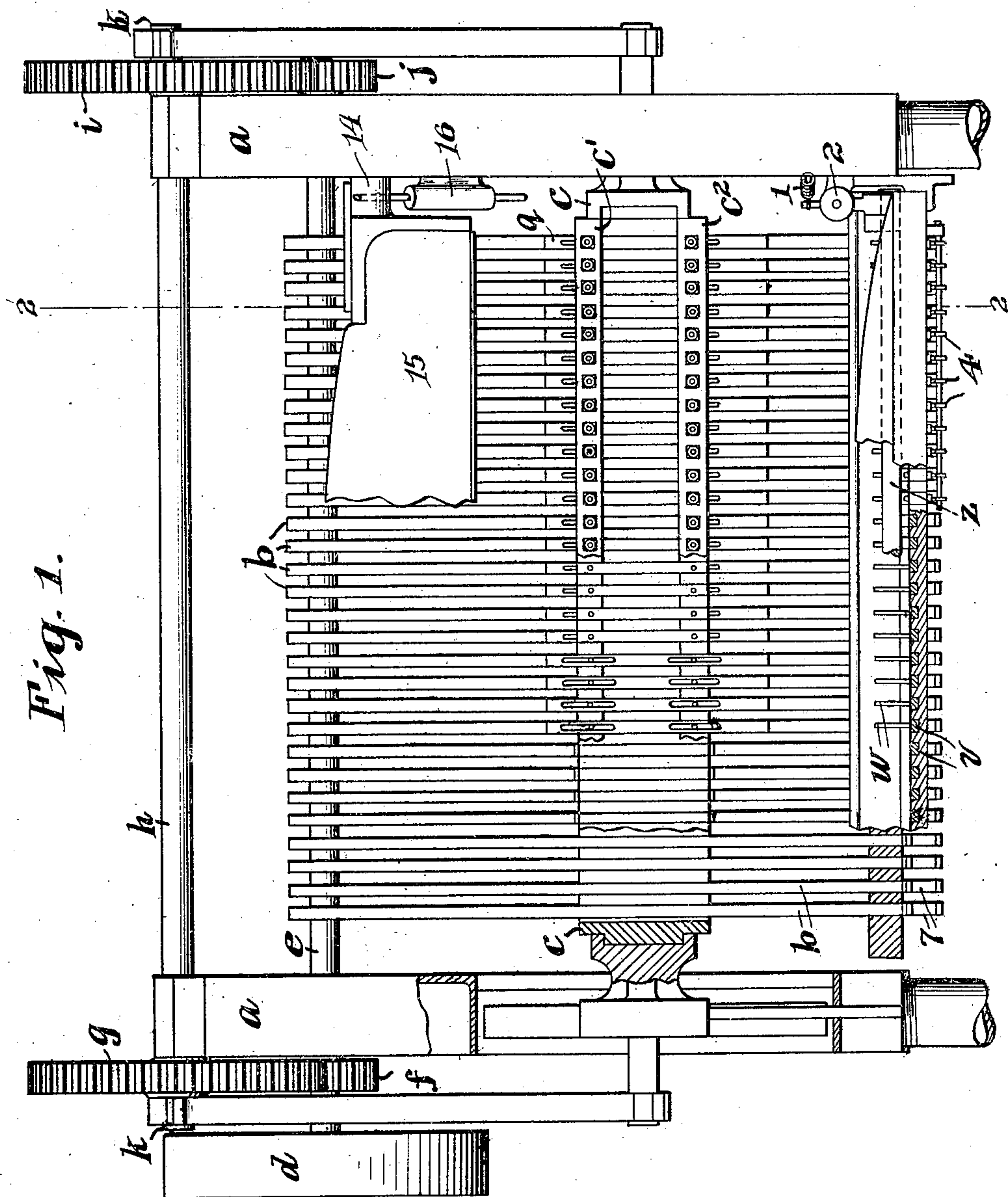


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2 SHEETS—SHEET 1.



WITNESSES:  
Daniel Webster, Jr.  
A. M. Brian.

