D. COCKBURN & D. MacNICOLL.

STEAM REGULATING VALVE.

APPLICATION FILED JAN. 13, 1916.

1,195,658.

Patented Aug. 22, 1916.

4 SHEETS—SHEET 1.

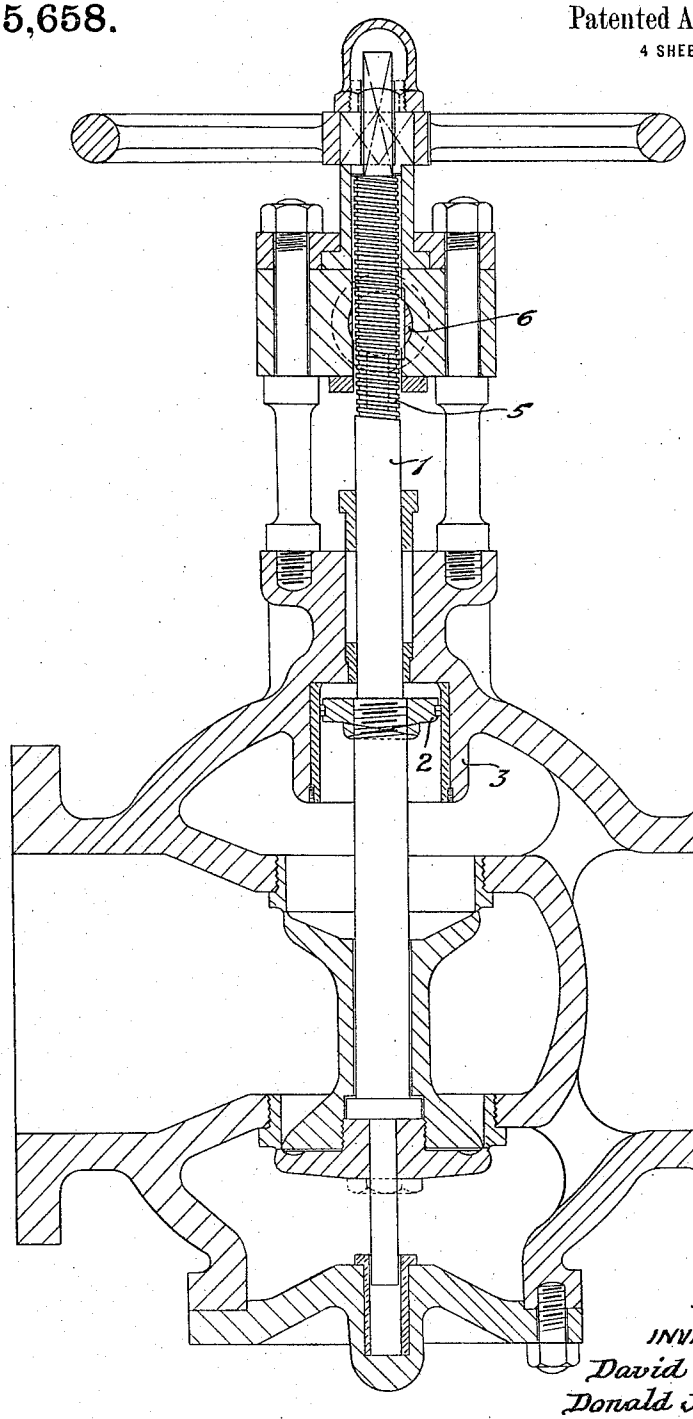


FIG. 1.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