R. B. & H. S. THOMAS & W. R. DAVIES.

METHOD OF MANIPULATING METAL ARTICLES.

APPLICATION FILED MAR. 7, 1916.

1,207,662. Patented Dec. 5, 1916.

Fig. 1.

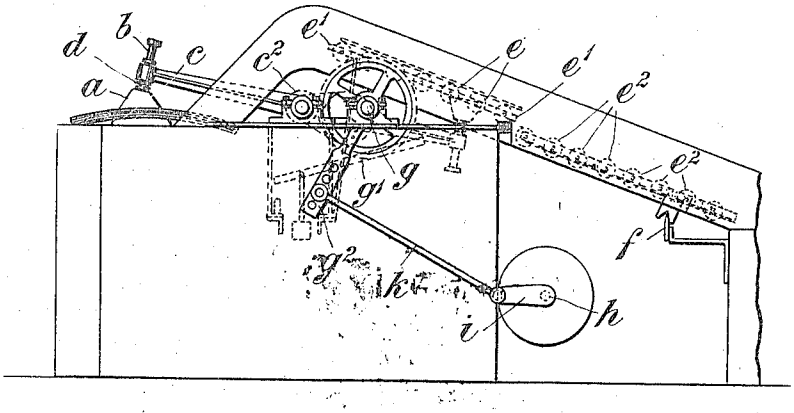


Fig. 2.

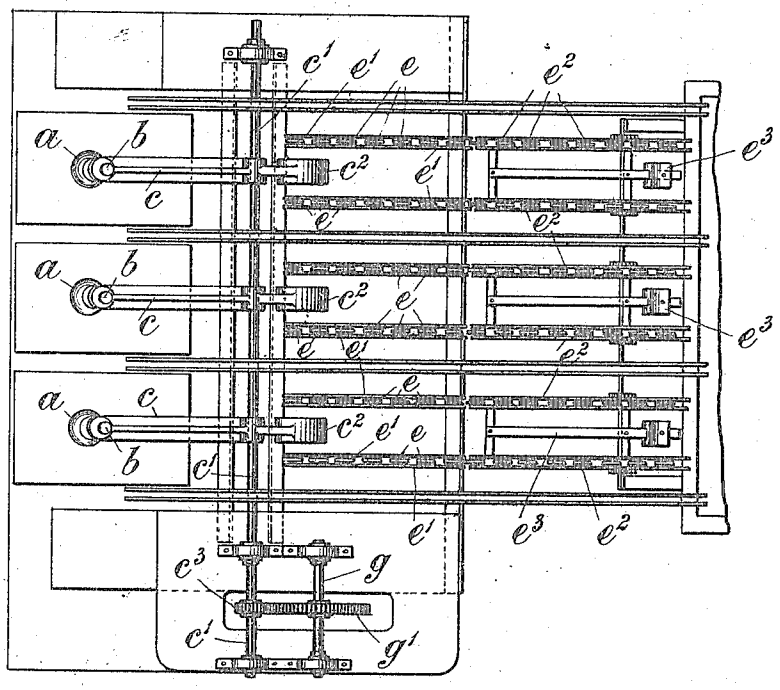
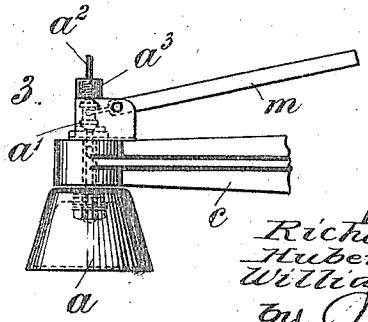


Fig. 3.



Witnesses:—

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UNITED STATES PATENT OFFICE.

RICHARD BEAUMONT THOMAS, OF LONDON, ENGLAND, AND HUBERT SPENCE THOMAS, OF LLANDAFF, AND WILLIAM ROBERT DAVIES, OF WHITCHURCH, WALES.

METHOD OF MANIPULATING METAL ARTICLES.

1,207,662. Specification of Letters Patent. Patented Dec. 5, 1916.

Original application filed June 20, 1914, Serial No. 846,305. Divided and this application filed March 7, 1916. Serial No. 82,754.

To all whom it may concern:

Be it known that we, RICHARD BEAUMONT THOMAS, HUBERT SPENCE THOMAS, and WILLIAM ROBERT DAVIES, subjects of the King of Great Britain, residing, respectively, at No. 39 Hyde Park Gate, London, England; "Hazelwood," Cardiff Road, Llandaff, county of Glamorgan, Wales, and "Forest-Lyn," Heoldon, Whitchurch, county of Glamorgan, Wales, have invented certain new and useful Improvements in Methods of Manipulating Metal Articles, of which the following is a specification.

