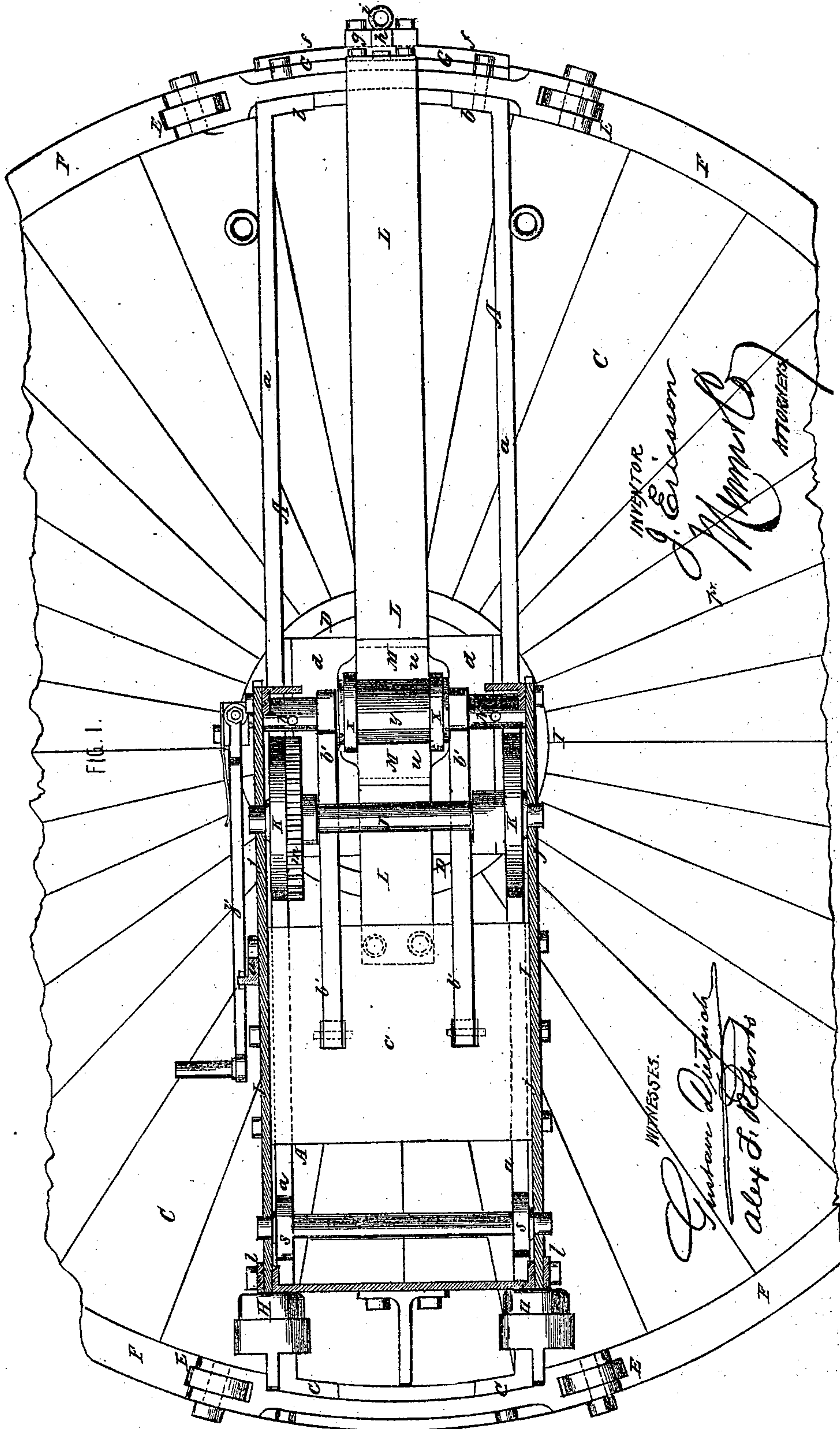


J. ERICSSON.
GUN CARRIAGE.

No. 100,514.

