Nov. 8, 1932. F. W. PITTS 1,886,581

METHOD OF TREATING STEEL

Filed Feb. 21, 1929 3 Sheets-Sheet 1

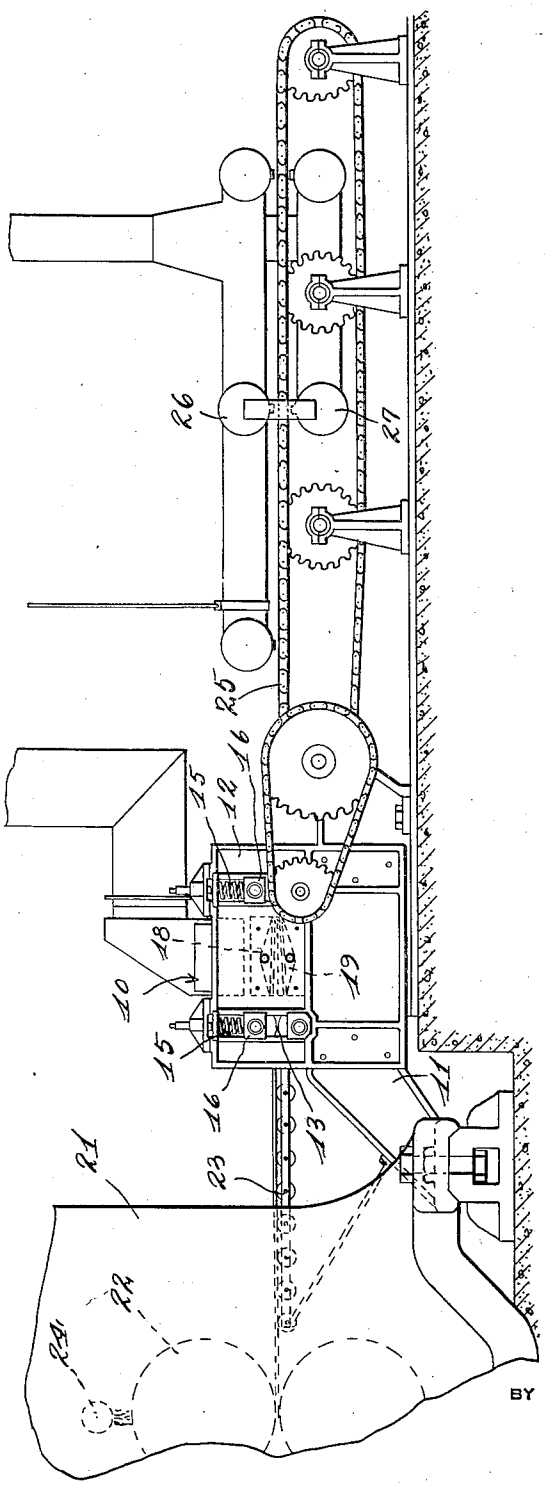


Fig. 1.

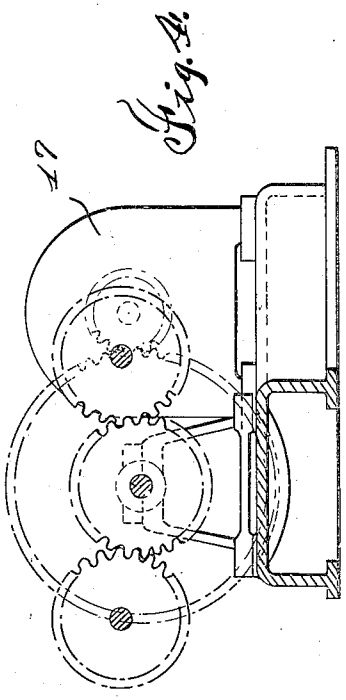


Fig. 4.

