

(No Model.)

2 Sheets—Sheet 1.

A. N. OGLE & C. M. MAGUNSON.
STEAM ENGINE.

No. 519,966.

Patented May 15, 1894.

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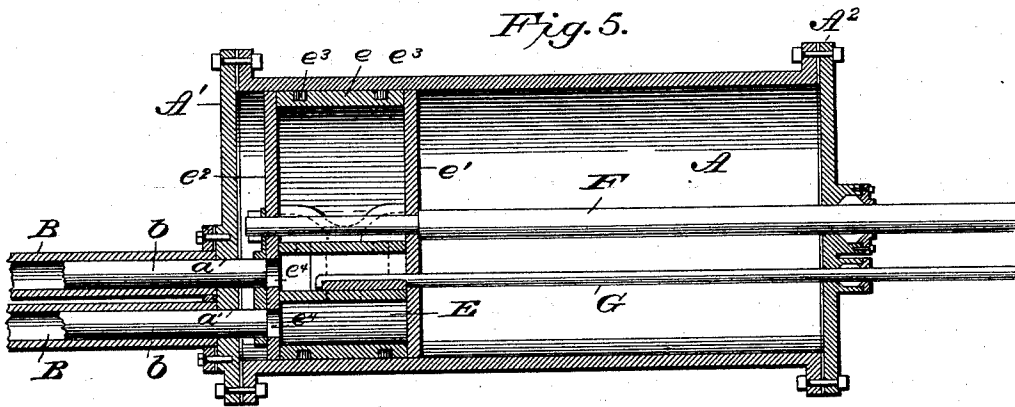


Fig. 6.

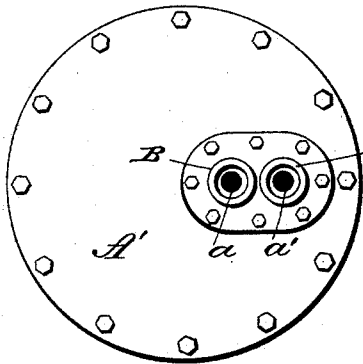


Fig. 12.

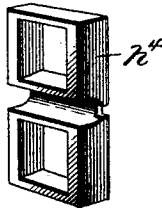


Fig. 7.

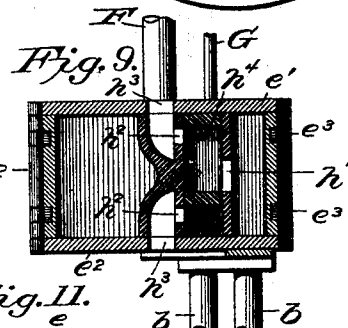
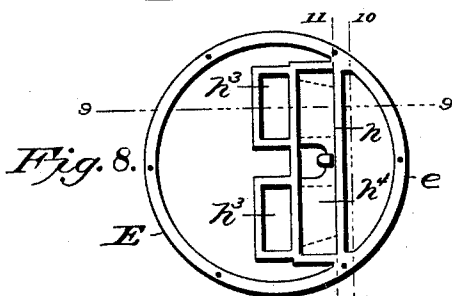
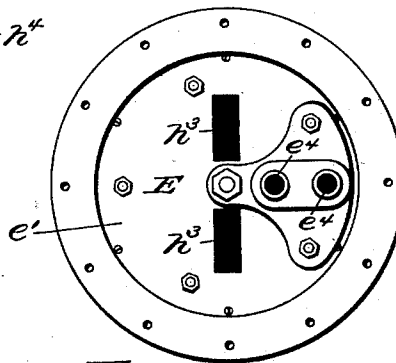


Fig. 10.

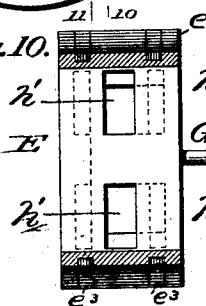
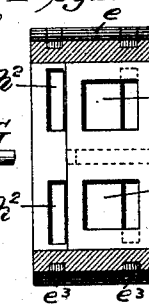


Fig. 11.



WITNESSES
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INVENTORS

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UNITED STATES PATENT OFFICE.

ALFRED N. OGLE AND CHARLES M. MAGUNSON, OF TWO HARBORS,
MINNESOTA.

STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 519,966, dated May 15, 1894.

Application filed February 15, 1894. Serial No. 500,288. (No model.)

