C. N. SCOTT.

ENGINE FRAME.

APPLICATION FILED JAN. 6, 1909.

984,161.

Patented Feb. 14, 1911.

Fig. 1.

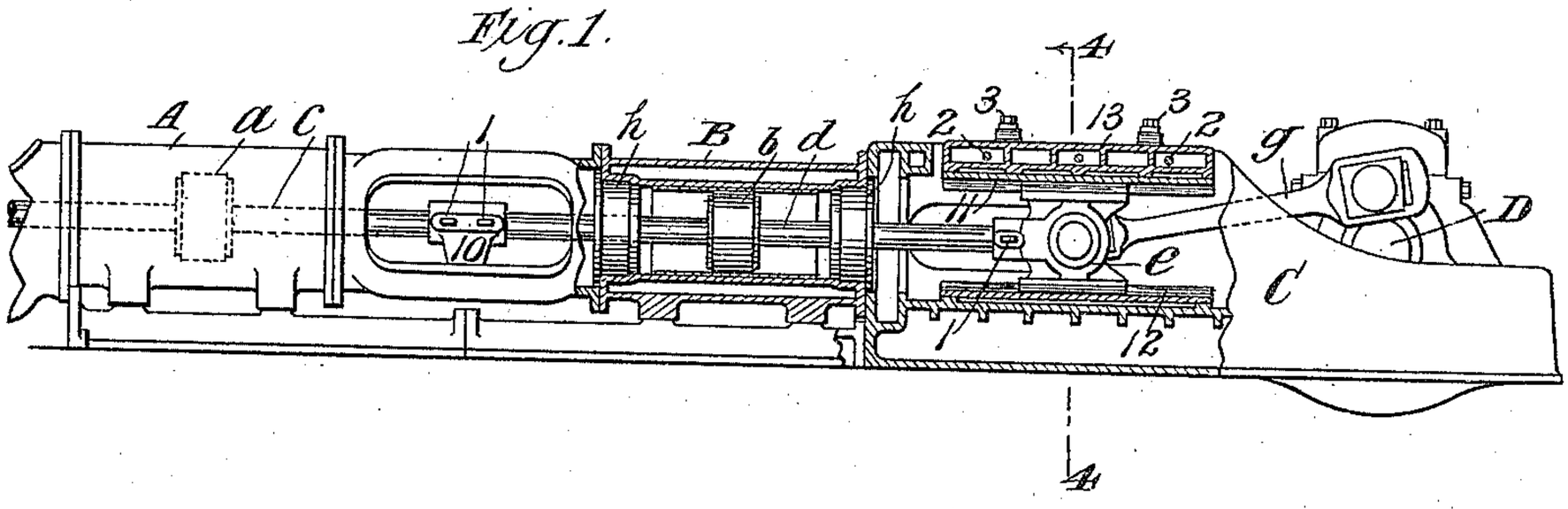


Fig. 2.

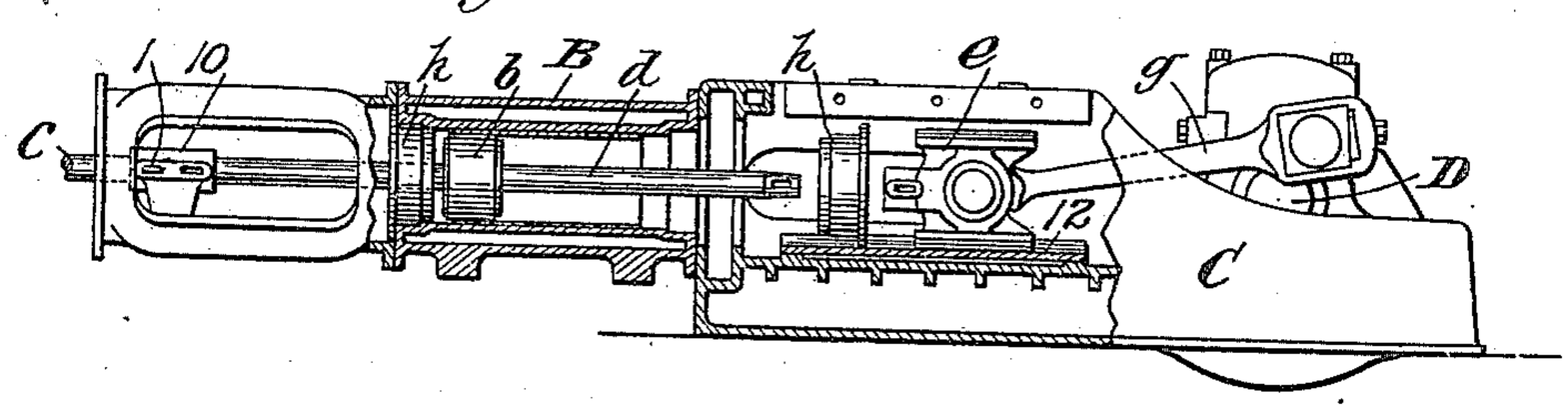


Fig. 3.