INVENTOR
Frederick W. Pitts
Whittemore Hulbert
Whittemore & Belknap

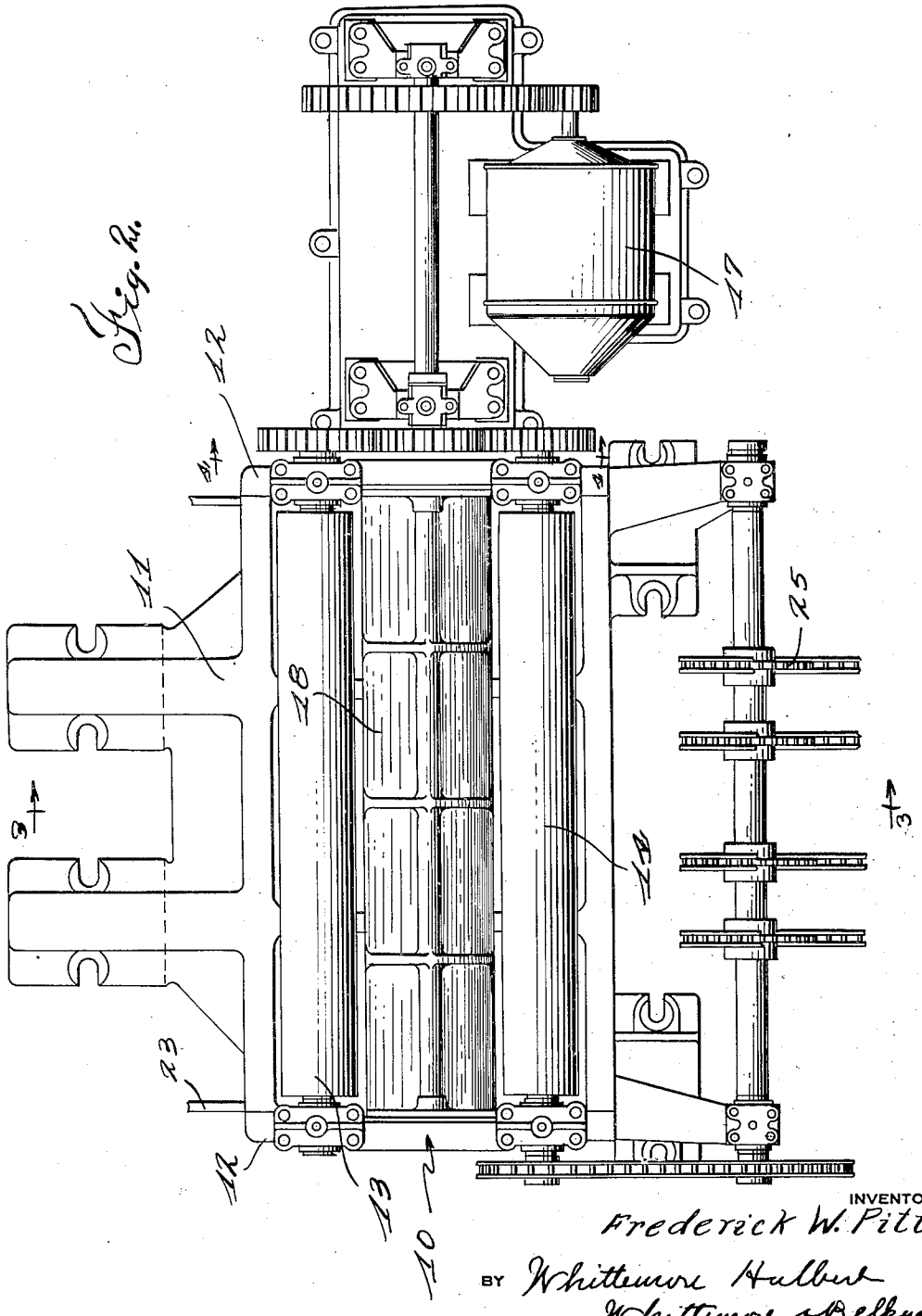
ATTORNEYS

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Fig. 2.



INVENTOR
Frederick W. Pitts
BY Whittemore Hulbert & Whittemore & Belknap
ATTORNEY

