T. J. BLAKE.

Shovel.

No. 161,321. Patented March 30, 1875.

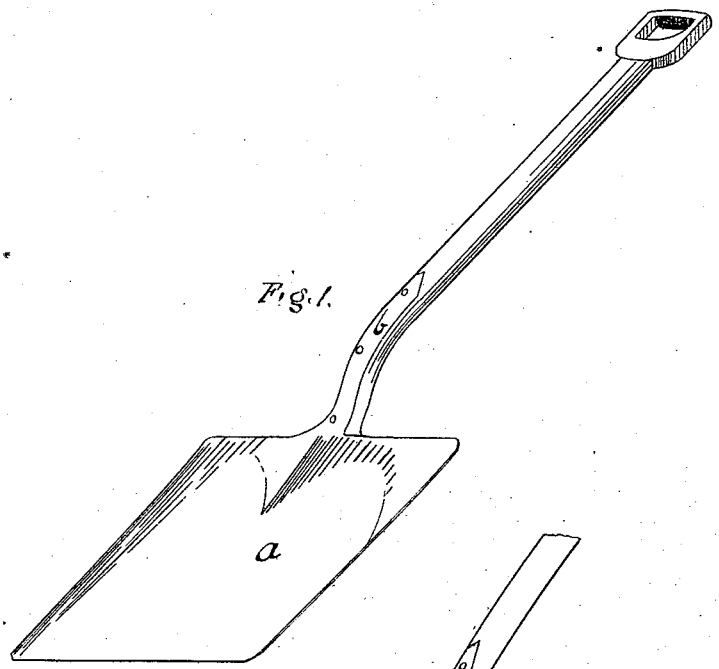

Fig. 1.

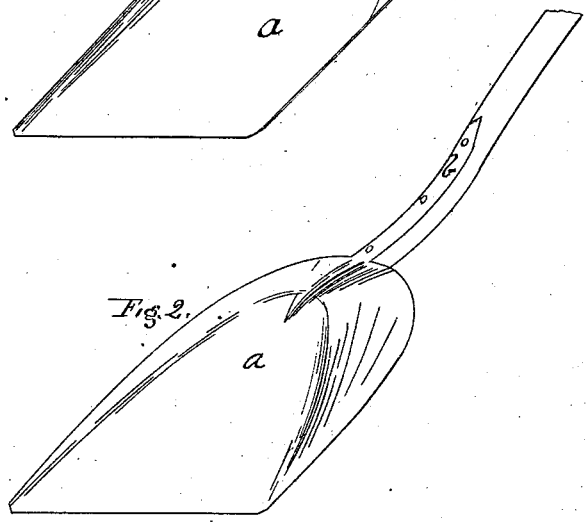

Fig. 2.

WITNESSES

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UNITED STATES PATENT OFFICE.

THOMAS J. BLAKE, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN SHOVELS.

Specification forming part of Letters Patent No. **161,321**, dated March 30, 1875; application filed June 1, 1874.

To all whom it may concern:

Be it known that I, THOMAS J. BLAKE, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Shovels; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 is a view of a shovel embodying my improvement, and Fig. 2 is a similar view of a scoop.

Like letters of reference indicate like parts in the several figures.

My invention relates to improvements in shovels or scoops; and it consists in a shovel having a blade and shank with socket and straps for attachment to the handle, the whole complete in a single piece of metal composed of steel differing in temper or composed in part of steel and in part of iron, so that in either case the said components shall exist in union independent of the use of welding under pressure or of the use of rivets or other separate fastening, or of the two devices or methods in any combination. My improved shovel may be produced from the shovel-blank described in Letters Patent granted to me May 19, 1874, No. 151,077, or a blank produced in a similar manner.

For the purposes of description I will here recite the manner of producing a shovel-blank as set forth in the said patent, and some of the modification thereof in carrying out my present invention.

In the drawings, *a* represents the shovel-blade; *b*, the straps. In producing a smooth-backed shovel of this kind it is necessary that the union between the straps, which is of one grade of metal, and the blade, which is of another, be formed without the use of rivets or pressure welding, which, if either were followed, would leave indications of the weld or the presence of rivets, which is not desirable in a shovel. In carrying out my invention I take a bar of wrought-iron or soft steel of sufficient thickness and width to form the strap *b* and bend it, bringing the ends together, leaving a loop, which is cut in forming the strap. The loose ends of the bent bar are then spread by forging, the tapering portion being formed wider than the strap, but not so thick. And it is this portion that extends for a limited distance into the upper central portion of the shovel-blade *a*. The strap, formerly described in either a hot or cold state, is then placed in a suitable mold, narrowed at the point, which receives the strap and broadened at the portion of the mold in which the steel ingot is cast. The strap having been placed in the narrow portion of the mold, so as to extend about half way into the portion of the mold which is to receive the steel ingot, the molten steel is poured into the mold onto the lower end of the strap, uniting with it, and filling the body of the mold. If desired, the strap may be plated at the time the blank is cast, by placing pieces of iron in the end of the narrow portion of the mold on opposite sides of the strap, so that the steel will run in upon the sides of the strap, filling the small space left between the strap and the mold welding onto the strap.

