

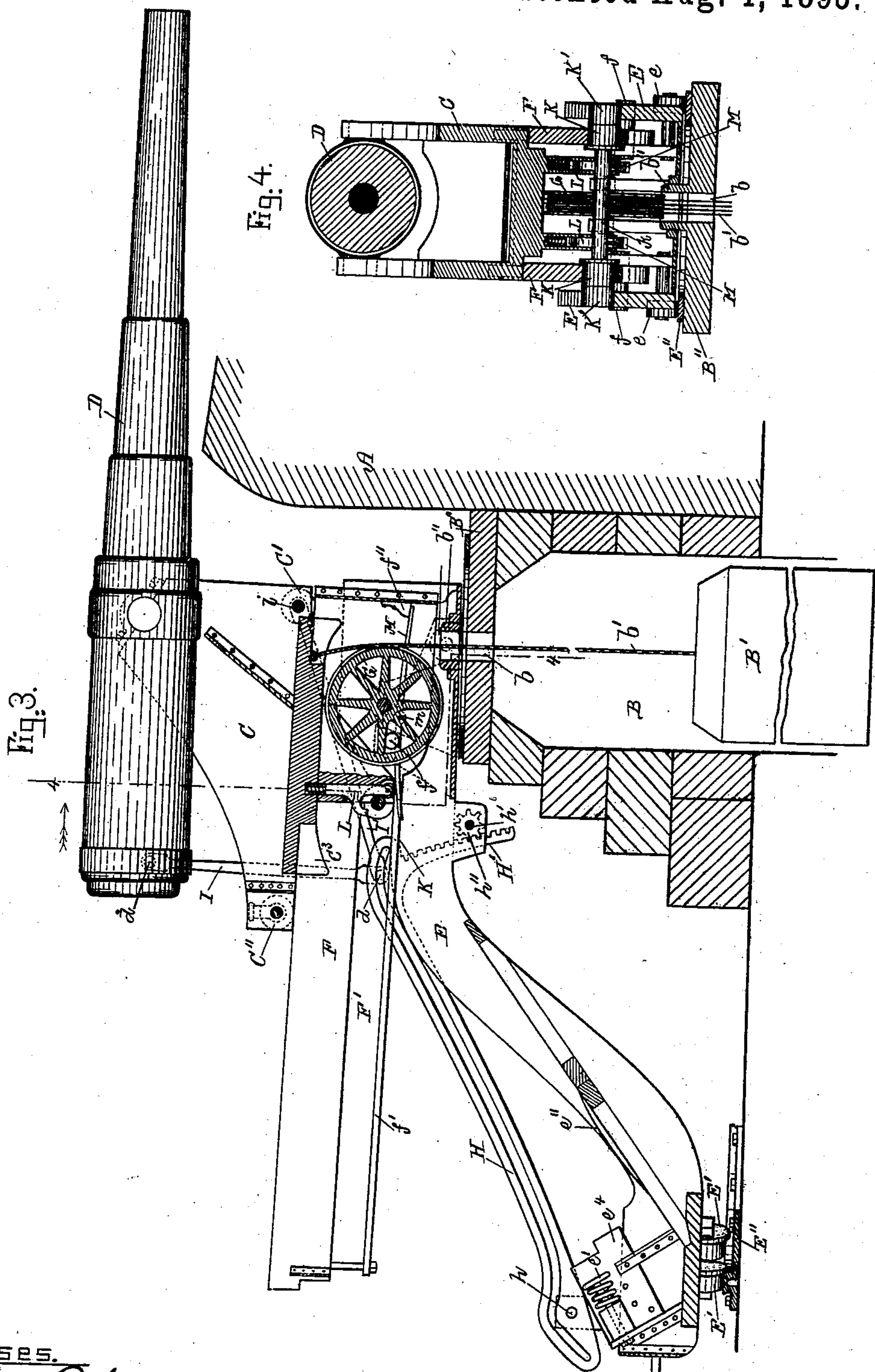
(No Model.)

2 Sheets—Sheet 1.

S. M. MANSFIELD.
DISAPPEARING GUN CARRIAGE.

No. 502,569.

Patented Aug. 1, 1893.



Witnesses.

Alice A. Perkins.

Lauritz. N. Möller.

Inventor.

Samuel M. Mansfield
by Abner Andrus, his atty.

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Fig. 2.