Patented Mar. 8, 1870.

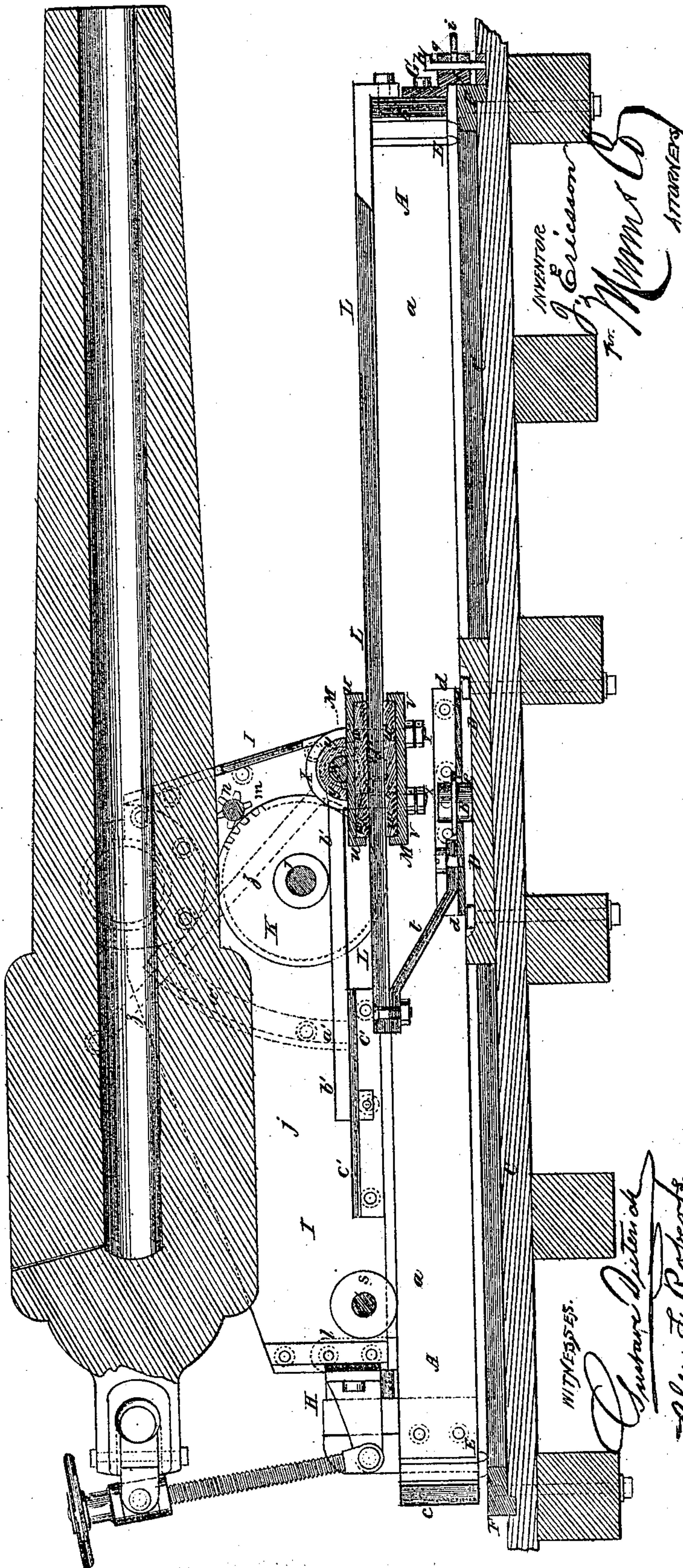


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FIG. 2.

