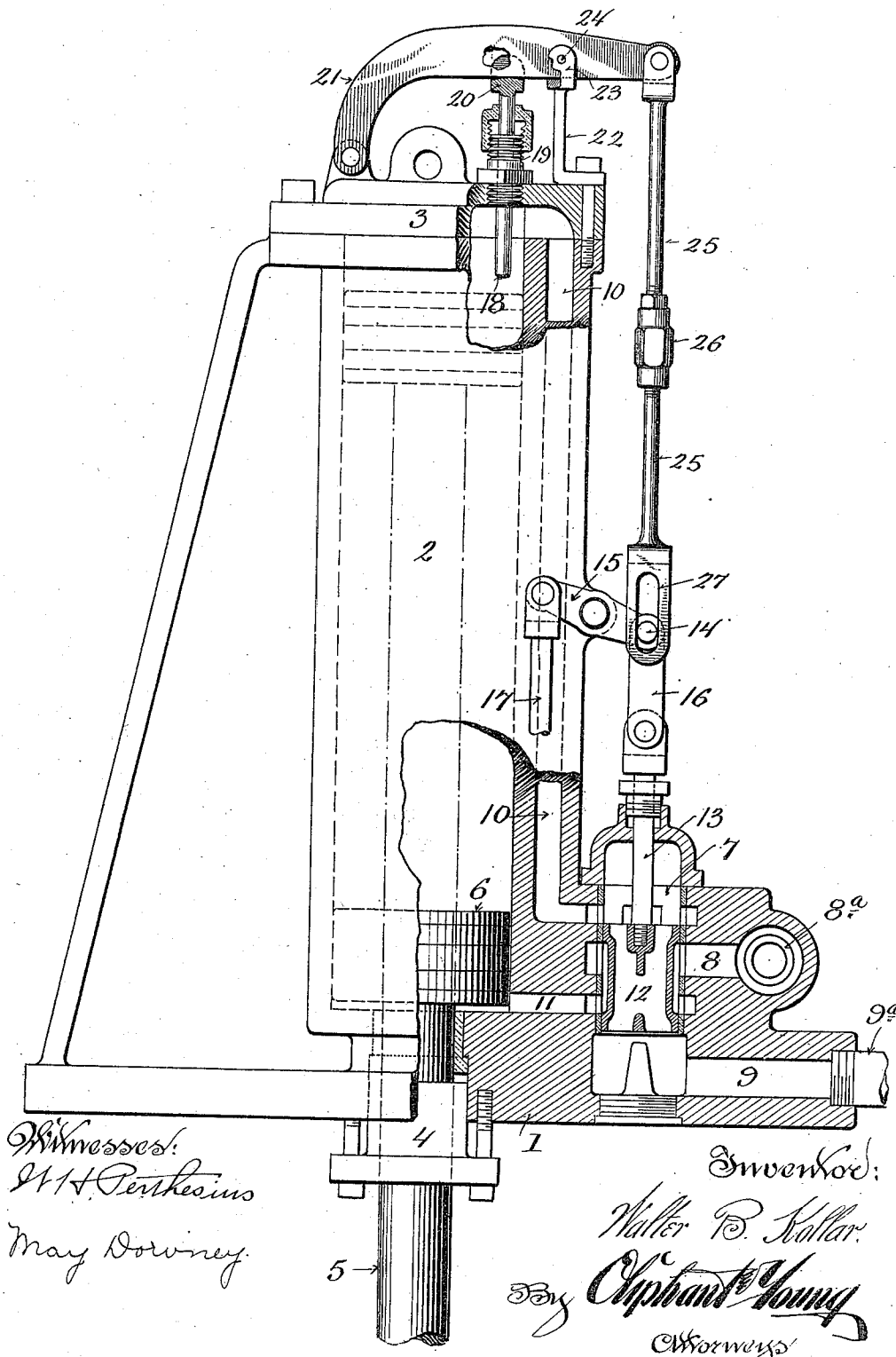


W. B. KOLLAR.
SAFETY DEVICE FOR STEAM ENGINES.
APPLICATION FILED OCT. 21, 1910.

984,935.

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UNITED STATES PATENT OFFICE.

WALTER B. KOLLAR, OF LANSING, MICHIGAN.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WALTER B. KOLLAR, a citizen of the United States, and resident of Lansing, in the county of Ingham and State of Michigan, have invented certain new and useful Improvements in Safety Devices for Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention refers to steam engines, its object being to provide a simple, economical and effective automatic safety appliance in connection therewith, whereby cylinder heads are prevented from being knocked out due to breakage of the piston-rod or overthrow of the piston from other causes, the invention being particularly applicable to power mechanisms such as steam hammers, steam feeds for saw-carriages, or the like. The construction and arrangement of the safety appliance is such that a tappet extends into the cylinder and is in link connection with the valve-gear of the engine, the apparatus as a whole being held in a normal inert set position by a brake-pin, whereby the end of the tappet is clear of the normal stroke of the piston. Should overthrow of the piston occur from any cause, it would result in power being applied to the tappet sufficient to sever the brake-pin and thus, through a series of lever connections between the tappet and valve-gear the steam power will be immediately reversed or cut off entirely therefrom.

With the above object in view the invention therefore consists in certain structural features and combination of parts as hereinafter set forth with reference to the accompanying drawings and subsequently claimed.

The drawing represents an elevation of an engine cylinder and a portion of the valve-gear, parts being broken away and in section to more clearly illustrate my safety invention, which invention is shown in connection with the cylinder and valve-gear.

