

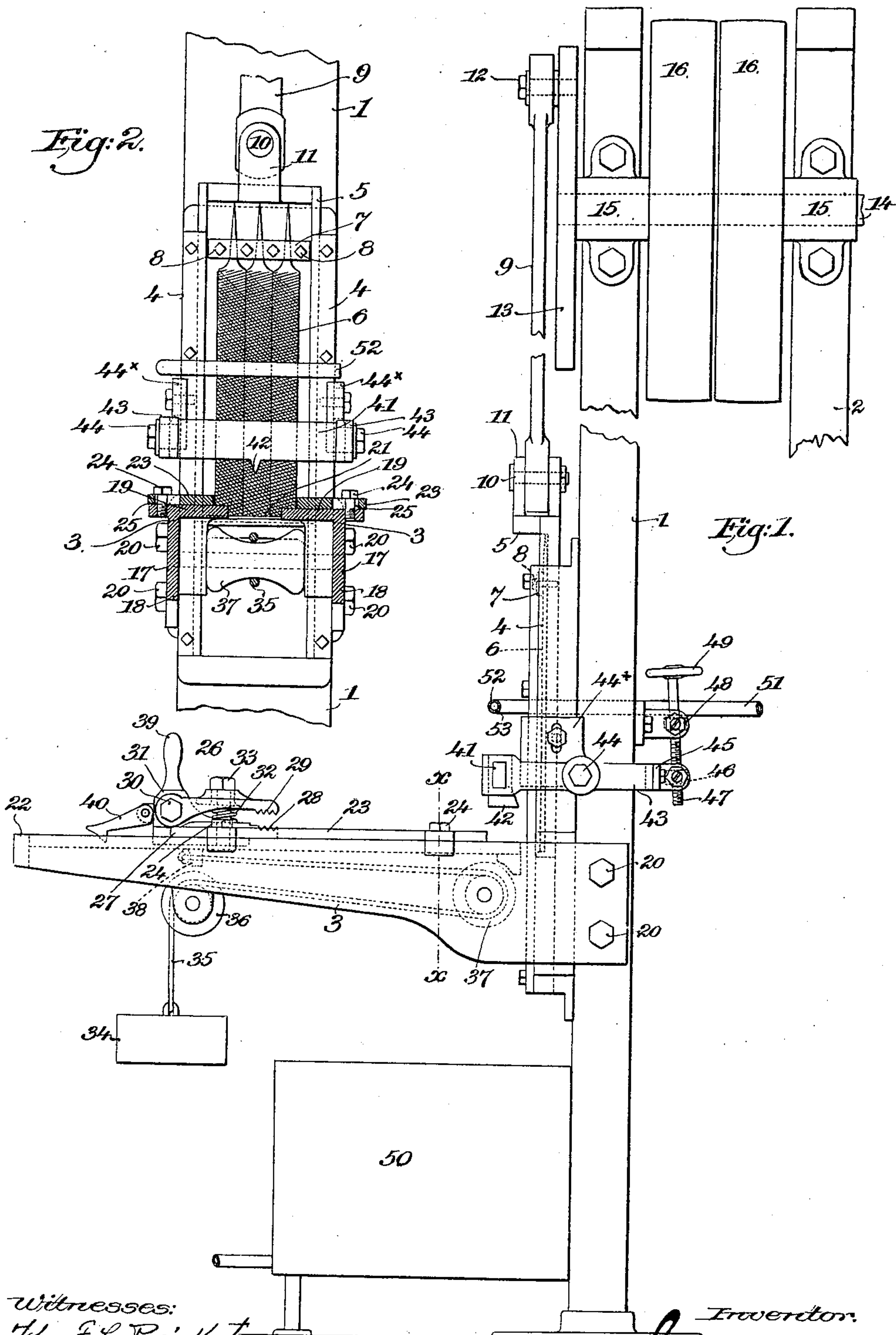
No. 666,409.

