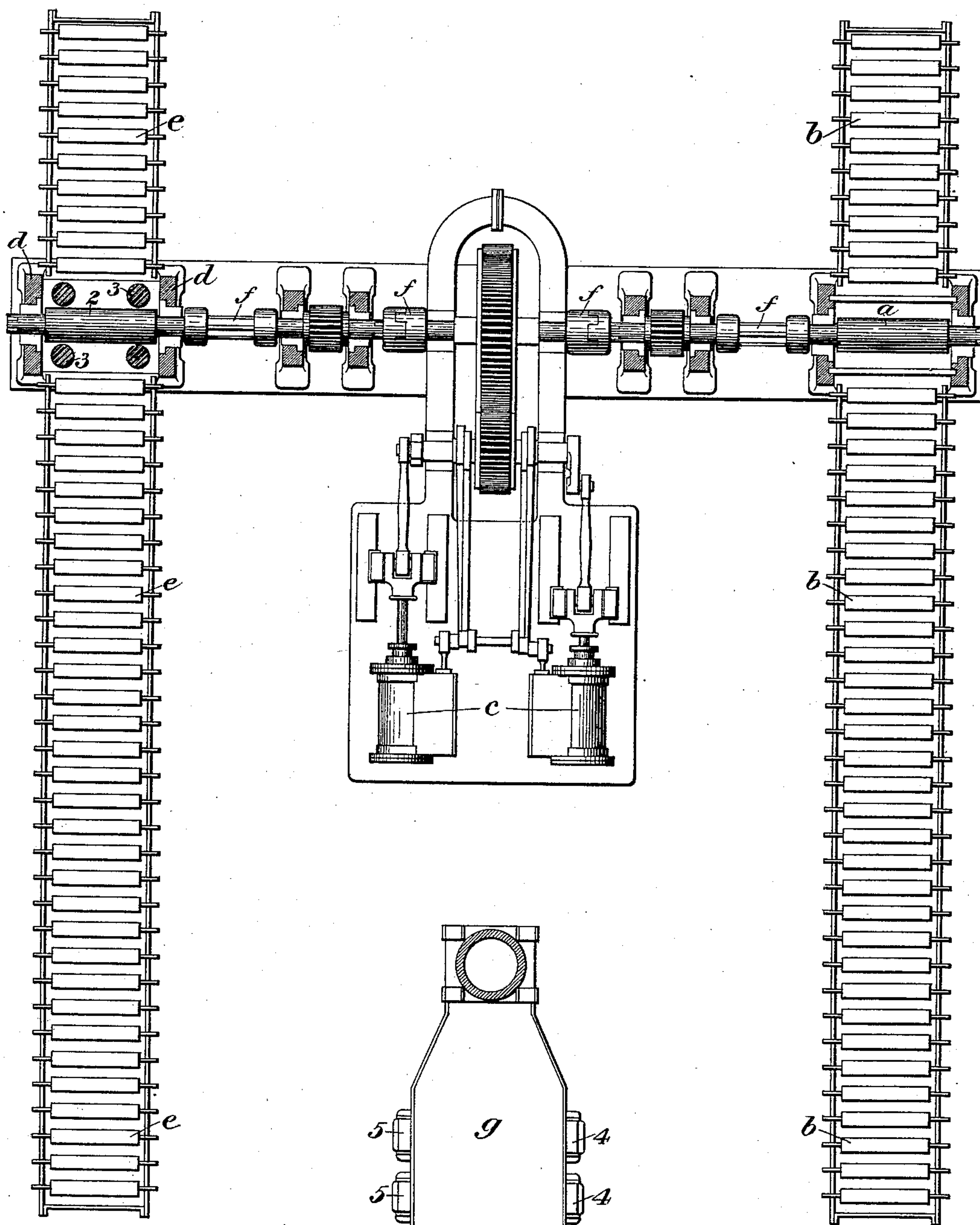


(No Model.)

D. B. OLIVER.  
METHOD OF MAKING PLATES.

No. 348,990.

Patented Sept. 14, 1886.



*Witnesses.*

W. B. Corwin  
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By his attys

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# UNITED STATES PATENT OFFICE.

