

1,410,117.

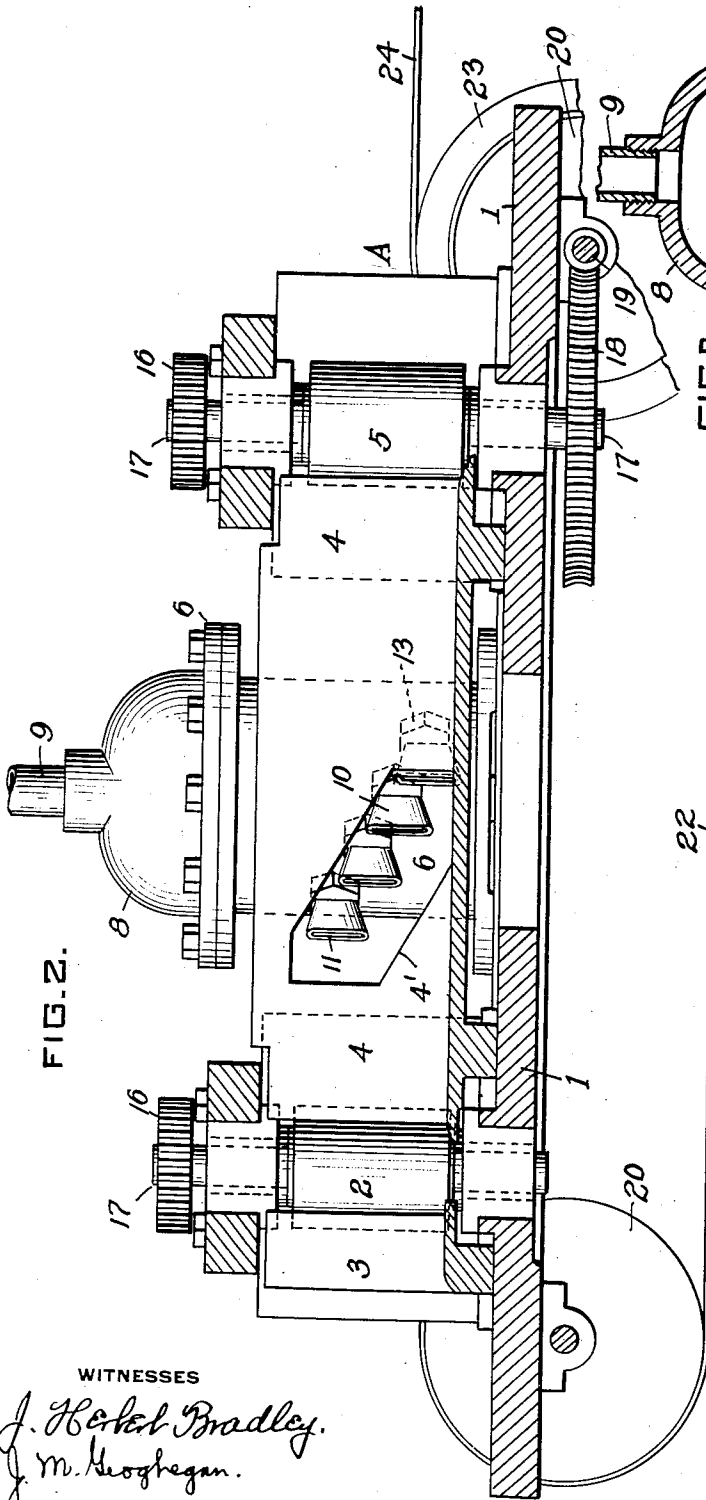
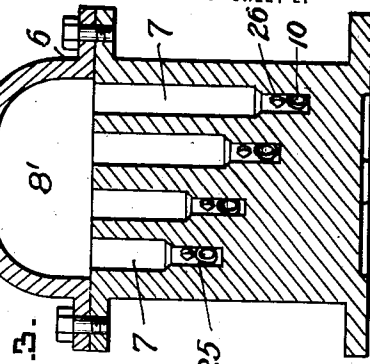
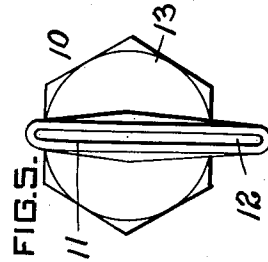
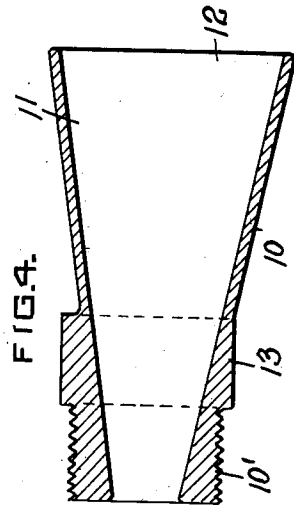
2 SHEETS—SHEET 1.



