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PROVISIONAL SPECIFICATION.

Intense Lighting Apparatus for Instantaneous Photography.

I, JOSE FERREIRA GUIMARAES, a Photographer, at Bois-Colombes (Seine), 17, Rue de la Paix, France, do hereby declare the nature of this invention to be as follows:—

5 The present invention relates to improvements in flash-light apparatus for photographic purposes of the type in which a brilliant flash of light is produced by bringing into contact with a colourless flame a powder containing magnesium or equivalent highly combustible and luminous material, the composition of which powder forms no part of the present invention.

10 Apparatus of this type as up to the present constructed possesses certain drawbacks in practical use, notably in the means for collecting the fume from the luminous material, and also in neutralizing the effect of the dazzling flash of light upon the countenance of the sitter. It is found that such an intense illumination projected upon the face of the person in comparative darkness causes him to alter the expression of the face, and especially of the eyes, to the detriment of the photograph obtained.

15 My present invention provides a means for obviating these drawbacks.

The apparatus comprises:—

- 20 (a). A long metallic rod with a rim placed horizontally.
- (b). A metallic tube of the same length as the rod and open throughout its whole length. This tube is filled with asbestos.
- (c). A cover of partially circular section capable of fitting exactly over the upper part of the tube so as to hermetically close the longitudinal opening. This lid, which is lined inside with asbestos cloth, is fixed to the end of two arms each hinged to an intermediate piece screwed or rivetted on each of the metal blades
- 25 which support at the same time the rod and the tube. These blades are bent at their lower ends so as to be able to hook on to the knob of the support.

In order to explain the operation of this essential portion of my invention I will assume the parts to be placed in their first position. In this position it will be understood that the whole combination formed by the rod, the tube and the blade is so arranged that the flat part of the rod is perfectly horizontal; this position is maintained by a support, its lower extremity engaging in a slot of the piece in which is arranged a small extensible air reservoir formed of a fixed tube and a movable sheath, which reservoir is joined to a flexible tube and capable of being inflated with air by pressure upon a rubber ball placed at the other end

35 of the tube. On the other hand the cover is raised and supported by the bolt placed in a suitable manner for this purpose: such is the first position of my lighting device. Before placing it thus with a view to operation it must be carefully detached by unhooking it from the rest of the apparatus and the necessary quantity of powder placed all along the rod and a small quantity of spirit poured

40 into the tube throughout its entire length so as to wet the asbestos; everything having been replaced as described above the apparatus is ready to operate. For producing the light it is only necessary at the desired moment and after having

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previously lighted the spirit in the tube, to press the ball. A reservoir lengthens and projects the support outside the slot. The lower part of the device being now no longer supported drops and whilst doing so the powder placed on the rod slips off and falls on the tube, the spirit in which is burning; it is instantly set alight and produces the intense illumination desired. The movable part in dropping has likewise caused the lid to drop, which then comes out of engagement with the bolt and being no longer supported is thrown forward. This lid fits then on to the tube and instantly extinguishes the flame. 5

The light producing mechanism constructed substantially as above described is suspended in a suitable manner at the back of the chamber and inside this latter at a suitable distance above the frame on which the blind is drawn down. Beneath the frame is arranged a movable sash having a blue glass; this sash which is arranged so as to be capable of being easily raised and lowered is attached to the main frame of the apparatus, and to the front of the chamber to which it is closely fitted so as not to allow light to pass at the sides of the glass. For this purpose also cloth bands are fixed at the sides of the chamber; at the back of the sash with blue glass is hinged at a certain distance beneath the chamber for the purpose of leaving a free space through which the necessary quantity of air for the combustion can be introduced. A lower blind forming the bottom of the smoke chamber is formed of wooden slats glued to some textile material; it is fixed at one of its ends to the chamber and can be extended and completely closes the lower opening, fitting to the edges of the frame. At the commencement of the operation this blind is rolled round a roller and held thus at the top of the opening by means of the pin which will be described later on; the upper shutter is actuated by the cord. 10 15 20 25

The device operates as follows:—

The cord detachably attached to the releasing pin rises along the back of the chamber then returns towards the front (passing over pulleys suitably arranged) and bears the counterweight and blind. To this counterweight is attached another cord which is joined to the upper lid and afterwards is prolonged in order to be attached at its other end to a pin, which placed in a hole of the frame keeps the blind raised when it is rolled up. 30

The impulse given by the rubber ball is transmitted through the tube, and operates as described above for effecting the projection of the magnesium powder and its combustion and then its immediate extinction. In consequence of these movements the cord and consequently also the counterweight are released; counterweight then acts on the cord in order to shut the upper shutter (which by its sudden movement produces the aspiration of the gases), and to take out the pin. The blind being no longer supported then unrolls by reason of its own weight, and the chamber is then as hermetically closed at the top as at the bottom, thus enclosing the smoke produced by the combustion perfectly. 35 40

The releasing mechanism alluded to above consists of a pin fixed behind the piece, and passed through a hinged blade behind this said piece; this blade is in its lower part provided with a ring which passes freely through the piece and projects in front exactly to the place where the tube abuts. The cord is simply held on to the pin by a ring, but may easily be detached by simply slipping it along the pin. It is obvious that when the principal piece producing the light falls into its lower position it strikes against the ring moving it back together with the blade which then pushes the cord and releases it from the pin. 45

