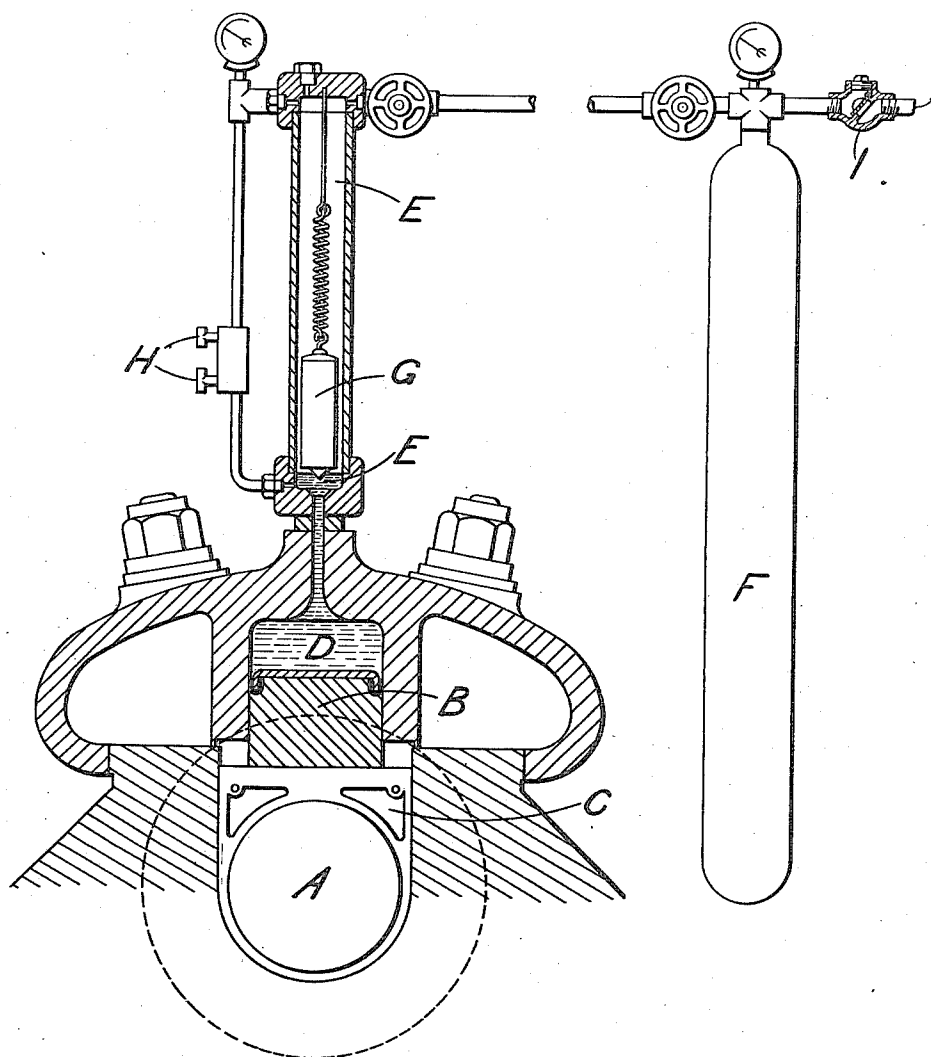


J. H. BLAKESLEY.
ROLLING MILL.
APPLICATION FILED JULY 20, 1911.

1,030,865.

Patented July 2, 1912.



WITNESSES.

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JOHN HOLMES BLAKESLEY, OF LONDON, ENGLAND.

ROLLING-MILL.

1,030,865.

Specification of Letters Patent.

Patented July 2, 1912.

Application filed July 20, 1911. Serial No. 639,554.

To all whom it may concern:

Be it known that I, JOHN HOLMES BLAKESLEY, subject of the King of England, residing at London, in England, have invented certain new and useful Improvements in Rolling-Mills, of which the following is a specification.

This invention relates to mills for rolling metals, fiber or other materials, and has for its object to render the rolls more resilient, less liable to become broken and to overcome the results of such an occurrence.