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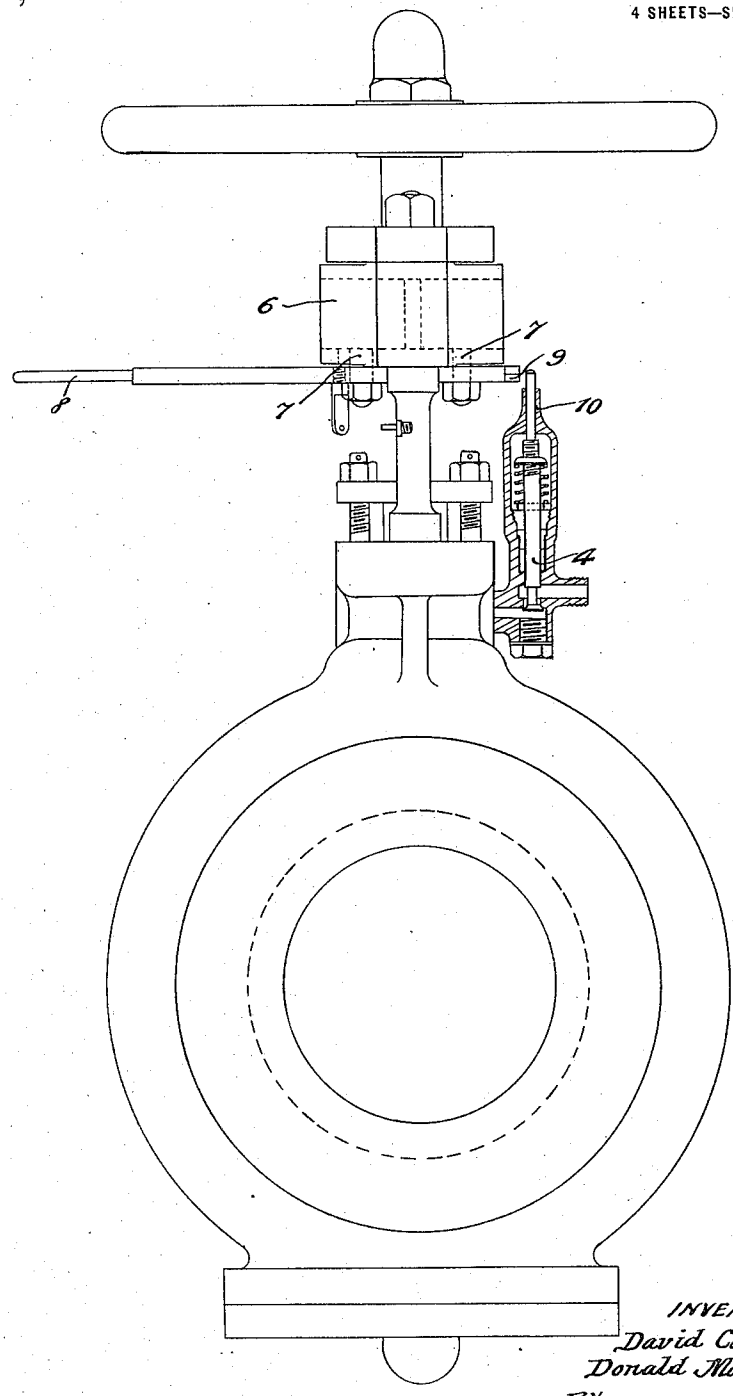


FIG. 2.

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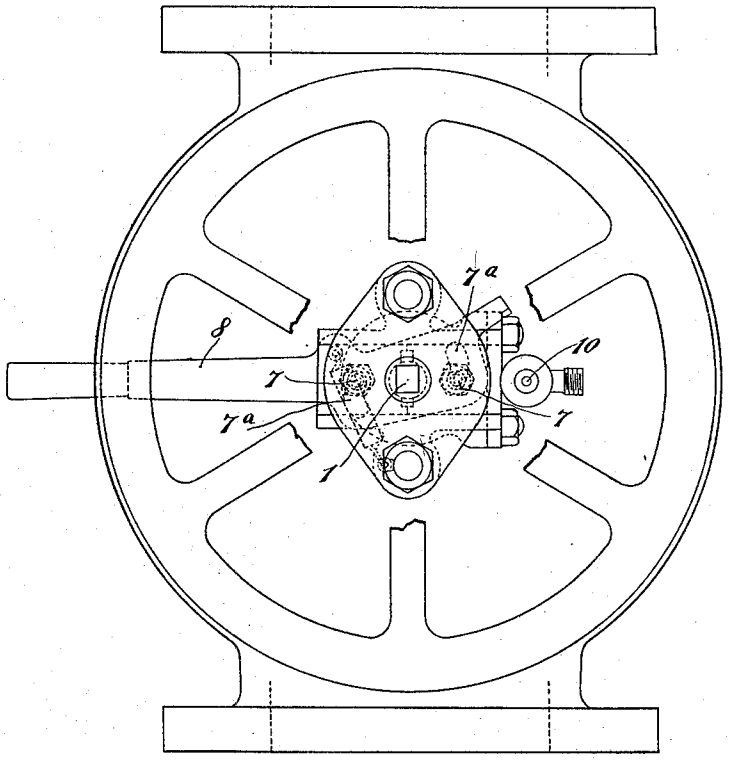


Fig. 3.

