A. LAMBERTON.

METHOD OF ROLLING PLATES.

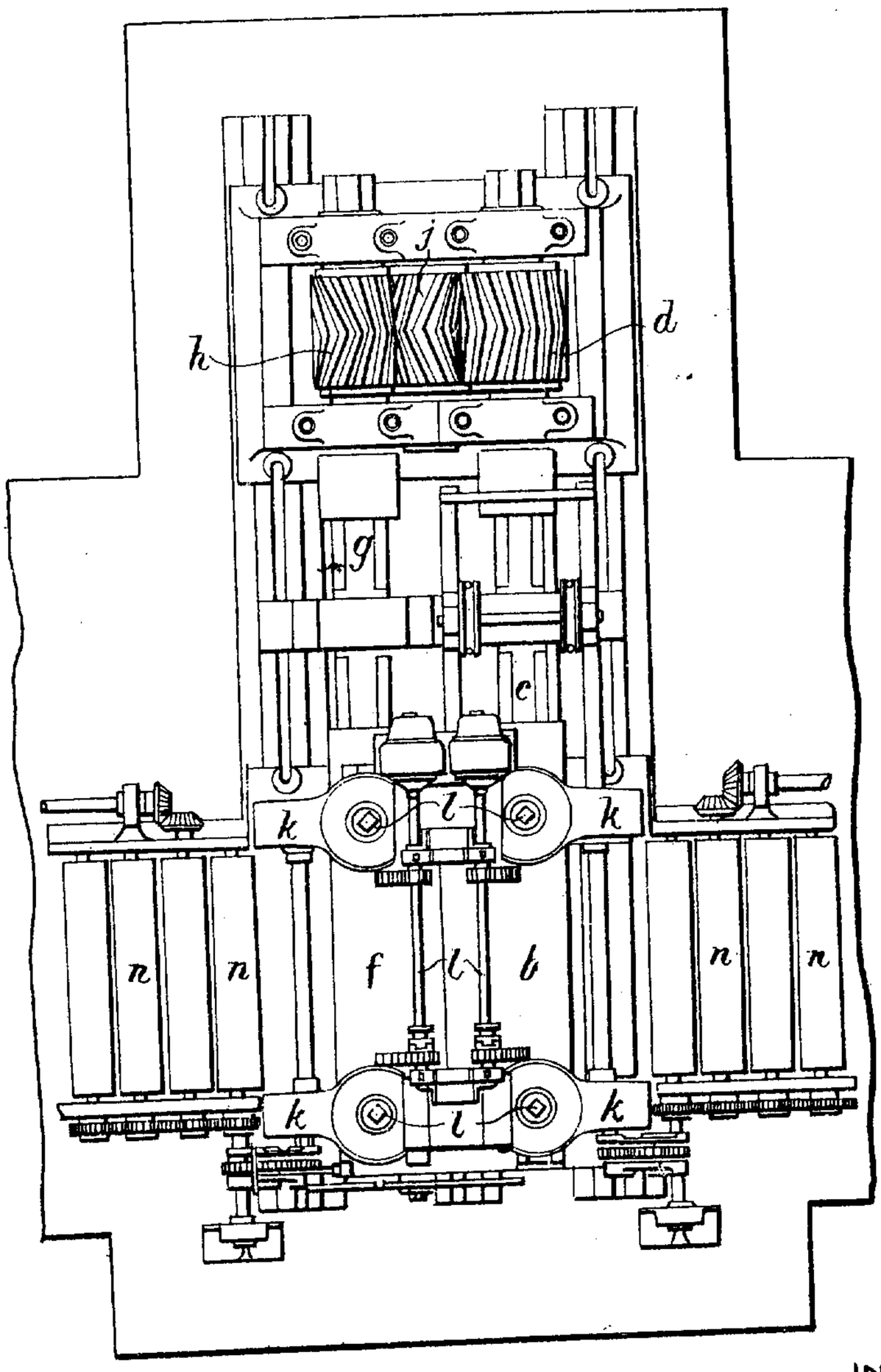
APPLICATION FILED APR. 6, 1907.

898,900.

Patented Sept. 15, 1908.

3 SHEETS—SHEET 1.

FIG. I.



