2 Sheets—Sheet 1.

R. WALLACE.

Manufacture of Spoons and Forks.

No. 220,002. Patented Sept. 23, 1879.

Fig. 1.

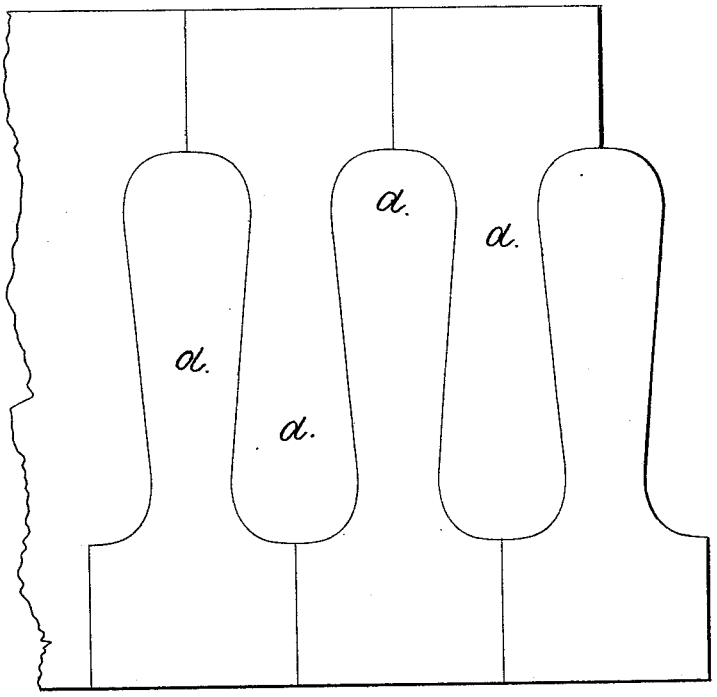

Fig. 2.

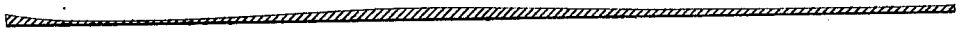

Fig. 3.

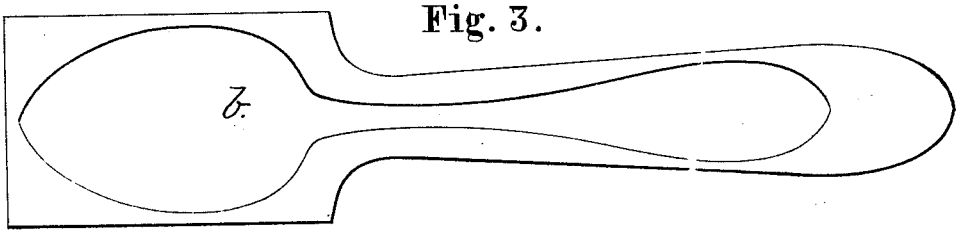

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Fig. 4.

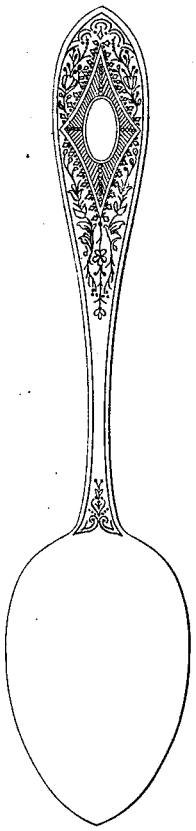


Fig. 5.