Another method in which the strap may be formed and united with the blade is by taking a bar of wrought-iron or of soft steel of the thickness and of the width required for the spread end of the strap, and by suitable hammers, or otherwise, drawing down the bar through its middle portions to the width of the required strap and then bending, as above mentioned. The strap thus formed being placed in the mold so as to unite with the central upper portion of the cast ingot, or so as to have the ingot cast between the extended ends in the form of a wedge.

Still another method is by taking a bar of wrought-iron or soft steel of sufficient length and diameter to form the strap, placing it within the narrow portion of the mold and casting the ingot, after which the bar, which is to form the strap *a*, may be split by sawing or otherwise. The necessary object to be attained in either case is to cause the union between the strap and the blade at the time of casting.

From a blank produced in either of the before-mentioned methods or any equivalent method which shall fulfill the requirements above set forth, I proceed to form a shovel in the following manner: If the portion of the blank which is to form the strap has been made by bending or looping the soft metal, I cut

the loop, or if a bar has been used, I have the bar sawed or separated down to the ingot, which is to form the blade *a*, and then punch the socket in the center. This blank is then rolled in the usual manner for producing shovels or for forming scoops. In rolling, the different metals of which the shovel is composed keep their relative position, and form a blade smooth and finished throughout, with no indications of the point of union between the two metals, except such as would arise from the difference in colors of said metals.

The portions of the blank forming the strap do not unite when rolled out, but retain their relative position without union; but it is best to fill the socket with scale or similar material, thereby avoiding any possibility of its closing.

In thus uniting the strap and blade it is believed that a molecular union takes place between the different grades of metal used, and not simply a weld, as commonly understood—that is to say, that a strap being of one grade of metal and the blade of another grade of metal, when the portion of the blank which is to form the blade is poured onto the end of the strap in the mold the heat is such that the metal at the point of union is equalized, as it were, forming an intermediate grade of metal between the soft and the hard—that is to say, that the strap being, for instance, of wrought-iron, and the blade made from cast-steel, there will be a point between the two which is the point of union, and which will be a third grade, intermediate between the wrought-iron and the cast-steel, one metal shading off into the other, as it were—so that in fact the blade and strap constitute, in reality, one piece of metal, simply differing at different points in temper or quality, having a hard durable metal at the point where it is required—namely, in the blade—and a softer and more ductile metal at the point where it is required—namely, in the strap.

Heretofore shovels have been made from wrought-iron, having the blade and shank, with socket and strap complete, in a single piece of metal; but the material which was used, while being suitable for straps, is not the best adapted for blades.

To overcome this difficulty the shovel has been made with strap and blade in one piece, namely, of cast-steel, thus obtaining the best material for the blade, but one entirely unfit for straps; the loss being great in both manufacture and use, and due to the hard, brittle nature of the strap.

Another attempt to produce a suitable shovel, which should have the desirable quality of a hard and durable blade and a strap of softer metal, was by making the blade of steel, and securing soft-metal straps thereto by welding and riveting in the usual manner; but the last does not furnish the article sufficiently cheap to meet the demand.

My improved shovel is distinguishable from any shovel now in the market by the following characteristics: The blade and strap consist of a single piece, composed of two grades of steel, the blade harder than the strap; or a blade of cast-steel and a strap of wrought-iron, the point of union in both cases being only distinguishable by the different colors of the two grades of metal; the fact of there being two grades of metal established not only by the colors in the polished shovel, but by one being harder than the other; and, finally, my shovel is distinguishable from those in the market by having a smooth back, and being devoid of rivets, or the appearance of having been welded, as is common to shovels where a soft-metal strap has been united to the blade by the common method of pressure-welding.

The shovel produced by my improved method is superior in strength, and will wear equally with any other, while the manufacture is very materially cheapened.

I am aware that the uniting, by welding, of the iron handle-straps to the sheet cast-steel blade has been practiced, and lay no claim to an article so produced; but

Having thus described my invention, I claim—

As a new article of manufacture, a shovel consisting of a blade and shank, with socket and straps for attachment to handle, the whole complete in a single piece of metal, composed of steel differing in temper, or composed in part of steel, and in part of iron, as above described, the said components existing in union independent of pressure-welding, rivets, or other separate fastening, substantially as specified.

In testimony whereof I, the said THOMAS J. BLAKE, have hereunto set my hand.

THOMAS J. BLAKE.

Witnesses:
F. W. RITTER, Jr.,
T. B. KERR.