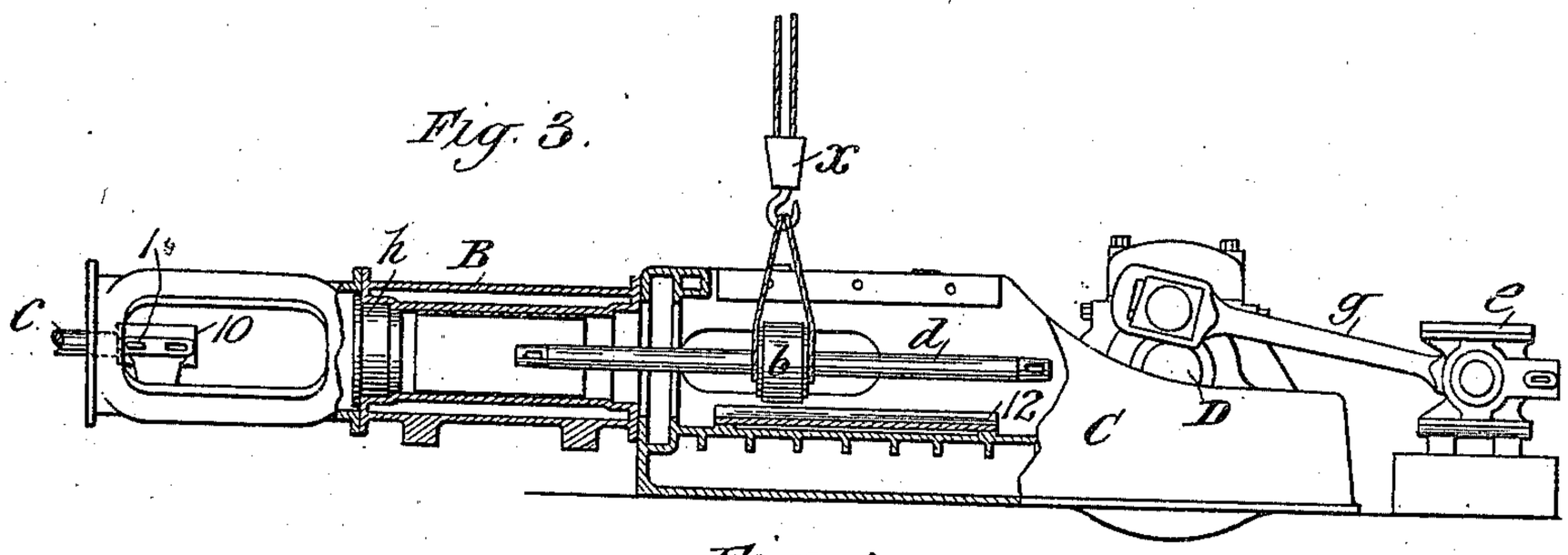
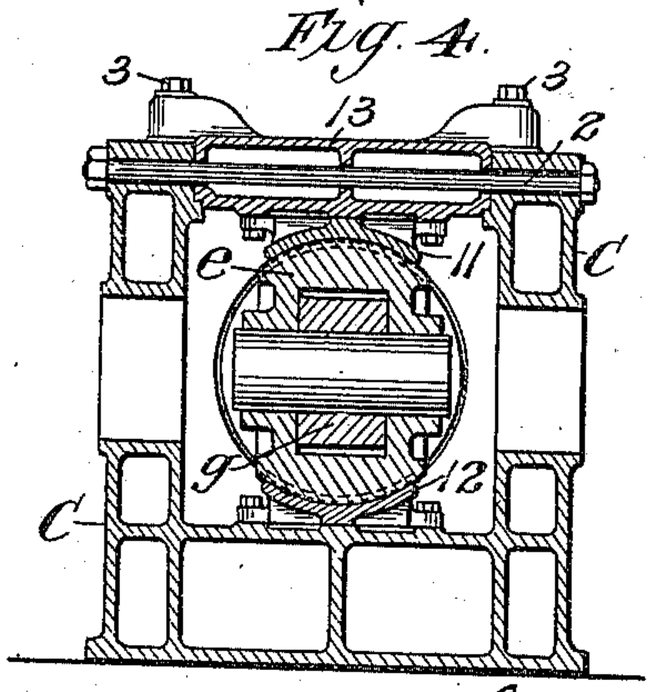


Fig. 4.



Witnesses:
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W. F. Kennedy.

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UNITED STATES PATENT OFFICE.

CLARENCE N. SCOTT, OF BUFFALO, NEW YORK, ASSIGNOR TO INTERNATIONAL STEAM PUMP COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

ENGINE-FRAME.

984,161. Specification of Letters Patent. Patented Feb. 14, 1911.

Application filed January 6, 1909. Serial No. 470,911.