A small door is arranged on each of the sides of the chamber for the purpose of lighting the spirit after all the preparations are finished and the sitter has been posed. 50

By means of the above described arrangements the smoke is perfectly retained without any of it escaping into the room. Moreover the blue glass interposed between the light and the subject possesses considerable advantages. 55

Firstly; although it does not absorb the actinic rays it diminishes the brilliance, which would otherwise be very disagreeable and cause the eyes of the sub-

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ject to close at the moment of the operation; by means of this glass on the contrary the eyes remain unaffected when the illumination is produced. Thus the glaring light on the face of the sitter is obviated, also the defects resulting from a too quick action of the lens, and in general all those defects and inconveniences resulting from the production of too strong a light. The blue glass employed in reality filters the light which thus arrives pure and attenuated in its dazzling effects though without having lost its actinic quality. On the other hand the products of combustion instead of falling to the ground or escaping into the atmosphere spread over the glass where they remain, if it has been slightly covered with glycerine, from whence they are easily removed after the operation by simply sponging with water.

All the operations described above co-operate to produce the flash-light necessary for photographic operations and for retaining in the chamber the smoke resulting from the production of this light. The apparatus also comprises a flexible tube projecting from one of the walls of the chamber and connected to a flue, chimney, or any other exit in the wall of the room, whereby smoke is automatically discharged outside.

In order that the apparatus may be moved about as desired according to the requirements of the photographic operations, the tube is constructed as shown. It is made in accordion form in order to be able to lengthen and shorten it as desired without materially decreasing its section; it is preferably fastened by the rings to a cord attached on one hand to the side of the chamber above the tube and passing on the other hand over a pulley fixed to the wall near the opening communicating with the outside. The counterweight keeps the cord constantly extended.

It will be understood that by this means the apparatus is freely supported in all positions whilst maintaining communication with the outside.

The whole apparatus is mounted on a wooden stand so constructed that the flashing device may be easily placed in each case at the desired height. As in many photographic processes it is desirable to illuminate the object by two apparatuses set at a certain angle to one another varying according to circumstances, a stand with double wings is preferably employed. In this stand the uprights, after the apparatuses have been attached thereto can be fixed at any height and at any desired angle.

For filling the necessary quantity of spirit methodically and rapidly into the spirit tube; a graduated funnel is provided, having at its bottom a pipe which branches beneath a cock into two very small tubes, supplying a single tube of still smaller section of the same length as the spirit tube, and perforated on its lower edge to uniformly distribute throughout the length of the spirit tube; the spirit previously measured into the graduated funnel. A rubber ball is placed beneath the cock; in the pipe at the bottom of the funnel. After the spirit has run into the spirit tube the cock is closed and the ball compressed; whereby any drops of spirit remaining in the tubes will be blown out. A support is provided for facilitating the employment of the device.

Dated the Tenth day of January 1900.

W. P. THOMPSON & Co.,
322, High Holborn, London, W.C.,
Patent Agents for the Applicant.

COMPLETE SPECIFICATION.

Intense Lighting Apparatus for Instantaneous Photography.

I, JOSE FERREIRA GUIMARAES, a Photographer, at Bois-Colombes (Seine); 17, Rue de la Paix, France, do hereby declare the nature of this invention and

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in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention relates to improvements in flash-light apparatus for photographic purposes of the type set forth in my British Patent Specification No. 11553 of 1899. In this type of apparatus a brilliant flash of light is produced by bringing into contact with a colourless flame a powder containing magnesium or equivalent highly combustible and luminous material, the composition of which powder forms no part of the present invention. 5

The invention set forth in my French patent aforesaid possesses certain drawbacks in practical use, notably in the means for collecting the fume from the luminous material, and also in neutralizing the effect of the dazzling flash of light upon the countenance of the sitter. It is found that such an intense illumination projected upon the face of the person in comparative darkness causes him to alter the expression of the face, and especially of the eyes, to the detriment of the photograph obtained. 10 15

My present invention provides a means for obviating these drawbacks.

The apparatus as now constructed is illustrated in the accompanying drawings, in which

Figure 1 is a transverse sectional elevation of the complete apparatus.

Figure 2 is a front view of the complete apparatus with the pipe conveying the smoke partially in section. 20

Figures 3, 4, and 5 shew respectively in transverse section on a large scale the detail of the lighting arrangement in three different positions.

Figure 3 shews these arrangements before the operation; Figure 4 after the lowering of the igniter, and Figure 5 after the operation is completed. 25

Figure 6 is a transverse section in full size of all the light-producing parts.

Figures 7 and 8 illustrate the special spirit distributor for supplying the igniter.

Figure 9 illustrates in front view a simplified arrangement of my lighting apparatus for constructions where it is not provided with the smoke box. 30

Figure 10 shews a foot stand for the simultaneous employment of two of my apparatuses.

The apparatus comprises:—

(a) A long metallic rod 1 with a rim, placed horizontally.