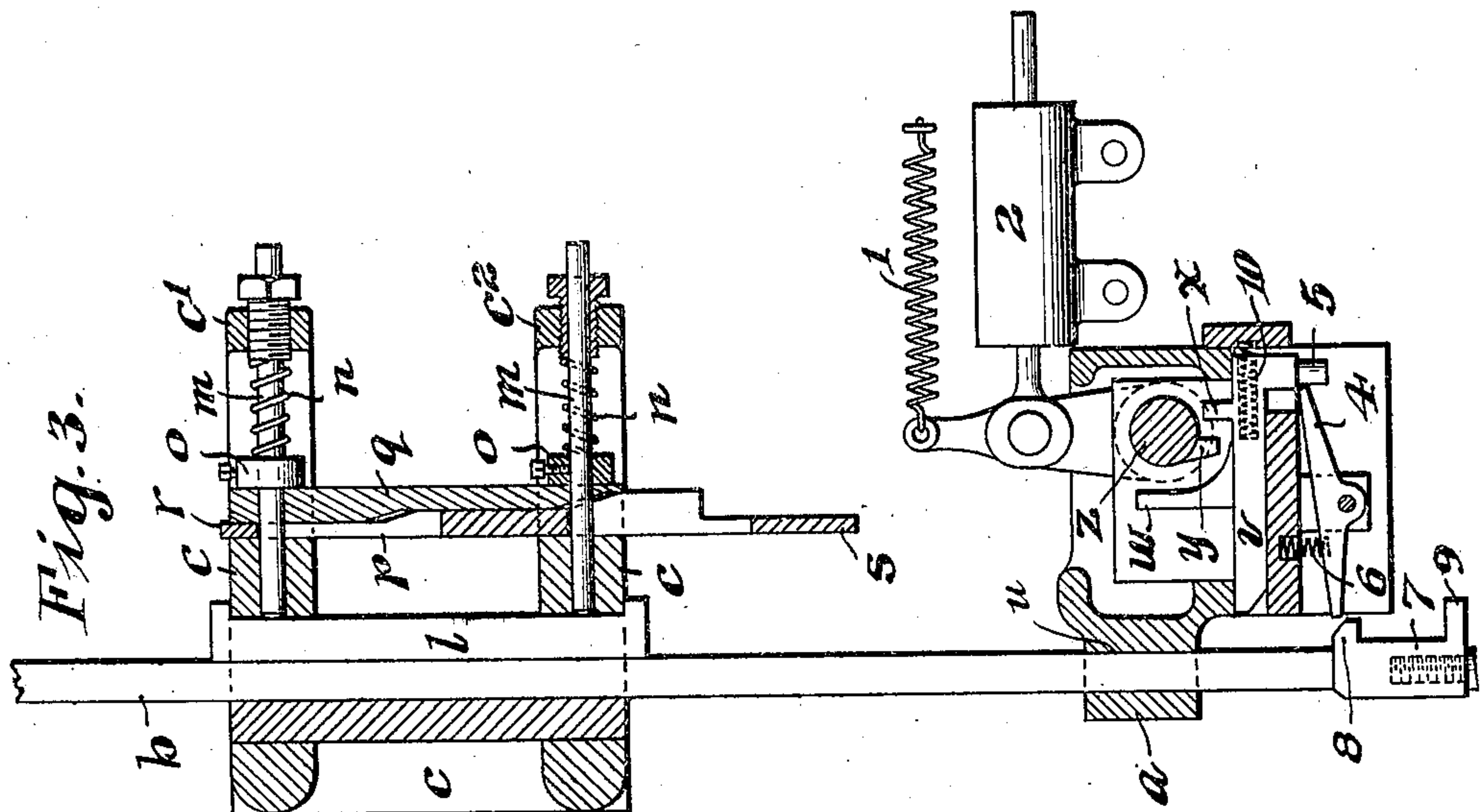
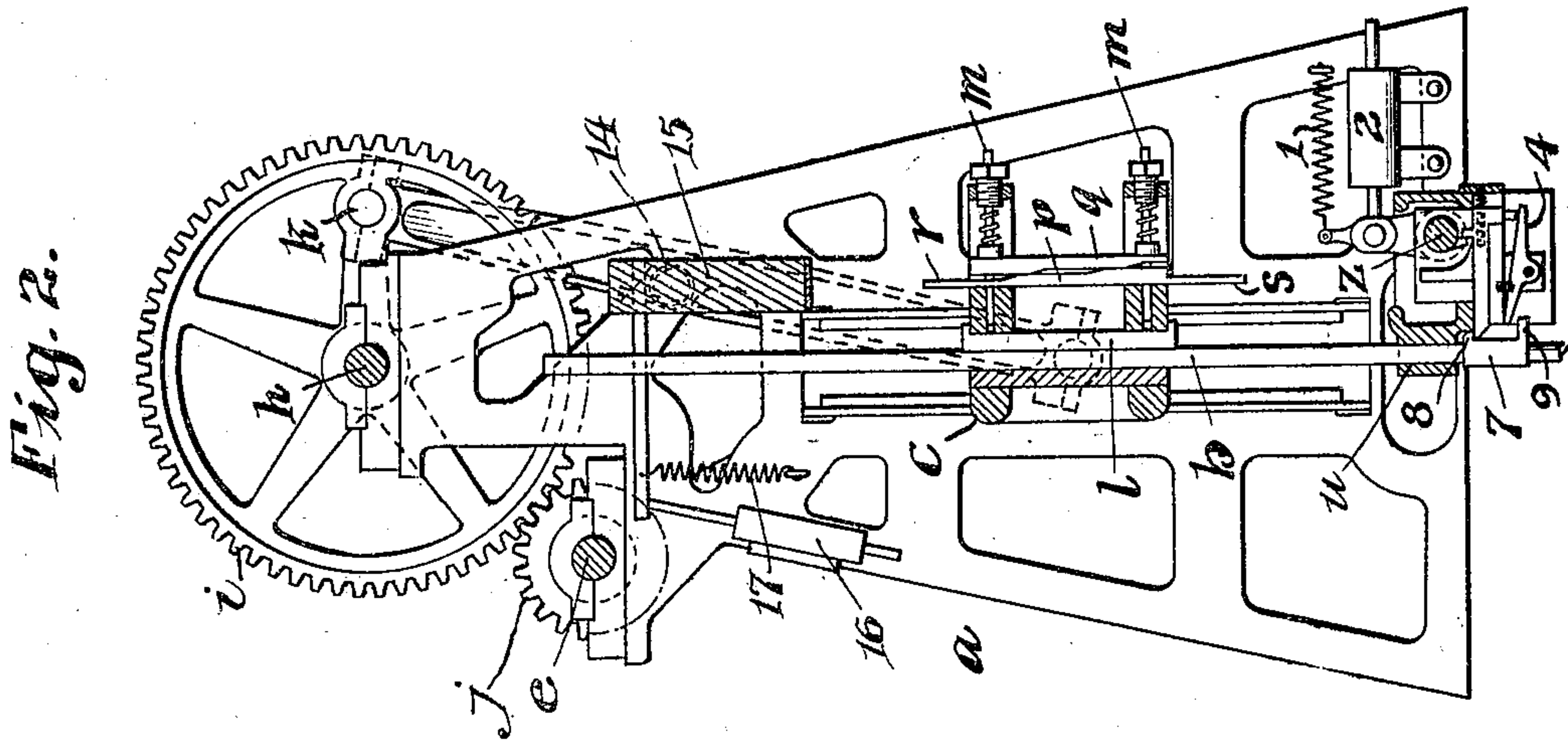
INVENTOR  
Howard A. Stillwell  
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WITNESSES:  
Daniel Webster, Jr.  
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# UNITED STATES PATENT OFFICE.