To all whom it may concern:

Be it known that I, CLARENCE N. SCOTT, a subject of the King of Great Britain, residing at Buffalo, county of Erie, State of New York, have invented certain new and useful Improvements in Engine-Frames, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

In large engines of those types having a cross head frame next that end of the engine cylinder at which the engine piston must be removed, and especially in engines in which the piston and piston rod are integral or the piston is permanently secured to the rod so that the piston and rod must be removed together, the removal of the piston from the frame has been an inconvenient and expensive operation. This is especially true in large tandem gas engines as now built, with the cross head between the inboard end of the inner cylinder and the crank shaft, the present practice being to remove the cross head from the pitman, and the crank and pitman from the crank shaft, and then draw the engine piston and rod back through the frame and block it up to clear the crank shaft, before raising it out of the frame by a sling. This takes time and labor, as well as care and skill in connecting and disconnecting the cross head, pitman, crank, and crank shaft and blocking up the piston rod so as to be safely supported.

The present invention provides a construction by which the piston and piston rod, as well as the cylinder head and cross head, may readily and conveniently be removed from the frame by the block and tackle, without disconnecting the cross head, pitman, crank, and crank shaft. This result is secured by providing the engine frame inclosing the cross head and carrying the upper and lower cross head guides with an opening at the top of sufficient width to permit the piston, cylinder head, and cross head to pass through it, and removably securing in this opening the upper cross head guide. By removing the upper cross head guide, therefore, and unkeying the piston rod from the cross head, the cross head may be raised from the frame and swung back on the crank out of the way, and the cylinder head and piston then removed readily and conveniently through the cross head guide opening.

In the accompanying drawings I have shown for illustration of the invention a horizontal tandem gas engine embodying the invention in its preferred form, and the invention will now be described in detail in connection with this construction and the features forming the invention specifically pointed out in the claims.

In the drawings:—Figure 1 is a side elevation of the engine with the inner cylinder, frame and cross head guides sectioned to show the construction. Fig. 2 is a similar view, omitting the outer cylinder and showing the upper cross head guide removed and the piston rod, cylinder head and cross head detached for removal. Fig. 3 is a view similar to Fig. 2 showing the construction after removal of the cross head and cylinder head, and with the piston and its rod on the sling and being lifted. Fig. 4 is a cross section on an enlarged scale on line 4 of Fig. 1.

In the drawings, A, B, are the outer and inner engine cylinders, *a*, *b* the corresponding pistons which are formed integral with or permanently secured to their respective rods *c*, *d*.

C is the engine frame in which moves the cross head *e* connected by the pitman *g* to the crank on the crank shaft D. The rods *c*, *d* are secured together by the coupling piece or cross head 10 to which the rods are keyed by keys 1, and the inner end of the piston rod *d* is keyed by key 1 to the cross head *e*. The engine cylinders have removable heads *h*. The cross head *e* runs on upper and lower cross head guides 11, 12 supported in the engine frame and fitting the cross head.

The construction thus far described is the same as engines heretofore built, and may be of any other suitable form.

Referring now to the especial features of the present invention, the frame C, instead of being permanently closed at the top, is open at the top so as to permit the withdrawal of the cross head guide, cylinder head and piston through the opening, and this opening is closed by a frame portion 13 carrying the cross head guide 11, the cross head guide and its support thus being removable to open the top of the engine frame when the piston is to be removed.

The cross head guide support 13 may be secured in place by any suitable means, the means shown consisting of through bolts 2 passing through the side walls of the frame and the support 13 and top bolts 3 passing through ears on the support 13 and into the side walls of the frame, a strong rigid frame and cross head guide construction being thus secured.

The operation of the construction will be understood from a brief description in connection with the drawings.

In the operation of the engine, the parts are as shown in Fig. 1, with the upper cross head guide and its support 13 in place. When the piston *b* and its rod *d* are to be withdrawn, the rod *d* is unkeyed from the coupling piece or cross head 10 and the cross head *e*, and the inner cylinder head *h* withdrawn from the piston rod into the frame C, and the upper cross head and its support 13 removed to open the top of the frame, as shown in Fig. 2. The cross head *e* and cylinder head *h* may now be removed by lifting them out of the engine frame by the sling *x*, and the cross head guide and pitman swung back out of the way, the cross head conveniently being blocked up behind the engine, as shown, and the piston *b* and its rod *d* may then be drawn back into the frame sufficiently for the outer end of the rod to clear the engine cylinder in lifting, and the piston and rod then raised out of the frame by the sling *x*, all as shown in Fig. 3.

What is claimed.

1. The combination with a horizontal engine cylinder, its piston and piston rod, an engine frame at the end of the cylinder, a cross head moving in the frame, a crank shaft having a pitman connected to said cross head, and a cylinder head removable from the cylinder into said frame, said frame having an opening at the top of such size as to permit the removal through it of the cross head, cylinder head, and piston, of an upper cross head guide removably secured in said opening.

2. The combination with two horizontal engine cylinders arranged tandem, a crank shaft at the end of the engine, a frame between the crank shaft and inner cylinder, a cross head moving in said frame, a piston rod and piston for the inner cylinder with the piston rod detachable from the cross head for removal with the piston, a cylinder head at the inner end of the inner cylinder removable into the frame, upper and lower cross head guides in said frame, and a removable top frame section carrying the upper cross head guide and of such size as to provide by its removal an opening through which the cross head guide, cylinder head and piston may be lifted out of the frame.

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

CLARENCE N. SCOTT.

Witnesses:
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