(No Model.)

W. CRABB.

MACHINE FOR FLATTENING THE SHANKS OF PICKER TEETH.

No. 354,463. Patented Dec. 14, 1886.

Fig. 1.

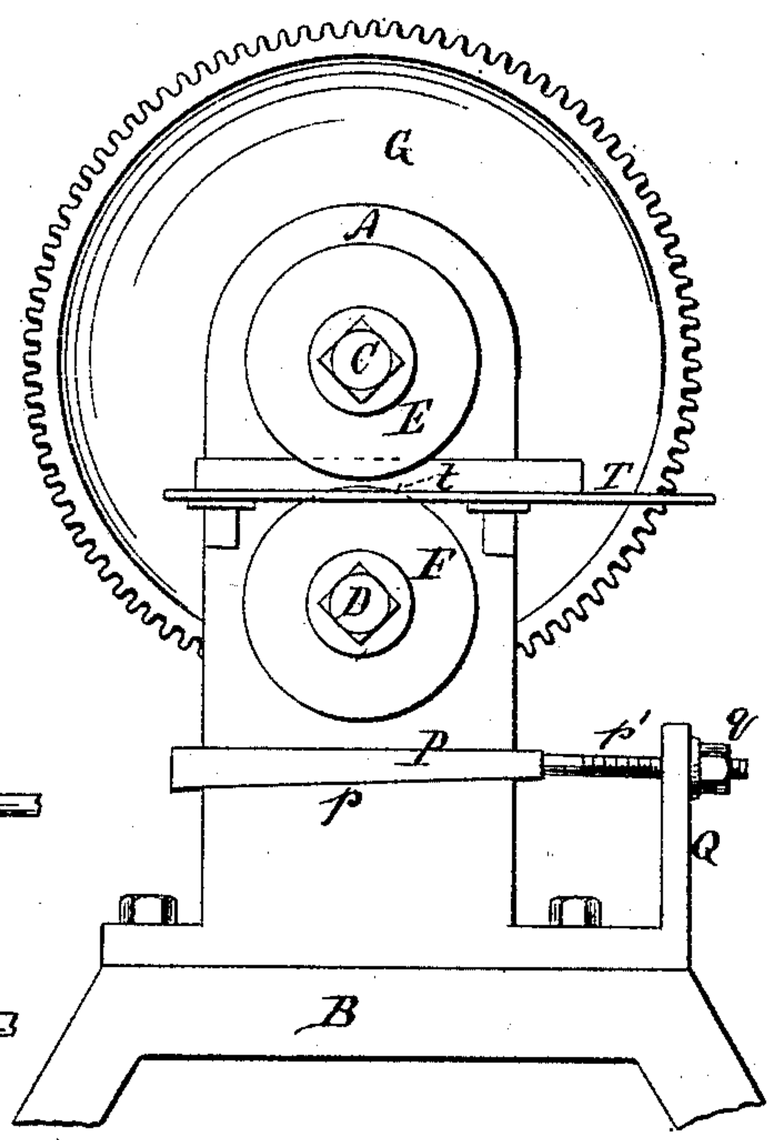


Fig. 6.

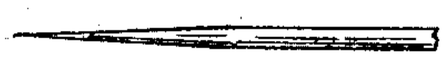


Fig. 7.

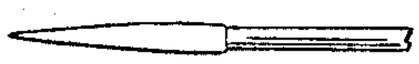


Fig. 4.

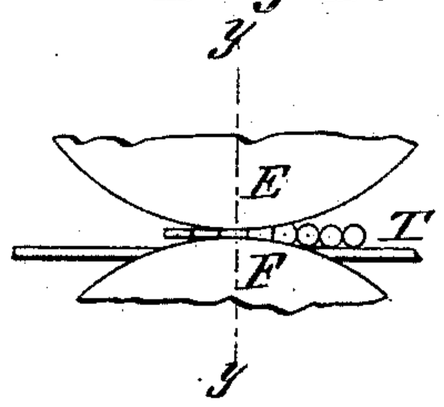


Fig. 5.

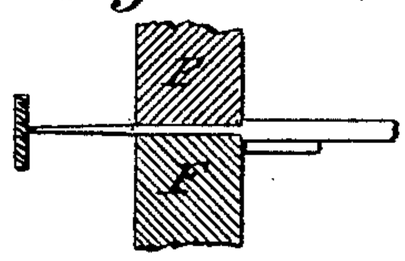


Fig. 2.

