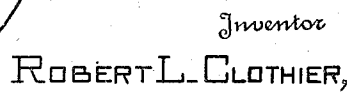


Filed July 16, 1943

2,449,979

4 Sheets-Sheet 1



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Sept. 28, 1948.

R. L. CLOTHIER
METHOD AND DEVICE FOR REMOVING ROTATING
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4 Sheets-Sheet 2

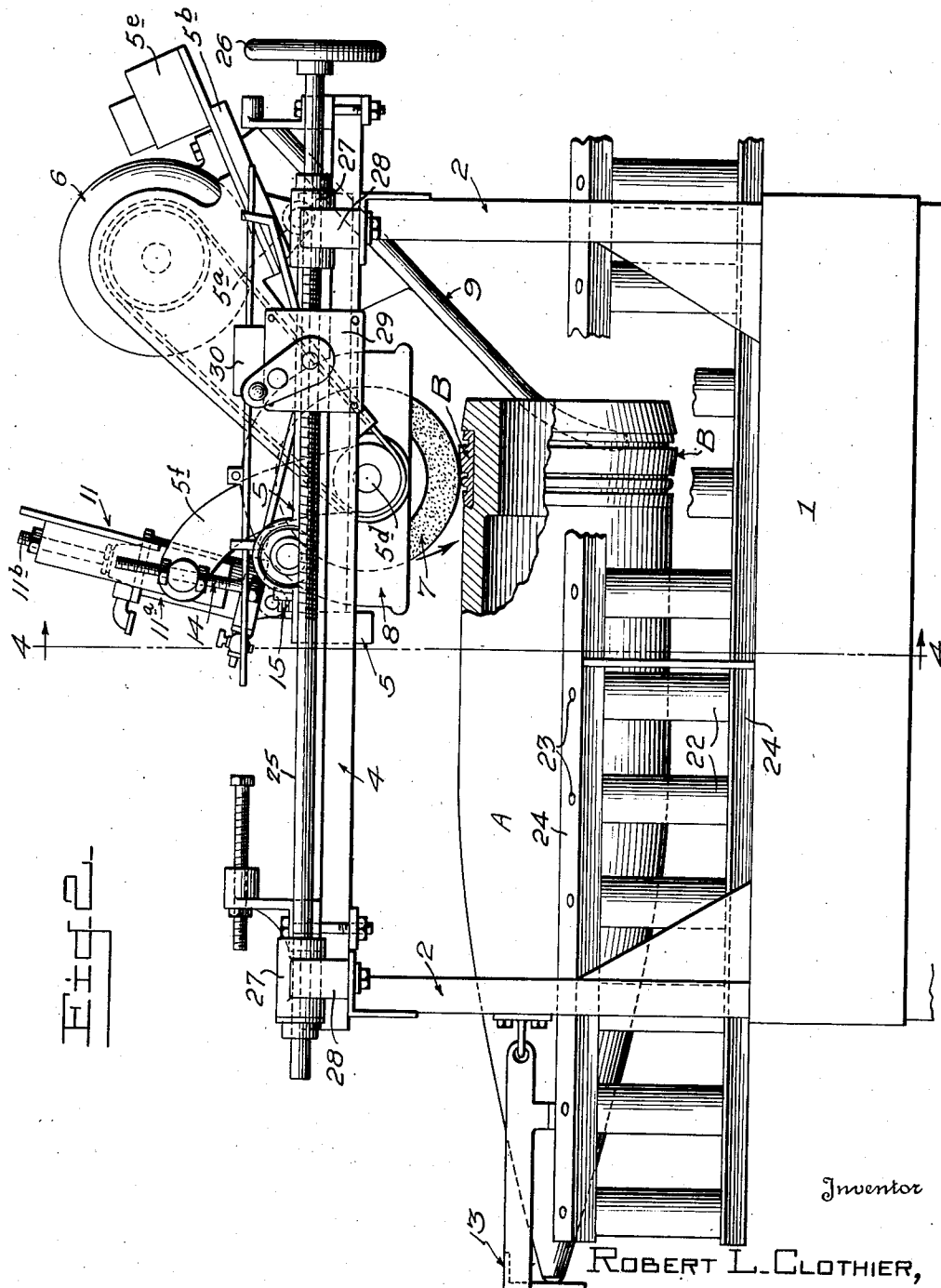


Fig. 2.