WITNESSES

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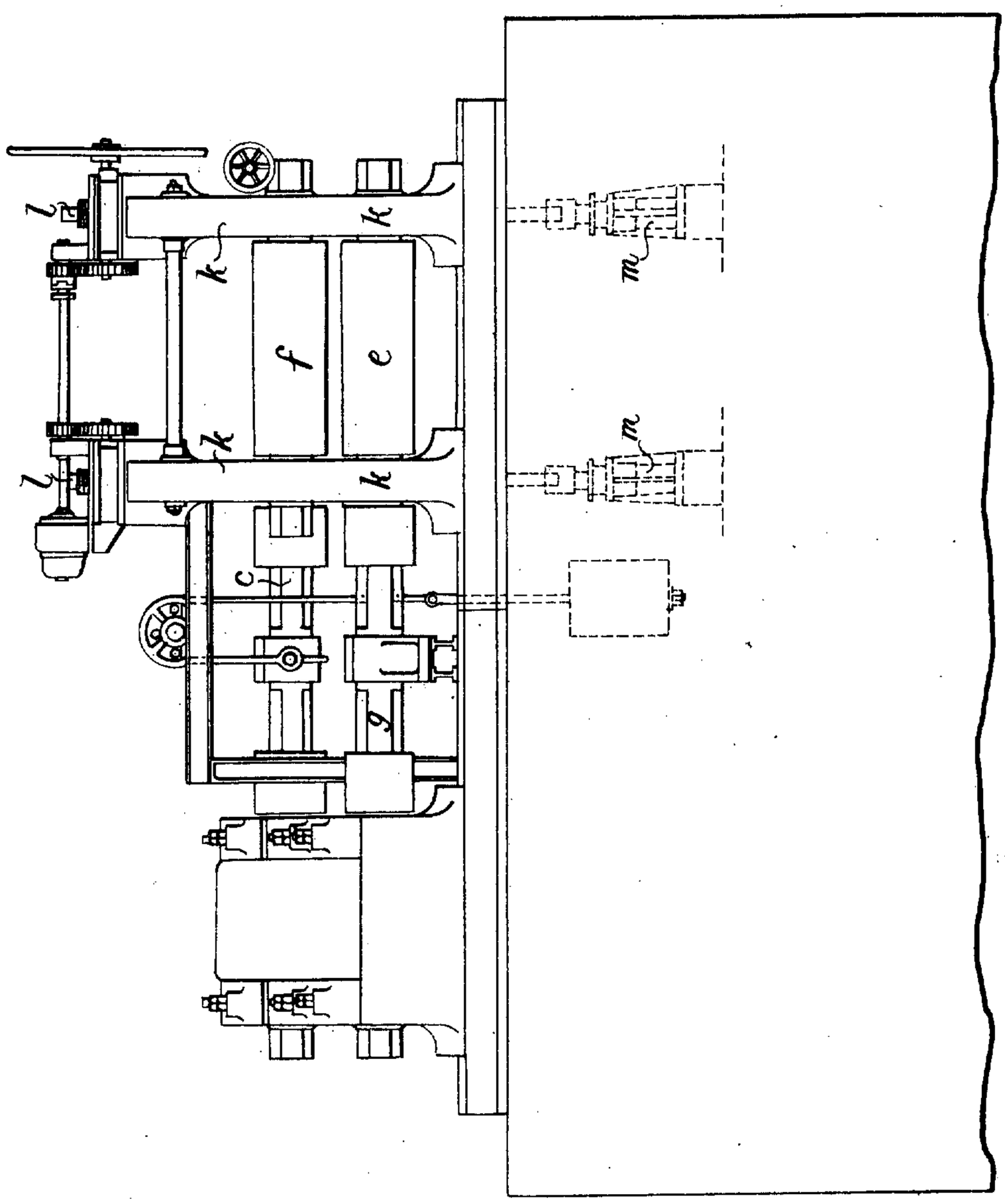
3 SHEETS—SHEET 2.

FIG. 2.



