

No. 646,369.

Patented Mar. 27, 1900.

J. KRONE.

APPARATUS FOR MECHANICALLY LOADING ORDNANCE.

(Application filed Jan. 3, 1900.)

(No Model.)

Fig. 1.

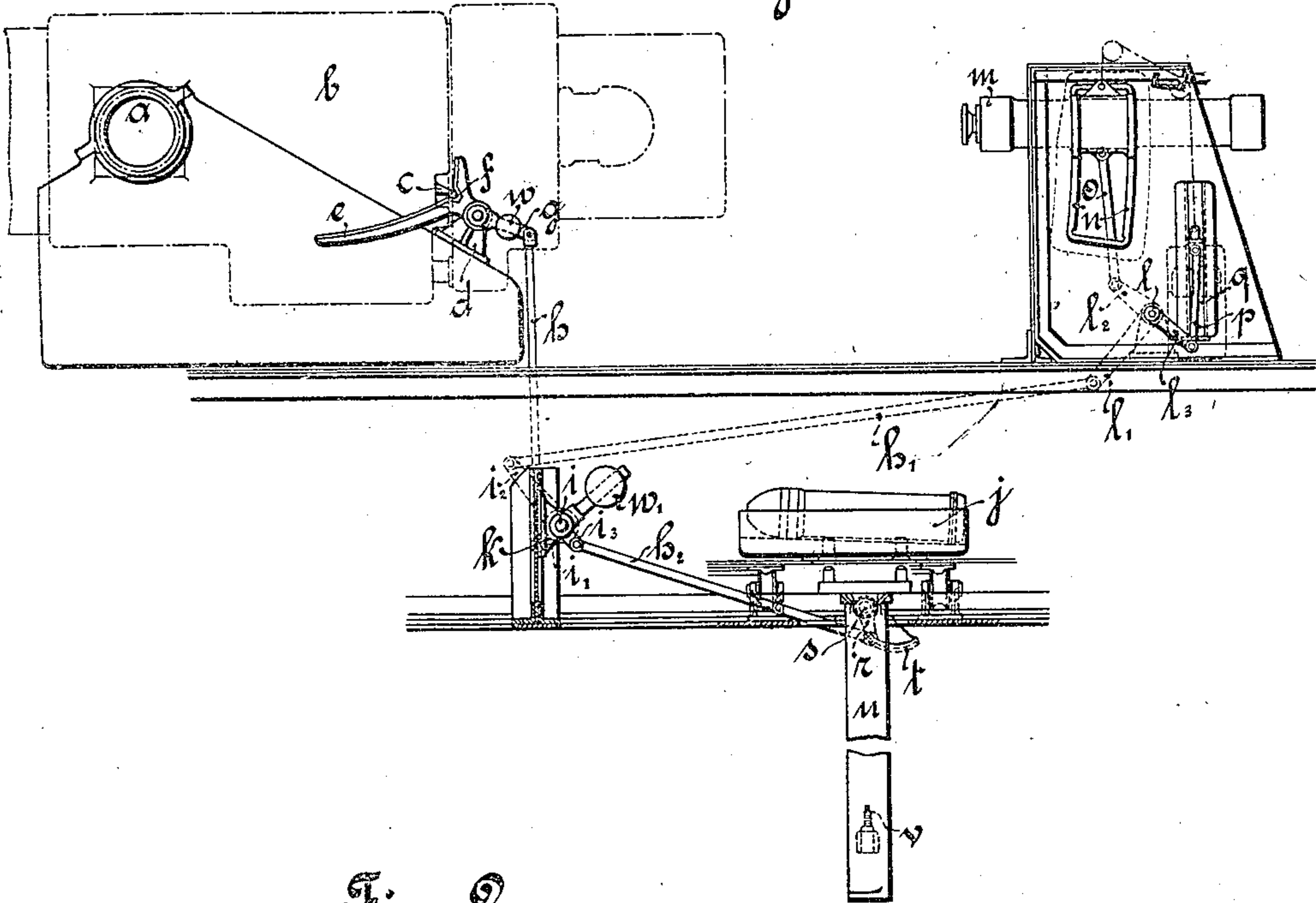


Fig. 2.