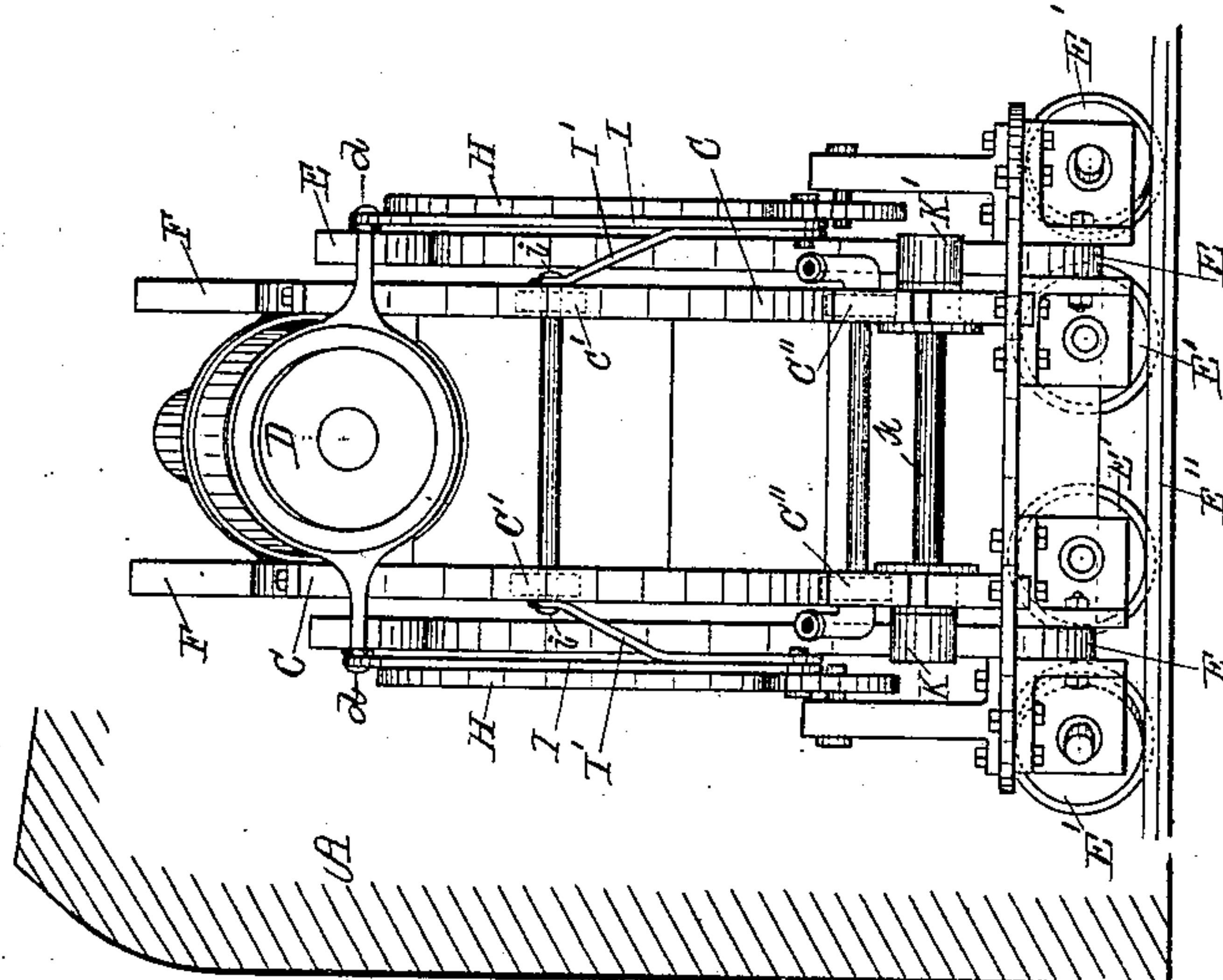
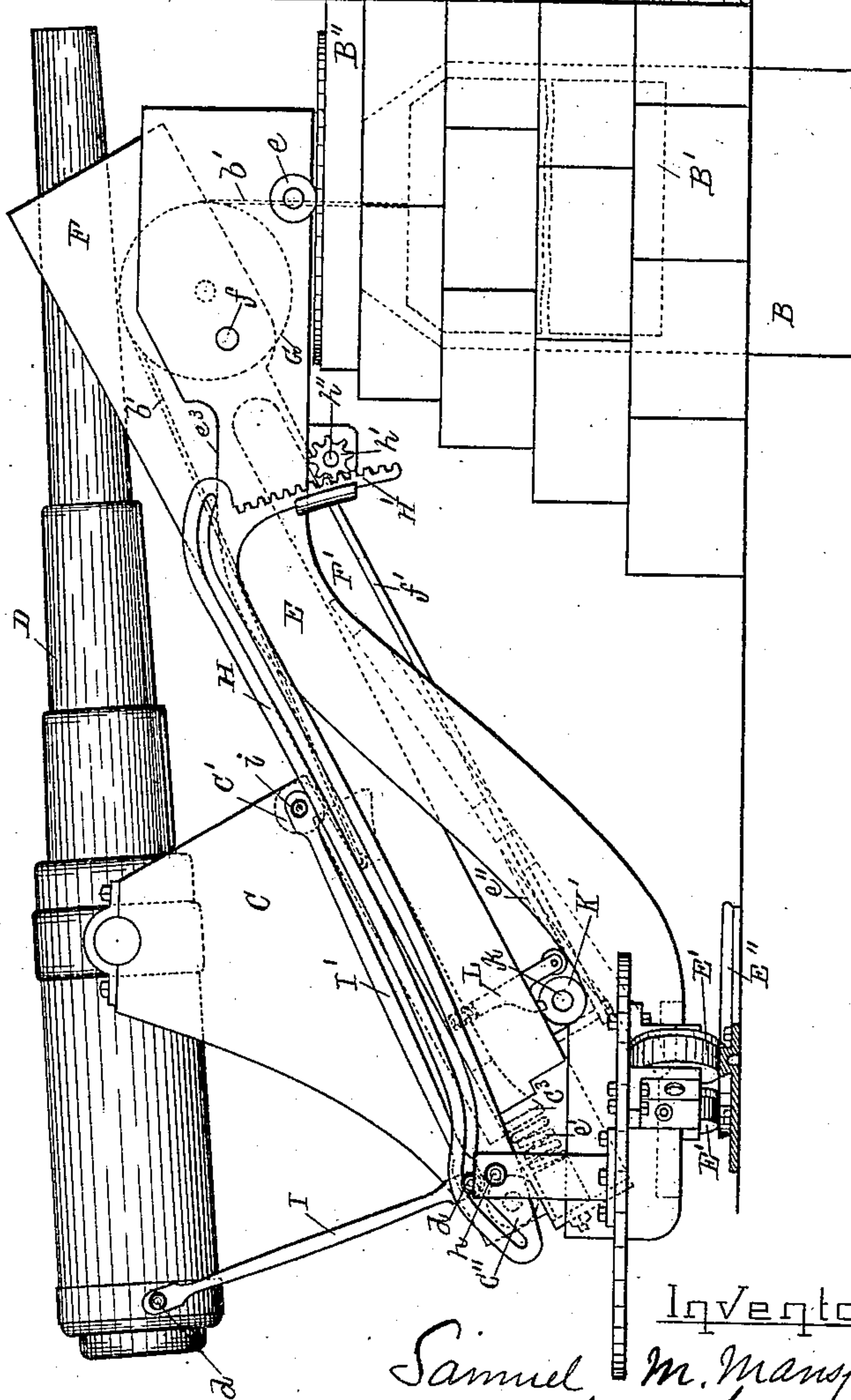