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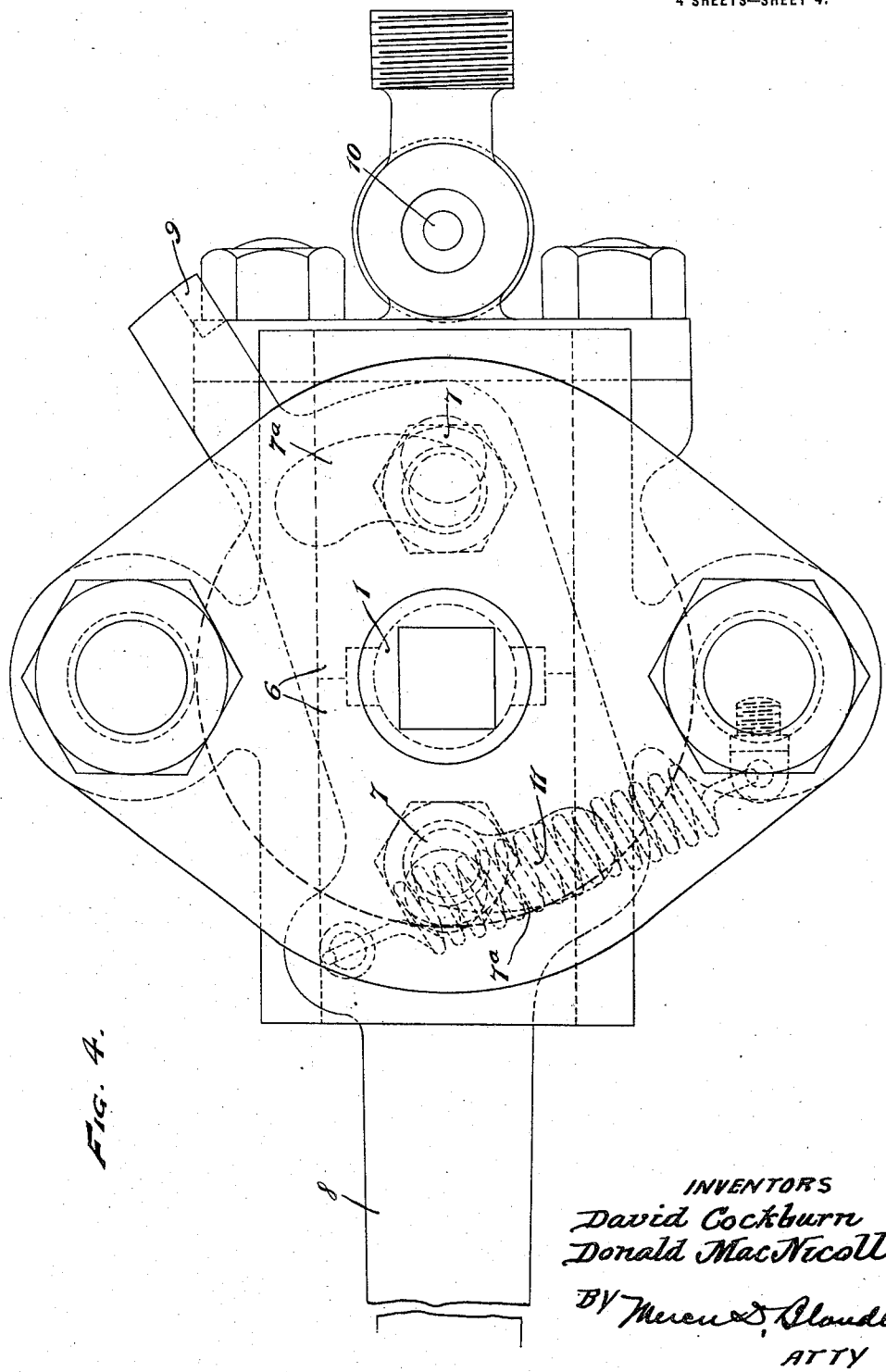


FIG. 4.

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UNITED STATES PATENT OFFICE.

DAVID COCKBURN AND DONALD MacNICOLL, OF CARDONALD, NEAR GLASGOW, SCOTLAND.

STEAM-REGULATING VALVE.

1,195,658. Specification of Letters Patent. Patented Aug. 22, 1916.

Application filed January 13, 1916. Serial No. 71,974.

To all whom it may concern:

Be it known that we, DAVID COCKBURN and DONALD MacNICOLL, subjects of the King of the United Kingdom of Great Britain and Ireland, and both residing at Cardonald, near Glasgow, Scotland, have invented a certain new and useful Improvement in Steam-Regulating Valves, of which the following is a specification.

This invention relates to improvements in steam regulating valves and has for its primary object to provide a valve capable of being rapidly closed, but also adapted to be opened or closed more or less slowly when desired.