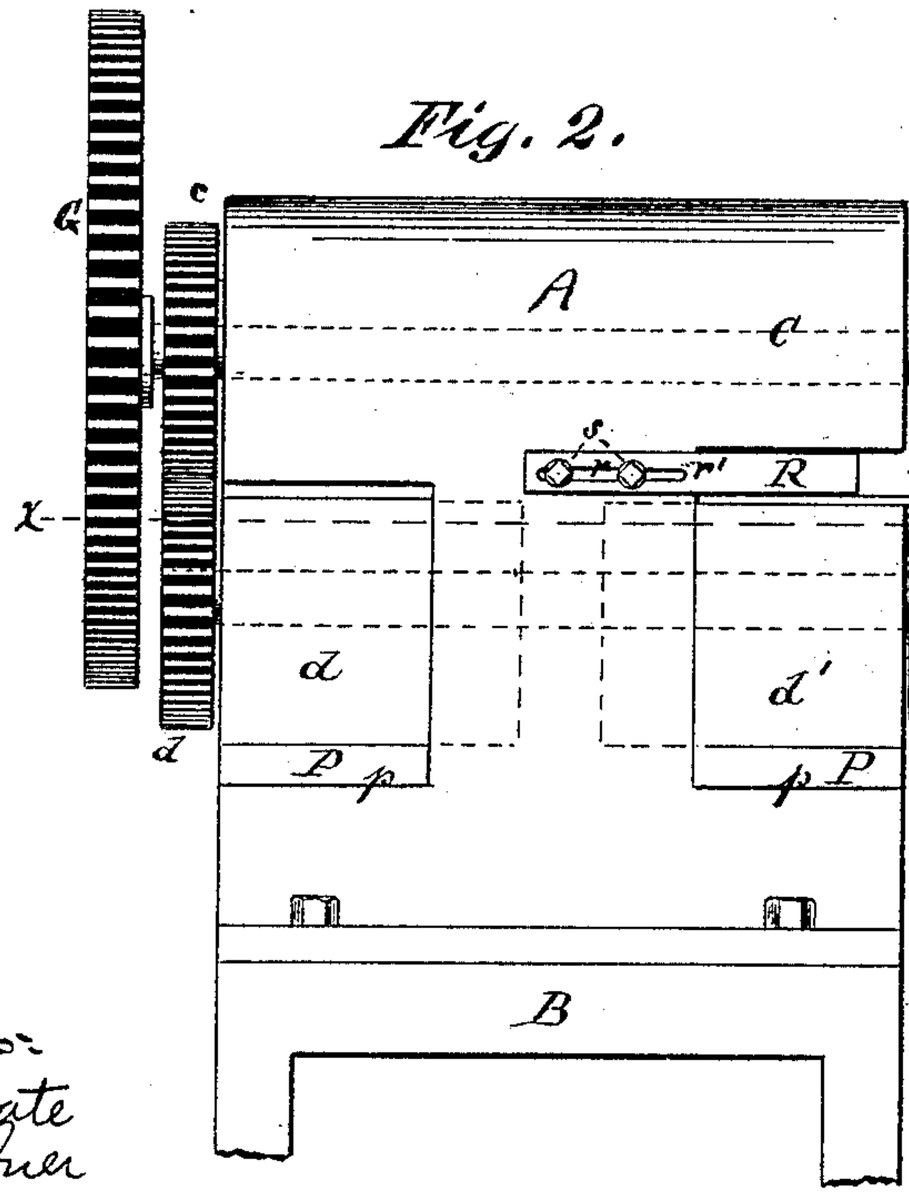
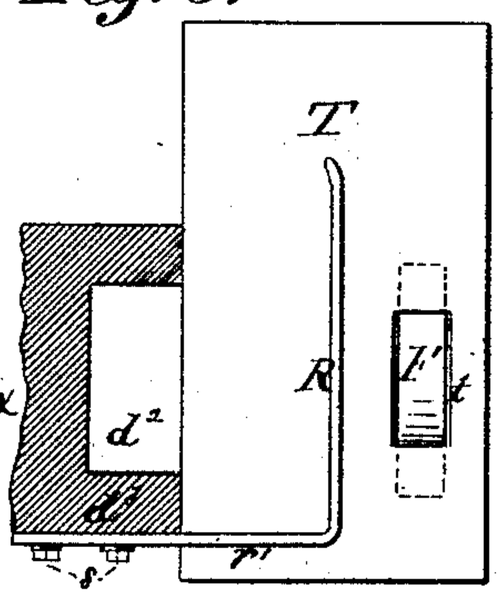


Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM CRABB, OF NEWARK, NEW JERSEY.

