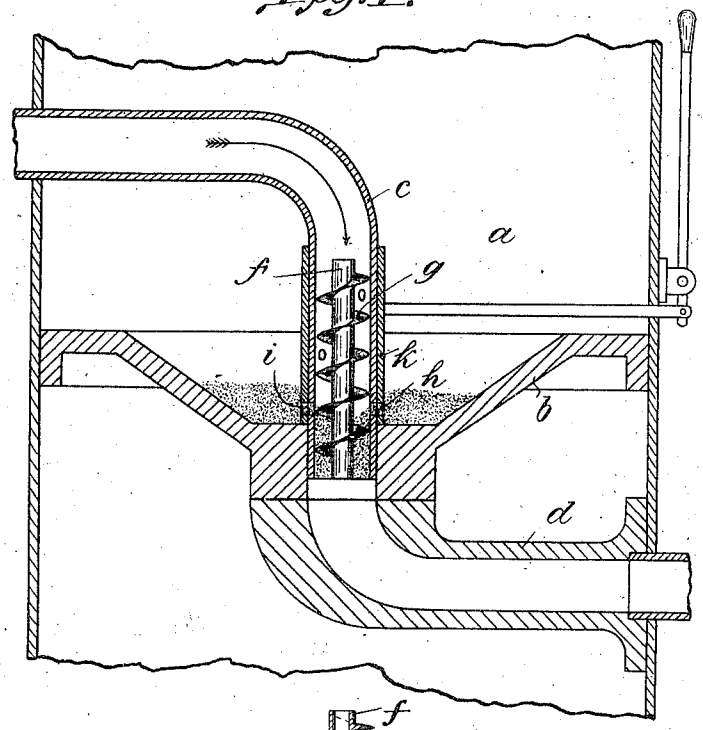
L. SAUER.

SAND BLAST APPARATUS.

APPLICATION FILED DEC. 4, 1911.

1,032,777. Patented July 16, 1912.

Fig. 1.



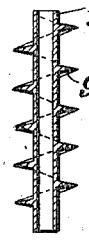


Fig. 2.

Witnesses:
Oscar Bock
Eugen Maier

Inventor:
Ludwig Sauer,
By Goepel & Goepel
Attorneys

UNITED STATES PATENT OFFICE

LUDWIG SAUER, OF KITZINGEN, GERMANY.

SAND-BLAST APPARATUS.

1,032,777. Specification of Letters Patent. Patented July 16, 1912.

Application filed December 4, 1911. Serial No. 663,914.

To all whom it may concern:

Be it known that I, LUDWIG SAUER, a subject of the King of Bavaria, German Empire, residing at Kitzingen-on-the-Main, in said Empire, have invented new and useful Improvements in Sand-Blast Apparatus; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to sand blast apparatus such as is used for cleaning castings, removing rust from large structures such as railway stations, bridges, ships' hulls and the like.

The invention has for object to provide an improved apparatus by means of which the sand blast can be produced at a fixed station and conducted with undiminished force to great distances without the piping through which the blast is transmitted becoming scoured or blocked up. This object is attained by means of the invention which consists substantially in dividing the compressed air into two streams one of which flows in a straight line and the other in a helical path, the sand being supplied to the blast moving in the helical path.

One constructional form of the improved sand blast apparatus is shown in Figure 1 in sectional elevation in the accompanying drawing, and Fig. 2 is a detail vertical central section of the central tube of the apparatus.

It comprises a sand box *a* the pressure in which is that of the compressed air, the said box having a conical or hopper shaped floor *b* to which sand is continuously supplied in any known manner. A pipe *c* coming from the compressed air supply is connected to the bottom of the hopper where it leads into a pipe or channel *d* from which the sand air mixture is conducted to the working place. According to this invention a tube *f* open at both ends is arranged in the compressed air pipe *c* and in the annular space between the tube *f* and the internal wall of the pipe *c* is provided a helical rib *g*. Distributed over the length of the helical rib *g* or in proximity to the lower end of the helical rib and central tube *f*, the compressed air pipe *c* has openings *h* which can be closed or partially or fully opened by rotating or sliding a sleeve *k* provided with corresponding openings *i* and embracing the vertical portion of the pipe *c*.

This apparatus operates as follows. The compressed air, which is supplied to the channel formed between the tube *f* and helical rib *g* through the pipe *c* and to the central tube *f* is distributed partly over the screw surface *g* and partly to the straight tube *f*. The portion of the air which flows through the helical space between the screw surface *g* and the sides of the tubes *f* and *e* is constrained to execute a helical motion in the said space. The outer air current moving in this manner, shortly before it leaves the screw surface *g*, flows past the openings *h* in the sleeve *k* and draws the sand through to participate in the motion so that the sand air mixture formed here also advances in a helical path after leaving the screw surface. Simultaneously the air current issuing from the lower end of the straight pipe *f*, blows through the outer whirling envelop of sand and air, and possessing a greater velocity than the latter, it draws the sand therefrom toward the middle and carries the sand to great distances to the working place, without the sand being able to come in contact with the walls of the conducting piping, or to collect in the bends therein. This result is explained by the fact that the outer air current whirling in a helical path is robbed of its sand and forms an air cushion between the pipe walls and the inner sand saturated blast or jet flowing in a straight line. The friction in the piping is thus limited to the greatest extent, wear and clogging up of the piping prevented, and the possibility created of transporting the sand from a central station to considerable distances to the working place, by means of the compressed air.

Having thus described my invention, I claim and desire to secure by Letters Patent:

1. An improved sand-blast apparatus comprising a compressed-air supply-pipe, a straight central tube in said supply-pipe, a helical rib in the space between the central tube and the supply-pipe, and means for supplying sand into the channel formed by the helical rib whereby the compressed air-supply is divided into two streams one flowing in a straight line and the other in a helical path.

2. An improved sand-blast apparatus comprising a compressed-air supply-pipe, a

straight central tube in said supply-pipe, a helical rib located in the space between the straight tube and the inner wall of the air supply-pipe, a hopper containing sand, and means for supplying sand from said hopper into the helical channel formed between the air supply-pipe and the central tube in the same.

3. An improved sand-blast apparatus comprising a compressed-air supply-pipe having openings in its lower end, a straight central tube in said supply-pipe, a helical rib located in the space between the straight tube and the inner wall of the air supply-pipe, a hopper containing sand, a sleeve surrounding the lower end of the air supply-pipe and provided with openings registering with the openings in the same for supplying sand from the hopper into the helical channel formed between the central tube and the lower end of the air supply-pipe.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

LUDWIG SAUER.

Witnesses:
OSCAR BOCK,
EUGEN MAIER.