Patented Jan. 22, 1901.

G. D. COLEMAN.  
COMMUNICATING MACHINE.

(Application filed Feb. 10, 1899.)

(No Model.)



Witnesses:  
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# UNITED STATES PATENT OFFICE.

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## COMMINUTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 666,409, dated January 22, 1901.

Application filed February 10, 1899. Serial No. 705,219. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE D. COLEMAN, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Comminuting-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to a comminuting-machine, and particularly to a machine for producing comminuted particles of metal, such as copper and lead.

The objects of the present invention are to produce a machine of simple design and arrangement adapted to produce from pigs of lead or copper comminuted particles and to so arrange the mechanism of the said machine that the pig of metal will be progressively advanced and properly guided to the comminuting-tool.

To the above ends the present invention consists of the devices and combinations of devices which will be hereinafter described, and particularly pointed out in the claims.

The present invention is illustrated in the accompanying drawings, wherein—

Figure 1 shows in broken side elevation a machine embodying the same. Fig. 2 shows in front elevation and partial section, taken on the line *x x* of Fig. 1, portions of the machine.

Similar reference characters will be used throughout the following specification and drawings to designate corresponding parts of the machine.

As shown in the illustrated embodiment of the present invention, the machine comprises a suitable framework, which may consist of the vertical standards 1 and 2 and the horizontal table 3, secured to the vertical standard 1. Secured to the front of the vertical standard 1 are suitable guides 4, and arranged to reciprocate vertically in said guides 4 is a tool-carrier 5, consisting of a suitable rectangular plate, to the front of which is secured the comminuting-tool 6, which, in the illustrated embodiment of the present invention, consists of a plurality of coarse rasps, the

lower ends of which rest upon a flange of the tool-carrier 5 and the upper ends of which are secured beneath a clamping-plate 7, held to the tool-carrier 5 by suitable headed bolts 8. The tool-carrier 5 is designed to be reciprocated in the guides 4, and such reciprocations may be secured by any suitable mechanism, that shown in the illustrated embodiment of the present invention comprising a link 9, pivotally secured by a bolt 10 between ears 11 on the upper end of the tool-carrier 5, and at its upper end said link is pivotally connected with a crank-pin 12 on a disk 13, secured to the outer end of a shaft 14, mounted to rotate in suitable bearings 15, secured to the vertical uprights 1 and 2, and said shaft 14 is provided with pulleys 16, by means of which the shaft 14 may be driven by a belt from any suitable source of power to impart vertical reciprocations to the tool-carrier 5 and the comminuting-tool 6, supported by said carrier.

The piece of metal, such as a pig of lead or copper, to be subjected to the comminuting-tools 6 is designed to rest upon the table 3 and to be fed against the working face of the comminuting-tools 6, and to secure this supporting and advancing of the piece of metal I have in the illustrated embodiment of the present invention arranged a suitable clamp to engage the rear end of the piece of metal and progressively advance the metal toward the working face of the comminuting-tools 6.

As shown in Fig. 2 of the drawings, the table 3 comprises angular members 17, consisting of vertical plates 18 and horizontal plates 19, and the members 17 are secured by bolts 20 to the opposite sides of the upright 1, and when in position, as shown in Fig. 2 of the drawings, leaving a space 21 between the adjacent edges of the horizontal plates 19. The outer ends of the members 17 of the table 3 are connected by a suitable cross-piece 22, it being understood that the members 17 and the cross-piece 22 may be formed as a single casting or of separate pieces suitably secured together. Secured to the upper surface of the horizontal plates 19 of the table 3 are guide-plates 23, which, as shown in Fig. 2 of the drawings, are held in position by suitable bolts 24, passing through slots 25,