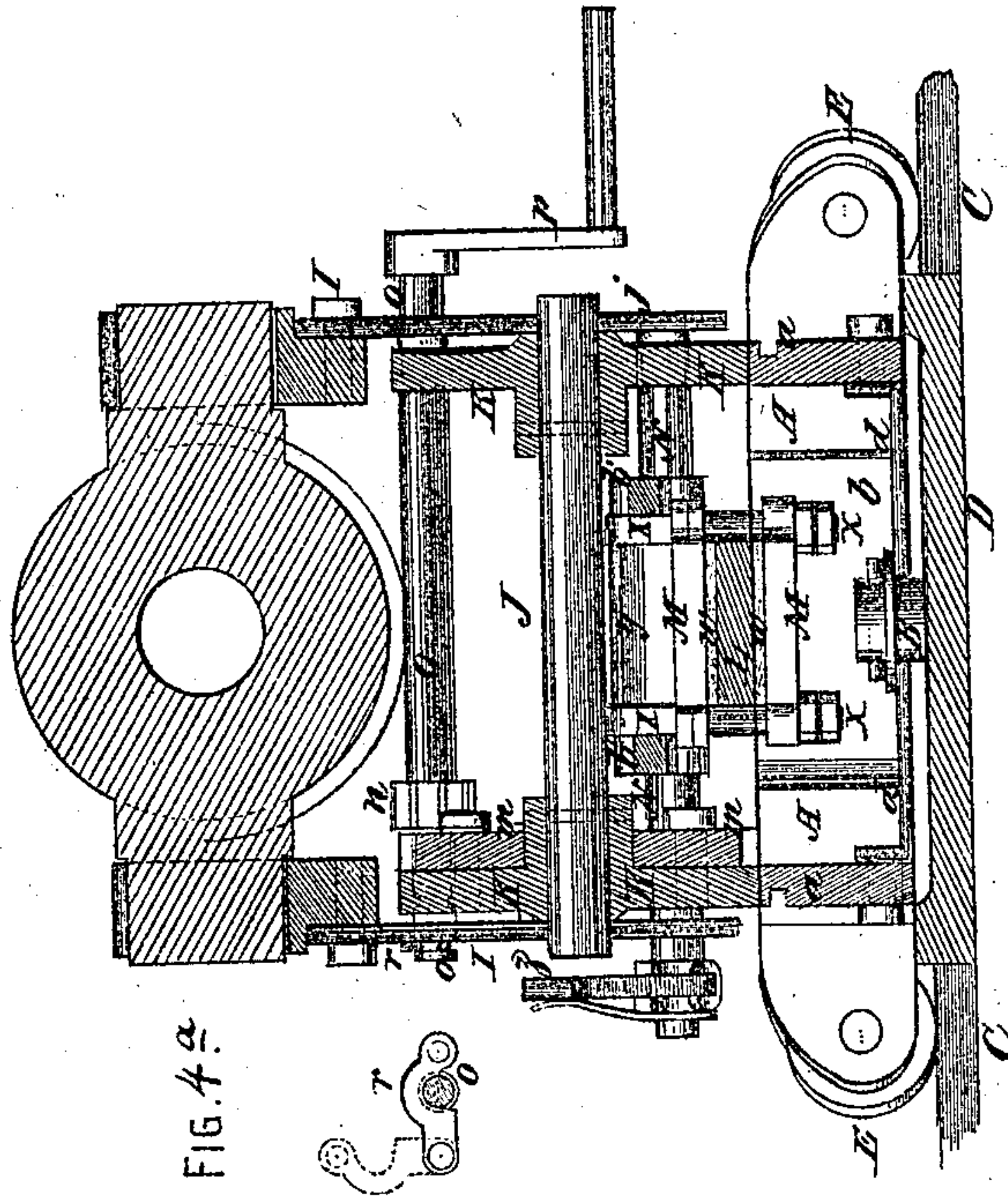


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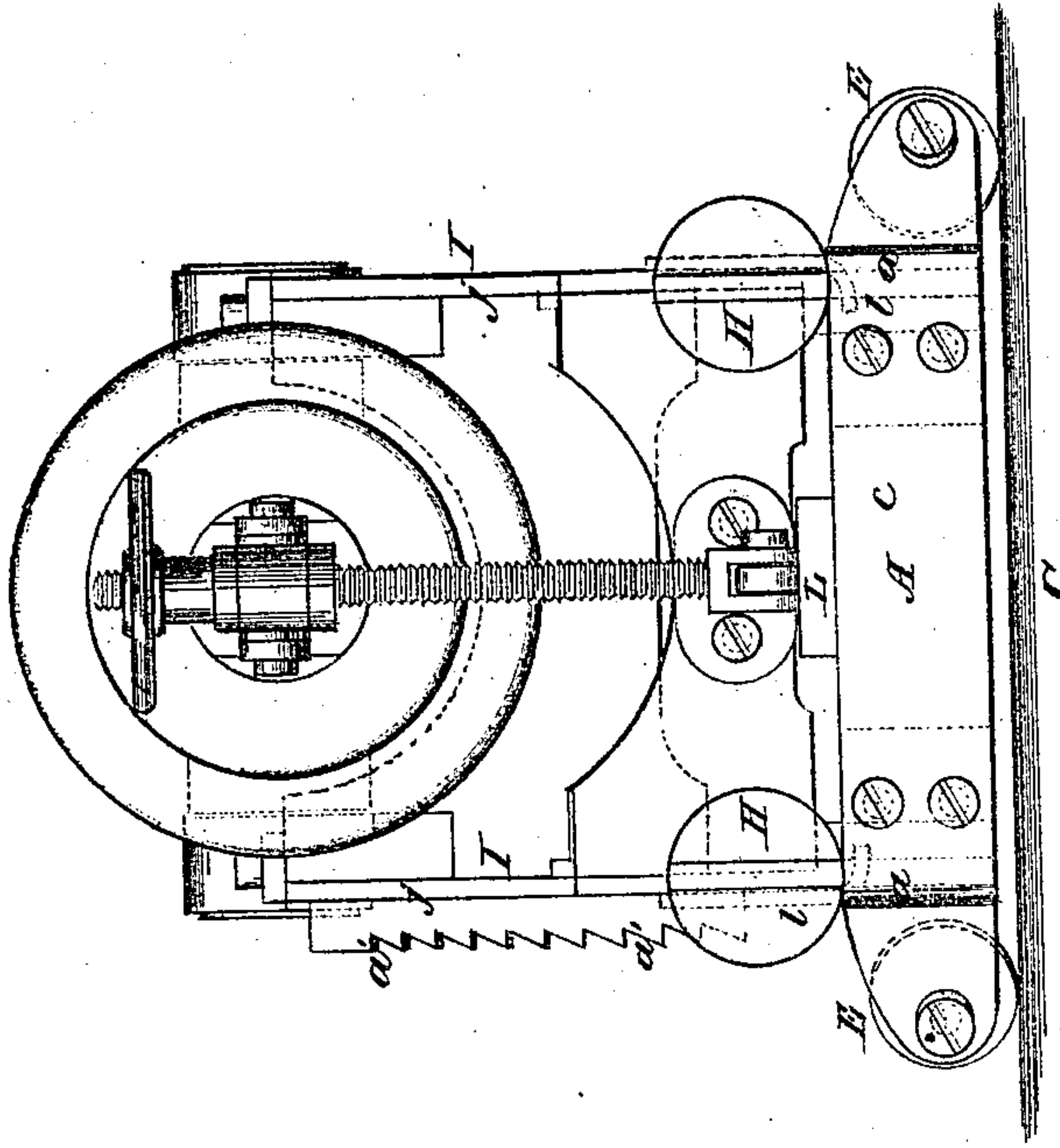
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FIG. 4.



INVENTOR.
J. Ericsson
For: *[Signature]*
ATTORNEYS.

FIG. 3.