(b) A metallic tube 2 of the same length as the rod 1 and open at 2^a throughout its whole length. This tube is filled with asbestos 2^b. 35

(c) A cover 3 of partially circular section capable of fitting exactly over the upper part of the tube 2 so as to hermetically close the longitudinal opening 2^a. This lid, which is lined inside with asbestos cloth 3^a, is fixed to the end of two arms 4 each hinged to an intermediate piece 5 screwed or rivetted on each of the metal blades 6 which support at the same time the rod 1 and the tube 2. These blades 6 are bent at their lower ends so as to be able to hook on to the knob 7 of the support. 40

In order to explain the operation of this essential portion of my invention I will assume the parts to be placed in their first position shewn on a larger scale in Figure 3. In this position it will be understood that the whole combination formed by the rod 1, the tube 2, and the blade 6 is so arranged that the flat part of the rod 1 is perfectly horizontal; this position is maintained by a support 8, its lower extremity engaging in a slot 9 of the piece 14 in which is arranged a small extensible air reservoir 10 formed of a fixed tube and a movable sheath, which reservoir is joined to a flexible tube 11 and capable of being inflated with air by pressure upon a rubber ball 12 placed at the other end of the tube 11. On the other hand the cover 3 is raised and supported by the bolt 13 placed in a suitable manner for this purpose; such is the first position of my lighting device. Before placing it thus with a view to operation it must be carefully detached by unhooking it from the rest of the apparatus and the necessary quantity 55

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of powder placed all along the rod 1 and a small quantity of spirit poured into the tube 2 throughout its entire length so as to wet the asbestos; everything having been replaced as described above the apparatus is ready to operate. For producing the light it is only necessary at the desired moment and after having previously lighted the spirit in the tube 2, to press the ball 12. The reservoir 10 lengthens and projects the support 8 outside the slot 9. The lower part of the device being now no longer supported drops and whilst doing so the powder placed on the rod 1 slips off and falls on the tube 2, the spirit in which is burning; it is instantly set alight and produces the intense illumination desired. At this point of the operation the parts are in the position shewn in Figure 4. The movable part in dropping has likewise caused the lid 3 to drop which then comes out of engagement with the bolt 13 and being no longer supported is thrown forward. This lid fits then on to the tube 2 and instantly extinguishes the flame; the different parts are then in the position shewn in Figure 5.

The light producing mechanism constructed substantially as above desired is suspended in a suitable manner at the back of the chamber 15 and inside this latter at a suitable distance above the frame 17 on which the blind 18 is drawn down. Beneath the frame 17 is arranged a movable sash 19 having a blue glass 19^a; this sash which is arranged so as to be capable of being easily raised and lowered is attached at 19^b to the main frame of the apparatus, and at 19^c to the front of the chamber 15 to which it is closely fitted so as not to allow light to pass at the sides of the glass 19^a. For this purpose also cloth bands 20 are fixed at the sides of the chamber 15; at the back the sash 19 with blue glass is hinged at a certain distance beneath the chamber 15 for the purpose of leaving a free space through which the necessary quantity of air for the combustion can be introduced. The lower blind 18 forming the bottom of the smoke chamber is formed of wooden slats glued to some textile material: it is fixed at one of its ends at 18^a to the chamber and can be extended and completely closes the lower opening, fitting to the edges of the frame 17. At the commencement of the operation this blind 18 is rolled round a roller 18^b and held thus at the top of the opening by means of the pin 21 which will be described later on; the upper shutter 22 is actuated by the cord 23.

The device operates as follows:

The cord 24 detachably attached to the releasing pin 26 rises along the back of the chamber 15 then returns towards the front (passing over pulleys suitably arranged) and bears the counterweight 25 and blind. To this counterweight 25 is attached another cord 23 which is joined to the upper lid 22 and afterwards is prolonged in order to be attached at its other end to a pin 21, which placed in a hole of the frame 17 keeps the blind 18 raised when it is rolled up. The apparatus is then set as shewn in Figure 1 of the drawing.

The impulse given by the rubber ball is transmitted through the tube 11, and operates as described above for effecting the projection of the magnesium powder and its combustion and then its immediate extinction. In consequence of these movements the cord 24 and consequently also the counterweight 25 are released; counterweight 25 then acts on the cord 23 in order to shut the upper shutter 22 (which by its sudden movement produces the aspiration of the gases), and to take out the pin 21. The blind 18 being no longer supported then unrolls by reason of its own weight, and the chamber 15 is then as hermetically closed at the top as at the bottom, thus enclosing the smoke produced by the combustion perfectly.

The releasing mechanism alluded to above consists of a pin 26 fixed behind the piece 14, and passed through a hinged blade 27 behind this said piece 14; this blade is in its lower part provided with a ring 28 which passes freely through the piece 14 and projects in front exactly to the place where the tube abuts. The cord is simply held on to the pin 26 by a ring, but may easily be detached by simply slipping it along the pin. It is obvious that when the principal piece producing the light falls into its lower position it strikes against the

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ring moving it back together with the blade 27 which then pushes the cord and releases it from the pin.

A small door 44 is arranged on each of the sides of the chamber 15 for the purpose of lighting the spirit after all the preparations are finished and the sitter has been posed.

By means of the above-described arrangements the smoke is perfectly retained without any of it escaping into the room. Moreover the blue glass interposed between the light and the subject possesses considerable advantages.

