G. H. SELLERS.

HYDRAULIC HOUSING FOR ROLLS.

No. 103,667. Patented May 31, 1870.

Fig. 1.

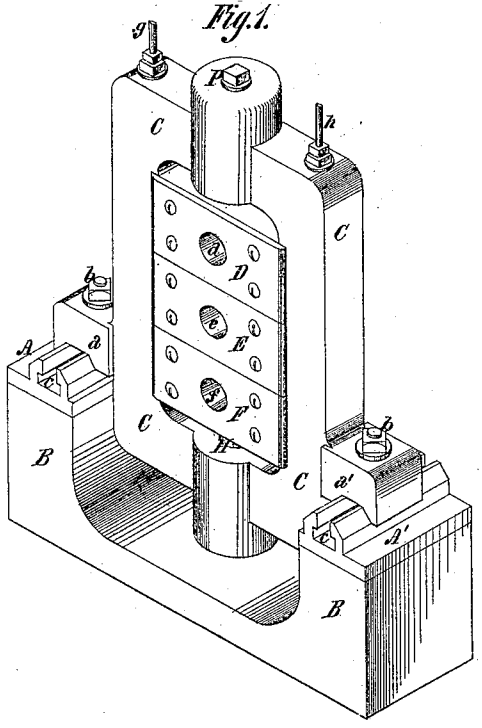
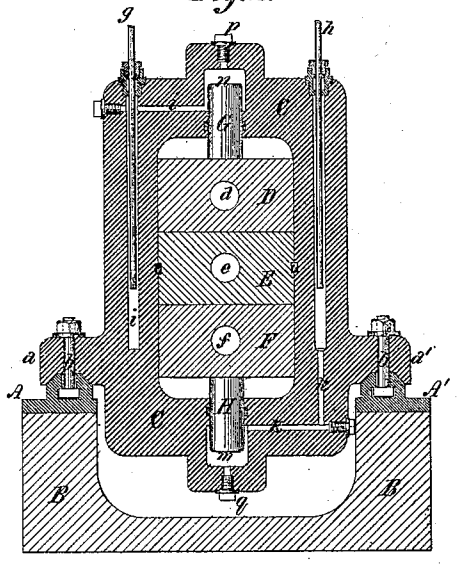


Fig. 2.



Witnesses.

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GEORGE H. SELLERS, OF WILMINGTON, DELAWARE.

Letters Patent No. 103,667, *dated May* 31, 1870.

IMPROVEMENT IN HYDRAULIC HOUSINGS FOR ROLLS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, GEORGE H. SELLERS, formerly of Phœnixville, in the county of Chester, and State of Pennsylvania, but now residing at Wilmington, in the county of New Castle, and State of Delaware, have invented certain new and useful Improvements in Hydraulic Housings for Rolling-Mills, of which the following is a sufficient description and specification.

My invention relates to that class of rolling-mills in which the rolls are adjusted by hydraulic pressure. Such mills, as heretofore constructed, have allowed the fluid, by the pressure of which one of the rolls was forced up, to escape. after having performed its work, through a suitably arranged valve or cock, the advance of the roll being greatest when no escape was permitted, and least when the amount of escape was increased.

The object of my invention is, in such a mill, without the use of any cock or valve whatever, and without any escape or discharge of the fluid, not only to secure a perfect regulation and adjustment of one or more of the rolls, but also to make it practicable for the rolls to be advanced or retired toward or from each other while the work is passing through them, so as to roll tapers and pieces of varying thicknesses in different parts; and

My invention, to these ends, consists in combining in a roll-train, housings to support the rolls; rolls mounted in the housings; sets of cylinders of different areas containing the fluid; and plungers of correspondingly different diameters, operating in their respective cylinders, the fluid in all the cylinders of each set being confined to that set, but its flow from one cylinder to another of the same set being unobstructed by cocks or valves, and regulated solely by the plungers, as hereinafter more fully set forth.

In the accompanying drawings, which illustrate the invention herein claimed—

Figure 1 is a view in perspective, and

Figure 2, a vertical central section through the same.

A suitable foundation, B B, supports the bed-plates A A′ of the housings C C, having lugs *a a′* projecting laterally from their base and resting upon the bed-plates.

Bolts *b b* pass through these lugs into longitudinal grooves or ways *c c* in the bed-plates, the heads of the bolts fitting in these grooves.

The bed-plates and housings are thus firmly clamped together, while the housings may be moved along the bed-plates to adjust them properly relatively to the rolls, as well as to permit the rolls to be removed.

In this example journal-boxes D E F, provided with proper bearings, *d e f*, for the necks of the rolls, are mounted in the housings.

The central box, E, is fixed in the housings, but the upper and lower boxes, D F, are movable in vertical ways, formed, in this instance, by flanges on the boxes, overlapping the sides of the housings.

The boxes D F are forced toward each other by plungers, G H, moving in properly-packed cylinders, *n m*, in the housings.

Each of these plungers is mediately operated through the fluid by its respective plunger *g h*, moving in a corresponding reservoir, *i k*, these reservoirs *i k* being of larger area than the diameters of the plungers *g h*, respectively, so that, while the plungers *g h* force the fluid from the reservoirs *i k*, respectively, into the cylinders *n m*, there always remains an annular space in the reservoirs *i k*, around the plungers *g h*, respectively, through which the ebb and flow of the fluid between all of the cylinders of the same set is permitted.

The fluid thus forced into the cylinders *n m* pushes out the plungers G H, which correspondingly move their respective boxes D F toward the central box E, and thus cause the rolls mounted in these boxes D F to approach each other.

The plungers move through boxes packed properly to prevent leakage.

The box D being counterweighted in the ordinary manner, when the plungers *g h* are retracted the fluid will flow back from the cylinders *n m* to the reservoirs *i k* respectively.

The plungers *g h* may be operated by any well-known mechanical means, such as levers, screws, cams, or racks and pinions, and, being of much smaller diameter than the plungers G H, they will very accurately indicate the adjustment of the rolls. If, for instance, the plungers *g h* were made of one-tenth the area of the plungers G H, then the movement of the plungers *g h* one inch would move the plungers G H one-tenth of an inch.

Screw-p' s *p q*, in the cylinders *n m*, are convenient for releasi the rolls when jammed, as, by unscrewing them, and thus allowing the fluid to escape, the pressure upon the rolls will at once be relieved.

Two or more small plungers may be used in the reservoirs to actuate the large plungers in the cylinders.

For rolling tapered iron, the plungers *g h* may be connected with the roll-train by any well-known mechanical device, in such manner as to be automatically moved thereby, so as to cause the rolls gradually to recede from or approach toward each other, as required for this kind of work.

For rolling iron of irregular or varying thicknesses in different parts, a correspondingly irregular or varying motion must be imparted to the plungers *g h*, and these motions can also be derived from the roll-train by any of the well-known mechanical devices to that end.

In either of these cases the connection or disconnec-

tion of the roll-train and plungers should be effected by the entrance of the bar between the rolls or its exit therefrom.

I have, for convenience, shown in this example the plungers *g h* and reservoirs *i k* arranged in the housings, but it is obvious that they could be arranged outside of the housings or in any convenient location, and connected by suitable pipes or passages with the cylinders *n m*, without departing from the essence of my invention.

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

In a rolling-mill, the rolls of which are to be adjusted by hydraulic pressure, the combination with the rolls of cylinders of different areas, and plungers of correspondingly different diameters, the forcing-plungers *g h* being smaller than the reservoirs *i k*, in which they operate, respectively, substantially as and for the purpose described.

GEO. H. SELLERS.

Witnesses:
ELI GARRETT,
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