1,410,117.

Patented Mar. 21, 1922.

2 SHEETS—SHEET 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

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TREATING METAL ARTICLES.

1,410,117.

Specification of Letters Patent. Patented Mar. 21, 1922.

Application filed January 11, 1919. Serial No. 270,650.

To all whom it may concern:

Be it known that I, JOSEPH E. POOL, a citizen of the United States, and a resident of Carnegie, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Treating Metal Articles; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to treating metal articles, and has special reference to the cleaning of steel strips, bars, pipe, shafting and other similar articles.

The object of my invention is to produce a cheap, simple and efficient method and apparatus for removing the projections or particles of scale, slag, oxide coatings and other impurities from such articles, while in a cold state, and thus place them in a thoroughly smooth and clean state or condition for future operations or use, as is desired.

To these ends my invention consists, generally stated, in the novel method and apparatus for treating metal articles, as hereinafter more specifically set forth and described and particularly pointed out in the claims.

To enable others skilled in the art to which my invention appertains to practice my improved method and construct and use my improved apparatus for treating metal articles, I will describe the same more fully, referring to the accompanying drawings, in which:

Figure 1 is a plan view partly in section of my improved apparatus for use in carrying out my improved method of treating metal articles;

Fig. 2 is a longitudinal central section of the same, taken on the line 2—2 Fig. 1 and looking in the direction of the arrows;

Fig. 3 is a section of one of the sand blocks, taken on the line 3—3 of Fig. 1 and looking in the direction of the arrows;

Fig. 4 is a sectional view of one of the sand nozzles; and

Fig. 5 is an end view of the nozzles and looking at the outer end of the same.

Like symbols of reference herein indicate like parts in each of the figures of the drawings.

As illustrated in the drawing, my improved apparatus for treating metal articles is shown at A and consists of a bed or table 1, preferably of cast metal, which is supported on legs (not shown) or in any other

suitable manner, and on the front or entering end of such table is mounted a pair of rolls 2, which are set in a vertical position and in line with each other. In front of the rolls 2 is a guide 3 and back of the said rolls is another guide 4 which extends from said rolls back to another pair of rolls 5 and which are mounted at the rear or discharging end of such table 1, and such rolls 5 are similar to the rolls 2 and are also set in a vertical position and in line with each other. Between the rolls 2 and 5 and on each side of the guide 4 is a sand block 6, preferably of cast metal, which is provided with vertical pockets 7 thereon and of different depths. The blocks 6 are each provided with a cover 8 for forming a receptacle 8' over the same, and into the top of such cover leads a base or other tubular connection 9. This tubular connection 9 leads from a suitable sand supply tank (not shown) which can be located over said blocks or at any suitable place desired, and is adapted to be subjected to an air pressure in any suitable manner for forcing the sand down into the pockets 7. Connected to each one of the pockets 7 in the blocks 6, is a passage-way or nozzle 10, which is screwed into holes 6' in such blocks by a threaded inner portion 10' in the usual manner, and such nozzles extend forwardly at an angle from each of said blocks. These nozzles 10 are placed opposite openings 4' in each of the sides of the guide 4 at different heights and overlap each other so as to stagger the same. The outer or outlet portions 11 on the nozzles 10 are flattened vertically in order to project the sand therefrom over the greatest space possible on the articles being cleaned and by a narrow orifice 12 formed thereby. A flat-sided shoulder 13 is formed on the nozzles 10 in order to permit the use of a wrench on the same to remove and insert such nozzles in the blocks when desired.