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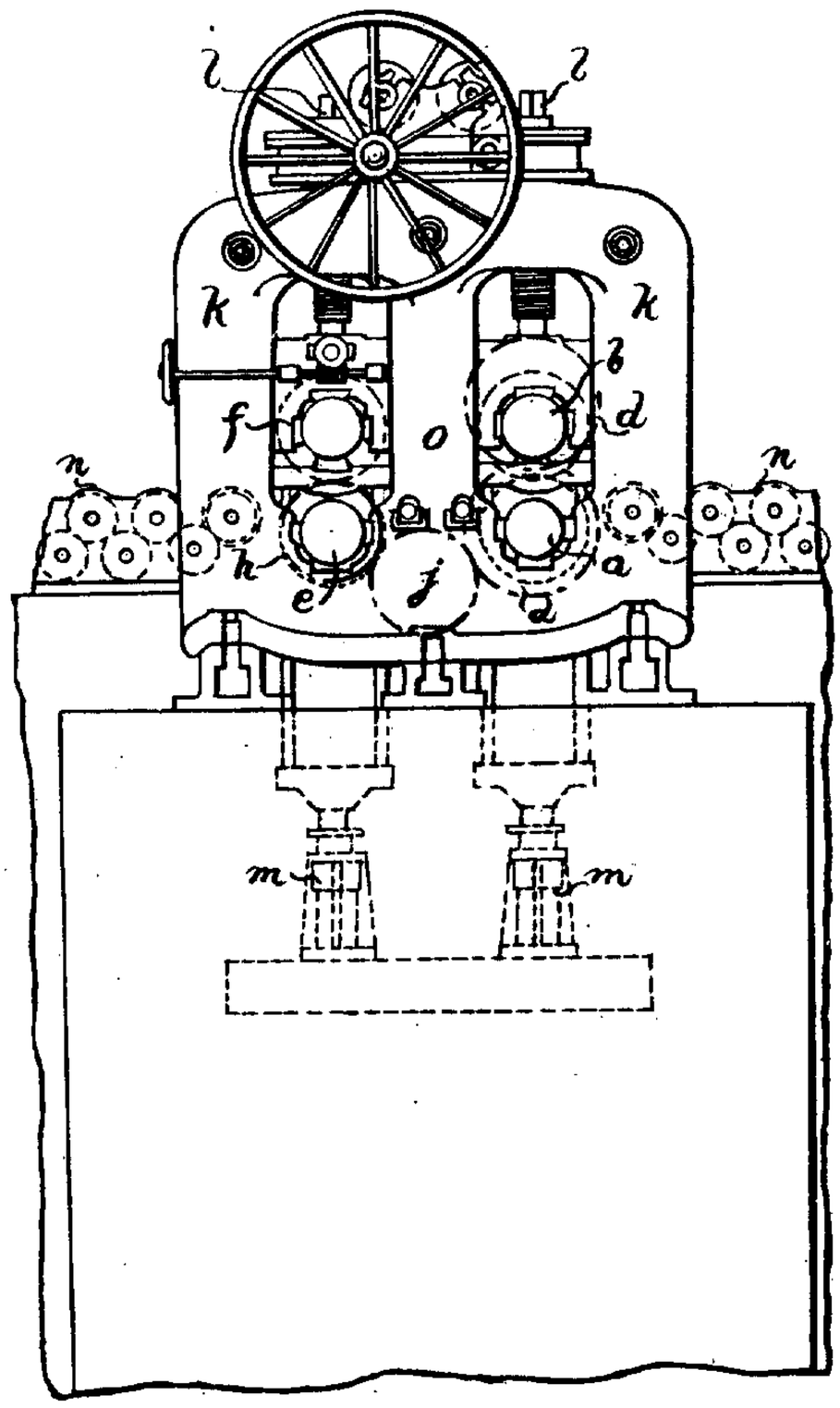
3 SHEETS—SHEET 3.

FIG. 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

ANDREW LAMBERTON, OF COATBRIDGE, SCOTLAND.

METHOD OF ROLLING PLATES.

No. 898,900. Specification of Letters Patent. Patented Sept. 15, 1908.

Application filed April 6, 1907. Serial No. 366,744.

To all whom it may concern:

Be it known that I, ANDREW LAMBERTON, a subject of the King of Great Britain and Ireland, and a resident of Coatbridge, in the county of Lanark, Scotland, have invented certain new and useful Improvements in the Methods of Rolling Plates, and of which the following is the specification.

This invention relates to that class of rolling mill used for the production of plates, sheets, or strips of iron, steel, or other metals. Hitherto, for this purpose a pair of two-high reversing mills side by side, the one roughing and the other finishing have been used, the plates after a sufficient number of passes through the roughing rolls being transferred sidewise to the finishing rolls.

In a plate mill driven by a reversing engine I according to this invention provide a composite housing containing a pair of roughing rolls and also a pair of finishing rolls, or I may use separate housings, but in either case the roughing and finishing rolls are driven by the same engine and being tandem are both served by the same fixed live roller tables.

