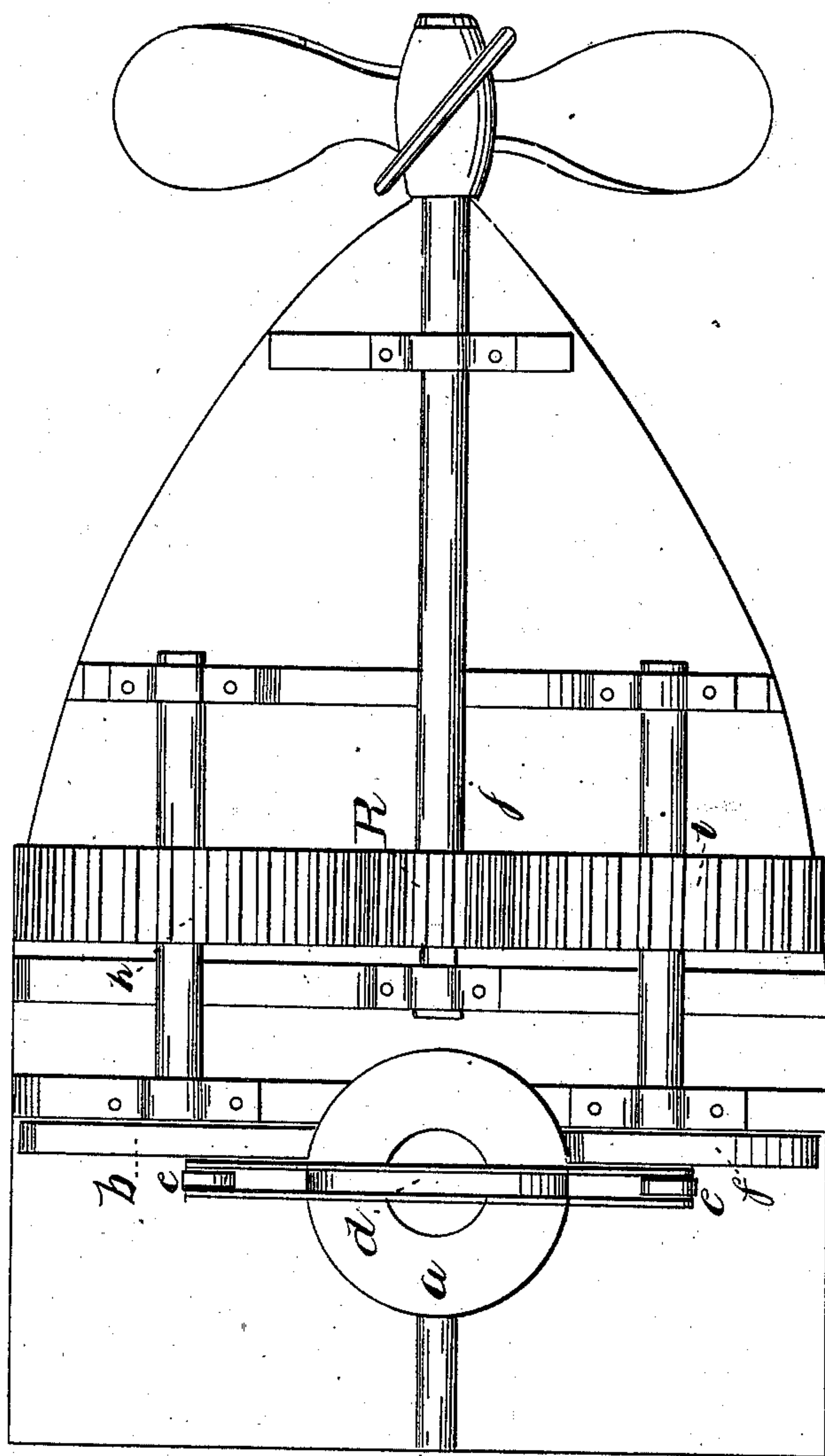


Sheet 1-2 Sheets.

