

(No Model.)

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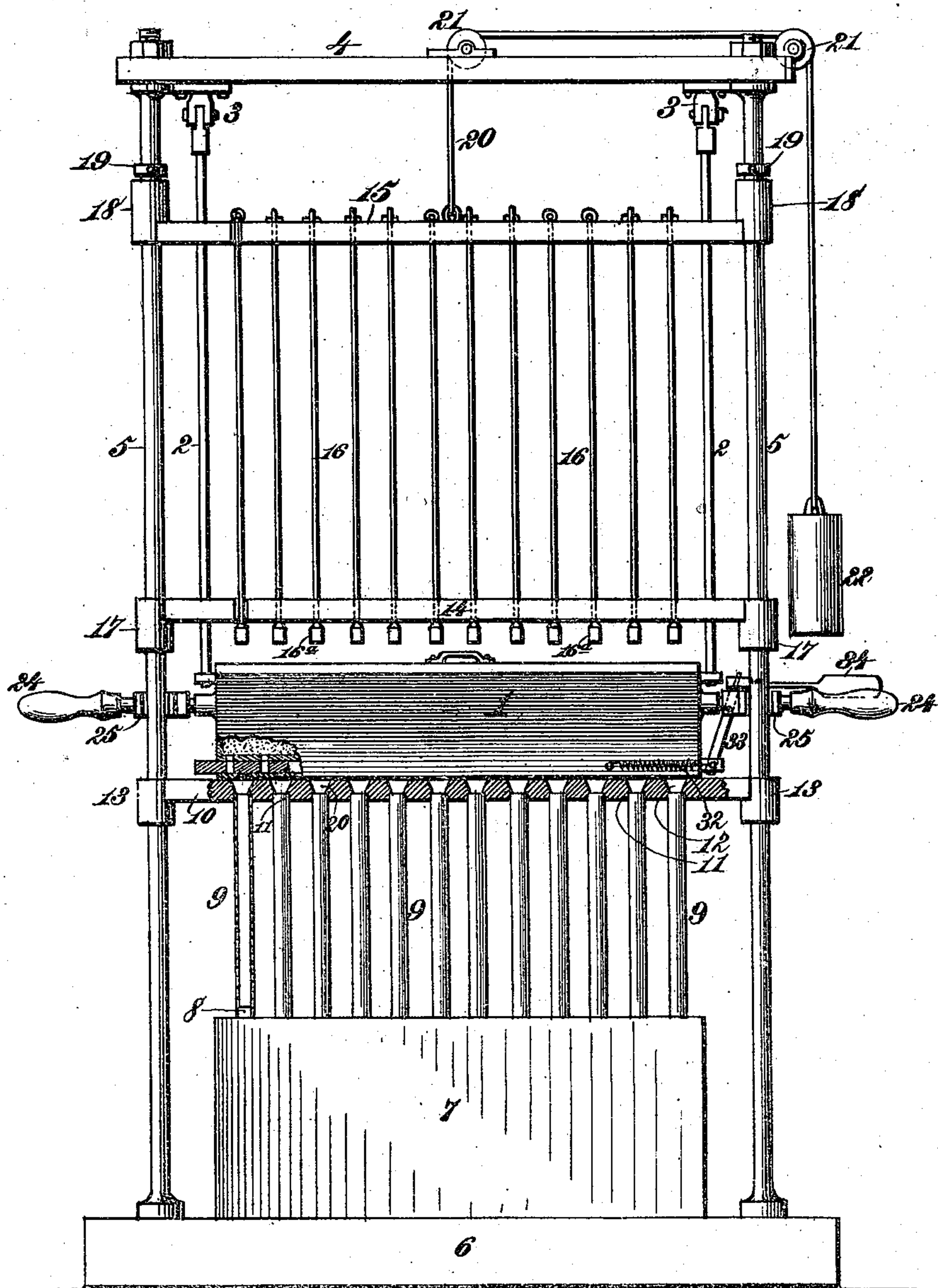
C. WADSWORTH.

## APPARATUS FOR CHARGING FIRE WORKS.

No. 376,691.

Patented Jan. 17, 1888.

*Fig. 1.*



Witnesses.

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J. A. Kutherford.

*Inventor,*

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By *James L. Norris.*

(No Model.)