Firstly: Although it does not absorb the actinic rays it diminishes the brilliance, which would otherwise be very disagreeable and cause the eyes of the subject to close at the moment of the operation; by means of this glass, on the contrary, the eyes remain unaffected when the illumination is produced. Thus the glaring light on the face of the sitter is obviated, also the defects resulting from a too quick action of the lens, and in general all those defects and inconveniences resulting from the production of too strong a light. The blue glass employed in reality filters the light which thus arrives pure and attenuated in its dazzling effects though without having lost its actinic quality. On the other hand the products of combustion instead of falling to the ground or escaping into the atmosphere, spread over the glass where they remain, if it has been slightly covered with glycerine, from whence they are easily removed after the operation by simply sponging with water.

All the operations described above co-operate to produce the flash-light necessary for photographic operations and for retaining in the chamber 15 the smoke resulting from the production of this light. The apparatus also comprises a flexible tube 16 projecting from one of the walls of the chamber 15 and connected to a flue, chimney, or any other exit 46 in the wall of the room, whereby smoke is automatically discharged outside.

In order that the apparatus may be moved about as desired according to the requirements of the photographic operations, the tube 16 is constructed as shewn. It is made in accordion form in order to be able to lengthen and shorten it as desired without materially decreasing its section; it is preferably fastened by the rings 29 to a cord 30 attached on one hand to the side of the chamber above the tube and passing on the other hand over a pulley 31 fixed to the wall near the opening communicating with the outside. The counterweight 32 keeps the cord constantly extended.

It will be understood that by this means the apparatus is freely supported in all positions whilst maintaining communication with the outside.

The drawing shews the tube proceeding from one of the sides of the chamber; of course it could equally proceed from the other side as shewn in dotted lines in Figure 2 or from the back or top of the chamber.

The whole apparatus is mounted on a wooden stand so constructed that the flashing device may be easily placed in each case at the desired height. As in many photographic processes it is desirable to illuminate the object by two apparatuses set at a certain angle to one another varying according to circumstances, the stand with double wings as shewn in Figure 10 is preferably employed. In this stand the uprights, after the apparatuses have been attached thereto can be fixed at any height and at any desired angle.

For filling the necessary quantity of spirit methodically and rapidly into the tube 2 the following apparatus is provided, (see Figures 7 and 8):

The graduated funnel 33 has in its bottom a tube 34 which beneath the cock 35 branches into two very small tubes 36 supplying a single tube 37 of still smaller section and of the same length as the tube 2. This tube 37 is perforated on its lower edge so that the spirit previously measured into the recipient 33 is uniformly distributed throughout the length of the inner tube 2. A rubber ball 40 is placed beneath the cock 35, and after the spirit has run into 2 the cock 35 is closed and the ball 40 compressed, whereby any drops of spirit re-

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maining in the tubes will be blown out. A support 38 is provided for facilitating the employment of the device.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. In photographic flash-light apparatus, a chamber, an adjustable flash-light mechanism in said chamber, movable screens on said chamber, and an actinic light screen before the aperture of said chamber.

10 2. In photographic flash-light apparatus, a movably enclosed chamber, a pneumatically controlled flash-light mechanism in said chamber, an adjustable upper shutter at the top of said chamber, an adjustable shutter at the bottom of said chamber, and an actinic light screen before said chamber.

15 3. In photographic flash-light apparatus, a movably enclosed chamber, a pneumatically controlled flash-light mechanism in said chamber, an adjustable upper shutter at the top of said chamber, an adjustable shutter at the bottom of said chamber, and an inclined blue glass screen beneath the lower aperture of said chamber.