W. S. Phelps,
Reciprocating Steam Engine,
N^o 47,748, *Patented May 16, 1865.*

Fig. 1.

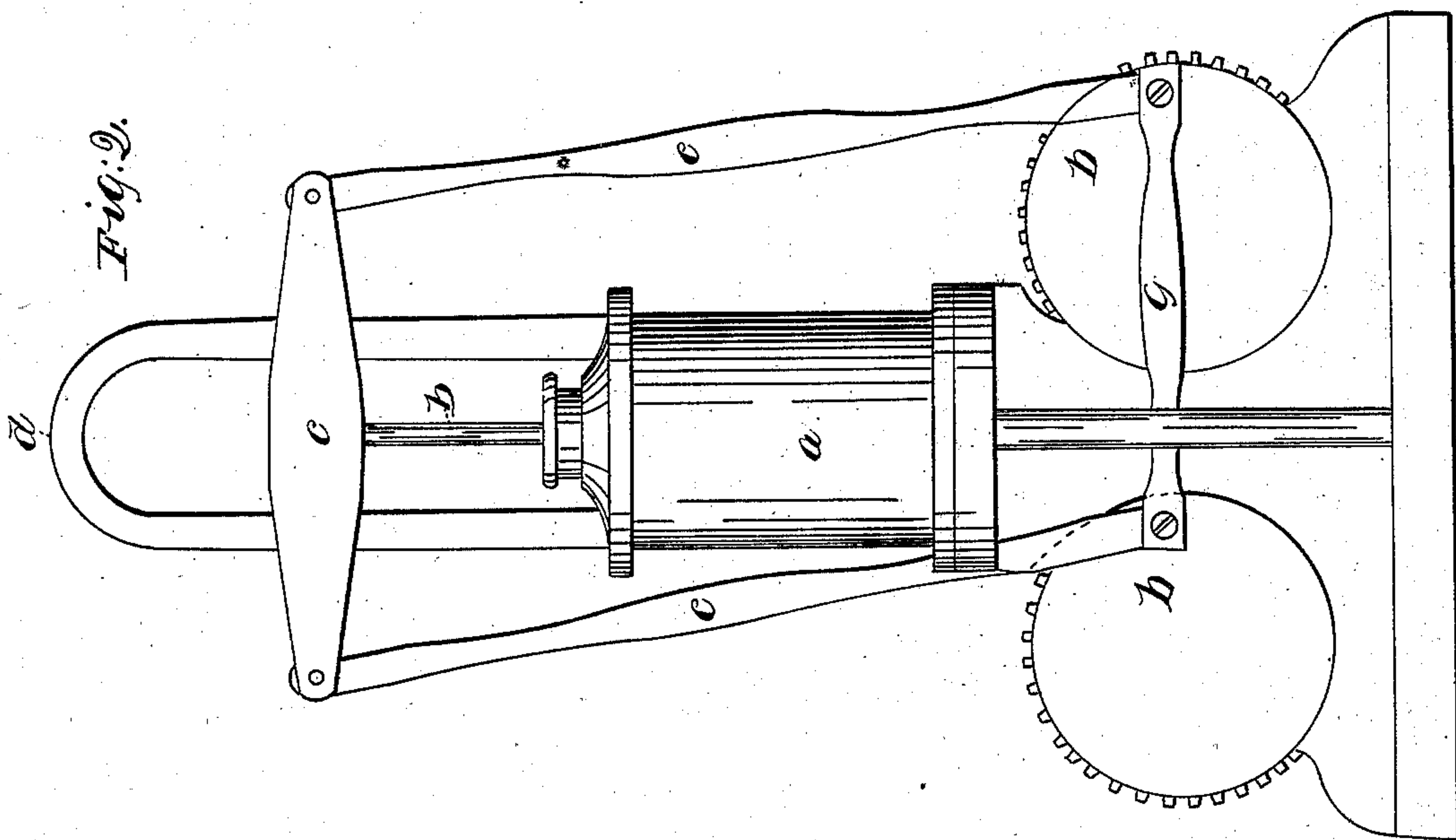


Witnesses:
T. Smith.
L. Jones,

Inventor:
W. S. Phelps.
By Atty. J. T. Everett

Sheet 2-2 Sheets.