To all whom it may concern:

Be it known that we, ALFRED N. OGLE and CHARLES M. MAGUNSON, citizens of the United States of America, residing at Two Harbors, in the county of Lake and State of Minnesota, have invented certain new and useful Improvements in Steam-Engines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of this invention is to provide an engine of improved construction which is so constructed as to dispense entirely with a side steam-chest and ports, the cylinder receiving the steam through one of the heads from which it is conveyed to a valved piston the slide of which is operated by a link-motion carried by the piston-rod.

The invention further embodies the special construction of the piston and manner of connecting the steam supply and exhaust pipes thereto.

The invention consists in the construction and combination of the parts, as will be hereinafter fully set forth and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification: Figure 1 is a side elevation of the steam-engine. Fig. 2 is a plan view of a three-way cock which is connected to the steam supply and exhaust pipes of the engine. Fig. 3 is a horizontal sectional view of Fig. 2. Fig. 4 is a vertical section of the turning-plug of the three-way cock. Fig. 5 is a longitudinal sectional view of the steam-cylinder and piston. Fig. 6 is a view of the back cylinder head. Fig. 7 is an end view looking into the cylinder, the back cylinder head being removed. Fig. 8 is an end view of the piston, one of the heads of the same being removed. Figs. 9, 10 and 11 are sectional views of the piston taken on the lines indicated in Fig. 8, and Fig. 12 is a detail view of the slide-valve located within the piston.

A designates the steam-cylinder to which is secured in the usual manner a back cylinder-head A' and a front cylinder head A".

The back cylinder-head is provided on one side of its center with openings *a* and *a'* with which connect the steam supply and exhaust pipes B B, while the front cylinder-head is provided with the usual central opening for the passage of the piston-rod and below the same with an opening through which passes a rod which connects the slide-valve of the piston with the link-motion, these openings being surrounded by the usual glands for the reception of packing.

The steam supply and exhaust pipes B B may be coupled to a three-way cock which consists of a suitable casing containing a turning-plug having a stem *c'* which extends through the casing and is squared to provide for turning the plug. The turning-plug is provided with a steam-way *c''* which is contracted at one end so as to connect the steam supply pipe D with one of the pipes B, the pipe to which it is connected becoming the supply pipe for the valved-piston and the other the exhaust pipe, the under side of the turning-plug being cut away as shown in Fig. 4 so that the exhaust-steam can pass through an opening in the under side of the casing and be exhausted therefrom. By means of this three-way cock the live-steam can be conducted to either one of the pipes B or entirely cut off by positioning the turning-plug so that the contracted end of the steam-way *c''* will be against the part of the casing which separates the openings to which the pipes B B are connected. The turning-plug is operated by a lever *c'''* having a lug which engages a rack-plate *c''''* secured to the casing. It will be noted that but a slight movement of the turning-plug is required to change the supply of live-steam to either of the pipes B, or to cut it off entirely. When the lever is in engagement with the central notch of the rack the steam is entirely cut off from the engine.

E designates the piston which is made up of a band *e* and heads *e'* and *e''*, the band having the usual packing rings *e'''*. The heads of the piston are each provided with a central opening for connecting the piston-rod F thereto, while the head *e'* has also an opening for the passage of the rod which operates the slide-valve and the head *e''* openings *e''''* with which connect pipes *b b* which extend through

the apertures a and a' in the back cylinder-head and slide in the pipes B B. The pipes b b are provided with suitable packings to provide steam-tight joints.

5 The slide-valve which is located within the piston comprises a space h for the reciprocating valve h^4 which connects with one of the pipes b through the opening e^4 , with the other pipe b through the port h' and with the steam cylinder through the ports h^2 and steam-ways h^3 . The reciprocating valve h^4 is adapted to slide in the space h and is provided with openings or ways so that when it is operated by the rod G it will open and close the ports h' and h^2 to deliver the steam on one side of the piston while the dead-steam is exhausted from the other side.