formed in said guide-plates, whereby they may be adjusted toward and from each other, according to the width of the piece of metal which rests upon the upper surface of the horizontal plates 19 of the table 3, between which guide-plates 23 the piece of metal will be guided as it is advanced toward the comminuting-tool 6. For the purpose of advancing the piece of metal toward the comminuting-tool 6 there is provided a clamp 26, which comprises a horizontal base-plate 27, which rests upon the upper surface of the horizontal plates 19 of the table 3 and is guided between the guide-plates 23. At the forward end of the horizontal base-plate 27 of the clamp 26 there is formed a roughened clamping-jaw 28, which coöperates with a complementary roughened clamping-jaw 29, pivoted at 30 to a vertical post 31, projected from the base-plate 27. In order to securely grip the reduced end of a piece of metal and hold the same while it is being advanced toward the comminuting-tool 6, the pivoted clamping-jaw 29 may be arranged to be elevated by means of a spiral spring 32, placed between said jaws and surrounding the bolt 33, which passes through the pivoted jaw 29 and is tapped into a threaded bearing (not shown) in the base-plate 27 and by means of which the pivoted jaw 29 may be forcibly moved toward the jaw 28 to clamp the piece of metal. The clamp 26 is advanced along the table 3 by means of a weight 34, which is connected by means of a cord 35, passing over rollers 36 and 37, (see Fig. 1,) to a lug 38, depending from the under side of the clamp 26, the arrangement being such that the weight 34 constantly and progressively advances the clamp 26 and the piece of metal clamped thereby toward the reciprocating comminuting-tool 6.

In order to retract the clamp 26 against the power of the weight 34, I have provided the said clamp with a suitable handle 39, which may be gripped by the operator and the clamp 26 moved backwardly toward the outer end of the table 3, and, if desirable, in order to maintain the clamp 26 in its retracted position during the placing of a piece of metal therein the said clamp may be provided with a pivoted hook 40, arranged to engage the cross-bar 22 at the outer end of the table 3 and hold the clamp in its retracted position.

It will be noted that by the foregoing arrangement the piece of metal will be constantly held in contact with the rasping-surface of the comminuting-tool 6, which upon its downstroke will remove from the forward end of the piece of metal comminuted particles. In order to insure that the piece of metal to be comminuted will be positively guided in a proper direction toward the comminuting-tool 6, and in order to prevent it being displaced vertically by the upward movement of the comminuting-tool, I have provided a clamp-guide arranged to engage the upper surface of the piece of metal immediately in front

of the reciprocating comminuting-tool. As shown in the illustrated embodiment of the present invention, this clamp-guide consists of a cross-bar 41, provided at its central portion with a sharpened blade or point 42, adjusted to engage, and preferably so positioned that it will cut into, the upper surface of the piece of metal a slight distance to prevent any lateral displacement of the piece of metal and also prevent its vertical displacement by reason of its contact with the reciprocating comminuting-tool. This clamping-bar 41 is preferably arranged to be moved up or down for the purpose of positioning the point 42 with reference to the thickness of the piece of metal being acted on by the machine, and in order to secure this result the cross-bar 41 is supported by carriers 43, which are pivotally secured at 44 to the opposite sides of the frame supporting the guides 4 or to vertically-adjustable plates 44<sup>x</sup>, secured thereto, and at their rear ends the carriers 43 are connected by a cross-bar 45, in which is pivoted a nut 46, through which passes an adjusting-screw 47, arranged to turn in a suitable bearing 48 carried by a bracket secured to the rear of the standard 1, said adjusting-screw at its upper end being provided with a hand-wheel 49, whereby it may be turned in its bearing and by means of the nut 46 raise or lower the clamping-bar 41 and the guide-clamp 42.