W. S. Phelps,
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No. 47,748, Patented May 16, 1865.



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By Atty. J. T. Everett.

UNITED STATES PATENT OFFICE.

WALTER S. PHELPS, OF COLUMBUS, OHIO.

IMPROVEMENT IN STEAM-ENGINES.

Specification forming part of Letters Patent No. 47,748, dated May 16, 1865.

To all whom it may concern:

Be it known that I, WALTER S. PHELPS, of the city of Columbus, in the State of Ohio, have invented a certain new and useful Improvement in Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings and to the marks and letters thereon.

Figure 1 of these drawings, which form part of this specification, is a top view, or a view had by looking down upon an engine constructed and arranged under my improvement; and Fig. 2 is a front view of such engine.

In both of these figures where like parts are shown like marks and letters are used to indicate the parts.

It will be seen that my improvement relates to "geared engines" and is here shown applied to a screw or propeller, but, as is evident, can be applied to a shaft for any purpose where a high or low pressure engine with a straight or crank shaft can be used.

These drawings show a vertical cylinder, *a*, with the piston-rod *b* attached to a cross-head, *c*, the guide *d* thereof passing through slots in the cross-head, the guide being affixed to the cylinder, and from each end of the cross-head a connecting-rod, *e e*, passing to crank-disks *f*. A rod or bar, *g*, passing from the one crank to the other and working at right angles to the two connecting-rods is also shown. On each of the crank-shafts are toothed wheels *h* and *i*, and between the crank-shafts is the propeller-shaft *j*, having upon it a pinion, *k*, geared to the wheels *h* and *i*. These shafts are shown to have suitable bearings and boxes, and the ends of the connecting-rods and the rod or bar *g* will have the usual boxes and keys for adjustment.

The arrangement and construction of the parts here recited allows the following advantages: First, the driving of a propeller or screw with one low-pressure or high-pressure cylinder with the application of two connecting-rods, working two separate cranks upon two separate shafts parallel with each other,

with the center of the cylinder above or below the space between these shafts or cranks and directly over the keelson of the vessel; second, the adjustment of these cranks, by which means the spur or geared wheels retain their proper positions in their rotary motions, by a parallel rod working at right angles to the two connecting-rods on each side of the cylinder; third, the application of two spur or geared wheels, one upon each crank-shaft or crank, of equal size and number of teeth, driving a pinion between, and by these two spur or geared wheels said pinion is driven, being placed upon the main shaft or line of shafts; fourth, the applying of one-half the power of the engine to one crank and thence through the shaft or spur or geared wheel to one side of the pinion, and the other one-half of the power of the engine, through the same combination and at the same time, to the other side of the said pinion upon the main shaft or line of shafts, thereby diverting the strain and power of the engine from the pillar blocks or bearings of the main line of shafts or shafting, and thus releasing the said pillar blocks or bearings from all undue strain, except the weight of the shaft and force of propulsion caused by the screw to the vessel in a forward or backward movement; fifth, this arrangement and adjustment will not cause listing to the vessel or undue strain upon the sides of the vessel, but places the cylinder directly over the keelson and in line with the main shaft or shafting, with an equal amount of strain upon each side of the pinion while working upon any and all pressures of steam.

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

The arrangement of the vertical cylinder, connecting-rods, crank-shafts, and propeller or power shafts, herein recited.

This specification signed this 14th day of November, 1864.

WALTER S. PHELPS.

Witnesses:

RICHARD PAGE,
ROBERT N. PAGE.