HOWARD A. STILLWELL, OF WOODBURY, NEW JERSEY, ASSIGNOR TO E. I. DU PONT DE NEMOURS POWDER COMPANY, OF WILMINGTON, DELAWARE, A CORPORATION OF NEW JERSEY.

MACHINE FOR PACKING NITROGLYCERIN COMPOUNDS INTO SHELLS.

983,655.

Specification of Letters Patent.

Patented Feb. 7, 1911.

Application filed March 17, 1910. Serial No. 549,902.

To all whom it may concern:

Be it known that I, HOWARD A. STILLWELL, a citizen of the United States, residing at Woodbury, county of Gloucester, and State of New Jersey, have invented a new and useful Improvement in Machines for Packing Nitroglycerin Compounds into Shells, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

With this character of explosives the packing is performed by vertically movable rods or tamps. As the explosive is highly explosive, it is quite essential that the tamping rod corresponding to the shell shall go out of action as soon as the shell is filled, and that friction be removed from tamp when not in use, to prevent heating and wearing of both the tamp and the frame, by which it is operated.

In practice there are provided tamps or rods equal in number to the shells, and the present invention relates to mechanism for automatically rendering any and all of these tamps or rods inoperative as soon as its corresponding shell is filled, and also removing friction from said tamp.

I will first describe the embodiment of my invention as illustrated in the accompanying drawings and then point out the invention in the claims.

In the drawings:—Figure 1 is a front view partly broken of my improved machine. Fig. 2 is a section on line 2—2, Fig. 1. Fig. 3 is an enlarged section showing a portion of the mechanism of Fig. 2.

*a* represents the main frame of the machine.

*b* are the tamps or packing rods equal in number to the shells to be packed. *c* is the frame for reciprocating these tamps or rods. This frame *c* is reciprocated in the following manner. *d* is a driving pulley on shaft *e*, on which is the gear *f* meshing with the gear *g* on the shaft *h*. On the opposite side of the apparatus and on shaft *h* is a gear *i* corresponding to gear *g* and which meshes with gear *j*. *k*, *k* are eccentrics, one on each side of the machine on, respectively, gears *g* and *i*, and connected by straps or loose connections respectively with each side or end of frame *c*. Each rod or tamp *b* passes through an orifice in the frame. The frame

*c* is practically a skeleton frame. Corresponding and in line with each rod or tamp *b* is a bearing piece *l* supported in the frame. The frame *c* at points corresponding to each rod or tamp *b* has the projections *c'*, *c''* through which extend the pins *m*, on each of which is a spring *n* confined respectively between a head *o* and the end wall of respective projections. *p* and *q* are reverse wedges, the surface of wedge *q* contacting with head *o*. The wedge *p* has the extension *r* at its upper end and the extension *s* at its lower end. *u* is an orifice in the main frame through which the tamps *b* loosely pass. *v* is a piece slidably mounted upon the main frame and having the projection *w* movable into and out of alinement with the extension *s* of wedge *p*. This piece *v* has also a projection *x* in line of movement of the projection *y* mounted on the rock shaft *z*. When the rock shaft *z* is moved in one direction the projection moves the slide *v* to the position shown in Fig. 3. When it rocks in the other direction, except otherwise restrained, the slide *v* is returned by the spring 10 so as to bring the projection *w* in line with the extension *s* of wedge *p*. The rock shaft *z* extends across the apparatus and is common to all the tamps or rods *b*. The rock shaft is operated in one direction to move the slide *v* to the position shown in Fig. 3 by means of compressed air admitted by the operator to the cylinder 2, the piston rod operating the lever centrally, one end mounted on the rock shaft and the spring 1 being connected to the other end. 4 is a catch pivoted centrally to the main frame. One end, in the position shown, in Fig. 3, contacts with the locking pin 5 on the slide *v*. A spring 6 on the opposite side of the pivot connects the bracket and catch. The end of the catch 4 on this side of the pivot is in line with the trip 7 mounted on the tamp *b*. This trip 7 has the upper operative end portion 8 and the lower operative portion 9. The contact between the frame *c* and the rods or tamps *b*, with the wedges *p* and *q* in the position shown in Fig. 3, is such as to cause the corresponding rod or tamp to move with the frame *c* but the tamp or rod *b* can move vertically through the frame *a* as the shell is filling.

