the end 22 of the pawl-lever 18 is a pin 23, adapted to engage in a sleeve 24 on a rod 25 within the trunk 3. The lower end of the rod 25 is connected to a switch-lever 26, which is pivoted at 27 and provided with a handle 28. This switch-lever is clearly shown in Figs. 4, 5, and 6 of the drawings, and its operation is shown in Figs. 7 and 8. These last represent line-wires 29 30, leading, respectively, from and to a dynamo or source of electric energy. (Not shown.) The line 29 leads to a contact-button 31 and the line 30 to a contact-button 32. Both of these, together with a third contact 33, are mounted on a switchboard 34, carrying a pair of switch-levers 35 36, coupled together by a bar 37. From the pivoted ends of the levers 35 and 36 wires 38 and 39 lead to the brushes of the armature 40 of the motor 9. From the contact 33 a wire 41 leads to a contact-button 42, while a shunt-wire 43 leads to a similar contact 44, located adjacent but separated from the point 42. A metal contact-blade 45 on the switch-lever 26 serves to connect the points 42 44 when desired.

The operation is as follows: When the device is used for hoisting ammunition or the like up through the trunk 3, the switch-lever

26 is set as shown in Figs. 1, 4, and 7 of the drawings. The current passing, as shown in Fig. 7, through the motor 9, actuates the sprocket-wheels 5 to move the chain 4 in the direction of the arrow, Fig. 1. It is obvious that the trunk 3 is provided with suitable openings, preferably adjacent its lower end and at its upper end, as well as at any point intermediate thereof, for the introduction onto any of the carriages 10 of a box or other article 11 and that suitable loading and receiving platforms (not shown in the drawings) may be provided. It is clear that by the action of gravity, assisted by that of the spring 21, the pawls or safety-catches 14 will be normally depressed, as shown in Fig. 9, so as to be interposed in the path of the article which is being hoisted. It is also clear that the box or other article will raise the pawl 14 out of its way, so as to freely pass the same, and that the pawl will immediately fall into its operative position, ready to prevent the accidental descent of the box or other article caused by the breakage of a chain or carriage or any other cause. In this position the butt 14<sup>x</sup> of the pawl bears upon a shoulder 12<sup>a</sup>, formed in the lower part of the casing 12. To prevent noise and unnecessary pounding, a strip 13<sup>x</sup> of rawhide or the like may be partially inserted in a recess in the shoulder 12<sup>a</sup> or otherwise secured thereto.

When it is desired to reverse the direction of movement of the chain 4, so as to use the device for lowering instead of hoisting, the operator throws the lever 26 to the position shown in dotted lines, Fig. 4, or in full lines in Fig. 8 of the drawings. It is understood that the lever 26 may, if desired, be suitably connected by any well-known device (not shown) to the coupled levers 35 36, so as to shift the same to the position shown in Fig. 8, whereby the current passing through the armature 30 is reversed. In any case the connecting-blade 45 on the lever 26 connects the buttons 42 44 and completes the circuit. By reason of the connection of rod 25 between the end of the lever 26 and the sleeve 24 the movement of the lever 26 tilts the pawl-lever 18, so that through the lugs 16 and 17 the safety-pawl 14 is raised out of its operative position and stowed entirely within the casing 12, as shown in Fig. 9 of the drawings. As the spring 21 connects the pawl-lever 18 and the pawl 14, the simultaneous movement of these does not increase the tension on the spring, so that no force is required to be overcome in raising the pawl 14, except those of gravity and friction. This is of importance where several pawls are used, as in cases of long hoists passing through a number of decks.

It will be seen that in my device these pawls or safety-catches, with all their connecting parts, are containable and secured within the casing 12, so that the devices may be made of standard size and completed in the shop,



it being only necessary in erecting them to cut the proper holes in the wall of the trunk 3 and connect the casing thereon. The sleeves 24 are provided with right and left threads, 5 so that the rod 25 may be screwed thereinto from either end and may be set up without brackets and without the necessity of a workman entering the trunk.

It will be seen that the device may be set 10 either vertically or at any desired angle, either fore and aft or athwartship, that there is nothing in the trunk to jam or interfere with the free movement of the ammunition-box therethrough, and that the pitch or roll 15 of the ship has no effect to prevent the successful operation of the hoist.

It is evident that any other form of motor may be substituted for the electric one shown or that the reversing device may be applied 20 to any well-known means for supplying power.

It will be apparent that while I have shown in the drawings the preferred manner of assembling the pawls, operating-lever, and rod, and their adjuncts I do not desire to be limited 25 thereto in every instance, since various changes may be made by those skilled in the art which will come within the scope of my invention, and I do not, therefore, desire to be limited in every instance to the exact construction shown and described; but I have 30 shown herein the preferred form and the one which I have found to give the best results in practice.