DAVID B. OLIVER, OF ALLEGHENY CITY, PENNSYLVANIA.

## METHOD OF MAKING PLATES.

SPECIFICATION forming part of Letters Patent No. 348,990, dated September 14, 1886.

Application filed June 7, 1886. Serial No. 204,327. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID B. OLIVER, of Allegheny City, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Rolling Plates; and I do hereby declare the following to be a full, clear, and exact description thereof.

Iron and steel plates rolled in the universal mills are greatly preferred by engineers for structural purposes because the edges have the same smooth rolled surface as the sides.

Where structural plates are rolled in any ordinary plate-mill having only horizontal rolls the edges are ragged and uneven, and require to be sheared to straighten them; but these sheared edges are not smooth and the fiber of the metal is torn and exposed. In making these plates by the use of a universal mill the edges are subjected to the rolling pressure of the vertical or side rolls, which makes them smooth in surface and dense in structure. This method is attended, however, with additional expense, because the pile or ingot from which the plate is rolled has to be made of about the same width as the finished plate. When wide plates are required, these piles or ingots are so wide that they take up a large space in the heating-furnace, and therefore a comparatively small number and tonnage can be charged into the furnace at one time. The result is that much valuable time is lost and the mill is idle a considerable part of the time, materially decreasing its possible output. Another objection is that the pile or ingot is rolled lengthwise only, and tests taken crosswise of the finished plate will show it to be very low in tensile strength, elastic limit, and reduction of area. The tensile strength of the plates diagonally is also very low, which limits their use for web-plates.

To enable others skilled in the art to make and use my invention, I will now describe it by reference to the accompanying drawing, which is a plan view, partly in section, of a portion of a rolling-mill plant adapted to carry out my invention.

Here *a* indicates a set of plain rolls; *b*, the feed-tables of the rolls *a*; *c*, a pair of reversing-engines for driving the rolls; *d*, a universal mill having horizontal rolls 2 and vertical

rolls 3; *e*, the feed-tables of the mill *d*; *f*, a line of shafting and gearing connecting the engine *c* with the rolls *a* and *d*, and *g* is a heating-furnace having charging and discharging doors 4 and 5.

In practicing my invention, I take a heated pile or ingot of the proper weight and any desired width, which may be much narrower than the finished plate, and pass and repass it crosswise between the plain rolls *a* until it attains about the desired width of the finished plate. It is then transferred to the table *e* of the universal mill *d*, and is passed and repassed through the same until it is rolled down to the proper thickness, width, and length. The result of this operation is a plate with a smooth, compact, and unbroken surface or skin, having its fiber so disposed by the rolling that it will afford high tests both laterally and longitudinally, and the pile or ingot is of such shape that it can be economically and expeditiously heated, whereby unnecessary delay in operating the mill is avoided and its output is increased. These wide plates have never to my knowledge been made from a rolled blank, bloom, or slab, and no blooms or slabs suitable for the purpose exist or have been made in merchantable shape. Piles are masses of iron composed of small pieces made up into various shapes. They do not exist in merchantable shape, but are made up in the mill and charged directly into the furnace. When made of less width than the finished plate, they must be put through the rolls *a*, as described, before being rolled in the universal mill *d*.

The heating-furnace *g* is provided, so that if it is necessary to give the piece a wash-heat before putting it through the mill *d*, it may be transferred from the table *b* to the furnace *g* through the door 4, and thence through door 5 to the table *e* of the universal mill *d*.

While I have described a particular form of mill suitable for carrying my invention into practice, I do not limit myself to such construction, but desire to use any suitable form and arrangement of mill.

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

The method of making metal plates, which consists in rolling a pile or ingot of less width

than the finished plate crosswise between plain  
rolls until it attains about the width of the  
finished plate, and then rolling it lengthwise  
between top and bottom and side rolls to the  
5 desired thickness, width, and length, whereby  
a smooth unbroken rolled surface is imparted  
to the sides and edges of the plate, substan-  
tially as and for the purposes described.

In testimony whereof I have hereunto set my  
hand this 2d day of June, A. D. 1886.

DAVID B. OLIVER.

Witnesses:

W. B. CORWIN,

THOMAS B. KERR.