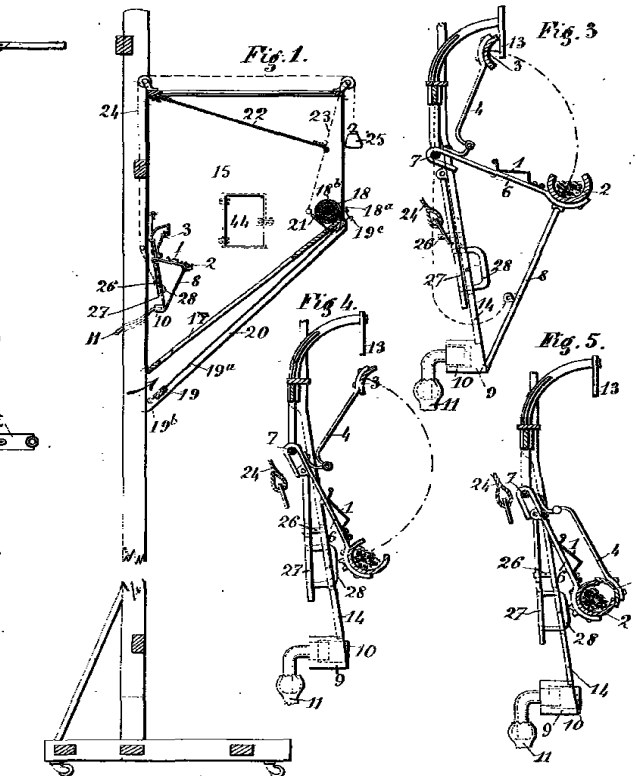
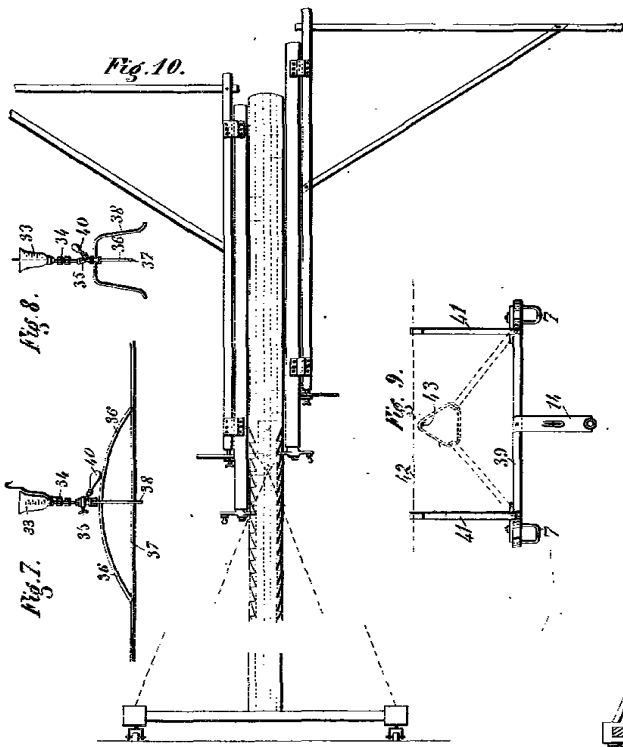
20 4. In photographic flash-light apparatus, the chamber 15, the powder holder 1, the ignition tube 2, the cover 3, the ball 12, the reservoir 10, the support 8, the catch 13, and means for enclosing the chamber and for differentiating the light rays therefrom.

25 5. In photographic flash-light apparatus, a chamber, apertures above and below said chamber, the hinged upper shutter 22, the under frame 17, the roller shutter 18, engaging at its edges with said frame, the blue glass light screen 19^a, and means for producing a flash-light within said chamber.

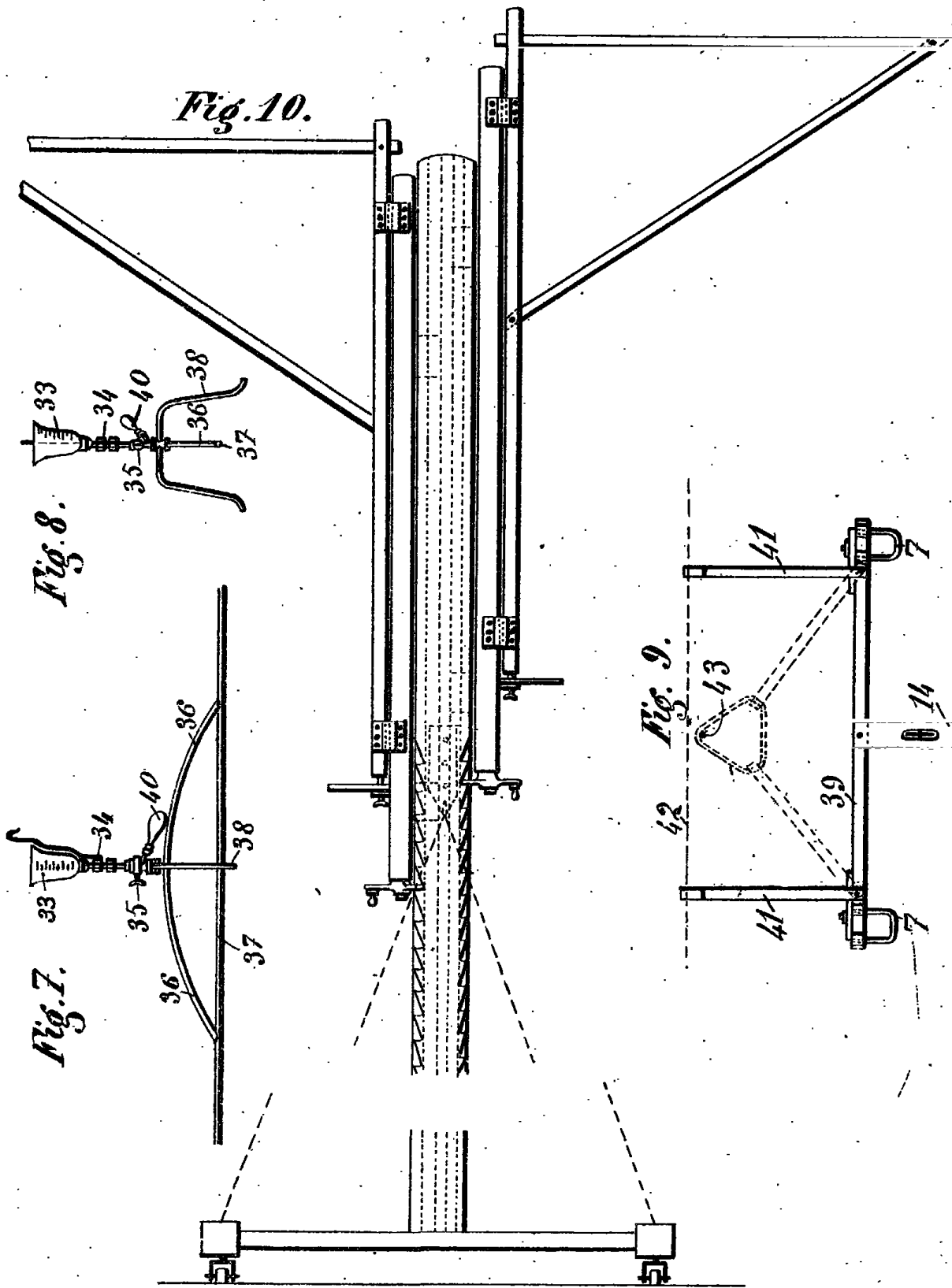
6. Photographic flash-light apparatus substantially as described and illustrated in the accompanying drawings.