So far as I am aware, I am the first in the 35 art to combine in an ammunition-hoisting apparatus of the character described the element of means adapted to simultaneously operate a safety catch or catches and to coact with a circuit-breaking device connected with the 40 motor or other source of power whereby improper rotation of the motor with respect to the position of the safety-catches is prevented, so that all danger of accident to the apparatus is reduced to a minimum, and my claims to 45 this feature are therefore to be interpreted with corresponding scope.

The construction shown is essentially adapted for hoisting small-arm ammunition, usually packed in boxes; but, if desired, slight modifications may be made, as in the shape of the 50 trunk and shape of the division-plate. When it is desired to use the hoist for handling large sizes, or fixed ammunition, or ammunition with shell and powder cans separate, (such 55 as is used in six-inch and seven-inch naval guns,) I may, if desired, make the division-plate of curved section, to better guide this character of ammunition.

Having thus described my invention, what 60 I claim as new, and desire to secure by Letters Patent, is—

1. An ammunition-hoist comprising a trunk, a carrier in said trunk, a casing secured exterior to the wall of said trunk, and a safety- 65 pawl movably mounted within said casing and

normally projecting into said trunk in the path of an article raised by said carrier, said casing, pawl and connected parts being integrally secured to said trunk.

2. An ammunition-hoist comprising a trunk, 70 a carrier in said trunk, a casing on said trunk, and a pawl pivotally mounted in said casing and normally projecting into said trunk in the path of the article raised by said carrier, said pawl having a second bearing in said casing 75 when in its operative position, said casing, pawl and connected parts being integrally secured to said trunk.

3. An ammunition-hoist comprising a trunk, a carrier in said trunk, a casing on said trunk, 80 a pawl movably mounted in said casing and normally projecting into said trunk in the path of an article raised by said carrier, a lever mounted in said casing and engageable with said pawl for raising the same out of its operative position, means exterior of said trunk 85 and spaced away from said casing for operating said pawl-lever, and a rod within said casing connecting said operating means and said pawl-lever. 90

4. An ammunition-hoist comprising a trunk, a carrier in said trunk, means for reversing the direction of movement of said carrier, a pawl normally projecting into said trunk and 95 in the path of an article raised by said carrier, and means connecting said pawl and said reversing means whereby the actuation of said reversing means to lower an article in said trunk raises said pawl out of its operative position. 100

5. An ammunition-hoist comprising a trunk, a carrier in said trunk, means for reversing the direction of motion of said carrier, a casing exterior of and secured to said trunk, a pawl in said casing and normally projecting 105 into said trunk in the path of the article raised by said carrier and means connecting said reversing means and said pawl, whereby the actuation of said reversing means to lower an article in said trunk acts to raise said pawl 110 into said casing.

6. In an ammunition-hoist, a trunk, a carrier in said trunk, a casing secured on said trunk, a pawl movably mounted in said casing, a pawl-lever operatively connected to move 115 said pawl, a lever for reversing the direction of motion of said carrier, and means connecting said reversing-lever and said pawl, whereby the actuation of said reversing-lever to lower an article in said trunk acts to raise said 120 pawl into said casing.

7. An ammunition-hoist comprising a trunk, a carrier in said trunk, an electric motor for operating said carrier, a casing on said trunk, a pawl movably mounted in said casing and 125 normally projecting into said trunk in the path of an article raised by said carrier, a switch for permitting a reversal of current through said motor, a lever forming part of said switch and means connecting said switch- 130



lever with said pawl whereby the actuation of the lever to permit the flow of current in the direction to lower an article on said carrier acts to raise said pawl out of the path thereof.

8. In an ammunition-hoist, a trunk, a carrier in said trunk, a casing secured to the wall of said trunk, a safety-pawl pivotally mounted in said casing and normally projecting into said trunk and in the path of an article to be raised by said carrier, a pawl-lever also pivotally mounted in said casing, a spring connecting said pawl and said lever and operative to depress said pawl and means for actuating said lever to raise said pawl whereby said pawl is raised without alteration of the tension of said spring.

9. In a device of the character named, a safety-catch for an ammunition-hoist, mechanism for throwing said catch into operative and inoperative positions, a motor, electrical connections therefor, and means coacting with said mechanism for causing said motor to run forwardly when said catch is in normal position, and for permitting said motor to run in a reverse direction, when said catches are in stowed position.

10. In a device of the character named, the combination of a safety-catch, a rod for op-

erating the same, a lever connected to said rod, a contact-plate carried by said lever, ammunition-hoisting devices, a motor, and electrical connections common to said motor and lever, whereby when the hoisting mechanism is running in a forward direction said catches are in their normal position, but when said hoisting mechanism is running backwardly said catches are moved out of the path of the same.

11. In an ammunition-hoist, hoisting means, an electric motor operatively connected to said hoisting means, means for reversing the direction of current in said motor, a safety-catch for an article to be hoisted, and means operatively connected with said current-reversing means for moving said safety-catch out of its operative position.

12. In an ammunition-hoist, hoisting means, actuating mechanism for said hoisting means, devices for reversing said actuating mechanism, a safety device and means for automatically moving said device from its operative position when said actuating mechanism is reversed.

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