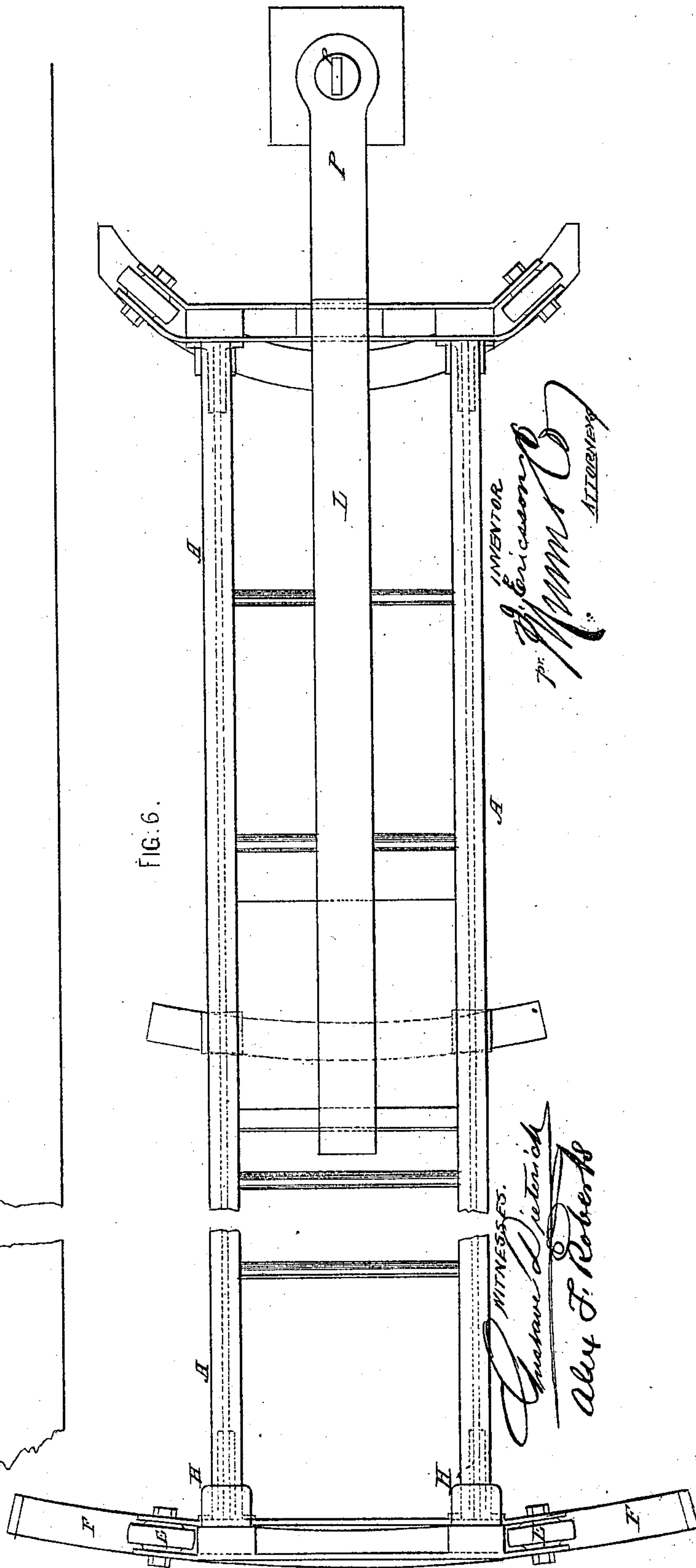
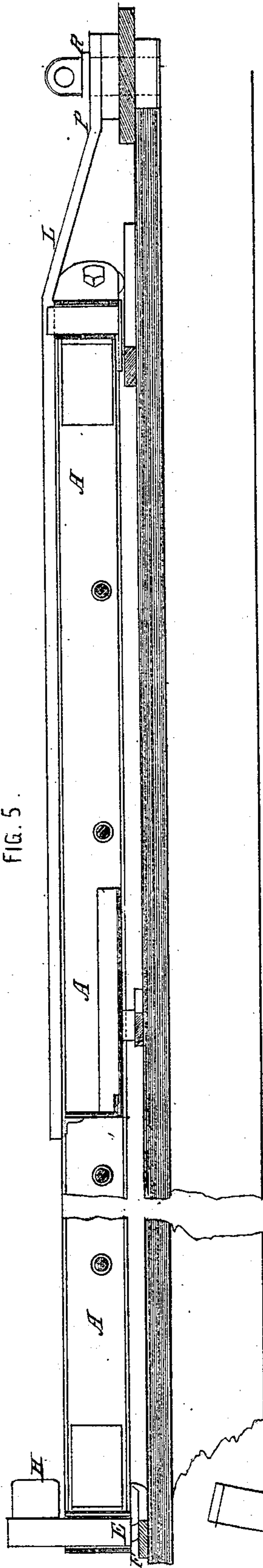