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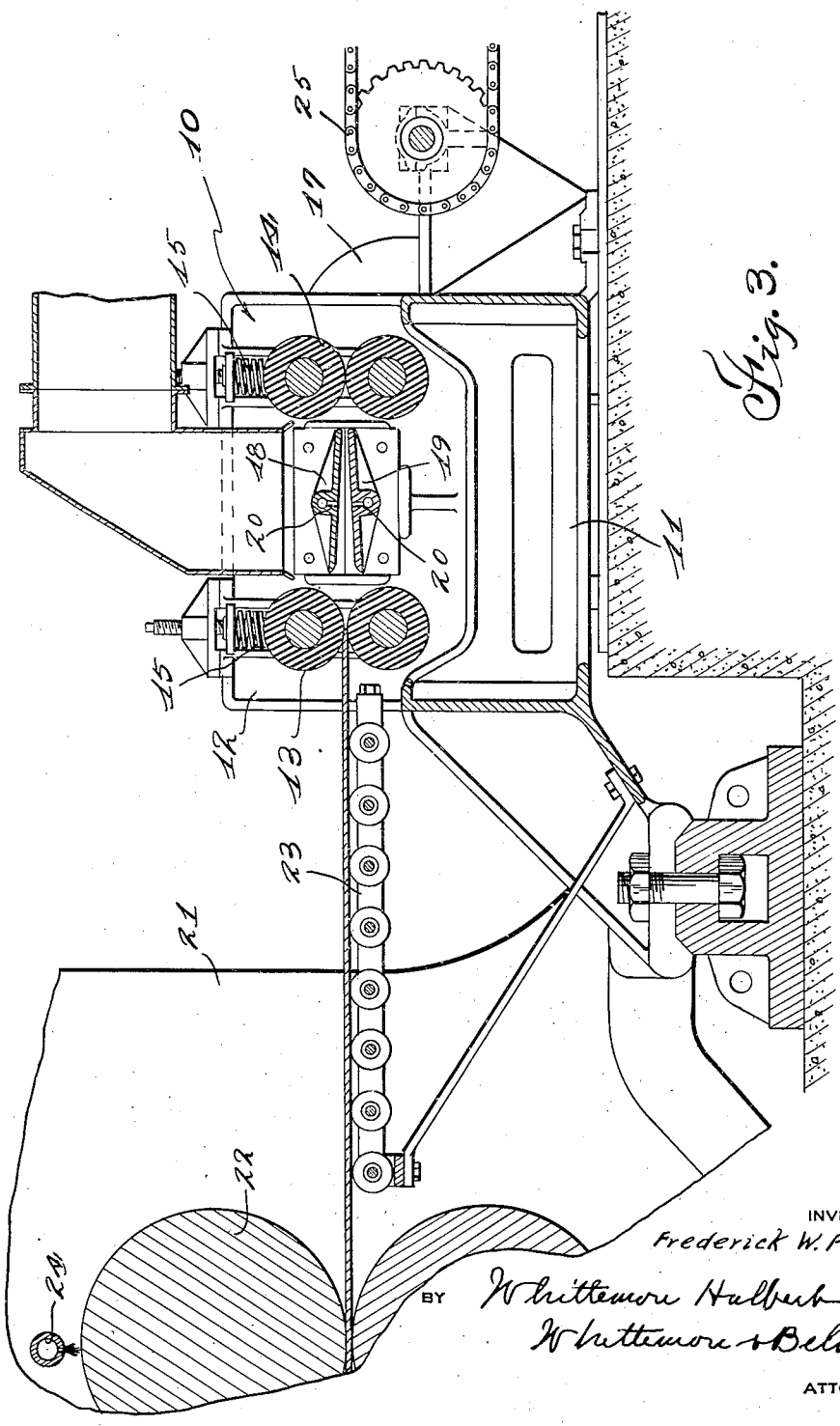


Fig. 3.

INVENTOR
Frederick W. Pitts
BY Whittemore Hulbert
Whittemore & Belknap
ATTORNEYS

Patented Nov. 8, 1932 1,886,581

UNITED STATES PATENT OFFICE

FREDERICK W. PITTS, OF DETROIT, MICHIGAN, ASSIGNOR TO MICHIGAN STEEL CORPORATION, OF DETROIT, MICHIGAN, A CORPORATION OF NEW JERSEY

METHOD OF TREATING STEEL

Application filed February 21, 1929. Serial No. 341,786.

This invention relates to the method of treating metallic sheets and the like and more particularly in improvements in methods of this character which effect economy in manufacture, and expedite the production to a great extent.

The invention concerns itself more particularly with the method of cleaning metallic sheets after the same have been rolled to the desired gage.

Heretofore in the manufacture of metallic sheets of the above type it has been customary to clean the sheets by a process commonly known in the trade as wash pickling wherein each sheet is deposited in a bath of sulphuric acid solution. Although this process has been found satisfactory for removing any stains and other foreign matter from the sheets, nevertheless it is objectionable from the standpoint of economy owing to the labor required for handling each sheet separately and the relatively great area of floor space necessary to accommodate the apparatus for carrying out this process.

It is, therefore, one of the primary objects of this invention to eliminate the expensive step of wash pickling in the method of manufacturing metallic sheets and to replace this step with a more efficient process wherein the sheets are automatically and expeditiously cleaned and dried.

In practicing my improved method, the sheets upon being rolled to the desired gage, are introduced into a suitable scrubbing machine which operates to discharge a fluid upon opposite sides of the sheet to thoroughly clean the same. After being cleaned, the sheets are passed through a pair of presser rolls which operate to remove the cleaning fluid from the sheets. Thereafter the sheets are thoroughly dried and cooled by passing the same through a current of air supplied by suitable headers arranged upon opposite sides of the path of travel of the sheets.

The several objects and advantages of this invention and a detailed description of the several steps of the method will be made more apparent as this description proceeds especially when considered in connection with the accompanying drawings wherein:

Figure 1 illustrates semi-diagrammatically one form of apparatus found satisfactory for carrying the present method into effect.