From the foregoing description it will be seen that as the pig or piece of metal is advanced toward the reciprocating comminuting-tool 6 and held in contact with the rasping face of said tool, said tool will, on its down stroke, remove a portion of the end of the pig in the form of comminuted particles, which will fall through the opening in the table 3 into a suitable box or receptacle 50, placed beneath the table 3 to receive the same, and that the pig of metal will be constantly and progressively advanced as the action of the comminuting-tool reduces the size of the pig, and this operation will be repeated until substantially the entire pig of metal has been reduced to comminuted particles. It is necessary that a stream of water be constantly discharged upon the comminuting-tool 6 and the end of the pig of metal which is being acted on by said tool in order that the comminuted particles may be washed from the face of the comminuting-tool and caused to drop into the receptacle 50, and for the purpose of supplying the water as above described I have provided a pipe 51, through which water may be permitted to flow from any suitable source of supply, and the pipe 51 is arranged to extend laterally across the front of the machine, as shown at 52, slightly in front of the reciprocating comminuting-tool 6, and the arm 52 of the pipe is provided with suitable apertures 53, arranged to discharge jets of water on the face of the comminuting-tool 6.

It is thought that the operation of the machine has been sufficiently described in con-



nection with the foregoing description of its form and arrangement and that a further description of its operation is unnecessary.

5 Having described the construction and mode of operation of my invention, I claim as new and desire to secure by Letters Patent of the United States—

1. In a comminuting-machine, the combination with a vertical standard, of a horizontal  
10 table secured thereto and projected at right angles therefrom thus providing a support for the metal to be comminuted, guides to direct the movement of the metal, a clamp having means for clamping it upon the metal and  
15 provided with a catch to hold it in its retracted position, a rope attached to the clamp, guide-rollers therefor and a weight for moving the clamp and metal toward the comminuting-tool, a comminuting-tool consisting of  
20 a plurality of rasps fixedly secured to a carrier by means of a clamping-plate, a flange on said carrier for supporting the lower ends of the rasps, suitable guides in the vertical standard for supporting said carrier, and  
25 means for actuating said tool, substantially as described.

2. In a comminuting-machine, the combination with a standard, of a table secured thereto, a clamp mounted thereon, and means for  
30 moving it toward the standard, a comminuting-tool supported in suitable guides in the standard, means for reciprocating said tool transversely to the direction of movement of the material fed forward by the clamp, pipes  
35 for discharging jets of water on the comminuting-tool, and a combined adjustable hold-down and guide adapted to engage the metal immediately in front of the comminuting-tool and hold it from accidental lateral and ver-  
40 tical displacement by the comminuting-tool, substantially as described.

3. In a comminuting-machine, the combination with a vertical standard, of a horizontal

table secured thereto and projected at right angles therefrom, thus providing a support for  
45 the metal to be comminuted, guides to direct the movement of the metal, a clamp consisting of toothed jaws and means for clamping them upon the metal, said clamp being provided with a handle to draw the clamp back  
50 and a latch to hold it in its retracted position, a rope attached to said clamp, guide-rollers therefor and a weight for moving the clamp and metal toward the comminuting-tool, a combined holddown and guide pivotally sup-  
55 ported upon said vertical standard, a hand-wheel and screw rotatably mounted upon said standard and adapted to adjust the holddown and guide to the varying thicknesses of metal, a comminuting-tool consisting of a plurality  
60 of rasps fixedly mounted upon a carrier by means of a clamping-plate, a flange on said carrier to support the lower ends of the rasps, suitable guides on the vertical standard for supporting said carrier, means to reciprocate  
65 said carrier and said tool, pipes for discharging jets of water upon said tool, and a suitable receptacle below said tool for collecting and retaining the comminuted particles, sub-  
70 stantially as described.

4. In a comminuting-machine, the combination with a vertical standard, of a horizontal  
table secured thereto, a guideway in said table having adjustable sides, a clamp for  
75 clamping the metal to be comminuted, a reciprocating comminuting-tool mounted in the vertical standard, and means for moving the clamp toward the tool to feed the metal to be  
80 comminuted along said guideway, substantially as described.

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

GEORGE D. COLEMAN.

Witnesses:

T. HART ANDERSON,  
JAMES V. ROE.