WITNESSES.
[Signature]
Alex. F. Roberts

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Patented Mar. 1870.



United States Patent Office.

JOHN ERICSSON, OF NEW YORK, N. Y.

Letters Patent No. 100,514, dated March 8, 1870.

IMPROVEMENT IN GUN-CARRIAGES.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern:

Be it known that I, JOHN ERICSSON, of New York city, in the county and State of New York, have invented a new and improved Gun-Slide and Carriage; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings forming part of this specification.

This invention has for its object to improve the construction of naval gun-slides and carriages, and more particularly those of pivot-guns, that the several parts of the same will not be injured by the shocks of the recoil, and that, in fact, such shocks may to a great extent be overcome.

This invention relates to gun-carriages, and

It consists in certain improvements thereon which are hereafter specified in the claim.

The invention consists also in the arrangement of a friction-bar on the slide, and of a double-acting adjustable clutch on the carriage, for producing friction on the bar while the gun recoils. The force of the recoil is thereby gradually distributed and not collected, as usually, in a single shock.

The invention consists also in certain details of construction as regards the hanging of the clutch-shaft, the locking of the slide, &c., as hereinafter more fully described.

In the accompanying drawing—

Figure 1 represents a plan or top view, partly in section, of my improved gun-carriage and slide.

Figure 2 is a vertical longitudinal section of the same.

Figure 3 is a rear elevation of the same.

Figure 4 is a vertical transverse section of the same.

Figure 4* is a detail side view of the lever for holding the maneuvering-wheels in and out of gear.

Figure 5 is a detail longitudinal section of a slide for a broadside gun.

Figure 6 is a plan or top view of the same.

Similar letters of reference indicate corresponding parts.

A in the drawing represents the slide of a pivot-gun.

It is constructed of the side rails *a a*, front cross-piece *b* and back cross-piece *c*, and of a central cross-plate, *d*, through which the fighting-bolt B is fitted.

The bolt B is secured to or formed on a metal plate, D, which is firmly bolted or secured to the deck C.

The bolt B projects through a slot, *e*, of the plate *d*, the slot being longer in the direction of the longitudinal center of the slide than the diameter of the bolt, to allow the slide some slight longitudinal play on the bolt.

At the ends, the slide carries the transverse trucks

E E, which roll on and are supported by the transverse or deck-ring F.

The fighting-bolt B being on the center of the ring F, forms, therefore, the pivot on which the entire carriage is swung to train the gun.

To the face of the front cross-bar *b* is secured a plate, G, which has a downward and projecting lip, *f*, the said lip fitting against the outer edge of the transverse ring F.

The lip *f* is intended to take the entire strain of the recoil brought against the slide, and to remove it entirely from the fighting-bolt.

When the carriage on the slide strikes the rear hurters H H, it will tend to move the slide backward.

The slight play given to the slide by the slot *e*, and by the very short distance between the ring F and the lip *f*, causes it to yield to the strain thus brought against it, and to move backward until the lip *f* arrests it.