MACHINE FOR FLATTENING THE SHANKS OF PICKER-TEETH.

SPECIFICATION forming part of Letters Patent No. 354,463, dated December 14, 1886.

Application filed October 22, 1885. Serial No. 180,559. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM CRABB, a citizen of the United States, residing in the city of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Machines for Flattening the Shanks of Teeth for Treating Fibrous Substances, of which the following is a specification.

My improvements relate to the means to be employed for flattening the shanks in the manufacture of teeth or pins to be used for treating fibrous substances. Heretofore the result has been accomplished by subjecting the shanks while resting upon a suitable anvil to the action of a heavy reciprocating hammer or die; but such method, besides requiring an inordinate degree of power to effect the result, and being also objectionable upon account of the shock and jar involved, is necessarily comparatively slow and tedious, owing to the amount of handling and manipulating of the blanks required. In such old form of apparatus the uniformity and perfection of the action upon the teeth cannot long be maintained, for the reason that the eccentric in the reciprocating machine wears rapidly and unevenly, producing variations in thickness. The reciprocating dies are also difficult to maintain in perfectly parallel positions with relation to each other, and the wear upon their surfaces being irregular soon renders them uneven and unfit for use, whereas in my method the strain upon the surfaces of the rolls occurring gradually, and all portions of the perimeters being brought successively into use, the wear is slight and uniform and does not occasion distortion or want of uniformity in the teeth.

The object of my invention is to overcome the objectionable features mentioned above, and to render the operation of flattening the shanks continuous and rapid, instead of intermittent and slow, so that an operator will be able to treat more blanks within a given time, actual experience having demonstrated that twenty teeth can thus be flattened in the time formerly absorbed in flattening one.

My invention consists in the use of means substantially such as hereinafter described, whereby the prepared blanks are subjected to compression laterally between rolls which flatten the shanks thereby formed from the cylindrical or nearly cylindrical portions of the wire blanks, (the outer ends of which have previously been sharpened, as required,) at the same time defining and prescribing the length of the teeth by the formation of shoulders upon the blank, which designate the point for the subsequent severance of the flattened tooth from the remaining portion of the blank.

By my apparatus I am enabled to effect the desired result not only continuously and rapidly, but also without noise or jar, and with the greatest economy of power, since the latter is applied in the most effective manner practicable, the metal in each succeeding blank being squeezed into shape gradually, although quickly, whereas in the old method the change in shape is effected instantaneously, and can only be accomplished by heavy and powerful apparatus, the intermittent action of which is wasteful of energy and objectionable for obvious reasons.

By the use of a suitable table and gaging-surfaces I am enabled to pass the blanks through my apparatus in a continuous line, which requires little or no support or manipulation by hand.

In the accompanying drawings, Figure 1 is a front view of my improved machine; Fig. 2, a side elevation; Fig. 3, a plan of the blank-supporting table and end gage, &c., and a portion of the frame or standard of the machine being shown in cross-section upon plane of line *x x*, Fig. 2. Fig. 4 is a detail view of adjoining portions of the peripheries of the two rotating rolls, illustrating their action upon the blanks. Fig. 5 is a section of the same upon plane of line *y y*, Fig. 4. Fig. 6 is a view of a blank before being passed through my apparatus, and Fig. 7 a view of the same after being passed through my apparatus.

The main casting or standard A of my machine is mounted upon a suitable table or support, B, the lower part of which is broken away in the drawings. Superposed horizontal shafts C D pass longitudinally through the standard A at suitable distances apart. Upon the front ends of these shafts C D are mounted the circular rolls E F, and upon their rear ends are the gears *c d*, which mesh with each other, and thus insure the revolution of the

shafts and rolls in opposite directions. One of the said shafts is also provided with a large gear, G, to which suitable power is applied by means of other gearing. (Not shown.) One of the shafts is mounted directly in a longitudinal bearing in the standard A, while the other rests in bearings which are adjustable with relation to the position of the other shaft. It is immaterial which shaft is thus made adjustable, or whether they are arranged vertically one above the other or not; but the arrangement shown in the drawings is the preferable form, in which the upper shaft, C, rests in the stationary bearings in the frame A, while the lower shaft, D, is mounted in boxes *d d'*, which are vertically adjustable, the standard A being suitably recessed or slotted to permit of the adjustment of the said shaft D. The boxes *d d'* are held against lateral displacement by means of suitable vertical engaging-shoulders d^2 d^3, (shown in Fig. 3,) or by other appropriate means.