With the parts in the position shown in Fig. 3, when a shell becomes filled to such



an extent as to cause the rod or tamp to rise to such an extent that the lower operative portion 9 strikes the end of catch 4, it moves on its pivot against the action of spring 6. The slide *v* being released, it is thrown forward by the spring 10 and its forward end moves under the projection 8 as shown in Fig. 2; thus locking the tamp *b* and rendering it inoperative. By the forward movement of *v* the projection *w* has been brought into alinement with the end *s* of wedge *p* and drives wedge *p* upward on the next downward movement of frame *c*. This forces the piece *q* backward against the collar *o* on the pin *m* and withdraws the pin *m* from contact with the friction piece *l*, thus removing the friction from the tamp *b* while it is not in use, the sliding piece *v* preventing the tamp from falling. Each tamp is thus locked and the friction removed until all the shells have been filled. When a new set of shells are in place, air is admitted to the cylinder 16 and the swinging bar 15 on the shaft 14 is swung into line with the end *r* of the wedge *p* as shown in Fig. 2. At the same time air is admitted to cylinder 2 and the bar *z* is rotated to withdraw the pieces *v* simultaneously by means of projections *y* and *x*. This allows all the tamps to drop downward upon the dynamite in the hopper of the machine. On the first upward movement of the frame *c* the wedges *p* are simultaneously driven downward, relative to *c*, by the bar 15, and the pin *m* being thrown forward by the springs *n* brings the friction pieces *l* into contact with the tamps which thus on the downward movement of frame *c* force the dynamite into the shells. The air has been in the meantime exhausted from the cylinders 2 and 16, and *z* and 15 have resumed their inoperative positions.

The object of the mechanism is to remove friction from the tamps while inoperative, and to allow said tamps to be dropped through the frame upon the dynamite in the hopper.

Having now fully described my invention, what I claim and desire to protect by Letters Patent is:

1. In an apparatus for filling shells with an explosive, in combination, a reciprocating frame, a tamp, locking mechanism for connecting said frame and tamp, releasing mechanism, normally inactive, adapted to release said locking mechanism, and a device carried by the tamp adapted in the movement of said tamp to render said releasing mechanism active.

2. In an apparatus for filling shells with an explosive, in combination, a reciprocating frame, a tamp, locking mechanism for connecting said frame and tamp, releasing mechanism, normally inactive, adapted to release said locking mechanism, a device carried by the tamp adapted in the movement

of said tamp to render said releasing mechanism active, and means to return said locking means to locking position.

3. In an apparatus for filling shells with an explosive, in combination, a reciprocating frame, a tamp, locking mechanism for connecting said frame and tamp, releasing mechanism adapted to release said locking mechanism, means adapted to move and hold said releasing mechanism in active position, means to move said releasing mechanism out of active position, locking means for holding said releasing mechanism in said inactive position, and a device carried by the tamp and adapted in the movement of the tamp to release said releasing mechanism lock in the movement of the tamp.

4. In an apparatus for filling shells with an explosive, in combination, a reciprocating frame, a tamp, locking mechanism for connecting said frame and tamp, releasing mechanism adapted to release said locking mechanism, means adapted to move and hold said releasing mechanism in active position, means to move said releasing mechanism out of active position, locking means for holding said releasing mechanism in said inactive position, a device carried by the tamp and adapted in the movement of the tamp to release said releasing mechanism lock in the movement of the tamp, and means to return said locking means to locking position.

5. In an apparatus for filling shells with an explosive, in combination, a reciprocating frame, a tamp, wedges for connecting said frame and tamp, one of said wedges being movable upon the other to make and release said wedge connection, a projection adapted, when in the line of movement of said movable wedge, to move said wedge to release, said projection being movable in and out of alinement with said movable wedge, a device carried by the tamp and adapted to control the movement of said projection into alinement with said movable wedge.

6. In an apparatus for filling shells with an explosive, in combination, a reciprocating frame, a tamp, wedges for connecting said frame and tamp, one of said wedges being movable upon the other to make and release said wedge connection, a projection adapted, when in the line of movement of said movable wedge, to move said wedge to release, said projection being movable in and out of alinement with said movable wedge, a device carried by the tamp and adapted to control the movement of said projection into alinement with said movable wedge, and means to move said wedge to make connection.