The slot *e* is long enough to leave the bolt entirely undisturbed during this motion, all the strain being taken up by the lip *f* and ring F.

The fighting-bolt is by this arrangement protected, and cannot become loose or be bent, and the adjustment of the slide on the traverse will consequently always remain accurate and true.

The hurters H are elastic blocks set into suitable sockets that are formed on the rear part of the slide. Their construction and arrangement may be varied to a suitable degree.

To the face of the lip *f* is or may be secured a perforated plate or eye-bolt, *g*, adapted to receive a vertical check-bolt, *h*, reaching into a mortise provided in the deck, as is clearly shown in fig. 2.

The bolt *h* can be locked in the lowered or in an elevated position by means of a set-screw or pin, *i*, that is fitted through the plate *g* or through the bolt *h* alone.

The object of the check-bolt is to lock the slide in a position parallel to the central line of the vessel, the muzzle of the gun pointing toward the bow.

The gun-carriage I is constructed of metal or other suitable material of suitable form.

Its cheeks *j j* are so much further apart from each other than the rails of the slide, that wheels K K, which are between the cheeks mounted upon a horizontal shaft J, may rest upon the upper edge of the said rails.

The shaft J has its bearings in the cheeks of the carriage near the front end of the same, so that the front end of the carriage will be supported on the slide of the wheels K. The said wheels may, however, if desired, be on the outer side of the cheeks, in which case the latter are brought closer together.

The rear part of the carriage is supported on the rails by the rollers S S, as shown.

l l are hooks projecting downward from the cheeks, at or near the rear end of the same, and inwardly into longitudinal grooves provided in the side of the rails *a*, as indicated by dotted lines in fig. 3.

The hooks *l* serve to hold the rear end of the carriage in contact with the slide.

If desired, friction-rollers may be used to work in the grooves of the rails *a* instead of the horizontal arms of the hooks *l*, or other equivalent devices may be employed.

Upon the shaft *J* is mounted, between the cheeks *j*, a toothed wheel, *m*.

Into the same mesh the teeth of a pinion, *n*, which is mounted upon a horizontal shaft, *o*, that has its bearings in the cheeks.

The shaft *o* carries a crank, *p*, at its outer end, whereby it can be conveniently revolved to impart rotary motion to the shaft *J* and wheels *K*.

When the gun is to be run into battery, the shaft *o* is revolved, and the wheels *K* will then carry the carriage forward on the rails.

In order to prevent the shaft *o* from revolving when the gun recoils, and the consequent dangerous revolution of the crank *p*, I have made the shaft *o* transversely adjustable in its bearings, so that when the gun is ready for firing, such shaft may be thrown out of gear and locked out by a catch, *r*, fig. 4 and 4', or other suitable apparatus.

During the recoil, the carriage will, therefore, roll back on the wheel *K* without revolving the shaft *o*.

A suitable hook may be made to drop into the cogs of the pinion *n*, in which case the wheels *K K* will slide on *a a* during the recoil.

To the front cross-piece *b* of the slide is firmly secured, either by overlapping or otherwise, a narrow metal plate, *L*, which is somewhat higher than or about on a level with the upper edge of the rails *a*. It extends backward along the middle of the slide, and beyond the center of the same, and has its rear end supported on the plate *d* by an oblique brace, *t*, or on the rails by suitable diagonal or oblique stays.

The plate *L* is termed the friction-bar.

The friction-bar is embraced by a friction-clutch, *M*, which consists of two plates *u* and *v*, one being placed upon and the other held against the under side of the bar *L*, both of them being prevented from overcrowding each other by means of a tooth and notch, *d'*, on their ends at the sides of the bar.

The faces of the plates *u v*, which are contiguous with the friction-strap, are provided and filled with wooden or other equivalent wearing-blocks *w w*, which can be readily replaced when worn, and which protect the metal of the plates *u v*.