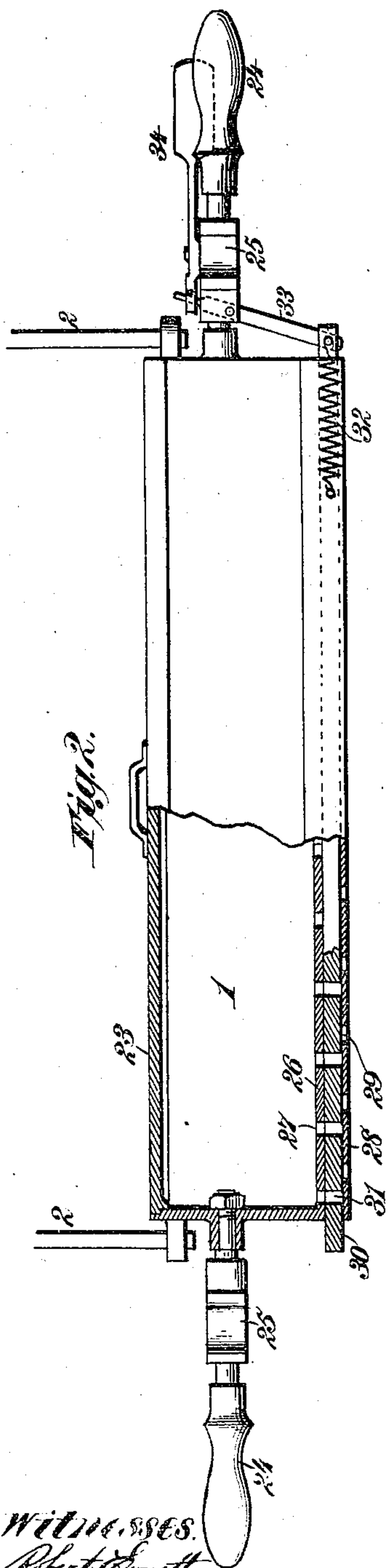
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C. WADSWORTH.