A manifold 14 for accommodating the air and leading from a suitable air supply is placed along the outer sides of each of the sand blocks 6, and from such manifold pipes 15', each controlled by a valve 15, lead into the blocks. These pipes 15 open into each of the pockets 7 and abut the center of the same, so that the air passing through the same and into the pockets from the manifold will pick up and mix with the sand as it is dropped from the receptacle 8' into the pockets and will continue out through

the nozzles 10 on to the article being cleaned, as hereinafter described.

The rolls 2 and 5 are operated by any suitable mechanism, such as by means of
 5 pinions 16 connected to the upper end of the roll shafts 17 and meshing with each other, and one of said shafts on each of the rolls 2 and 5 is provided with a worm wheel 18 at the lower end of the shafts 17
 10 which engages with a worm 19 on a cross-shaft 20. A pulley 21 is placed on the ends of each of the shafts 20 and such pulleys are connected together by a belt 22. Another pulley 23 is also placed on one of the cross-shafts 20 and a belt 24 is placed around the
 15 same and connected to any suitable source of power.

The lower ends of the pockets 7 are contracted as at 25, and a set screw 26 is adapted to pass into the same to regulate the
 20 amount of sand fed to the nozzles 10 from said pockets

The manner of practicing the method and using the apparatus for my improved
 25 treating of metal articles is as follows:

The article to be cleaned, such as a steel strip, after it has been rolled to the proper size and shape and while in such state is placed on its edge and passed through the
 30 guide 3 and into the rolls 2 where it will be caught by said rolls and then it passes into the guide 4. The strip in passing through the guide 4 to the rolls 5 will be caught by said rolls, and such strip in passing the openings 4' in said guide the sand blast composed of the sand and air will be projected against the sides of the strip
 35 from the nozzles 10 and thus clean the scale, slag, oxide or other impurities from the sides of said strip. After the strip has been thus cleaned and passed through the guide 4 and rolls 5 it can be run onto a reel (not shown) and will then be ready for distribution to other departments for operators,
 40 etc.

After the sand has thus played on the strip it can drop through an opening 27 in the table into a suitable receptacle (not shown) where it can be collected for future
 50 use, and it will be evident that a suitable cabinet or enclosure can be placed between the rolls 2 and 5 to overcome any possibility of the sand escaping in operating on the strips.

The rolls 5 are arranged to operate a little faster than the rolls 2 in order to give a good taut strip in passing through such rolls and thus give a slight stretch to the strip, which will help to a certain extent to
 60 upset or loosen the formation of the oxide on the metal before it is exposed to the action of the sand blast.

It will be obvious that different widths of articles can be passed through the device to be cleaned by the sand blast, and in

case it is desired to clean narrower sheets than the height of some of the nozzles 10, the upper nozzle or nozzles can be shut off by simply closing their valves 15' thereby shutting off the air and the sand in such
 70 nozzle or nozzles.

It will thus be seen that in the use of my improved method and apparatus, the great expense, dissatisfaction and loss due to the usual pickling of these articles are overcome and the guides and other parts of the device may be made to accommodate the
 75 widest strips, while at the same time an article will be produced in which the scale, slag, oxide coating and other impurities will be entirely removed from the same. The method and apparatus is easily operated and will require no constant attention, as in the case of pickling, while it being without any hand operations it can be operated
 80 continuously and on a variety of articles.

Various modifications and changes may be made in the design and construction of the apparatus, without departing from the spirit of the invention or sacrificing any of
 90 its advantages.