Fig. 1.



Witnesses.

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Lauritz N. Mollen.

Inventor.

Samuel M. Mansfield
by *Wm. Andrews*

UNITED STATES PATENT OFFICE.

SAMUEL M. MANSFIELD, OF THE UNITED STATES ARMY.

DISAPPEARING-GUN CARRIAGE.

SPECIFICATION forming part of Letters Patent No. 502,569, dated August 1, 1893.

Application filed October 24, 1892. Serial No. 449,746. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL M. MANSFIELD, lieutenant-colonel, Corps of Engineers, of the United States Army, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Disappearing-Gun Carriages, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to improvements in disappearing gun carriages and it is carried out as follows, reference being had to the accompanying drawings, wherein—

Figure 1 represents a side elevation of the invention showing the gun depressed below the parapet in loading position. Fig. 2 represents an end elevation of Fig. 1. Fig. 3 represents a central longitudinal section of the invention showing the gun as being elevated above the parapet; and Fig. 4 represents a cross-section on the line 4—4 shown in Fig. 3.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

In the drawings A represents the parapet inside of which is arranged the well B in which is suspended the counterpoise B' from the upper carriage C as will hereinafter be more fully shown and described. The top of the well is covered by a metal plate B'' having a vertical perforation b through which passes one or more ropes b' by means of which the counterpoise B' is suspended from the upper carriage C as fully shown in the drawings.

D is the gun mounted in bearings in the upper carriage C as is common in devices of this kind.