Hitherto the rolls of certain types of such mills have been provided with rams usually actuated by water or other liquid under pressure so as to allow the rolls to yield if any foreign body of excessive magnitude or hardness occurs in the material being rolled. Such arrangements have been deficient in resilience and moreover necessitate the employment of a separate pump and accumulator for each standard of rolls.

According to this invention air supplied under pressure acts directly on a shallow layer of liquid which transmits the pressure to the rolls through a ram, but is of such small total mass as not seriously to diminish the resilience of the air by liquid friction. This layer of liquid feeds the backings of the ram and serves other objects hereafter described. A reservoir or accumulator is provided for the compressed air of a sufficient size to prevent dangerous increase of pressure when the rolls are lifted, and an air compressor is employed to maintain the necessary pressure. In this manner a more even pressure is maintained on the rams and rolls, and greater resilience is obtained than has hitherto been possible, so that the rolls are readily and quickly returned to their normal position after being forced apart.

Considerable saving is effected in the piping between the rams and the accumulator, as, owing to the small resistance to the flow of gas, piping of smaller diameter can be employed than in the case of hydraulic rams, this piping being not only cheaper but stronger. Further, for the same reason, the pipes may be of greater length so that the same compressor serves a large number of rolls.

In the accompanying drawing, one form of apparatus constructed in accordance with this invention is diagrammatically illustrated, in which A is the center of the up-

per roll in a mill and B a ram pressing downward on the bearing C of the roll A. The ram B is mounted in a cylindrical cavity forming a ram chamber D, and a narrow neck or conduit establishes communication between the ram chamber and an intermediate chamber or reservoir E disposed above it. From the upper end of the reservoir E piping leads to the reservoir or accumulator F for the compressed air, and further to the compressor, which is not shown, as the type thereof may vary and forms no part of the present invention. The chamber E constitutes a liquid reservoir and is of sufficient size to contain all the liquid behind the ram so that none of this can be forced into the small tubing connecting the liquid and air reservoirs when the ram rises.

A float G is suspended by a spring within the reservoir E from the upper end thereof and the bottom of the float fits into a seating formed at the upper end of the conduit connecting the liquid reservoir and ram chamber D so that when the float descends far enough it will form a valve and shut off communication between the liquid reservoir and ram chamber. The spring is strong enough to hold up the float G against the flow of liquid when the ram is normally falling after a rise, but should the ram chamber D be reduced to atmospheric pressure by the breakage of a roll, bearing or standard, or some other accident, the flow of the liquid from the reservoir E, and the fall of its surface level, will cause the float to sink and close the valve, thus preventing the escape of the compressed air, and the danger resulting therefrom. The reservoir E is provided with a pipe which communicates with the upper and lower ends thereof having in its course two cocks H, H, which serve as gage cocks for observing and controlling the level of the liquid in the reservoir E, the arrangement being similar to that employed with steam generators. One or more valves, as I, may also be provided near the air compressor to prevent the escape of air in the case of accident to this, so that the mills will continue to work for some time without further addition of air.

It will be understood that by suitably curving the conduit connecting the liquid reservoir and the ram chamber, pressure may be applied vertically or obliquely, in an upward or downward direction, or horizon-

tally, so that, without departing from this invention, the arrangement is equally applicable to a bottom or a side roll in any position, though it is here only represented as
5 applied to a horizontal or top roll. Although compressed air has been described as the fluid which maintains the necessary pressure, it will be understood that any inert gas which does not condense at ordinary
10 temperatures may be employed without departing from this invention.

What I claim as my invention and desire to secure by Letters Patent is:—

15 1. In a rolling mill the combination with a pressure chamber provided with a ram actuated by air or gas supplied under pressure of a liquid reservoir communicating with the ram chamber and a valve adapted to shut off the supply of compressed air to

the ram chamber when the pressure therein 20 falls as and for the purpose set forth.

2. In a rolling mill the combination with a ram actuated by air or gas supplied under pressure of a liquid reservoir mounted between and communicating with the source 25 of pressure and the ram chamber and a float valve in the reservoir adapted to shut off the supply of compressed air when the liquid escapes from the ram chamber and reservoir as set forth. 30

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN HOLMES BLAKESLEY.

Witnesses:

MAURICE STRODE,
FRANK GODWIN.