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

1. An apparatus for treating metal articles comprising two pairs of feed rolls
 95 spaced from each other, means co-operating with each of said rolls to hold an article in frictional engagement therewith, a continuous guide extending from one pair of rolls to the other to direct an article from
 100 the first pair of rolls and its co-operating means into co-action with the other pair of rolls and its co-operating means, said guide having opposed inclined openings therein means for revolving the rolls to
 105 feed an article through the rolls, and an abrading blast device adapted to operate on said article between the rolls through the openings in said guide.

2. An apparatus for treating metal articles comprising two spaced apart pairs of
 110 vertically positioned rolls, the rolls of each pair being directly opposed and adapted to frictionally grip and feed an article therebetween, a continuous guide formed of
 115 parallelly arranged plates extending from one pair of rolls to the other to direct an article from the first pair into engagement with the second pair, said guide plates having inclined openings therethrough, means
 120 for revolving the rolls to feed an article therebetween, and abrading blast devices arranged to operate through said inclined openings and to simultaneously cover an area substantially co-extensive with the
 125 width of the height of the opening.

3. An apparatus for treating metal articles comprising pairs of vertically positioned feed rolls spaced from each other, means cooperating with each of said pairs
 130

of rolls to hold an article in frictional engagement therewith, a continuous guide formed of spaced apart parallel plates extending from one pair of rolls to the other
 5 to direct an article from the first pair of rolls into engagement with the other pair, said guide plates having inclined openings therein, and abrading blast devices operating through said inclined opening and comprising a plurality of nozzles arranged in
 10 an oblique row corresponding substantially to the inclination of the openings and arranged so that the area covered by one nozzle merges with that covered by the adjacent
 15 ones, said row of nozzles being adapted to cover an area co-extensive with the transverse width of the openings.

4. An apparatus for treating metal articles comprising an abrading blast device,
 20 means for moving an article across the path of the blast from said device, and means for tensioning or stretching said article when crossing the path of the blast.

5. An apparatus for treating metal articles comprising a pair of spaced article feeding devices adapted to have an article move
 25 therebetween, means for applying an abrading blast to said article between said devices, and means for operating one of said devices
 30 faster than the other to tension or stretch the portion of the article between the devices.

6. An apparatus for treating metal articles comprising a pair of spaced article feeding devices adapted to have an article move
 35 therebetween, an abrading blast device including a plurality of blast nozzles arranged obliquely of the path of movement of the article, the discharge portions of each of
 40 said nozzles being overlapped with the discharge portions of adjacent nozzles whereby the area covered by the blast of each nozzle

is merged into the area covered by the next adjacent blast so that the covered areas will extend unbrokenly transversely across the
 45 article, and means for varying the effective area of the blast devices to accommodate for variation in the widths of the articles.

7. An apparatus for treating metal articles comprising a pair of spaced apart feeding devices, each device including a pair of
 50 rolls which are yieldably supported so that they are movable toward and away from each other, said rolls being adapted to have an article moved therebetween, means on
 55 each side of the article and positioned directly opposite each other for applying an abrading blast device to said article between said feeding devices, and means for operating one of said devices faster than the other
 60 to tension or stretch the portion of the article between the members.

8. An apparatus for treating strips comprising two pairs of feed rolls spaced from
 65 each other for holding and advancing the strips, the rolls of each pair being oppositely positioned and yieldable with relation to each other, a continuous guide-way each
 70 side of the strip and between the rolls adapted to receive strips having a width co-extensive with the width of the rolls, and abrading blast devices positioned opposite each
 75 other to act on opposite sides of the strip and adapted to cover a width co-extensive with the width of the strips, said guide-way being provided with openings through which the blast devices operate.

In testimony whereof, I the said JOSEPH E. POOL have hereunto set my hand.

JOSEPH E. POOL.

Witnesses:

J. M. GEOGHEGAN,
 J. N. COOKE.