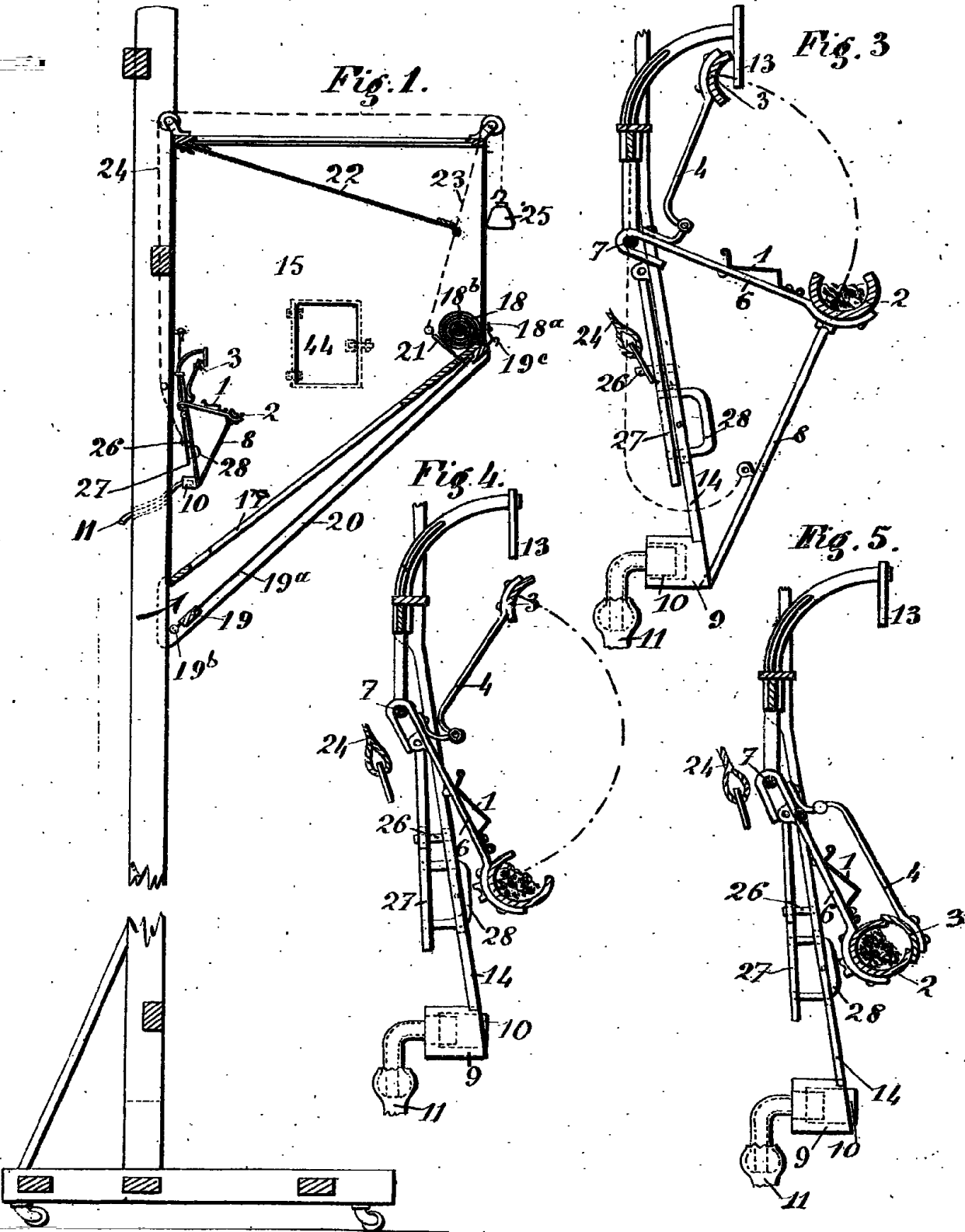
Dated this 9th day of January 1901.

W. P. THOMPSON & Co.,
Agents for the Applicant.



[This drawing is a reproduction of the Original on a reduced scale.]





[This Drawing is a reproduction of the Original on a reduced scale.]

