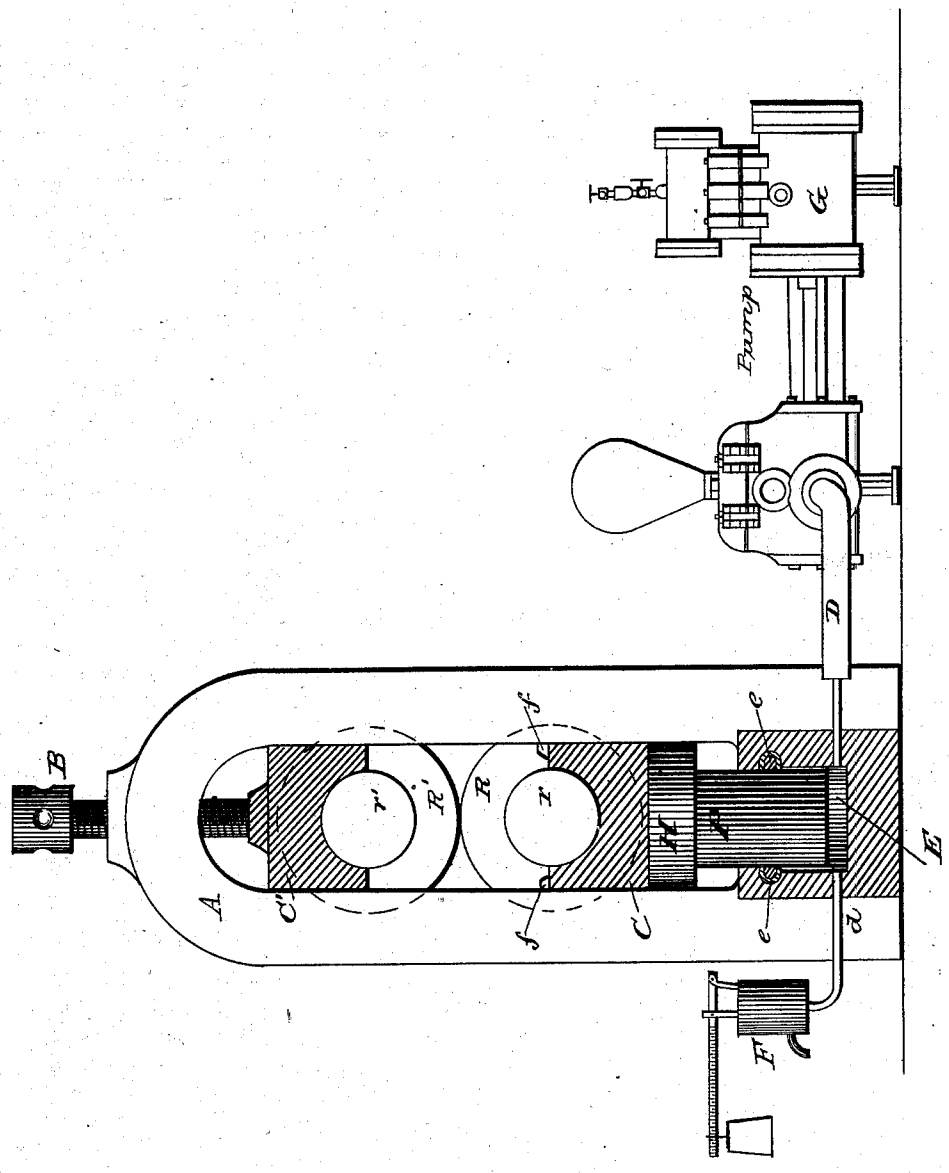
(No Model.)

R. UREN.

ROLLING MILL.

No. 274,856. Patented Mar. 27, 1883.



WITNESSES:

Fred. L. Dieterich.

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UNITED STATES PATENT OFFICE.

RICHARD UREN, OF HOUGHTON, MICHIGAN.

ROLLING-MILL.

SPECIFICATION forming part of Letters Patent No. 274,856, dated March 27, 1883.

Application filed December 8, 1882. (No model.)

To all whom it may concern:

Be it known that I, RICHARD UREN, of Houghton, in the county of Houghton and State of Michigan, have invented certain new and useful Improvements in Rolling-Mills; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, which forms part of this specification.

My invention has relation to rolling-mills; and it consists in the means, as hereinafter more fully described and claimed, for supporting the bottom roll at each end of a set of rolls, whereby I prevent breakage of the roll or its support in case of any sudden strain upon the rolls by neglecting to properly ease the adjusting-screw, or from other causes.

In the accompanying drawing I have shown a vertical elevation, partly in section, of one of the sides of the frame or so-called "cheeks" of a rolling-mill equipped with my improvement.

A is the frame; B, the adjusting-screw of the upper roll; R′ and R, the rolls; *r′* and *r*, their respective journals; and C′ and C, the "pillow-blocks" or bearings of the respective roll-journals. The pillow-block C of the bottom roll rests, at each end of the frame, upon the head H of a plunger or piston, P, said head being of a shape and area corresponding to or approximating that of the pillow-block C. The plunger P works in a cylinder or barrel, E, in the lower part of the frame, which has an inlet-pipe, D, communicating with a small but powerful force-pump, G, of any approved construction. This pump is kept in continuous operation while the mill is working, and pumps water, oil, or other liquid into the cylinder E, the pump connecting with a suitably-located tank or reservoir, (not shown in the drawing.) Another pipe, *d*, connects cylinder E with a safety-valve, F, of any desired construction, the weight on which (as usual in safety-valves) may be adjusted to regulate the fluid-pressure within cylinder E. The latter has an annular groove or channel, *e*, which is filled with packing, thus forming a stuffing-box for plunger P and preventing waste of the fluid through the top of the cylinder. Upon the cheeks A are stops *f*, which may be either fixed or adjustable, for the purpose of regulating the position of the lower roll and its bearings relative to the upper roll irrespective of the fluid-pressure to which plunger P is subjected. In other words, the bottom roll cannot rise higher than to the stops *f f*, which indicate its proper working position; but it will be maintained in this position by the hydraulic pressure caused by the steady inflow of fluid into cylinder E, which compensates for any waste or leakage that may occur. Excess of pressure beyond a given point brings the safety-valve F into operation, and the fluid will escape through it, and may be conducted back through suitable tubing to the tank or reservoir connecting with the force-pump, from which it is again fed to the cylinder, thus constituting a regular circuit. This of course applies equally well whether the excess of pressure is under the plunger or above it, caused by sudden strain or pressure on the bottom roll. In the latter case the roll will yield to the strain by depressing plunger P, forcing out a portion of the liquid through the safety-valve; but the moment the strain or excess of pressure ceases to operate, the roll will resume its former position by the injection of liquid into the cylinder through the force-pump, which, as I have stated, is in continuous operation during the working of the mill. The point at which the roll will yield is regulated by the adjustment of the safety-valve.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a rolling-mill, a bottom roll having its bearings supported upon the plunger or platen of a hydrostatic press connecting with a force-pump and safety-valve adapted to regulate the strain or pressure upon the roll at which it will yield, substantially as and for the purpose shown and set forth.

2. The combination, in a rolling-mill, of the bottom roll and its pillow-blocks or bearings, the hydrostatic press, the force-pump, and the safety-valve, constructed and arranged to operate substantially as and for the purpose shown and set forth.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

RICHARD UREN.

Witnesses:
A. R. GRAY,
THOS. C. POPE.