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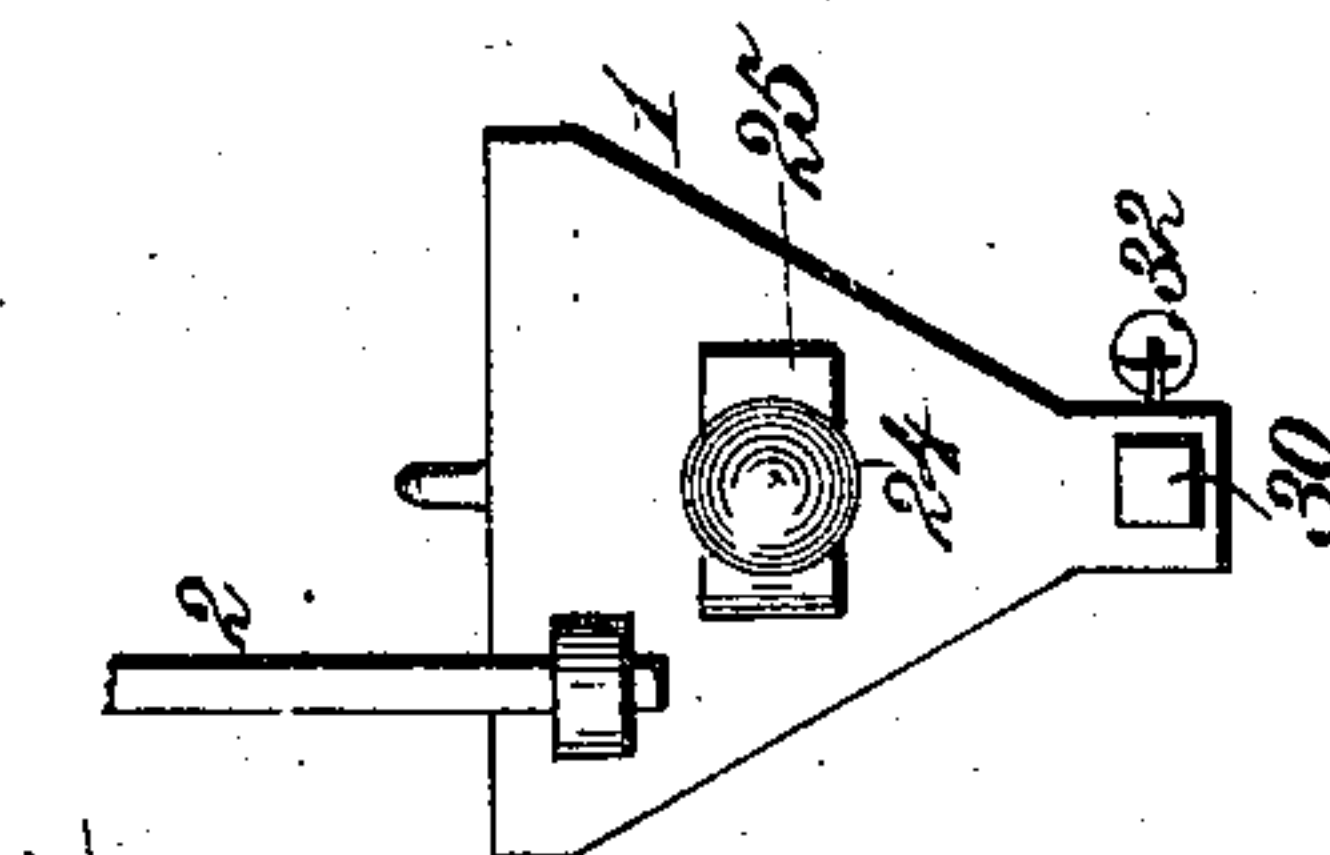
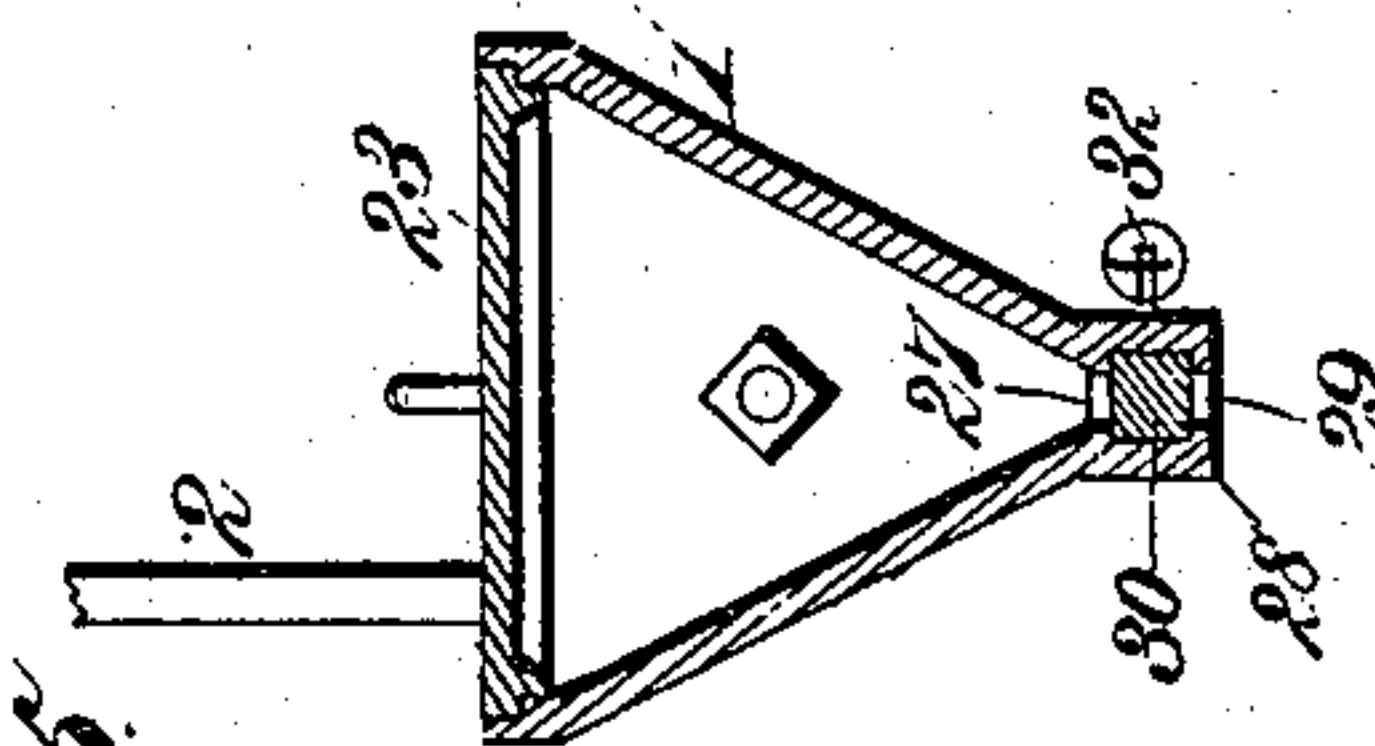
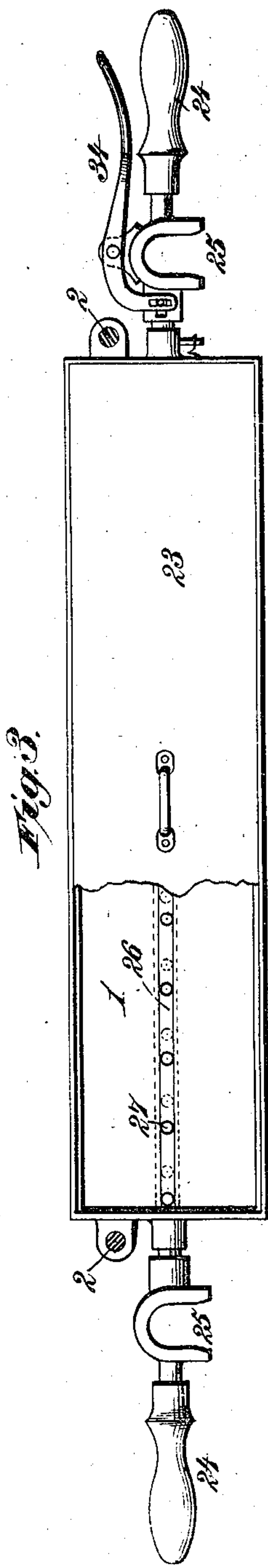
Patented Jan. 17, 1888.



