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PROCESS FOR SMOOTHING AND POLISHING METAL ARTICLES AND PARTS.

APPLICATION FILED SEPT. 14, 1908.

1,017,268.

Patented Feb. 13, 1912.

Fig 1

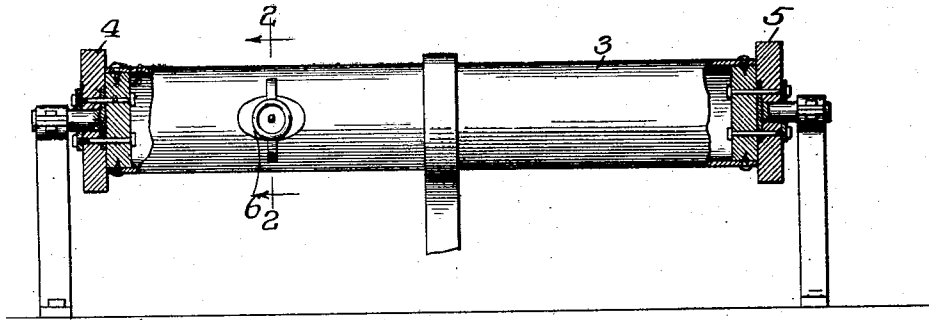
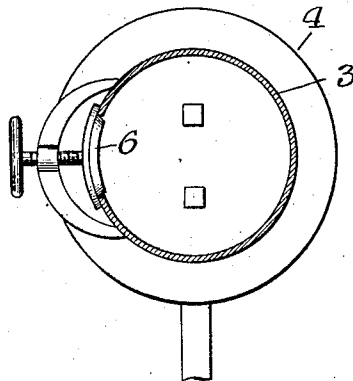


Fig. 2



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PROCESS FOR SMOOTHING AND POLISHING METAL ARTICLES AND PARTS.

1,017,268.

Specification of Letters Patent.

Patented Feb. 13, 1912.

Application filed September 14, 1908. Serial No. 452,977.

To all whom it may concern:

Be it known that I, WINSLOW R. PARSONS, citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Processes for Smoothing and Polishing Metal Articles and Parts, of which the following is a full, clear, and exact specification.

10 This invention relates to improvements in processes for smoothing and polishing metal articles and parts, and particularly those of steel having both angular and curved edges and faces, the edges of which have burs due to their stamping out and their surfaces more or less rough, which are not only desirably removed, but which must be removed in order to render them marketable and operative and capable of being smoothly polished.

20 The prime object of this invention is to entirely dispense with hand manipulation in removing burs from, and smoothing the surface of, and finally polishing throughout metal articles and parts for immediate use, or for subsequent plating, small metal articles and particularly those which are stamped from sheet steel, as for example, attachments for sewing machines, such as hemmers in one or more pieces, the parts of rufflers, tuckers, embroiderers, and screw driver parts, and any and all other small articles stamped from sheet metal, and also castings or forgings, both large and small.

35 In other words, it is the prime object of my invention to provide an improved method by which the tumbling barrel method may be exclusively used for both smoothing rough articles and polishing smooth articles and parts not before capable of being smoothed and polished in a tumbling barrel because of injury thereto, but reduced to a higher state of smoothness and polish than heretofore possible articles which, prior to my invention, were partly smoothed in a tumbling barrel, but for finally smoothing and polishing were necessarily removed therefrom and subjected to hand manipulation on emery wheels, buffers and the like.

In practicing my new method or process I may employ any old and well known form of tumbling barrel, such for example as

illustrated in the accompanying drawings, in which—

55 Figure 1 indicates an ordinary form of construction of tumbling barrel and Fig. 2 a cross section thereof in which the body of the barrel consists of a hollow cylinder 3, fixed in one end of which is a head 4, and at the opposite end a smaller but removable head 5 for the purpose of introducing and removing the articles or parts and the abrading materials thereof of my invention, care being taken that the heads are so closely fitted that neither the liquid nor other abrading materials employed may accidentally escape therefrom, and to which end, if desired, both heads may be permanently secured in position, and access to the barrel be had through a manhole in the side thereof and the outlet closed by a removable cover 6.

65 In carrying out my invention, so far as it relates to removing the otherwise smoothed articles to be subsequently polished and then abraded, if desired, the barrel is filled about three-fourths full with the articles or parts to be smoothed and scraps, cuttings, pinchings or chopped up pieces of brass spherical shaped and the variety of pieces of brass depending upon the shape of the article or parts to be smoothed, as for example, in hemmers made in one piece, and in which there are various angular and curved surfaces and angular and curved notches the brass pieces should be of such size and form that they may, in the tumbling barrel, project into and be rubbed against the surfaces of curved and angular corners without becoming locked or fastened therein, and with the other pieces of brass of such form as to engage and rub against the several flat surfaces, all of which and the sizes of brass pieces employed will be readily understood by those skilled in the operation of tumbling barrels as heretofore commonly employed for various articles and parts.