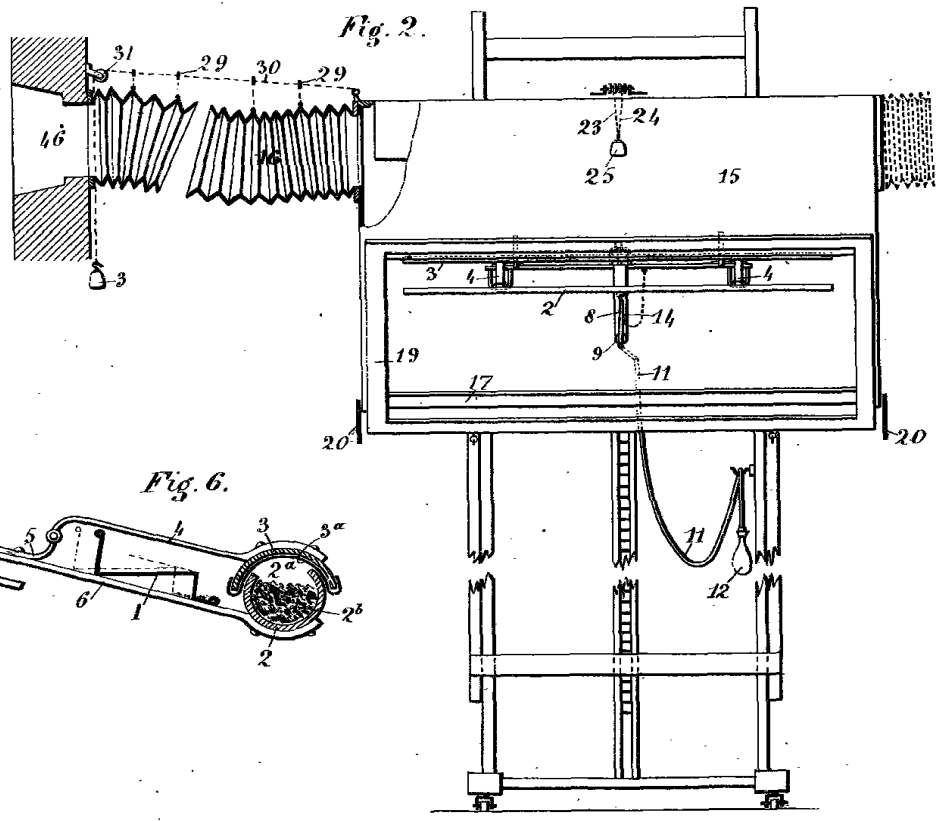


Fig. 2.

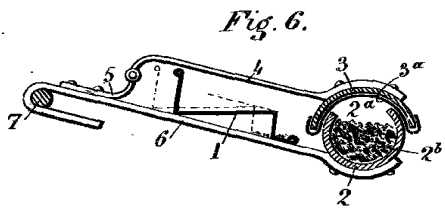


Fig. 6.