Figure 2 is a fragmentary top plane view of the apparatus shown in Figure 1.

Figure 3 is a sectional view taken on the line 3—3 of Figure 2.

Figure 4 is a detail view of the driving mechanism.

While obviously the particular form and the structural details of the apparatus employed for carrying into effect the herein described method, should in nowise be considered as limiting the broad interpretation of the present invention, nevertheless one form of such apparatus which in practice has been found to give extremely satisfactory results, is illustrated herein for the sake of clearness.

The specific form of apparatus utilized for the present method is illustrated in my copending application Serial No. 344,544, filed March 5, 1929, and accordingly will not be described in detail herein. Briefly described, the apparatus as illustrated in Figure 1 includes a scrubbing machine 10 having a base 11 and side frame members 12 secured to opposite ends of the base and extending upwardly from the latter. Supported upon the frame members 12 adjacent the ends of the latter are two sets of pressure or wringer rolls 13 and 14 the outer portions of which are preferably constructed from a yieldable material, such as rubber. The upper rolls of each set are mounted for vertical sliding movement relative to the lower rolls and are normally yieldably maintained in engagement with the lower rolls by reason of the springs 15 acting upon the slidable bearing blocks 16 for the upper rolls. The lower rolls of each set on the other hand, are connected through suitable reduction gearing to a prime mover 17.

Extending between and secured to the frame members 12 intermediate the two sets of presser rolls 13 and 14 are a pair of upper and lower headers 18 and 19 respectively adapted to contain a supply of cleaning fluid such as steam. The headers, as shown in Figure 1, are arranged upon opposite sides of

the path of travel of the sheets and are provided with a series of longitudinally spaced passages 20 through which the fluid is ejected upon opposite sides of the sheets as the latter are passed between the headers by the first set of rolls 13.

As shown in Figure 1, it is possible to use the scrubber as a separate and distinct unit or to use the same in combination with a cold rolling machine 21. In the event the scrubber is used in combination with the rolling machine 21 it is supported in such a manner that the pass between the two sets of presser rolls 13 and 14 is in direct alignment with the pass between the power driven rolls 22 of the machine 21 so that the sheets upon passing through the rolls 22 will be conveyed by the latter directly into the scrubber. A suitable table 23 is provided for supporting the sheets during their travel from one machine to the other.

Referring now to the various steps in the method of manufacture of the sheets, it will be apparent from the above description of the apparatus that the sheets are first placed upon the rolling machine 21 and passed between the rolls 22 which are supplied with water by a suitable header 24 and serve to cold roll the sheets. Immediately after the sheets leave the rolls 22 they are gripped by the first, or receiving set of presser rolls 13, and the moisture adhering to the sheets from the previous operation is removed by these rolls. The sheets are then passed between the headers 18 and 19 which serve to eject a fluid, such for example as steam upon opposite sides of the sheets to thoroughly clean the same. Thereafter the sheets are passed between the second set of presser rolls 14 which serve to remove the condensate from the sheets and to discharge the latter upon a suitable conveyor 25. The sheets are then moved by the conveyor 25 through a current of air supplied by the headers 26 and 27 also arranged upon opposite sides of the path of travel of the sheets so as to eject air upon opposite sides of the sheets to thoroughly dry the same.

It will be immediately apparent to those skilled in this art that the herein described method affords an economical and efficient means for cleaning and drying metallic sheets subsequent to rolling the latter to size. It will also be noted that the present method renders possible eliminating the step of wash pickling and the accompanying inefficiency thereof.

While in describing the present invention, particular stress has been placed upon the association of the apparatus for carrying into effect the present method with a rolling machine, nevertheless it should be understood that this apparatus may be installed as a separate unit isolated from the rolling machine without impairing the method, and the invention therefore contemplates such an arrangement. However it has been found that by combining the method of cleaning the sheets with the step of rolling the latter, the method may be carried into effect without the use of additional labor and as a consequence a great saving in the cost of manufacture of the sheets is effected.

What I claim as my invention is:

1. In the method of manufacturing metallic sheets and the like, those steps which consist in passing a sheet in a substantially horizontal plane through a machine ejecting a vaporized fluid upon opposite sides of a sheet to claim the same, and removing the cleaning fluid from opposite sides of the sheet.

2. In the method of manufacturing sheets and the like, those steps which consist in passing the sheet in a substantially horizontal plane between a pair of headers, ejecting steam from said headers upon opposite sides of the sheet to clean the same, and passing the sheet through a pair of rolls for partially removing the condensate therefrom.

In testimony whereof I affix my signature.

FREDERICK W. PITTS.