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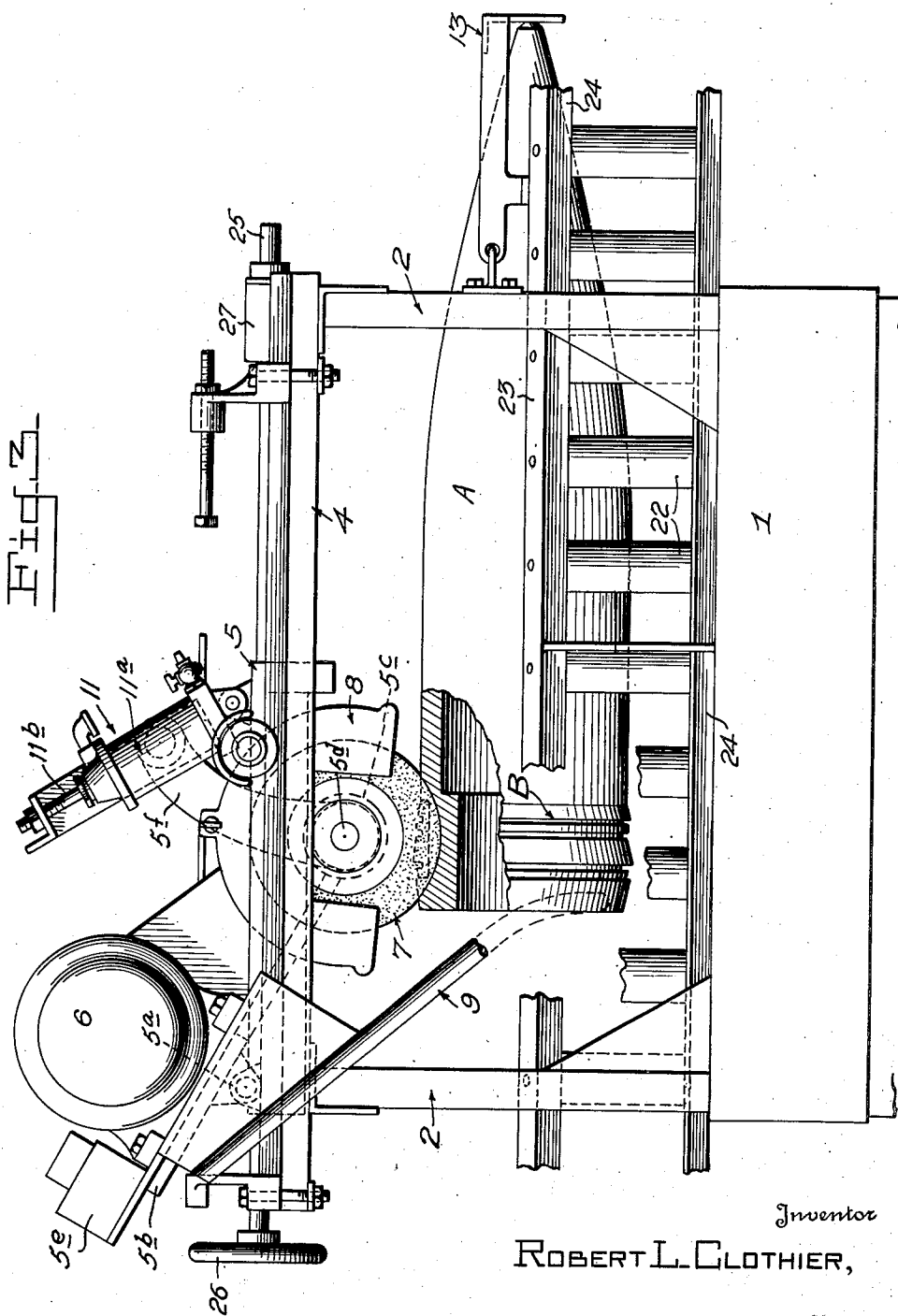
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4 Sheets-Sheet 3

2,449,979



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4 Sheets-Sheet 4

Fig. 4.