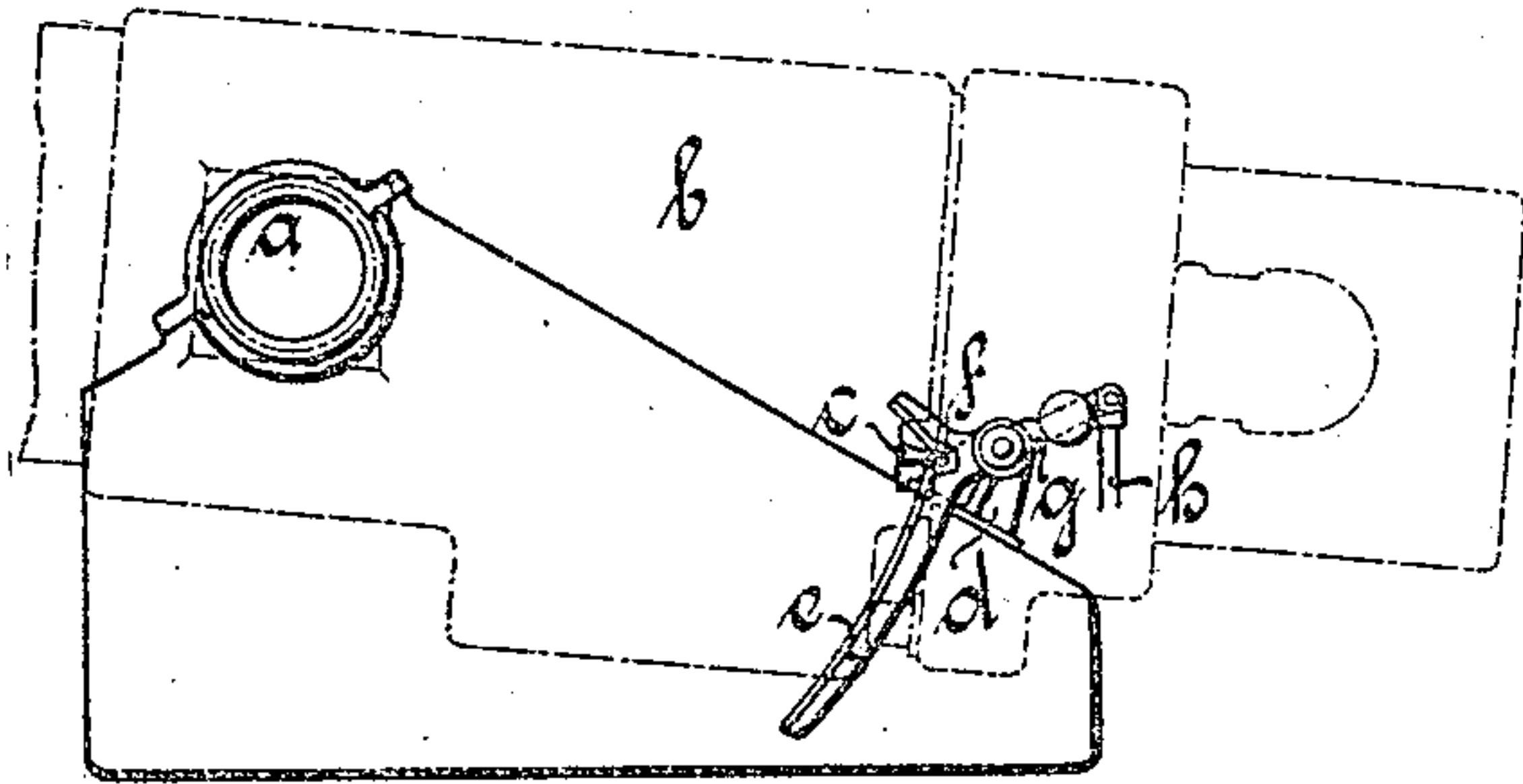
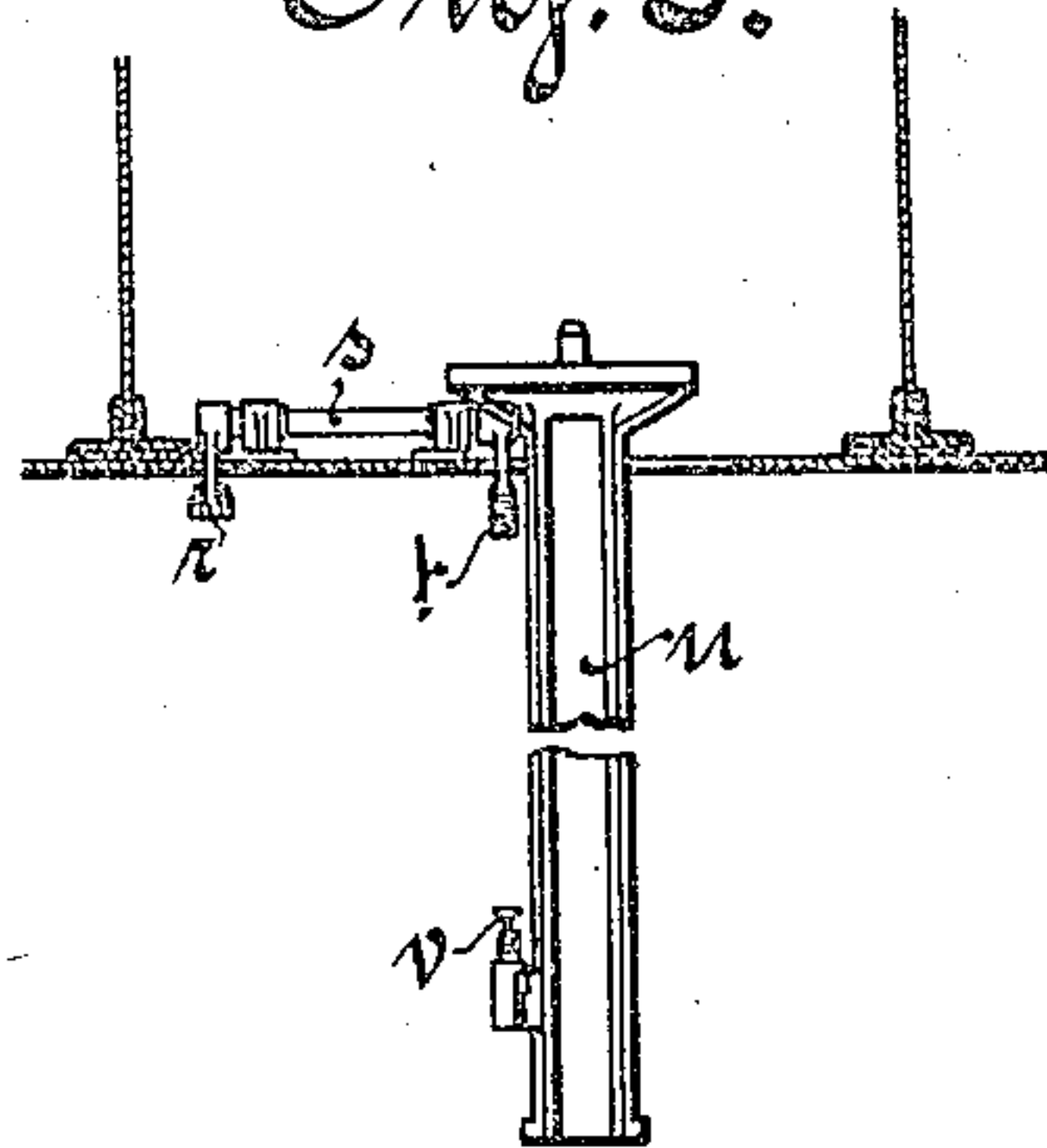