Witnesses.

Robert G. Smith,

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Inventor:  
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# UNITED STATES PATENT OFFICE.

CLAUDIUS WADSWORTH, OF BROOKLYN, ASSIGNOR TO THE UNEXCELLED  
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## APPARATUS FOR CHARGING FIREWORKS.

SPECIFICATION forming part of Letters Patent No. 376,691, dated January 17, 1888.

Application filed November 10, 1887. Serial No. 254,817. (No model.)

*To all whom it may concern:*

Be it known that I, CLAUDIUS WADSWORTH, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Apparatus for Charging Fire-Works, of which the following is a specification.

This invention relates to devices employed in charging Roman candles and similar fire-works having tubular or cylindrical casings; and it consists, particularly, in the peculiar construction of a closely-covered metallic powder-feeding box and its attachments, as hereinafter set forth, whereby gunpowder and other explosive compounds can be safely and conveniently fed in definite quantities, without liability of the usual great danger and risk to the operator incurred by accidental explosion of the fire-works.

The invention is illustrated in the annexed drawings, in which—

Figure 1 is a sectional front elevation of my improved apparatus for charging fire-works. Fig. 2 is an enlarged sectional front elevation of my improved feeding-box, forming part of the charging apparatus. Fig. 3 is a plan of the powder-feeding box, with a portion of its top broken away. Fig. 4 is an end elevation, and Fig. 5 a cross-section, of the powder-feeding box.

In the manufacture of Roman candles and similar fire-works the operator is ordinarily exposed to great danger from accidental explosion of fire balls or stars which are liable to throw sparks into the adjacent powder-feeder. My invention is designed to obviate this danger, and at the same time provide a simple, convenient, and reliable means of feeding charges of gunpowder, and, if desired, various pyrotechnic compositions, in definite quantities.

Referring to the drawings, the numeral 1 designates a metallic powder-feeding box, which is approximately triangular in cross-section and suspended by means of rods 2 from the ceiling or other support. As shown in Fig. 1, the suspension-rods 2 are hinged to lugs 3 on the under side of a transverse beam, 4, secured to the upper ends of standards 5, which form part of the charging apparatus. The lower

ends of the standards 5 may be secured to a bed-plate, 6, or to the floor; and resting on the floor or upon the bed-plate 6, between the standards 5, is a block, 7, having a series of short cylindrical bosses, 8, arranged at suitable intervals in a straight line across its upper face. These bosses 8 serve to hold in place the lower ends of the tubes or hollow cylinders 9, which are to be charged with pyrotechnic material, the tubes or cylinders being of such internal diameter as to fit over and around the bosses, as shown in Fig. 1.