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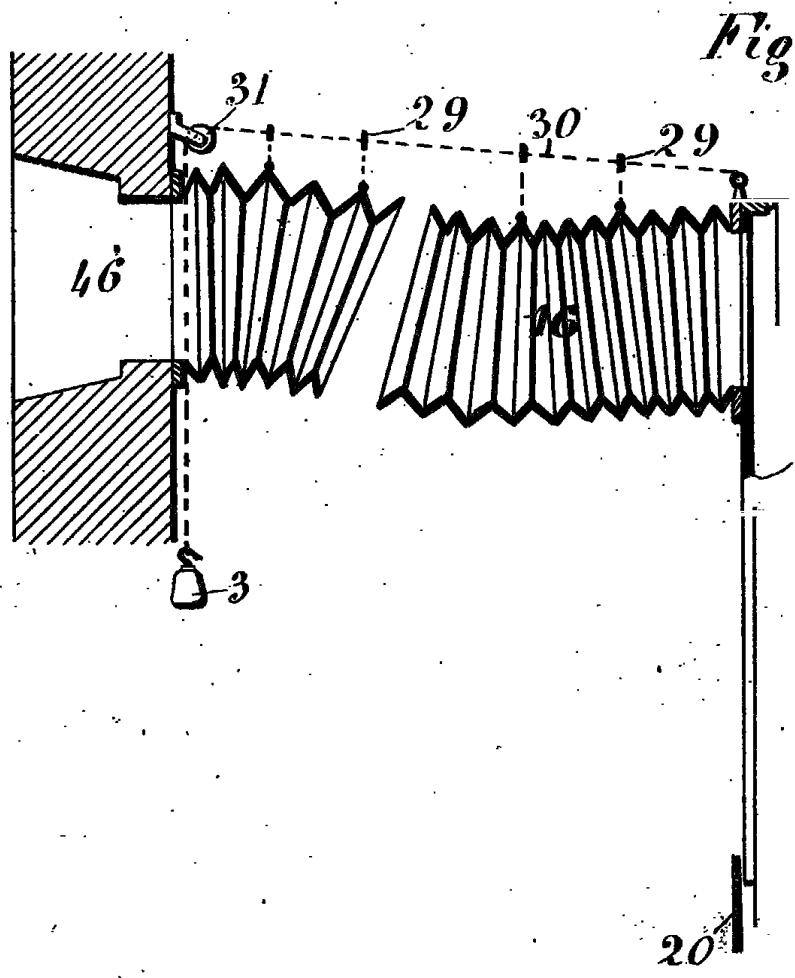
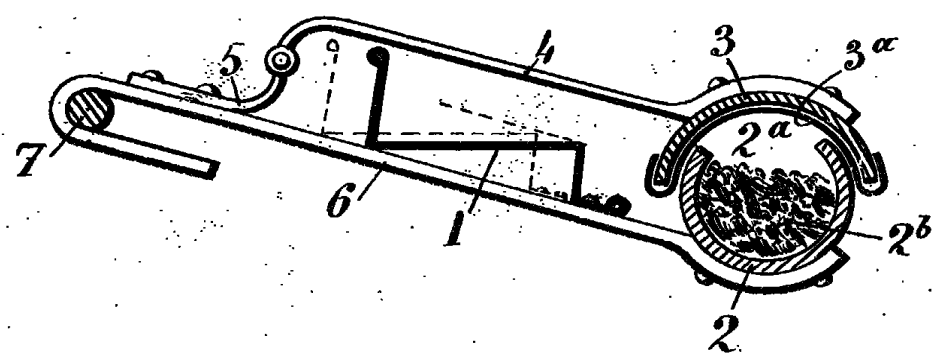
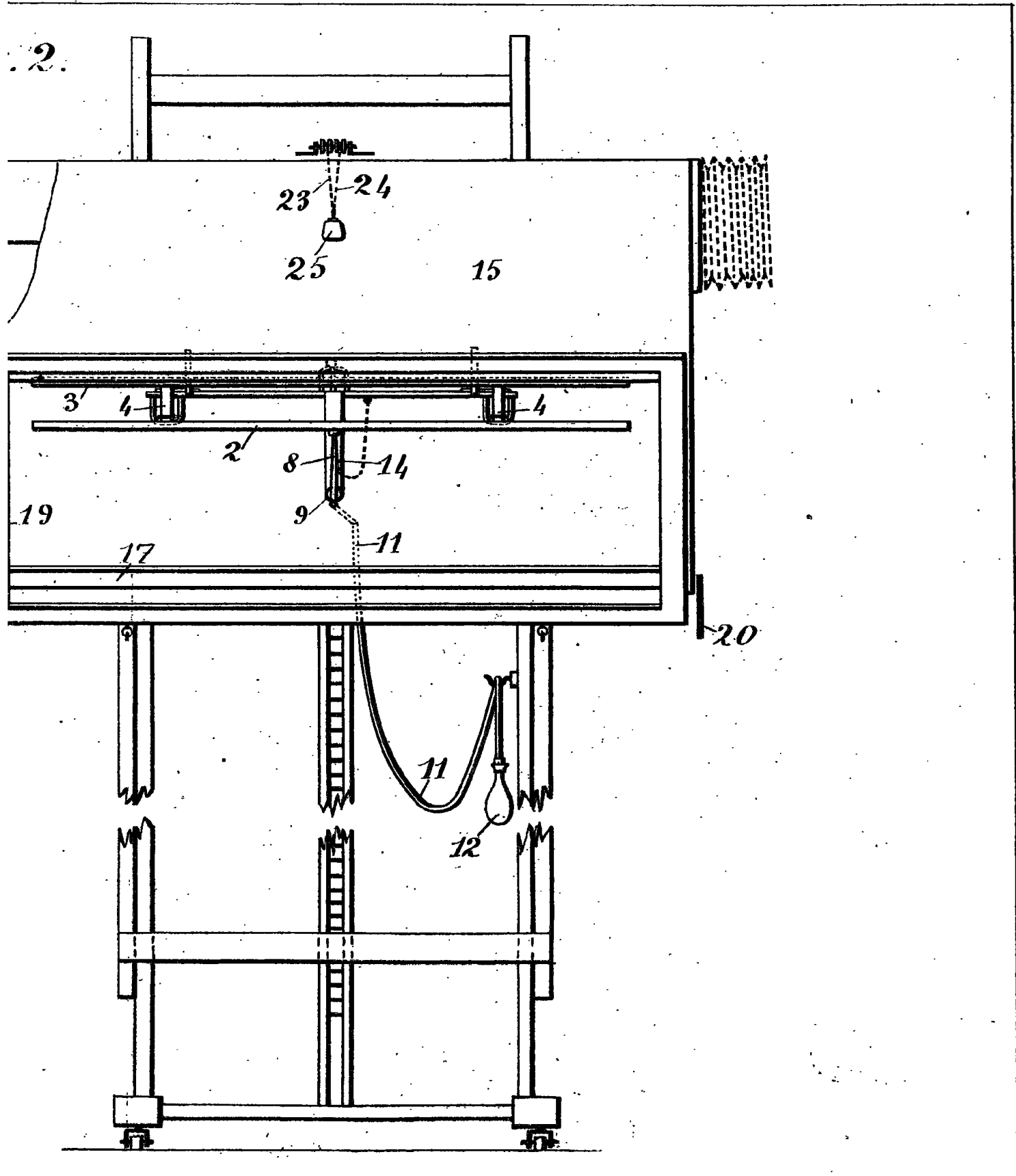


Fig. 6.





This Drawing is a reproduction of the original on which it was made.