This invention is a division of that disclosed in our application filed June 20, 1914, Serial Number 846305, and is an improved method of manipulating metallic plates, sheets, bars and the like, primarily to effect their withdrawal one by one from a stack or pile for such purposes as turning, examining, assorting, and feeding them.

Our improved method comprises the elimination or partial elimination of suction between the stacked articles, by separating or tending to separate them through the action of a blast against the edge or edges of the stack or the interposition of a material, such as sand, between the articles, and picking them up singly by suction through appliances adapted for handling the plates.

In the accompanying drawings, illustrating the invention, Figure 1 represents in side elevation an appliance or machine for feeding metallic plates or sheets to tinning machines. Fig. 2 is a plan of the same showing a series of three of the sheet feeding appliances. Fig. 3 represents in elevation drawn to a larger scale a modified sucker and parts adjacent thereto.

The same letters of reference indicate the same parts in the several figures of the drawing.

a is a hollow conical cup preferably of india rubber constituting the sucker proper the said sucker a being carried by a pin b occupying an eye at the end of the long arm of the lever c a coiled spring d being arranged between the sucker and the end of the long arm of the lever c. Preferably a series of the levers c is fixed on a rocking shaft c^1 and by the oscillation or backward and forward partial rotation of the said shaft the levers receive an oscillating motion through about 180 degrees. The long arms of the levers c are counterbalanced by the weighted short arms c^2. By the action of the levers a single plate is lifted and carried over on the chute e which consists of a series of lazy disk rolls the axes of which are supported by inclined bars e^1 the inclination of the bars being seen in Fig. 1. As soon as the sucker is released from the plate or sheet by the continued motion of the levers between and below the bars e^1 the plate or sheet travels down the chute and falls on to the preferably somewhat lower inclined chute e^2 which has the form of a counterbalanced lever with adjustable weights e^3.

The chute e^2 is pivoted on knife edge supports f (or their equivalents) and the counterbalanced weights e^3 are adjusted so that should more than a single plate be received on them simultaneously the chute e^2 will turn on its pivot and pass the said two or more plates or sheets under the table of the machine. If a single plate only is received by the chute e^2 it passes down the chute to the rolls or other appliances by which it is to be received. The oscillation of the shaft c^1 through the desired angle may be effected in various ways. In the drawing we have shown the said shaft operated by spur wheel gearing, c^3 being a pinion on the shaft c^1 in gear with a spur wheel g^1 on a spindle g arranged parallel with the said shaft. The spur wheel g^1 receives its backward and forward turning motion from the pulley driven, or otherwise driven, shaft h through the crank i and connecting rod k the said connecting rod k having a preferably adjustable connection with the lever arm g^2 carried by the spur wheel g^1 or its spindle g.

If thought necessary or desirable the sucker a may be carried below the chute e under water so as to wet the sucker previous to the next operation; and the sucker may be provided as heretofore with a valve a^1 as is represented in Fig. 3, the axial rod a^2 of which is kept down on its seat by the coiled spring a^3. A trip lever m is provided to effect the lifting of the valve a^1 off its seat when the plate or sheet reaches the chute e the trip lever being actuated automatically by projections arranged in its path. On the lifting of the valve air is admitted to the sucker and the plate or sheet is instantly re-

leased. If desired we may obtain a vacuum or partial vacuum in the sucker, by the action of a pump.

We wish it to be understood that we do not limit ourselves to the precise construction and arrangement of parts hereinbefore described and illustrated in the accompanying drawings as the operating mechanism may be varied within considerable limits without departing from the nature of our invention.

Having described our invention, we claim:

1. The method of manipulating metal articles having conforming surfaces tending to be held together by suction when in contact, which consists in stacking said articles with separating means between said conforming surfaces so as to prevent suction between them, and moving said stacked articles in sequence.

2. The method of manipulating metal sheets which consists in stacking said sheets in separated relation so as to permit the entrance of air between them and moving said stacked plates in sequence by the application of suction to exposed faces thereof.

3. The method of manipulating metal sheets which consists in stacking said sheets with sand between them so as to prevent suction between adjacent sheets and moving said sheets in sequence by the application of suction to the exposed surfaces of the outer sheets.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

RICHARD BEAUMONT THOMAS.
HUBERT SPENCE THOMAS.
WILLIAM ROBERT DAVIES.

Witnesses:

ALBERT EDWARD KING,
LORIN A. LATHROP.