

No. 699,132.

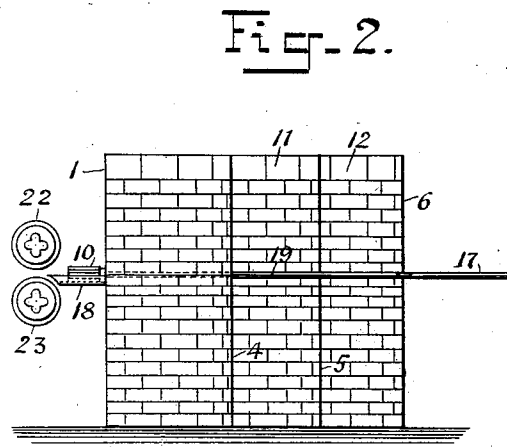
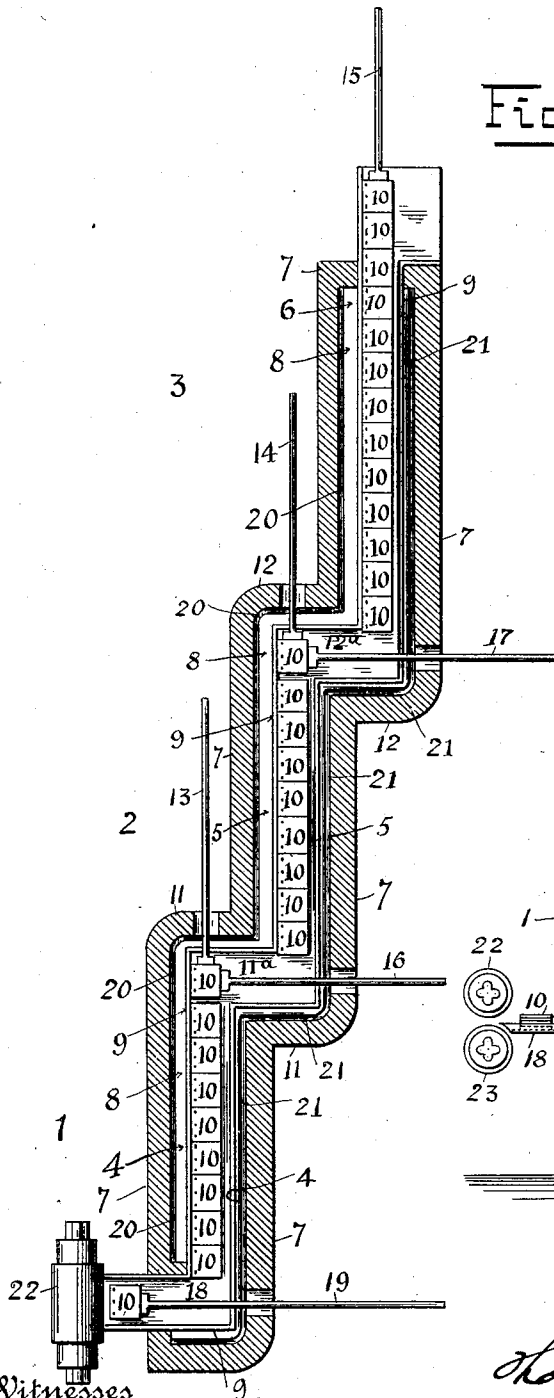
Patented May 6, 1902.

T. V. ALLIS.

METHOD OF FEEDING AND HEATING METAL PLATES OR PACKS.

(Application filed Sept. 23, 1901.)

(No Model.)



Witnesses
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May 21. 1878

UNITED STATES PATENT OFFICE.

THOMAS V. ALLIS, OF BRIDGEPORT, CONNECTICUT.

METHOD OF FEEDING AND HEATING METAL PLATES OR PACKS.

SPECIFICATION forming part of Letters Patent No. 699,132, dated May 6, 1902.

Application filed September 23, 1901. Serial No. 76,205. (No model.)

To all whom it may concern:

Be it known that I, THOMAS V. ALLIS, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented a certain new and useful Improvement in the Method of Feeding and Heating Metal Plates or Packs, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention consists in an improved method of progressively feeding and heating comparatively thin metal plates or packs of thinner metal plates in transit through a heating-furnace wherein the heat of said metal is augmented during its passage, all as hereinafter described and claimed.

That metal plates or packs may be uniformly and properly heated throughout in a progressive heating-furnace preparatory to reduction their time of transit must of necessity be proportionate to their thickness and the temperature of the furnace. In heating packs made up of thin metal plates it is impracticable to raise the heat in the furnace to a high degree for the purpose of hastening the operation of heating. This would cause the plates comprising the packs to become overheated and adhere to each other to the extent that separation after reduction would be impossible. It is also impracticable to heat thin metal plates in a progressive heating-furnace of high temperatures, for the reason that the edges and corners melt off, causing excessive waste, and in case of delay through accidents which interfere with their passage through the furnace the plates become overheated and damaged. It is therefore necessary that lower degrees of heat be employed and sufficient time allowed for its soaking into and permeating the metal, which means in the progressive method of heating a large output of plates or packs great length of heating area. It not being practicable to heat the above-described plates and packs in the ordinary straight-line "continuous" furnace as constructed for heating billets, the herein-described invention has been made and so contrived that the delivery portion of the furnace is maintained at the degree of heat required in the plates or packs to be reduced and that their travel therethrough shall be at

the speed required for them to arrive at its temperature, wherein they may become mel-
lowed by what is termed a "soaking" heat, having arrived at this condition by gradual progress through heated chambers.