E is the lower carriage adapted to be adjusted in a horizontal plane as usual, its upper end being for this purpose pivoted on a hollow cylindrical hub b'' projecting upward from the well cover B'' as shown in Figs. 3 and 4.

e, e, are wheels or rollers journaled near the upper end of the lower carriage E, and adapted to roll on the well cover B'' or a circular plate attached to the top of the latter. The lower end of the lower carriage E is provided with a series of wheels E', E', adapted to roll on the segment E'' as is common in gun carriages.

F is the chassis intervening between the upper and lower carriages C, E, said chassis being pivoted near its forward end at f to the upper end of the lower carriage and near its front end as shown in Figs. 1 and 3. The forward end of the upper carriage C is mounted on rollers C', C', adapted to roll on the chassis F during the forward motion of the upper carriage on said chassis. The upper carriage C rests directly upon the chassis during the recoil and rearward motion of the gun so as to cause a sliding and retarding frictional resistance to be overcome during such rearward motion of the upper gun carriage to partly absorb the energy of recoil and prevent a too rapid depression of the gun.

To the rear of the upper carriage is preferably journaled eccentrically the rollers C'', C'', the axle of which may be turned sufficiently to cause the said carriage to be supported on said rollers so as to allow the carriage to roll with less frictional resistance on the chassis from loading to firing position, such roller adjustment being well known in gun carriages.

G is a grooved or flanged wheel or pulley the shaft of which is journaled in suitable bearings preferably secured to the lower carriage, and on said wheel is guided the rope or ropes b' by means of which the counterpoise B' is suspended from the upper carriage C.

On the under side of the rear part of the upper carriage C is one, or more projections C³ adapted to come in contact with one or more, yielding or spring buffers e', when the said carriage C reaches its lowest position indicated in Fig. 1. The said spring buffers e' are for this purpose arranged at the lower end of the lower carriage E as shown in Figs. 1 and 3. In practice the counterpoise B' should be heavy enough to about counter-balance the gun D and its carriage C and connecting parts.

For the purpose of automatically inclining the gun from its loading to firing position and vice versa, I pivot at h, on each side of the lower rear end of the lower carriage E, a slotted bar H of a suitable and desirable curvature, the upper end of which is adjustable for the purpose of adjusting the gun in a vertical plane after it has been raised above the parapet A as shown in Fig. 3, and it may be

set for elevation before the gun is raised into battery.

The adjustment of the upper end of each of the slotted bars H is accomplished by means of a pinion h' meshing in the teeth of a curved rack H', forming a part of the upper end of each of the slotted bars H as shown in Figs. 1 and 3, said pinions being secured to a shaft h'' journaled in the upper end of the lower carriage E and actuated by means of power applied to a crank, hand-wheel or otherwise as may be most convenient or practical.

To each side of the rear end of the gun D is pivoted at d , a link I the lower end of which is guided in a suitable manner in the slotted bar H, and to such lower end of the link I is pivoted a link I' the forward end of which is pivoted at i to the forward end of the upper carriage C as shown in the drawings. By the arrangement of said links and grooved bar the gun is automatically guided from the position shown in Fig. 1 to the position shown in Fig. 3 (and vice versa) during the raising or lowering of the gun to or from firing position.

Each chassis rail F has on its under side a longitudinal groove F' preferably formed by means of a rail f' secured at a suitable distance from the under side of such chassis rail, as shown in Figs. 1 and 3. In such chassis grooves F' are located the rollers K, K', loosely journaled on a transverse shaft k , on which is also journaled a pair of rollers K', K', adapted to roll on the upper edges of the lower carriage E during the depression of the gun. It is essential that said roller shaft k should be connected to the upper carriage C during the depression of the gun, and for this purpose, I provide said upper carriage with one or more vertically yielding spring actuated clutches L adapted when released to encompass the said roller shaft k during the recoil and depression of the gun, and to be automatically released from said shaft shortly before the upper carriage reaches its lowest position on the chassis as shown in Fig. 1, such release is accomplished by the lower end of the clutch (preferably provided with an anti-friction roller) coming in contact with a cam surface or incline e'' on the lower carriage E represented in Figs. 1 and 3. During the upward motion of the carriage C on the chassis F and upward swinging motion of the latter on its pivot f , the roller shaft k remains in the rear end of the grooves F', F', until the chassis inclines slightly forward (shown in Fig. 3) when the said shaft k rolls forward in the grooves until it reaches its forward position where it is ready to engage with the upper carriage in its elevated position ready for a discharge. As the chassis by the gravity of the gun, as it reaches its forward position is swung into position for discharge the clutches L are automatically raised to allow the shaft k and its rollers to come into the position above mentioned and this is accomplished by means of a lever M (for each

clutch) pivoted at m to the lower carriage E, the rear end of which lever is swung upward against the lower end of the clutch when a projection f'' at the front end of the chassis F comes in contact with the forward end of said pivoted lever M as shown in Fig. 3.