Fig. 3.



UNITED STATES PATENT OFFICE.

JOHANNES KRONE, OF ESSEN, GERMANY, ASSIGNOR TO FRIED. KRUPP,
OF SAME PLACE.

APPARATUS FOR MECHANICALLY LOADING ORDNANCE.

SPECIFICATION forming part of Letters Patent No. 646,369, dated March 27, 1900.

Application filed January 3, 1900. Serial No. 210. (No model.)

To all whom it may concern:

Be it known that I, JOHANNES KRONE, engineer, a citizen of the German Empire, residing at 56 Bismarckstrasse, Essen-on-the-Ruhr, Germany, have invented certain new and useful Improvements in Apparatus for Mechanically Loading Ordnance, of which the following is a specification.

The present invention has reference to ordnance to which the ammunition is raised by an elevator and pushed into the barrel by a conveyer.

The objects of this invention are to automatically adjust the conveyer to the loading-line and to correspondingly limit the motion of the ammunition-tray. These objects are accomplished by a positive transmission of the turning motion of the cradle, respectively of the gun-barrel, to a swinging arm pivoted to the carriage, from which arm the motion of the conveyer and of an adjustable cam limiting the motion of the ammunition-tray is derived.

The nature of my invention will best be understood when described in connection with the accompanying drawings, illustrating an example for applying my invention to a gun-carriage in which the automatic adjustment of the conveyer and of the ammunition-tray is effected within certain limits of elevation of the gun.

In the drawings, Figure 1 is a side elevation of the general arrangement, the gun being in a horizontal position. Fig. 2 is a side elevation of the transmitting device in a position corresponding to the extreme elevation of the gun for which the adjustment of the conveyer and of the ammunition-tray is automatically regulated. Fig. 3 is a front view of the elevator-rod.

Similar letters of reference designate corresponding parts throughout the several views of the drawings.