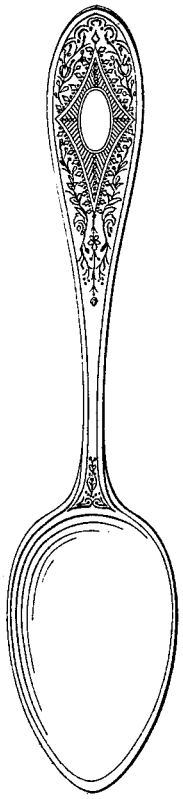
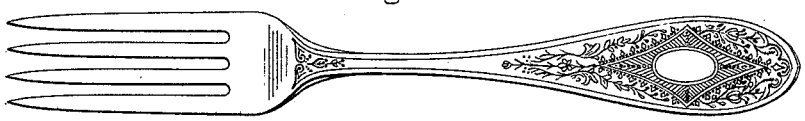


Fig. 6.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN THE MANUFACTURE OF SPOONS AND FORKS

Specification forming part of Letters Patent No. **220,002**, dated September 23, 1879; application filed June 7, 1878.

To all whom it may concern:

Be it known that I, ROBERT WALLACE, of Wallingford, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in the Process of Manufacturing Spoons and Forks; and I hereby declare that the following is a full, clear, and exact description of the same, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

Figure 1 represents a series of blanks cut from a strip of homogeneous steel. Fig. 2 is a longitudinal section of a blank rolled into proper shape for a spoon, and illustrates the variable thickness of different portions of the blank. Fig. 3 is a plan view of the rolled blank, and also the stamped-out spoon-blank. Fig. 4 is a plan view of the spoon-blank with ornamented handle. Fig. 5 is a view of the finished spoon, and Fig. 6 is a view of the finished fork.

This invention relates to an improved process for the manufacture of spoons and forks, consisting of inferior metal plated with precious metal, usually silver; the object being to produce spoons and forks which shall be of small initial cost, of great durability, and susceptible of a highly finished and ornamented surface.

Spoons and forks resembling silver in their finish, ornamentation, and general appearance have ordinarily been made of an alloy largely composed of copper and zinc, known in the arts as "German silver," and of other metals or alloys of similar composition, which could be rolled and stamped with as much facility as silver.

Sheet and cast iron have also been largely used in the manufacture of a cheap article of spoons and forks, and such articles of tableware have usually been provided with a coating of tin; but spoons and forks made of iron could not compete in their finish and appearance with spoons and forks made of German silver or similar alloys, and such articles form a distinct class of manufacture.

I am also aware that spoons and forks have long been made, in whole or in part, of steel, and in some cases the articles have been plated with precious metal, and hence I make no broad claim to spoons or forks made either of iron or steel, as my invention consists in an improved process for the manufacture of spoons and forks of homogeneous steel, whereby the finished article is possessed of all the desirable and valuable characteristics of silverware in its appearance, finish, ornamentation, strength, and durability, while it is much lighter in weight, and can be produced at a much lower cost than the ordinary articles of silverware.

German silver and similar alloys are adapted to be rolled and stamped with the same facility as silver; but homogeneous steel requires more than four times the pressure imparted to German silver before the homogeneous steel can be made to flow into the fine and deep recesses of that portion of the dies for producing the desired ornamentation, and hence the ordinary process resorted to in the manufacture of German-silver spoons and forks is wholly impracticable if it is desired to employ homogeneous steel in the manfacture of such articles.

I will now proceed to describe the various steps for carrying my improved process into effect.

The homogeneous steel is first rolled into sheets of the desired width, length, and thickness, and from such sheets the blanks *a a* are cut, as illustrated in Fig. 1, whereby the material is economized and waste-scrap avoided. The blanks *a a* are then rolled to extend the same, and to impart varying thicknesses to different portions of the blank, as shown in Fig. 2.

The blanks are rolled cold, and, as heretofore stated, when the blanks are composed of silver, German silver, or similar material, no difficulty is experienced in the process of rolling; but with homogeneous steel the blanks cannot be rolled in the usual manner on account of the greatly-increased power necessitated in forcing the blank through the rolls, and also for the reason that the surface of the steel is so smooth that the rolls fail to take hold of the blank promptly.