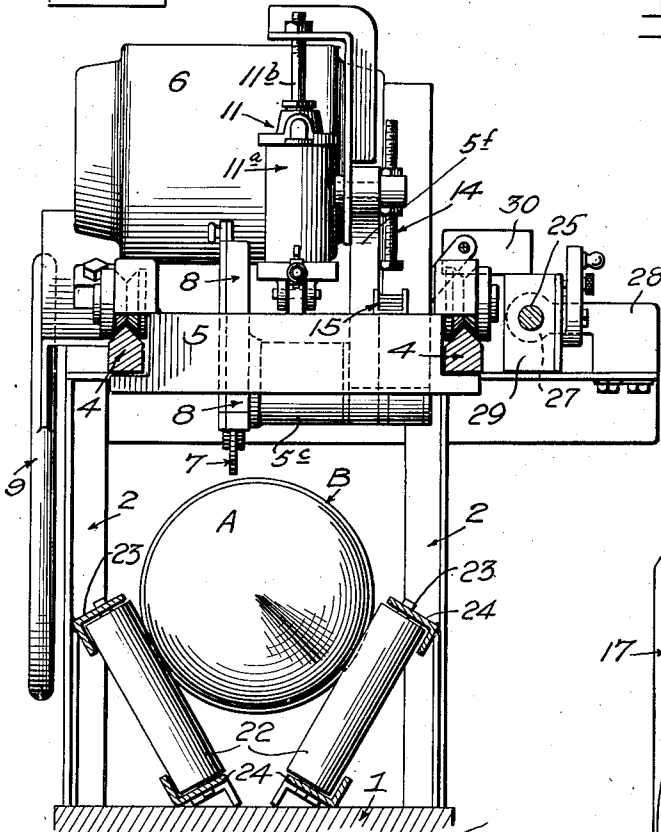


Fig. 6.

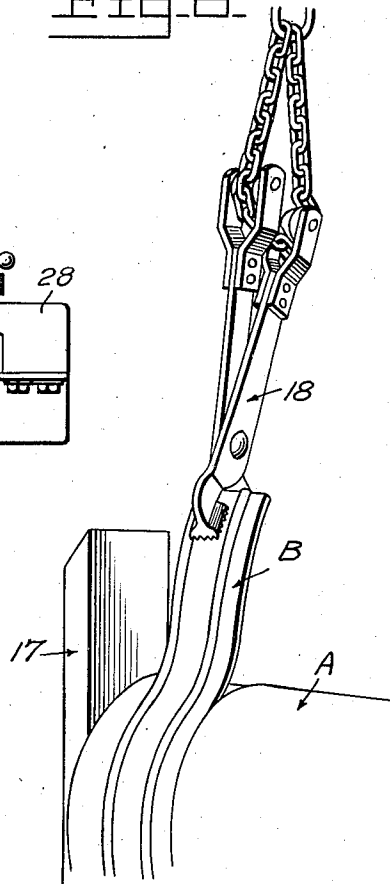
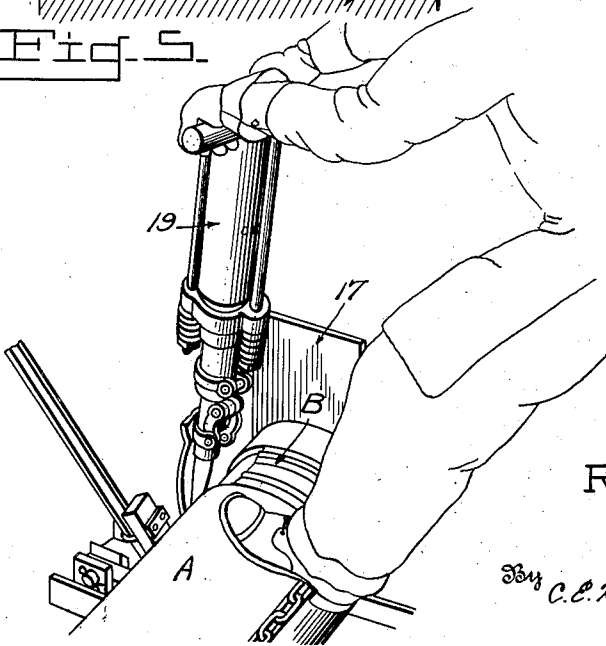


Fig. 5.