The present invention consists in an improved steam regulating valve including a spindle equipped with a piston for operation when the valve is under steam control and formed with a screw-threaded portion engaged by a divided nut which acts as an abutment restraining axial movement of the spindle unless during rotation of such spindle when the valve is under direct manual control and provided with means adapted to disengage the nut from the threaded portion and concomitantly to establish steam control of the valve, whereby the valve is constrained rapidly to close without interference by the elements for effecting direct manual control of the valve. As preferably constituted the means for effecting the change of control comprises a hand lever adapted to rotate around an axis coincident with that of the spindle and provided with slots eccentric to the spindle, each of such slots being entered by a pin or follower fitted to one of the divisions of the nut. Formed also on the hand lever is a cam surface cooperable with the spindle of a pilot valve which, when operated, permits exhaustion of steam from the side of the piston remote from the valve and thus effects immediate closure of the main valve. The arrangement is such that, when rocking movement is imparted to the hand lever, the divisions of the nut are constrained to separate and the spindle is rendered free for endwise movement whereafter the cam surface is brought into effective contact with the pilot valve spindle and the main valve is constrained rapidly to close under the influence of steam pressure.

The invention is illustrated in the accompanying drawings in which—

Figure 1 is a vertical section, Fig. 2 a side elevation, Fig. 3 a plan view, the central portion of the hand wheel being broken away, Fig. 4 a detail plan view, and Fig. 5 is a detail view of the piston and the adjacent walls of its cylinder, illustrating the gaps between the ends of the piston rings.

As shown, the improved steam regulating valve comprises a main valve spindle 1 equipped with a piston 2 for operation when the valve is under steam control. The piston is movable in a cylinder 3, the open end of which is subject to steam pressure and the closed end of which is normally subject to the pressure of steam leaking through the gaps between the ends of the piston rings past the piston, the piston being thus normally balanced. Communicating with the closed end of the cylinder 3 is a passage the outlet of which is controlled by a pilot valve 4 hereinafter referred to. The upper end of the spindle 1 is screw-threaded at 5 and is engaged by a correspondingly threaded nut 6 which normally sustains the spindle against axial movement. The nut 6 is divided into halves, the threaded faces of which are maintained in engagement with the screw-threaded portion of the spindle by virtue of end thrust imparted to such halves by pins 7 which act as followers to eccentric slots 7^a formed in a spring loaded hand lever 8 adapted to swing on an axis coincident with that of the main valve spindle 1. The eccentricity of the slots is such that, when the hand lever 8 is rocked, say through an angle of 30°, the halves of the nut are constrained to recede from or approach the spindle. Formed on one edge of the hand lever is a cam surface 9 adapted, when the lever is rocked into a position such that the halves of the nut 6 are separated, to enter into effective contact with the spindle 10 of the pilot valve 4 and thus to open said valve. It will be readily understood that the separation of the halves of the nut 6 and the immediately subsequent operation of the valve 4 will be accompanied by a rapid closing movement of the main valve. The lever 8 is urged by a spring 11 or springs tending to maintain the lever in the position corresponding to the engagement of the spindle

by the halves of the nut 6, so that, when the lever is released, it is moved automatically toward initial position, the pilot valve spindle 10 being restored to normal position and the halves of the nut being brought close together, either in actual engagement with the screw-threaded spindle or ready for engagement therewith as soon as the spindle 1 is rotated.

What we claim is:—

1. In a steam regulating valve, in combination, a manually rotatable valve spindle formed with a screw threaded portion, a divided nut engaging said screw-threaded portion, a piston on said spindle exposed to steam pressure when the valve is open, means for controlling the pressure on said piston, and means to disengage the nut from said threaded portion and concomitantly to actuate said controlling means to effect the closing of the valve by the pressure on said piston.

2. In a steam regulating valve, in combination, a manually rotatable screw-threaded spindle, a nut normally in engagement with, and acting to restrain axial movement of said spindle, a piston on said spindle, said piston being exposed to steam pressure on both sides when the valve is open, an escape valve to control passage of steam from one side of the piston, and means to operate the escape valve and concomitantly to disengage the nut from the spindle, substantially as and for the purpose set forth.

3. In a steam regulating valve, in combination, a valve spindle formed with a screw-threaded portion, a nut engaging said screw-threaded portion, a piston on said spindle exposed to steam pressure when the valve is open, means for controlling the pressure on said piston, and means to disengage the nut from said threaded portion and concomitantly to actuate said controlling means to effect the closing of the valve by the pressure on said piston.

4. In a steam regulating valve, in combination, a manually rotatable screw-threaded spindle, a piston, on said spindle, an escape valve to control the effect of steam pressure on said piston, a manually rotatable lever provided with eccentric slots and formed with a cam surface coöperating with said escape valve and a divided nut in engagement with said screw-threaded spindle and formed with studs entering said slots, substantially as and for the purpose set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

DAVID COCKBURN.
DONALD MACNICOLL.

Witnesses:
WALLACE CRANSTON FAIRWEATHER,
HENRY MASON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."