The standards 5 serve as guides and supports for a transverse plate or bar, 10, in the under side of which are formed a number of shallow cylindrical recesses, 11, to receive the upper ends of the tubes or cylinders 9, which fit closely therein. A series of funnel-shaped openings, 12, extend upward through the bar or plate 10, as shown in Fig. 1. The lower ends of these openings 12 communicate with the recesses 11, and are contracted to correspond with the interior diameter of the tubes to be charged, while the upper ends of the openings are enlarged and open on the top of the bar or plate in which they are formed. At each end of this bar or plate 10 is an eye or sleeve, 13, for engaging the standards 5, the bar being thus movable vertically on the standards, so that it can be raised to facilitate placing the tubes 9 in position and then lowered to engage said tubes.

The standards 5 also serve as guides for transverse bars 14 and 15, which are perforated vertically to serve in turn as guides for the vertically-movable rammers 16, by which the charges are compacted or pressed in the tubes 9 during the operation of charging. The lower guide-bar, 14, is provided at its ends with sleeves 17, engaging the standards 5, and projecting downward to rest on the sleeves 13 when the rammers are lowered, and the upper bar, 15, has upwardly-projecting guide-sleeves 18 to contact with adjustable stop-collars 19 on the standards 5 when the rammers are raised.

To the center of the upper guide-bar, 15, is attached a cord, 20, which passes over pulleys 21 on the cross-beam 4, and carries a weight, 22, at its other end, or is connected with a spring.



The rammers 16 are loosely supported at their upper ends in the upper guide-bar, 15, so as to be raised and normally held in an elevated position by the weight 22 or a spring acting on said bar. The lower guide-bar, 14, is partly supported by the enlarged rammer-heads 16<sup>a</sup>, and when the operator pulls the rammers down by grasping the upper bar, 15, the lower bar, 14, also descends and serves to hold the rammers in proper alignment, so that the rammer-heads will accurately register with the funnel-shaped openings 12 and pass through them into the tubes being charged. It will be observed that each rammer is loosely supported independent of the others, so that if the tubes should be unequally charged any rammer can yield somewhat without materially affecting the force of its blow.

While the contents of the tubes or cylindrical casings 9 are being acted on by the rammers, the suspended powder-feeding box 1 occupies a position at the rear of the standards 5 and out of the path of the rammers. As before stated, this powder-feeding box is approximately triangular in cross-section and made of metal, and in order to provide for security against the access of sparks it has a heavy close-fitting metallic cover, 23, which rests tightly in the countersunk or rabbeted upper edges of the box, as shown in Figs. 2 and 5. Secured to each end of the box 1 is a handle, 24, by which it can be drawn forward when required to feed powder into the tubes being charged, and each handle has a guide-yoke, 25, to engage the adjacent standard 5 and prevent longitudinal movement of the box. The lower contracted portion of the box 1 is provided with a double bottom, consisting of an upper plate, 26, having a line of perforations, 27, and a lower plate, 28, having a line of perforations, 29, as shown in Figs. 1 and 2. The perforations 29 are located at such intervals as to register with the funnel-shaped openings 12 of the bar or plate 10 when the feeding-box 1 is moved forward; but the openings 27 are arranged a little to one side, so that they do not register with the openings in the bottom plate. In the space between the perforated plates 26 and 28 is fitted a longitudinally-movable slide, 30, having perforations 31, which by moving the slide may be made to register alternately with the perforations 27 and 29, thereby receiving powder from the box through the perforations 27 and discharging it through the perforations 29 into the tubes.