Referring to the drawings, the letter *b* designates the cradle, which turns on trunnions *a* in a usual manner. A swingle *e* is pivoted to a bracket *d*, fixed on the gun-carriage, and said swingle is provided with a notch *f*, engaged by a tooth *c*, affixed to the cradle. The duration of the engagement is made to correspond to the limits of elevation or depression

of the gun within which the adjustment of the conveyer and of the ammunition-tray is to be automatically regulated. The arms forming part of the swingle *e* extend from opposite sides of the notch *f* and are curved in an arc of a circle having the axis of the trunnions *a* as a center, so that in the position shown in Fig. 1 the upper arm forms a guide for the tooth *c*, concentric with the trunnions, and in the position shown in Fig. 2 the lower arm forms a guide for said tooth. The arms insure the engagement of the tooth *c* with the notch *f*.

g is an arm extending from the swingle, upon which is mounted a balance-weight *w*. This latter arm is connected by a rod *h* to an arm *i*¹, secured to a horizontal shaft *i*, turning in a fixed bearing *k*, and to said shaft are secured two arms *i*² and *i*³ and also an arm provided with a balance-weight *w*¹.

To the frame of the conveyer *m* is pivoted a lever *l*, having three arms *l*¹, *l*², and *l*³, of which the arm *l*¹ is connected to the arm *i*² of the shaft *i* by a rod *h*¹. The conveyer *m* is guided in ways *n*, concentric to the trunnions *a*, and is connected to the arm *l*² of the lever *l* by a connecting-rod *o*. The arm *l*³ of the lever *l* is connected by a rod *p* to a balance-weight *q*, guided in suitable ways in the conveyer-frame. The weight *q* is connected to the conveyer *m* by a rope passing over suitable pulleys, and thereby relieves pressure on the rods *o* and *p*.

r is a lever secured to one end of a horizontal shaft *s*, turning in a fixed bearing, and it is connected to the arm *i*³ of shaft *i* by a rod *h*². To the other end of the shaft *s* is secured a corrugated cam *t*, against which a stop *v* of the lifting-rod *u* strikes, said lifting-rod forming part of the ammunition-elevator and said stop striking said cam during the upward motion of said lifting-rod. The weights of the rods and arms are balanced by the weights *w* and *w*¹, previously described.

The operation of the mechanism is as follows: When by well-known means the gun is elevated or depressed and the tooth *c* is in engagement with the notch *f*, the swingle *e* is turned. As soon as the tooth *c* leaves the notch *f* it glides on one of the arms of the

swingle without causing further motion of the same. The turning motion of the swingle is transmitted to the shaft *i* by the arm *g* and the connecting-rod *h*, and from thence by the connecting-rod *h'* to the conveyer *m*, and by the connecting-rod *h''* to the corrugated cam *l*. In view of this movement, the conveyer *m* is automatically placed in the loading-line and the lift of the ammunition-elevator so limited that the ammunition-tray *j* can only be raised to the height required by the elevation of the gun.

What I claim as new is—

1. In an apparatus for automatically adjusting the ammunition-tray and the conveyer of ordnance to the loading-line, the combination of a swingle secured to the carriage, intermediate mechanism to transfer the angular motion of the cradle (respectively of the gun) to this swingle, and intermediate mechanism connected to the swingle for limiting the motion of the elevator and adjusting the conveyer, substantially as specified.

2. In an apparatus for automatically adjusting the ammunition-tray and the conveyer of ordnance to the loading-line, the combination of a swingle secured to the carriage, and a tooth secured to the cradle and engaging a notch of the swingle, which latter has arms projecting from both sides concentrically to the axis of the trunnions, so that an angular change of the swingle takes place only during engagement of the tooth with the notch, while when the tooth leaves the notch it glides on one or the other of the arms, which arms in-

sure the reengagement of the tooth and notch, substantially as specified.

3. In an apparatus for automatically adjusting the ammunition-tray and the conveyer of ordnance, the combination of a swingle secured to the carriage, intermediate mechanism for transferring the angular motion of the cradle (respectively of the gun) to this swingle; intermediate mechanism connected to the swingle for limiting the motion of the elevator, and connecting rods and levers for transmitting the angular motion of the swingle to a conveyer guided concentrically to the trunnions, so as to bring the conveyer into the loading-line, substantially as specified.

4. In an apparatus for automatically adjusting the ammunition-tray and the conveyer of ordnance, the combination of a swingle secured to the carriage, intermediate mechanism for transferring the angular motion of the cradle (respectively of the gun) to this swingle, and mechanism for transmitting the angular motion of the swingle to a cam projecting into the path of a stop of the ammunition-hoist, whereby the motion of the elevator is limited to correspond with the elevation of the gun, substantially as specified.

—In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOHANNES KRONE.

Witnesses:

WILLIAM ESSENWEIN,
EMIL HOETTE.