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METHOD AND DEVICE FOR REMOVING
ROTATING BANDS FROM PROJECTILES

Robert L. Clothier, Denville, N. J.

Application July 16, 1943, Serial No. 495,070

1 Claim. (Cl. 51—34)

(Granted under the act of March 3, 1883, as
amended April 30, 1928; 370 O. G. 757)

1

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention relates to a method and means of removing rotating bands from obsolete or rejected shells.

In the manufacture of high caliber shells, as for example the 12 and 16 inch shells, a rotating band, usually made of copper is placed about the shell at one extremity thereof. In instances where the shells so manufactured are either obsolete or rejected for some defect, and it is desired to scrap the shell, it is necessary that the rotating band be removed before the remainder of the shell can be sent to the metal scrap furnaces for melting down of the desired steel scrap.

Heretofore this has been accomplished by the use of a cold chisel, whereby one man held the chisel against the copper band while another man pounded the chisel with a heavily weighted sledge hammer until such time that the band is severed. A steel wedge was then continuously forced under the opened cut of the band and the shell rotated until the band was completely removed. By the manual operation described it was the common practice for a gang of 17 laborers to remove on an average of 65 rotating bands from 16 inch shells in one 8 hour working day. In addition to the time consumed in removing the bands in the manner described, the work involved was laborious and most tiring with a result that the utmost working efficiency of a gang of laborers could not be accomplished.

The primary object of this invention is to provide a device whereby automatic mechanical means are provided for removing the copper rotating bands from shells at such speed and ease that a group of 10 laborers can accomplish the removal of an average of 215 rotating bands in the same period of time.

An important feature of the invention is that very little physical effort is required in removing the bands with resultant peak efficiency of a laboring group. Another feature of the invention is the adaptability of the machine and method described to remove rotating bands from any series of sizes of shells.

The invention can best be understood from the following description to be read in view of the attached drawings in which:

Figure 1 is a top plan of the band cutting machine showing travel of the shells worked upon;

Figure 2 is a side view of the machine showing shell in position at inception of cutting operation;

2

Figure 3 is a side view showing cutter in position at its completed cycle;

Figure 4 is an end view of the machine, taken on line 4—4 of Figure 2;

Figure 5 is a view in perspective of the 2nd stage of removing the rotating band; and

Figure 6 is a view showing means for completion of removal of rotating band from shell.

Referring to the drawings, 1 indicates the base of the machine within which is positioned a shell A having a rotating band B. The said base serving as a means for supporting a frame 2 which in turn serves to support the motor driving means for the functioning of the machine. Extending between the two ends of the frame 2 is a pair of rails 4, 4 upon which a carriage 5 is movable. The carriage 5 is provided at its rear end with bearings 5—a in which is pivoted a platform 5—b extending through an opening in the carriage 5 and having at its forward end a bearing 5c in which is journaled a shaft 5—d. Suitably mounted on the platform 5—b above the bearings 5—a there is a motor 6 which drives a rotating cutter 7, mounted on the shaft 5—d, in the direction 25 indicated by the arrow in Fig. 2. The platform 5—b is also provided at its rear end with a counterpoise 5—e. The cutter 7 is positioned within a guard housing 8 which extends below the rails 4. In the functioning of the motor driven cutter, the platform 5—b is tilted slightly to lower and 30 elevate the cutter 7 as required. A lever 9 secured to the platform 5—b serves for controlling the movement of the cutter 7. A switch box 10 is provided to start and stop the motor as the need arises. Forming part of the control means for the downward movement of the cutter 7 is an air chamber or dashpot 11 which serves as a means for providing an even, steady and continuous downward control movement of the cutter 7. The cylinder 11—a of the dash-pot 11 has its lower end pivotally mounted on the carriage 5, and its piston rod 11—b is pivotally connected with an arm 5—f extending upwardly from the platform 5—b.

A screw 25 provided with hand-wheel 26 is journaled in bearing blocks 27 carried by arms 28 attached to the frame. A cooperating screw element contained within housing 29 is mounted upon carriage 5 by means of member 30. Manual rotation of the screw 25 by the hand-wheel serves to translate the carriage upon the rails 4—4.