The lower plate *v* is, by means of straps *x x*, suspended from a horizontal shaft, *N*, hung transversely in the carriage.

A semi-cylindrical box, *y*, is interposed between the shaft *N* and the straps *x*. The said shaft is in contact with the upper plate *u*.

Between the plate *u* and the box *y* the shaft *N* is made of oval cross-section, *i. e.*, cam-shaped. When its prominent parts are horizontally opposite each other, there will be no pressure upon the plate *u*, nor will the plate *v* be elevated, and no friction is therefore produced on the friction-strap *L*.

When, however, the shaft *N* is turned to bring its prominent parts against the plate *u* and the box *y* respectively, thereby forcing the former down upon the friction-bar, and elevating the latter, by this means raising the plate against the friction-bar, the said bar will thus be clamped between the plates *u v* the more the prominent parts of the cam-shaft *N* are made to deviate from the horizontal position shown in fig. 2.

The degree of pressure is regulated by means of a

lever, *z*, which is attached to the end of the shaft *N* on the outside of the carriage, and which can be locked in suitable position on a notched segment, *a'*, or its equivalent.

The force of the recoil is by the clutch *M* transferred to a great degree by the friction-bar, which transmits it on the shortest route to the traversing-ring. The vehement shock generally produced when the carriage strikes the hurters is thus almost entirely prevented.

The degree of friction should be regulated in accordance with the charge in the gun.

The clutch serves also to hold the front end of the carriage upon the slide.

The shaft *N* is not hung in the cheeks of the carriage, but in the front ends of metal bars *b'* that project forward from the central transom *c'* of the carriage.

The bars *b'*, being merely secured at their rear ends, are somewhat yielding and elastic at their front ends, and allow the shaft which they hold to have a slight vertical play, making thereby the friction applied to the bar *L* more powerful, but less absolute than it would be if the shaft was hung in rigid bearings.

In figs. 5 and 6 is illustrated a slide for broadside guns.

In this case the friction-bar extends forward of the slide to form the tongue *P*, through which the pintle *R* is fitted into the port-sill. The strain in this case is entirely removed from the slide and brought directly against the pintle.

Having thus described my invention,

I claim as new, and desire to secure by Letters Patent—

1. The arrangement and combination herein shown and described, of the driving-wheels *K K* of the carriage, the gear-wheels *m m*, and the adjustable pinion *n*, whereby the gun may be run into battery and the driving-pinion ungeared, as and for the purpose specified.

2. The slotted plate *d e* of a rotary gun-carriage, sliding on bolt *B*, in combination with the downward-projecting lip *f* arranged on plate *G* of cross-bar *b*, all as and for the purpose specified.

3. A friction-plate, *L*, constructed and located as shown, in combination with the clutch *M*, having its two parts *u v*, arranged on alternate sides of the said plate, as and for the purpose specified.

4. The construction and arrangement of the perforated plate *g*, vertical check-bolt *h* and pin *i* to lock the slide to the deck, in the manner described.

5. The combination of the cam-shaft *N*, straps *x x*, and box *y*, all constructed and arranged as set forth to counteract the recoil force and lessen the shock upon the hurters, in the manner described.

6. The combination with the friction-clutch, operated by cam-shaft *N*, of the lever *Z*, and the notched and graduated arc-plate *a'*, to regulate the amount of friction in proportion to the charge in the gun, all as set forth.

7. The arrangement of the shaft *N* in bearings upon the front ends of metal bars *b'* that have a slight vertical play, for the purpose of relieving the friction-clutch upon the strap *L*, in the manner described.

8. The combination, with hurters *H H*, of the friction-clutch *M*, applied at the time and in the manner specified.

9. The combination, with a gun-carriage having a slight longitudinal play upon its pivot-bolt, of clutch *N*, hurters *H H*, and lip *f*, each of said instrumentalities operating at the time and in the manner specified.

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Witnesses:

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ALEX. F. ROBERTS.