In heating square billets of ordinary sizes they may be propelled through a progressive heating-furnace of any required length. By reason of their size and shape they are progressed through the furnace in a straight line side by side without any tendency to override. Not so with thin plates or packs built up of thinner plates exceeding in width many times their thickness. The weight of a line of such plates or packs lying edge to edge and of sufficient length to be economically heated for reduction would be so great that the force required to move them along the furnace-bottom would cause overlapping and riding one upon another. Packs composed of thin plates besides overriding become interlaced with one another and the plates bent and distorted in their red-hot soft condition. Having realized by experience the practical difficulties of progressively feeding and heating comparatively thin metal plates or packs in long lines, I have invented the herein-described improved method of overcoming such difficulties and have secured more economical results.

A line or train of the above-described plates or packs should be about one hundred feet in length, and being impracticable of propulsion in its entirety the train is broken into sections of lengths easy to move over the furnace-bottom without encountering the aforesaid difficulties.

With my improved method of breaking a long line of packs into short sections and moving them step by step through comparatively short heating-chambers and communicating transverse passages I am able to advance a large number of plates or packs through a heating area of unlimited length, augmenting their heat from start to finish and delivering the metal at the exit at the proper temperature for reduction by rolling or hammering.

In carrying out my method of moving a great number of metal packs or plates through a heating area of any length it is immaterial how the furnace is constructed, so long as provision is made whereby a long line of plates

or packs is broken up into comparatively short sections, progressively heated as advanced therein in sections and separately in divergent paths. The length of the heating area 5 may be governed by the thickness of the plates or packs to be heated, the temperature of the furnace, and the rapidity with which they are treated after leaving the furnace.

In order that others may understand and 10 practice the method claimed, I will proceed to describe an apparatus with which the methods may be carried out, Figure 1 representing a plan view and horizontal section, and Fig. 2 an elevation at the delivery end of the apparatus. 15

In the drawings a furnace is shown comprising three integral sections—viz., 1, 2, and 3. Each of these sections have the heating-chambers 4, 5, and 6, bounded by the side walls 7 20 and the roof. (Not shown.)

8 is the floor of the furnace, on which rest the channel-iron 9.

10 represents packs of thin metal plates.

11 and 12 are short offsets integral with the 25 parallel sections 1, 2, and 3, forming transverse passages 12^a and 11^a, leading from one chamber to another.

13, 14, and 15 are pusher-rods for progressing the contents of the chambers, and 16 and 30 17 are pusher-rods for transferring the packs through the transverse passages.

18 is a transverse passage leading from the last chamber 4 to the reducing-rolls 22 23, and 19 is a pusher-rod for transferring the 35 packs to the rolls.

20 and 21 represent gas heating-flues.

The packs or plates are entered at the end of the first heating-section 3 and by manipulation of the rod 15 are moved along the first 40 chamber and deposited one at a time opposite the transverse passage 12^a. From thence they are moved singly through said passage 12^a by means of rod 17 into the chamber 5, this op-

eration being repeated through the chamber 5, transverse passage 11^a, and chamber 4, and 45 to the reducing-rolls 22 23 through the transverse passage 18 by the respective pusher-rods 14, 16, 13, and 19, as shown. The gas heating-flues 20 21, it will be understood, are arranged to constantly convey the heat across 50 the furnace in both chambers and passages, thereby progressively augmenting the heat of the metal in transit therethrough.

From the foregoing descriptions and drawings it will readily be seen how a long line or 55 train of metal plates or packs is broken up into short sections which are easily moved by this method through an indefinite length of heating area, thereby giving any required time for requisite heating while in transit. 60

It is obviously impossible to move an unbroken straight line or train of plates or packs of indefinite length, as is accomplished by the herein-described method.

Having thus described my invention, what 65 I claim, and desire to secure by Letters Patent, is—

The method of progressively feeding and heating a train of metal plates or packs for reduction which consists in advancing said 70 train in separate sections, each section containing a plurality of plates or packs, by progressing each section the distance occupied by one plate or pack, and transferring a plate or pack from the forward end of each section 75 to the rear end of the preceding section, and augmenting the degree of heat in said packs or plates during their period of transit, as set forth.

In testimony whereof I affix my signature 80 in presence of two witnesses.

THOMAS V. ALLIS.

Witnesses:

CHAS. W. FORBES,
JOHN H. BLUE.