In rolling articles of irregular or varying thickness, it must be remembered that the blank must enter the rolls at a fixed point,

and that the slightest slip or variation of the blank not only ruins the blank, thus causing loss of material and all previous labor bestowed upon the blank, but that such variation or slip of the blank is liable to injure the rolls, and thus cause a still greater loss to the manufacturer.

To prepare the blank, therefore, for rolling, and prevent it from slipping as it enters between the rolls, I thoroughly cleanse the blanks—preferably by placing a large number of blanks into a tumbling barrel or mill with a quantity of pumice-stone or other similar substance that will operate to scour the surface of the blanks. Then, to insure a prompt and certain hold of the rolls on the blank and prevent the latter from slipping, I cover the rolls or the blank, or both, with turpentine, and when the blank is now entered between the rolls it is promptly and firmly grasped and transformed into the desired form, as indicated in Fig. 2.

From the blank, after having been rolled, is stamped the spoon-blank proper, *b*, as illustrated in Fig. 3, or a fork-blank in case the blank was rolled for the production of fork-blanks.

When homogeneous steel has been compressed by cold-rolling, as hereinbefore described, it is of such density that it is necessary to soften the metal by annealing that it may yield sufficiently to receive the impressions of the dies for ornamenting the surface of the article.

The operation of annealing is usually performed by heating and slowly cooling the blanks, and in the manufacture of spoons and forks from the metal ordinarily used the blanks are ordinarily annealed in an open oven or furnace; but this method of annealing will not answer when the blanks are formed from homogeneous steel, because the latter will oxidize and blister, and thus injure the surface of the blanks. To prevent this I pack the blanks tightly in close-fitting iron boxes, and close all the joints of the boxes by luting the joints with clay, and thus exclude the outer air from the blanks within the boxes. The boxes are then placed in a furnace and heated to the desired temperature, after which they are allowed to cool, care being taken not to open the boxes until they have become cold; and when the blanks are removed from the boxes it is preferable to protect them from the direct contact and influence of the atmosphere, which may be effected by sprinkling unslaked lime over them.

As the sharply-defined raised ornamentation such as is required on the better grade of spoons and forks cannot be formed or stamped on homogeneous steel which has the slightest particle of a blister or scale on the surface to be ornamented, it is of the greatest importance that the utmost care and attention be given the process of annealing, as success largely depends upon the manner in which this particular step in my improved process is conducted.

The blank is now prepared for stamping by grinding the same and removing any burrs therefrom. The shank or handle is first stamped in a press, forming a blank with sharp and finely-raised ornamentation, as illustrated in Fig. 4. The bowl of the spoon or the tines of the fork are next formed and the edges trimmed, thus producing a finished blank, as shown in Fig. 5 or Fig. 6, which is now ready to be plated. The plating is effected by first depositing a film of copper on the blank, then depositing a coating of nickel on the copper, and finally a coating of silver. The article is then burnished and polished, and when finished complete in the manner and by the successive steps hereinbefore enumerated affords an article of manufacture of great durability, of high finish, and ornamental appearance, and one which can be produced at a small initial cost in manufacture.

I would have it understood that I make no claim in this application to the article manufactured under my improved process, as such claims are made in a separate application for patent.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The method or process of manufacturing forks or spoons from homogeneous steel, consisting, essentially, in the following steps: first, in cutting the blanks of the desired size and form; second, in imparting a smooth surface to the blank; third, in applying adhesive substance, such as turpentine, to the blanks or rolls, or both, preparatory to rolling, and afterward cold-rolling the blanks to impart the desired thickness to the different portions thereof; fourth, in annealing the cold-rolled blanks in air-tight receptacles; fifth, in stamping, shaping, and plating the blanks to form the completed article, substantially as hereinbefore set forth.

2. In the process of manufacturing forks or spoons from homogeneous steel, the method of preparing the blanks, consisting in applying adhesive substance, such as turpentine, to the blanks or rolls, or both, preparatory to subjecting the blank to the pressure of the rolls, substantially as set forth.

ROBERT WALLACE.

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