7. In an apparatus for filling shells with an explosive, in combination, a reciprocating frame, a tamp, wedges for connecting said frame and tamp, one of said wedges



being movable upon the other to make and release said wedge connection, a projection, means to normally hold said projection in line with said movable wedge, means to move  
5 said projection out of said alinement, locking means to hold said projection in the last mentioned position and a tripping device carried by said tamp for releasing said locking means.

10 8. In an apparatus for filling shells with an explosive, in combination, a reciprocating frame, a tamp, wedges for connecting said frame and tamp, one of said wedges being  
15 movable upon the other to make and release said wedge connection, a projection, means to normally hold said projection in line with said movable wedge, means to move said projection out of said alinement, locking means  
20 to hold said projection in the last mentioned position, a tripping device carried by said tamp for releasing said locking means, and means to move said wedge to make wedge connection.

9. In an apparatus for filling shells with  
25 an explosive, in combination, a reciprocating frame, a tamp, wedges for connecting said frame and tamp, one of said wedges being movable upon the other to make and release said wedge connection, a projection, means  
30 to normally hold said projection in line with said movable wedge, a rock shaft, a projection from said rock shaft adapted when said shaft is rocked to move said wedge operating projection out of alinement with said  
35 wedge, locking means to hold said wedge operating projection in the last mentioned position and a tripping device carried by said tamp for releasing said locking means.

40 10. In an apparatus for filling shells with an explosive, in combination, a reciprocating frame, a tamp, wedges for connecting said frame and tamp, one of said wedges being movable upon the other to make and  
45 release said wedge connection, a projection, means to normally hold said projection in line with said movable wedge, a rock shaft, a projection from said rock shaft adapted when said shaft is rocked to move said wedge operating projection out of alinement with  
50 said wedge, locking means to hold said wedge operating projection in the last mentioned position, a tripping device carried by said tamp for releasing said locking means, and means to move said wedge to make wedge  
55 connection.

11. In an apparatus for filling shells with an explosive, in combination, a reciprocating frame, a tamp, locking means for connecting

said tamp and frame, releasing means for said locking means, and a device carried  
60 by the tamp for rendering said releasing means operative to release said locking means.

12. In an apparatus for filling shells with an explosive, in combination, a reciprocating  
65 frame, a tamp, locking means for connecting said tamp and frame, releasing means for said locking means, and a device carried by the tamp for rendering said releasing means operative to release said locking means, and  
70 means to return said locking means.

13. In an apparatus for filling shells with an explosive, in combination, a reciprocating  
75 frame, a tamp, wedges, one wedge being movable upon the other to release and connect said tamp and frame, a device adapted when operative to move said wedge to release, means to render said device operative, and controlling means carried by said tamp  
80 for throwing said last mentioned means into action.

14. In an apparatus for filling shells with an explosive, in combination, a reciprocating  
85 frame, a tamp, wedges, one wedge being movable upon the other to release and connect said tamp and frame, a device adapted when operative to move said wedge to release, means to render said device operative, and controlling means carried by said tamp for  
90 throwing said last mentioned means into action, and means to move said wedge to connect said tamp and frame.

15. In an apparatus for filling shells with an explosive, in combination, a reciprocating  
95 frame, a tamp, wedges, one wedge being movable upon the other to release and connect said tamp and frame, a device adapted to move said wedge to release, and controlling means for said device carried by  
100 said tamp.

16. In an apparatus for filling shells with an explosive, in combination, a reciprocating  
105 frame, a tamp, wedges, one wedge being movable upon the other to release and connect said tamp and frame, a device adapted to move said wedge to release, controlling means for said device carried by said tamp, and means to move said wedge to connect  
said tamp and frame.

In testimony of which invention, I have  
110 hereunto set my hand, at Gibbstown, N. J., on this 12th day of March, 1910.

HOWARD A. STILLWELL.

Witnesses:

H. L. RISLER,  
O. E. ADAMSON.