For ease of feeding the shells to be worked upon to the machine described, there is provided a conveyor 20 extending to the stock pile of shells. Conveyor 20 terminates in a separate section 12

mounted upon a turntable 21. The turntable may be rotated to position the conveyor section 12 to receive a shell from the conveyor 20 or to deliver a shell from such section over the concave rolls into the machine. After the shell is conveyed into the frame of the machine, a nose-stop 13 secured to the frame of the machine is lowered, and holds the shell firmly in position while the shell is being worked upon. For supporting the shell within the band cutting device, I provide a series of rollers 22 mounted on bearings 23 in channels 24 so as to permit the shells to be readily pushed beneath the cutting device. A pair of blocks may, if desired, be placed against the end of the shell to more securely hold the same. After the shell is so positioned the motor is set for operation and the cutter lowered to cut through the rotating band. Care must be exercised not to cause too sudden and too rapid a downward thrust of the cutter upon the rotating band. Such control can be had by careful adjustment of the air chamber or dashpot 11. After the band is cut to its base, the platform 5—b is tilted by means of lever 9 to elevate the cutter 7 and the machine is ready for another cycle of operation.

In order to determine the depth to which the cutter 7 shall operate, there is provided a bolt 14 adjustably mounted on the arm 5—f which in contact with a plate 15 mounted on the carriage 5 determines the depth to which the cutter 7 can descend. In instances where rotating bands of varied thicknesses are to be worked upon, and the cutter 7 is accordingly to be brought to various depths, a series of shims can be added to the plate 15 and so provide a stop means at any desired point.

After the rotating band has been cut, the nose-stop 13 is lifted and the shell is pushed forwardly onto another conveyor 16 leading to a platform. By the use of an air hammer 19, or similar type of machine a small portion of the cut band is forced upward. The shell is then placed between two uprights 17 one of which is provided with a pin, which can be inserted into the base plug area of the shell, the other with an opening in which the nose of the shell can be placed, permitting rotation of the shell. A pair of tongs 18 secured to a power driven means such as a crane is then affixed to the opened portion of the band, and the crane is then set in operation. The band will then be peeled from the shell as it rotates between the uprights 17.

In the adaptation of the machine to cut the rotating bands from varied length shells and projectiles, the carriage 5 carrying the power cutting means can be moved upon the rails 4, 4 in any desired position and setting.

While there has been herein described one par-

ticular adaptation of the preferred embodiment of the device, it is obvious that modifications and changes can be made to the machine and method of removing rotating bands as herein described without departing from the spirit and scope of the invention.

Having described the invention, what is claimed as new is:

A device for cutting the rotating bands of projectiles which comprises a base, a projectile trackway disposed longitudinally of said base for moving longitudinally oriented projectiles, upright members on either side of said trackway, a pair of parallel horizontal members supported by said upright members forming a track disposed longitudinally of said base and aligned vertically with said trackway, a carriage on said trackway mounted for longitudinal movement upon said track, an arm pivoted on said carriage for limited movement in a vertical plane parallel to said trackway, a power driven cutter carried by said arm in a plane parallel to the plane of movement of said arm, a motor carried by said arm and drivingly connected to said cutter, means for oscillating said arm about its pivot to raise and lower said cutter, means controllably moving said carriage upon said track, said arm and cutter being partially counterbalanced to weight said cutter for downward pivotal movement against a projectile band, controllable dashpot means for controlling the downward rate of pivotal cutting movement of said cutter, and adjustable stop means for stopping downward movement of said cutter after a predetermined depth of cut.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,017,784	Meyers	Feb. 20, 1912
1,358,993	Shaw	Nov. 16, 1920
1,553,601	Easton	Sept. 15, 1925
1,574,048	Mikaelson	Feb. 23, 1926
1,760,075	McCullough	May 27, 1930
1,908,713	McCarroll	May 16, 1933
1,969,238	Robinson	Aug. 7, 1934
2,187,299	Burkhardt	Jan. 16, 1940
2,249,148	Lovely	July 15, 1941

FOREIGN PATENTS

Number	Country	Date
159,928	Great Britain	Mar. 8, 1921
536,957	Germany	Oct. 29, 1931
778,280	France	Dec. 15, 1934