I designates the cross-head of the piston-rod which is connected to the pitman K in the usual manner and slides between the guides i i . To the cross-head is attached a bracket i' through which the rod G which operates the slide-valve passes. Upon the pitman adjacent to its connection with the piston-rod are secured a slotted plate L and a segment-rack M, between which is pivoted a lever N one end of which is slotted for engagement with a pin in the slot of the plate L while the other end is adapted to engage with the segment-rack. A link g is connected at one end to the pin l and at the other to the end of the rod G. By simply moving the lever the slide-valve contained within the piston can be adjusted so as to entirely cut off the supply of steam or as a variable cut off to reverse the supply and exhaust and change the direction of the engine. It will be noted that the link-motion comprising the slotted plate, segment-rack and lever are connected to the pitman so that as the angle of said pitman is varied by the movement of the crank-portion of the shaft the slide-valve will be shifted.

By means of the three-way cock hereinbefore described the live-steam can be fed into either one of the pipes which connect with the piston, and as the live-steam passes directly through the slide-valve there is no steam on top of the valve and consequently no pressure. It will also be noted that when live-steam is fed into the lower pipe b the passage of said steam through the slide-valve and ports will be reversed from the direction it takes if it enters through the upper pipe.

An engine thus constructed being without eccentrics power required to overcome lost motion and friction is obviated, and as the piston is supported from each end by the piston-rod on one side and feed and exhaust pipes on the other the wear on the bottom of the steam-cylinder and piston will be reduced to a minimum.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

65 1. In an engine, the combination, of a cylinder having heads A' and A^2 , the head A' having supply and exhaust pipes connected

thereto the other head having a central aperture for the passage of the piston-rod and an aperture for the passage of the valve-operating-rod, together with a piston having a slide-valve to which the valve operating-rod is connected, and supply and exhaust pipes which enter the pipes connected to the cylinder-head A' , substantially as shown and for the purpose set forth. 70 75

2. In an engine a piston having a slide valve and supply and exhaust pipes connected thereto, the supply and exhaust pipes extending through one of the heads of the steam-cylinder, the piston and valve rods passing through the opposite head of the cylinder, substantially as shown. 80

3. In an engine, a piston having a slide-valve located therein, supply and exhaust pipes connected with the slide-valve and extending into supply and exhaust pipes which extend beyond the steam-cylinder in combination with a cylinder having heads A' and A^2 , the head A' having supply and exhaust pipes B B into which the pipes carried by the piston pass, the head A^2 having a central opening through which passes the piston-rod and an opening through which the rod operating the slide-valve passes, substantially as shown, the rods and pipes attached to the piston supporting the same in the cylinder, as set forth. 85 90 95

4. In a steam-engine, the combination, of a cylinder having heads A' and A^2 as shown, one of the cylinder-heads having steam supply and exhaust pipes which communicate with openings in said head, of a valved piston one of the heads of which carries pipes which pass through the cylinder-head A' and enter the pipes attached thereto, one of said pipes entering the steam supply pipe, substantially as shown and for the purpose set forth. 100 105

5. In a steam-engine, a steam-cylinder having heads A' and A^2 , one of the cylinder-heads having connected thereto supply and exhaust pipes, a three-way cock connected with the supply and exhaust pipes and with a steam supply pipe, a valved piston having pipes b b which pass through the cylinder-head and enter the supply and exhaust pipes, and means for operating the valve in the piston, substantially as shown and for the purpose set forth. 110 115

6. In combination with a steam cylinder, a valved piston connected with steam supply and exhaust substantially as shown, a valve rod for operating the valve connected by a bar or link to a plate carried by the pitman of the engine substantially as shown. 120 125

7. In combination with a steam-cylinder, a valved piston connected with steam supply and exhaust substantially as shown, a rod for operating the valve connected by a link and pin to a slot in a plate carried by the pitman, substantially as shown. 130

8. In combination with a steam-cylinder, a valved piston connected with steam supply and exhaust substantially as shown, a rod for

operating the valve connected by a link and pin to a slotted plate carried by the pitman, together with a lever pivoted to the pitman and engaging at one end with the pin to which the valve-rod is connected, substantially as shown, and for the purpose set forth. 15

9. In a steam-engine, the combination of a cylinder constructed substantially as shown and provided with pipes B B, a valved-piston E carrying pipes b b which enter the pipes B B, the piston having ports and steam ways which lead from the space in which the valve slides into the steam-cylinder and into a

steam-way connected with one of the pipes b, the slide-valve having steam-ways as shown, together with a rod G for operating the reciprocating valve, substantially as shown, and for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

ALFRED N. OGLE.
CHARLES M. MAGUNSON.

Witnesses:

W. B. WOODWARD,
JOHN DWAN.