75 In practice the articles and the parts to be smoothed and the brass pieces should be more or less uniformly mixed before or during their introduction into the barrel. To the metal articles so distributed in the barrel I then add an abrasive material of a fineness which will cut the burs and smooth the several surfaces, and not coarse enough to scratch the surfaces, and this either with

or without first mixing the abrading material with a neutral oil, in other words, I preferably employ for such articles or parts as occur in sewing machine rufflers, hemmers and other similar small articles stamped out of sheet steel emery of about number 180, but may employ other abrasives of a number adapted for producing the same cutting without scratching, varying the abrasive material as the metals are hard or soft, thick or thin, using to a tumbling barrel of a capacity of about eight gallons, filled three-fourths full as before described, four-fifths of an ounce of emery of about No. 180, and about one pint of neutral oil, that is to say an oil preferably free from acid or substantially so in order to smooth all the edges and surfaces without any injury to the metals, such as is liable to occur by the use of oils in which acids are present. It would, however, be no substantial departure from my invention to somewhat increase or diminish the quantity of oil, and amount and size of abrasive materials, so long as the cutting may take place without scratching the articles or parts and that the oil be not in too great a quantity in proportion to the abrading material employed, but in practice it is found that when the oil and emery are in the perfect proportions above stated the burs are removed and the articles and parts perfectly smoothed respectively with thoroughness and the highest degree of polish and in the shortest possible time, that is to say, by operating the tumbling barrel continuously for about two days' time, when it will be found that they are entirely free of burs and other roughness of surface, but it should be borne in mind as the stocks of the parts are thicker and their edges rougher, the longer time the operation of the tumbling barrel must be continued, and that on the other hand the thinner the stock of which the articles or parts is composed a correspondingly shorter time of operation of the tumbling barrel is required to render them perfectly smooth.

After removing the burs and smoothing the articles or parts, as above described the articles or parts and the pieces of brass are thoroughly cleansed of emery, oil and dirt, and are then placed in another tumbling barrel into which is introduced a neutral oil but no emery, whereupon the tumbling barrel is then operated from one to three days depending upon the character of polish, and at the end of which time it will be found that all the surfaces of the articles or parts are polished to a very high degree, and may be to the highest possible degree that steel surfaces are capable of being polished.

For securing the best possible results in the polishing operation, the tumbling barrel should be filled or substantially filled full

with the articles or parts and the pieces of brass, to reduce their movement against the barrel and against each other to a degree that will prevent any possibility of their being scratched by blows either by the inner surface of the barrel, or by striking against each other, while at the same time the movements of these three things should be sufficiently free to produce a sliding, rubbing movement between the articles or parts and the pieces of brass to polish the former to the desired degree, notwithstanding without any possibility of their being scratched or otherwise marred. The articles or parts, when so polished are capable of taking on a more uniformly perfect and stable nickel or other plating heretofore and commonly employed because of the degree of smoothness underlying and the high degree of polish they have but to which end and before being subjected to the completing operation they may be first cleansed of any foreign substances and particularly oil by the usual methods, that is to say by first drawing off the oil, separating them from the brass pieces and then subjecting them, (the articles or parts or both, as may be) to hardwood sawdust, or may be to a very dilute alkaline bath a sufficient length of time to remove all the grease therefrom.

So far as I am aware I am the first to use in a tumbling barrel or other agitator pieces of brass having a rubbing contact with other base metals for smoothing and polishing, and the first to employ oil and an abrading material of any kind, and particularly emery in a tumbling barrel or other agitator for polishing metal articles or parts of any kind, and my invention is, therefore, not limited to the general employment of oil, brass and emery for purposes of smoothing metal articles or parts confined therein, although my invention includes all three for that purpose. Neither is my invention limited to the general use of oil and brass in a tumbling barrel for polishing metal articles contained therein, but extends to water or other liquids as a substitute for oil when brass pieces are employed for polishing purposes, as above described. My invention also includes the employment of any alloy that is adapted to perform the same or substantially the same smoothing and polishing effect that is due and attributable to the use of an alloy composed essentially of copper and zinc, commonly known and designated as brass.

In conclusion, it should be observed that the smoothing and polishing effect of pieces of brass upon steel has the same effect upon the brass, and that, therefore, my invention includes the polishing of brass articles by means of pieces of steel of sizes and forms adapted to contact with the regular and irregular surfaces of such brass articles, and

that there are instances in which both brass and metal articles may be polished without the employment of waste pieces of either of these materials.

5 Now having described my invention what I claim and desire to secure by Letters Patent is:—

10 1. The herein described method of smoothing metal articles and parts; the same consisting in subjecting them to a wearing frictional action simultaneously in the presence of brass, a liquid and an abrasive material, substantially as described.

15 2. The herein described method of smoothing metal articles and parts stamped from sheet metal, the same consisting in subjecting them to smoothing frictional contact

simultaneously with brass, oil and an abrasive material, and each with the other, substantially as described.

20 3. That improvement in the art of smoothing and polishing articles and parts of steel and brass, the same consisting in simultaneously subjecting both in the presence of a liquid to a frictional movement one upon 25 the other in the form and for a time substantially as herein described.

In witness whereof, I have hereunto set my hand and affixed my seal, this tenth day of September, A. D. 1908.

WINSLOW R. PARSONS. [L. S.]

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."