In operation I commence with a slab or ingot in the usual manner, the top roughing roll being balanced and the drafts regulated by suitable screwing gear. The slab is passed to and fro between the roughing rolls and is elongated and reduced in thickness, the engine being reversed at each pass. During this operation the top finishing roll is supported by suitable balance gear and as it is not driven by gearing it is simply held up out of the way of the gradually elongating plate.

The bottom finishing roll is meanwhile revolving in unison with the bottom roughing roll and acts as a feed roller to the plate. Driven or idle rollers may be inserted between the roughing and finishing rolls to carry the plate, and these may be adjustable in such a manner that the plate does not touch the finishing roll if found desirable. When the plate has been sufficiently reduced in the roughing rolls, the top roughing roll is lifted and the top finishing roll is lowered and relieved of its balance support, allowing it to rotate by frictional contact with the bottom finishing roll. The roughing mill is then out of action and the plate is finished by backwards and forwards passes through the finishing rolls in the usual manner.

In order that the invention and the manner of performing the same may be properly understood, there are hereunto appended three sheets of explanatory drawings showing an example of the improved rolling mill and in which Figure 1, Sheet 1, is a plan, Fig. 2, Sheet 2, and Fig. 3, Sheet 3, being, respectively an end and a side elevation.

In this example, the roughing rolls, A, B, are both driven by usual coupling shafts, C, from intermeshing mill pinions, D. The lower coupling shaft is driven by an ordinary reversing rolling mill engine (not shown). Only the lower, E, of the finishing rolls, E, F, is driven from a coupling shaft, G, through the pinion, H, with which there meshes a pinion, J, driven from the pinion, D, on the first motion shaft, so that these rolls rotate in the same direction as the roughing rolls as has already been explained. In this example, both sets of rolls are contained in a single housing, K, but of course separate housings may be used. The method of driving may also be varied.

Draft regulating gear, L, and hydraulic balance means, M, both of usual form are provided, and the rolls are served by live roller tables, N, in usual manner. Idle carrier rollers, O, are inserted between the pairs of rolls, A, B, E, F, but these rollers may be driven if desired and may be provided with means for adjusting their levels.

The action of the mill is as described, that is to say; the ingot or slab is first passed to and fro between the roughing rolls, A, B, the upper, B, of which is regulated to the desired draft by the draft gear, L, the engine being reversed at each pass. During this operation the upper finishing roll, F, is supported by its balance means, M, and as it is not gear driven is simply held up out of the way of the plate. The bottom finishing roll, E, is meanwhile revolving in unison with the bottom roughing roll, A, and acts as a feed roller to the plate which is also supported by the carrying rollers, O. Or these latter may be so set as to carry the plate clear of the roll, E. When the plate has been sufficiently reduced in the roughing rolls, A, B, the top roughing roll, B, is raised and the top finishing roll, F, lowered and relieved of its balance support, allowing it to rotate by frictional contact with the bottom finishing roll, E. The roughing rolls, A, B, are then revolving idly and the plate is finished by backwards and forwards passes through the finishing rolls in the usual manner. The rolls may as

shown be arranged to be run at slightly different speeds, they may be run at the same speed, or their relative velocities may be varied, as desired.

The advantages of this invention are reduction in capital expenditure, saving in cost of live roller tables (one set being common to both mills) saving in space, and also a saving in time, as it does away with the time lost in transferring the partly rolled plate across the mill from the roughing to the finishing rolls as presently practiced.

What I claim is:—

1. The method of rolling plates in a two high reversing mill having pairs of roughing and finishing rolls arranged in tandem, which consists in passing the plate back and forth between said rolls while the roughing rolls are closed and the finishing rolls are open until the plate is ready for the latter, then opening the roughing rolls and closing the finishing rolls and passing the plate back and forth between the latter until the plate is finished, substantially as described.

2. The method of rolling plates in a two high reversing mill having pairs of roughing and finishing rolls arranged in tandem and simultaneously rotating in the same direction, which consists in passing the plate back and forth between said rolls while the roughing rolls are closed and the finishing rolls are open until the plate is ready for the latter, then opening the roughing rolls and closing the finishing rolls and passing the plate back and forth between the latter until the plate is finished, substantially as described.

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

ANDREW LAMBERTON.

Witnesses:

DAVID FERGUSON,

WILFRED HUNT.