Referring by characters to the drawing, 1 represents the base of a steam-cylinder 2 that is closed at one end by a head 3 and provided at the opposite or lower end with a stuffing-box 4 for the reception of a piston-rod 5, the same being provided with a piston 6 that is adapted to reciprocate within said cylinder. The bed 1 is provided with a steam-chest 7 that is in communication with inlet and exhaust channels 8, 9,

respectively. The steam-cylinder is also provided with channels 10 and 11 that communicate with the upper and lower ends of the said cylinder and steam-chest in the usual manner, whereby steam is admitted upon opposite sides of the piston. A hollow slide-valve 12 is fitted within the steam-chest and adapted to control the several ports connected thereto, it being understood that the port 8 is provided with a suitable steam-feed pipe 8^a, while the exhaust port 9 has connected thereto a pipe 9^a. The slide-valve has a stem 13 that extends through a stuffing-box in the head of the steam-chest and this stem is connected to a pin 14 carried by a rocker 15 through a link 16, the opposite end of the rocker having attached thereto a valve rod 17 through which motion is imparted to the slide-valve from the piston in any desired manner.

The valve mechanism constituting the valve-gear just described forms no part of my invention and therefore further illustration of this mechanism is not considered necessary.

As a simple illustration of my invention to the steam-cylinder just described, I have, in this instance, shown a tappet 18 that passes through a stuffing-box 19 in the cylinder-head 3, the lower end of the tappet being normally so positioned that it is just clear of the piston 6, as indicated by dotted lines, when said piston is at its extreme upper end of the stroke. The upper end of the tappet is provided with a forked head 20 that engages a lever 21, which lever is fulcrumed to the cylinder head 3. Owing to the packing in connection with the stuffing-box 19, the tappet will be held against vertical movement, but even should said tappet drop to a slightly lower position due to vibration, the same would not affect the safety of the mechanism as this play would not be sufficient to cause disengagement of said tappet with relation to the lever. The lever 21 is supported in its normal position shown in the accompanying illustration by a bracket 22, which bracket is carried by the head 3 and is provided with apertured ears 23 that overlap the lever, through which apertures and a corresponding aperture of the lever a brake-pin 24 is passed. Thus said lever is securely locked against accidental movement. The end of the lever 21 has connected thereto a sectional rod 25 having a turn buckle connection 26, whereby the

rod may be adjusted as to length in its assemblage. This rod constitutes a connecting link between the safety mechanism and valve-gear, the lower end of said rod being
5 provided with a slotted head 27, through which slot pin 14 of the rocker extends. The length of the slot in head 27 is sufficient to permit free movement of the slide-valve in either direction.

10 In the accompanying illustration the piston is shown at the extreme lower end of its stroke, the slide-valve having just been reversed, whereby steam is now admitted under the piston through channel 11, steam
15 being exhausted through channel 10 that is open to the exhaust 9 through the hollow valve. The piston 6 will consequently now be forced upward to the position shown in dotted lines but, should breakage occur of
20 the piston-rod or through any other cause, the piston would have a further movement upward and engage the tappet 18, thrust upon which tappet would impart strain to the lever sufficient to sever the brake-pin 24.
25 Movement will consequently be imparted to the lever and its link connection to the valve-gear, whereby the same will be reversed and thus steam will instantly be admitted to the reverse side of the piston and accident avoided.
30 This same result might attain should any disarrangement of the valve-gear prevent shifting thereof at the proper time and such a contingency is possible in steam-feed mechanisms whereby the valves are hand-
35 controlled.

It should be understood that, while I have shown the piston as disconnected from any mechanism, it is apparent that the same may carry a hammer or analogous tool, or it
40 may be connected to the carriage of a saw-mill set-works. In either instance its effectiveness is apparent and liability to blow out the cylinder is avoided, the invention in its primary sense being provided as an emergency control of the steam supply to prevent overthrow of a piston.

I claim:

1. In a steam engine having a cylinder, a head therefor, a piston reciprocatively
50 mounted within the cylinder, a piston-rod for the piston, steam-channels connecting opposite ends of the cylinder, a controlling valve for the steam-channels, and actuating mechanism for the controlling valve; the

combination of a tappet extending through
55 the head into the cylinder normally disposed clear of the movement of the piston, a connecting means between the tappet and valve, and a brake-pin for locking the connecting
60 means.

2. In a steam engine cylinder having steam-channels connecting its opposite ends, and a controlling-valve for the steam-channels; the combination of a tappet extending
65 into the cylinder, a lever supported by the cylinder adapted to be engaged by the tappet, a brake-pin carried by said cylinder for locking the lever, and a link connection between the lever and valve.

3. In a steam engine having a cylinder, a
70 head-closure for the same, a piston reciprocatively mounted within the cylinder, a piston-rod in connection therewith, a steam-chest, inlet and exhaust steam-channels communicating with the chest, steam-channels
75 communicating with the chest and opposite ends of the cylinder, a slide-valve mounted in the steam-chest, a rocker, a pin carried by the rocker, and a link connection between the rocker-pin and slide-valve; the combination
80 of a lever fulcrumed to the end of the cylinder, a link carried by the lever having a slotted end adapted to engage the rocker-pin, a bracket extending from the cylinder having apertured ears, a brake-pin fitted in
85 the apertured ears and engaging said lever whereby the same is locked in its normal position, and a tappet extending into the cylinder having one end adapted to engage the
90 lever.

4. In a steam engine cylinder having steam-channels connecting its opposite ends, and a controlling valve for the steam-channels; the combination of a tappet extending
95 into the cylinder, a lever supported by the cylinder adapted to engage the tappet, means connecting the lever and valve, and other means for holding the lever in a set position relative to the tappet.

In testimony that I claim the foregoing I
100 have hereunto set my hand at Lansing in the county of Ingham and State of Michigan in the presence of two witnesses.

WALTER B. KOLLAR.

Witnesses:

GEROME S. BOND,
ED. S. TOOKER.