The operation of the invention is as follows: Supposing the gun to be in the elevated position and ready for discharge as represented in Fig. 3; the discharge of the gun causes its carriage C to recoil on the chassis under sliding friction at the same time as the clutches L on the carriage C are automatically connected to the roller shaft k the moment said clutches pass beyond the rear end of the levers M. The chassis F commence to swing downward as soon as the center of gravity of the gun D and its carriage C has moved back of the pivot f , where the chassis is hinged to the lower carriage E, and the curvature of the lower carriage will permit and during such downward swinging motion of the chassis the rollers K and K', on the shaft k , are caused to roll respectively against the under side of the chassis and top of the lower carriage E by which the downward sliding motion of the upper carriage C on the chassis and the tipping motion of the latter on its fulcrum f are properly constrained and retarded so as to check recoil and prevent a too rapid and dangerous descent of the gun to the depressed position shown in Fig. 1. When the chassis reaches its lowest position its rear end comes to a stop against an abutment e^4 on the lower carriage E as shown in Fig. 1. During the descent of the upper carriage C as it approaches its lowest position on the chassis the clutches L are automatically released from the shaft k by the cam or incline e'' before mentioned and the projection C^3 is brought against the yielding buffer e' on the lower carriage thus causing the gun to come to its loading position (Fig. 1) without shock or jar. During the descent of the gun the counterpoise B' attached to the carriage C is raised and its rope guided on the rotary wheel or pulley G. The gun will remain in its depressed position by the frictional resistance between the carriage C and upper portions of the chassis. During the descent of the gun it is automatically inclined from the position shown in Fig. 3 to the one shown in Fig. 1 by the pivoted links I, I', and grooved bar H as hereinbefore mentioned. After loading the gun, when it is desired to raise it, it is only necessary to cause the upper carriage C to rest with a rolling friction on the chassis, which is done simply by adjusting eccentric rollers C'' until they bear on the chassis when the rolling friction of the carriage C and the weight of it and the gun D will be overcome by the counterpoise B' causing the upper carriage C to be automatically moved upward and forward on the chassis, and as the center of gravity of the gun and its carriage C comes in advance of the fulcrum f , the chassis will gradually assume the slightly forward tipped position.

tion shown in Fig. 3 and as it reaches such position the clutches L are automatically raised by the projection f'' and lever M allowing the shaft k and its rollers K, K, to roll forward on the rails f' until the rollers on said shaft are brought to the forward end of the chassis grooves F' ready to engage with the upper carriage as before stated. During such upward motion of the gun it is gradually inclined from the position shown in Fig. 1 to the one shown in Fig. 3 by the agency of the links I, I', and grooved bar II as stated.

I desire to state the above is a general description of the construction and operation of the invention and that I do not wish to confine myself to any precise details shown as the component parts of the invention may be varied in size, number or shape without departing from the essence of my invention.

What I wish to secure by Letters Patent and claim is—

1. In a disappearing gun carriage, a lower carriage having pivoted to its upper end a chassis, and an upper carriage adapted to move on the chassis and connected to a counterpoise, substantially as and for the purpose set forth.

2. In a disappearing gun carriage, a lower carriage and a chassis pivoted to the latter and having longitudinal grooves combined with an upper carriage adapted to move on the

chassis, and a shaft having rollers adapted to roll against the chassis and lower carriage for the purpose of constraining the descent of the gun substantially as specified.

3. In a disappearing gun carriage, a lower carriage, upper carriage and intervening chassis pivoted to the lower carriage and serving as a support for the upper carriage, combined with slotted bars adjustable on the lower carriage and links pivoted to the gun and to the upper carriage, substantially as and for the purpose set forth.

4. In a disappearing gun carriage, an upper and lower carriage and an intervening chassis pivoted to the forward part of the lower carriage, and acting as a support for the upper carriage combined with clutches on the latter, a roller shaft interposed between the chassis and lower carriage and means substantially as described for automatically releasing said clutches as and for the purpose set forth and described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 20th day of October, A. D. 1892.

SAMUEL M. MANSFIELD.

Witnesses:

ALBAN ANDRÉN,

ALICE A. PERKINS.