The vertical thickness of the slide 30 and the diameter of the perforations 31 are such that said perforations will collect and discharge definite quantities of powder at each alternate movement of the slide. Both ends of the slide 30 project beyond the box 1, and to one of these projecting ends is attached one end of a spiral spring, 32, the other end of which is attached to the box. This spring normally holds the slide in such position that its perforations 31 coincide with the perforations 27 in the

plate 26, and so receive powder from the box. To one end of the slide 30 is pivoted a lever, 33, which is also pivoted to one of the box-handles 24, and on this handle is pivoted a thumb-lever, 34, which engages the upper end of the lever 33, so that through these levers the slide can be moved to bring the perforations 31 into line with the perforations 29 in the lower plate, 28, and thereby discharge the powder into the funnel-shaped openings 12, and thence into the tubes.

In charging the tubes 9 for Roman candles and similar fire-works it is usual to place in the lower end of each tube a clay-choke, which should be properly pressed or compacted by the rammers 16, while a number of the tubes are supported in the apparatus, as shown in Fig. 1. These rammers are operated by pulling down on their guide-bars 14 15, and when released they are returned to an elevated position by the action of the weight and cord or spring. The slow-burning composition—fire balls or stars—and powder are each separately introduced and rammed in a manner well known in the art, care being taken to avoid explosions and communication of sparks to the powder-feeder.

In this apparatus, during the operation of ramming, the powder-feeding box is swung back out of the way, and, being made of metal and tightly closed, affords no access for sparks in the event of a premature explosion of the tubes. At the proper time, by grasping the handles 24, the powder-feeding box can be drawn forward into proper operative position over the funnels 12, and then by manipulating the thumb-lever 34 the slide 30 will be actuated so as to discharge definitely-measured quantities of powder into the tubes, the spring 32 automatically retracting said slide as soon as the thumb-lever is released and the box again swung back.

The feeding-box 1 may contain gunpowder or any pyrotechnic composition according to the character of work to be done, and affords a safe, convenient, and easily-controlled device for use in charging fire-works.

What I claim as my invention is—

1. In an apparatus for charging fire-works, a suspended and swinging powder-feeding box composed of metal and having a close-fitting metallic cover, a double bottom composed of upper and lower plates having longitudinal series of perforations, the perforations in one plate being so located as to not register directly with the perforations in the other plate, and a longitudinally-movable slide located between said plates and provided with a series of perforations to register alternately with the perforations in the upper and lower plates of the box-bottom, substantially as described.

2. In an apparatus for charging fire-works, the combination, with a bar or oblong plate having in its under side a longitudinal series of recesses to fit over and receive the upper ends of a number of fire-work tubes to be charged, and provided on its upper side with



a longitudinal series of funnel-shaped openings communicating with said recesses, of an oblong tightly-covered metallic powder-feeding box suspended adjacent to said bar or plate and capable of being swung to and from a position above and in contact with the same, said powder-feeding box being provided with a double bottom composed of plates, in each of which is a longitudinal series of perforations so located that the perforations of one plate do not register with the perforations of the other plate, and a longitudinally-movable slide located between said plates and provided with a longitudinal series of perforations to alternately register with the perforations in the upper and lower plates and thereby receive powder from the box and discharge it through the funnel-shaped openings into a series of tubes, substantially as described.

3. In an apparatus for charging fire-works, a swinging and tightly-covered metallic powder-feeding box, having handles 24, and a double bottom composed of plates 26 and 28, provided, respectively, with a longitudinal series of perforations, 27 and 29, located in different vertical lines, said box being provided with a longitudinally-movable slide, 30, located between said plates and having a longitudinal series of perforations, 31, to register alternately with the perforations 27 and 29, levers 33 and

34, mounted on one of the box-handles and adapted to actuate the slide so as to cause its perforations to register with the perforations in the lower plate, 28, and a spring, 32, to retract the slide and cause its perforations to register with the perforations in the upper plate, 26, substantially as described.

4. In an apparatus for charging fire-works, the combination; with the standards 5 and a bar or plate, 10, having recesses 11 in its under side to receive the upper ends of the tubes or cases to be charged, and provided with funnel-shaped openings 12, leading into said recesses, of a covered metallic powder-feeding box suspended by hinged rods 2, so as to be capable of swinging to and from said bar, said box being provided at each end with handles 24, having guides 25, the perforated plates 26 and 28 forming a double bottom for said box, the perforated slide 30, located between said perforated plates, the levers 33 and 34, for actuating the slide, and the spring 32, for retracting the slide, substantially as described.

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

CLAUDIUS WADSWORTH.

Witnesses:

CHARLES H. SMITH,

GEORGE H. CRAWFORD.