The vertical adjustment of the shaft D, and consequently of the periphery of the roll F with relation to that of the upper roll, E, may be effected in various ways without deviating from my invention in this respect, the means shown by way of illustration in the drawings consisting in interposing wedge-shaped plates P P between the boxes *d d* and the supporting-bases or stationary parts *p p* of the machine.

The position horizontally of the wedge-plates P P is regulated and maintained by means of nuts *q q* bearing against a stationary part, Q, of the apparatus and engaging with screw-threads formed upon stems *p'*, projecting horizontally from the plates.

In the drawings the means for adjusting the front wedge-plate P only are shown, but that for effecting the rear plate P may be identical in every respect. In fact, I do not wish to confine myself to any special means of adjustment, the essential feature being the adjustment of the shaft D bodily in such manner as to preserve its parallelism with the other shaft for the purpose of insuring the proper alignment of the rolls with relation to each other.

A horizontal table or rest, T, is supported upon the frame A in a position relatively between the rotating dies E F. This table T is formed with an elongated slot, *t*, through which the periphery of the lower roll, F, projects slightly. Above the table T and at the rear of the dies E F an adjustable guide and gage plate, R, is arranged for the purpose of regulating the position of the blanks as they are fed to the rolls.

The gage-plate R is made adjustable with relation to the rolls E F in any convenient manner, that shown in the drawings consisting in securing it to a stationary part of the machine by screws *s s*, which pass through an elongated slot, *r*, formed in the rectangular member *r'* of the gage R.

The rolls E F are of plain cylindrical form, their peripheries forming sufficiently sharp angles with their outer sides to cause such outer edges to create well-defined shoulders or offsets upon the blanks subjected to pressure between them.

The mode of operating with the machine is simple. The rolls having been adjusted so that their adjoining peripheries are separated only by a space equal to the thickness of the tooth to be produced, and the gage R having been regulated according to the length of tooth desired, a handful of blanks the ends of which have been previously tapered are placed upon the right-hand side of the table T, with their ends against the gage R, and rolled along successively to the rolls E F, by which they are in turn drawn in, flattened, and delivered upon the left-hand side of the table. This operation is illustrated in Figs. 4 and 5.

It will be seen that the result of the operation upon a blank is that the outer or prepared end of the blank at a proper distance from the point is flattened transversely, to constitute the shank of the new tooth, the length of which is determined by the position of the gage R with relation to the front edges of the rolls, which latter, while compressing and flattening the cylindrical or nearly cylindrical shank simultaneously form shoulders upon either side, which prescribe the length of the tooth, which is subsequently severed from the remaining cylindrical portion of the blank at that point.

I am aware that rolls have heretofore been employed for lengthening, flattening, or stamping metal in various ways, and I do not claim the use of compressing-rolls, broadly, the distinguishing feature in my invention consisting in the special arrangement and construction of parts whereby each blank is rolled crosswise or transversely of its length, flattening the shank of the tooth under formation and defining its length.

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

1. In a machine for defining the length of picker and other metal teeth and flattening their shanks by transverse rolling substantially in the manner and for the purpose described, the combination, with the two opposed cylindrical compression-rolls capable of rotation in opposite directions, of the intermediate stationary horizontal blank rest or table, and the back-rest or gage-plate arranged thereon in a position at the rear of and parallel to the said compression-rolls, substantially in the manner and for the purpose described.

2. In a machine for defining the length of picker and other metal teeth and flattening their shanks by transverse rolling substantially in the manner and for the purpose described, the combination, with the two opposed cylindrical compression-rolls, and with the intermediate horizontal stationary blank rest or table, of a parallel back rest or gage for the blanks which is adjustable upon said

blank table and with relation to the said compression-rollers, substantially in the manner and for the purpose described.

3. In a machine for defining the length of picker and other metal teeth and flattening their shanks by transverse rolling substantially in the manner and for the purpose described, the combination, with the two opposed cylindrical compression-dies capable of rotation in opposite directions, and with the intermediate horizontal stationary blank rest or table, of means, substantially such as described, for adjusting the periphery of the lower cylindrical roll with relation to the upper surface of the said table and the periphery of the upper cylindrical roll, for the purpose and substantially in the manner described.

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