

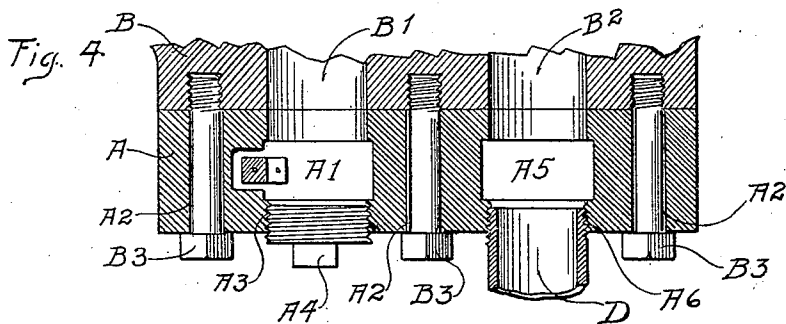
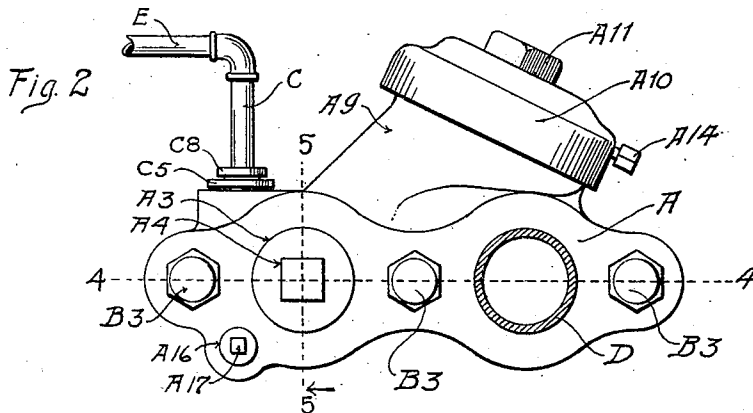
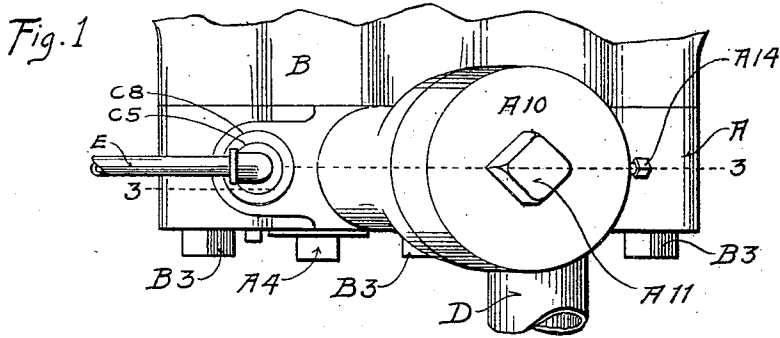
W. B. ROGERS.
SANDER.

APPLICATION FILED MAR. 12, 1912.

1,050,173.

Patented Jan. 14, 1913.

2 SHEETS-SHEET 1.



WITNESSES
Myrtle Kinger
W. W. Whaley

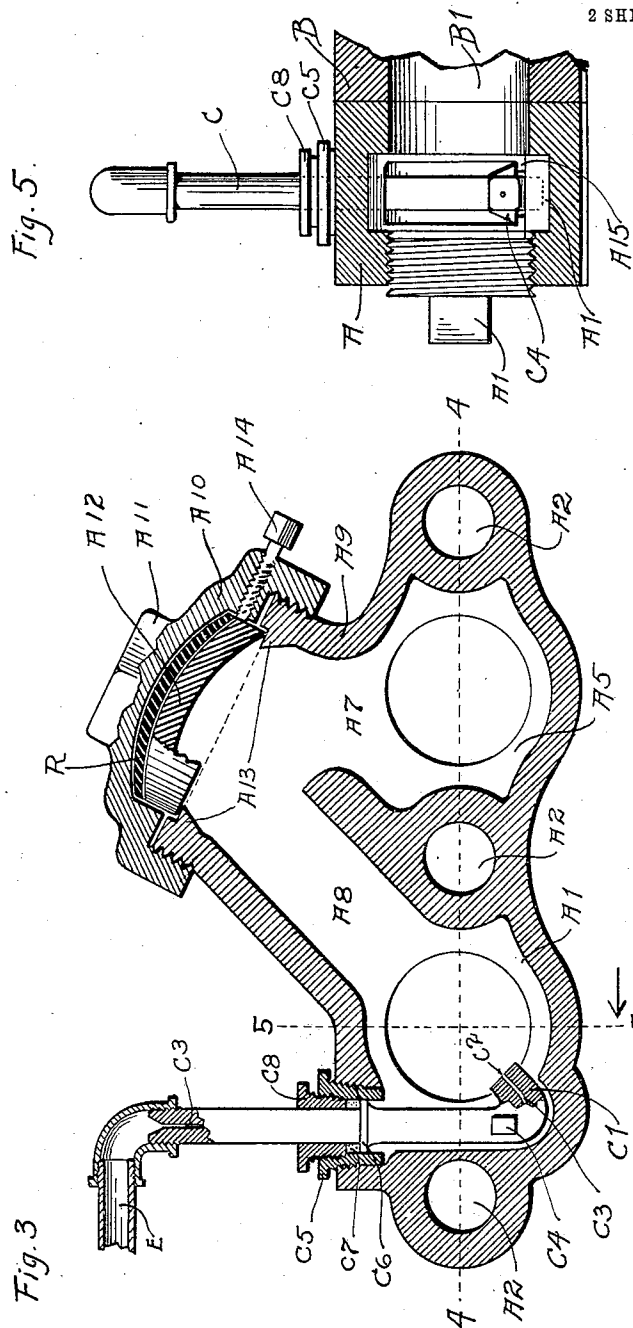
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Walter B. Rogers
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UNITED STATES PATENT OFFICE.

WALTER B. ROGERS, OF KNOXVILLE, TENNESSEE.

SANDER.

1,050,173.

Specification of Letters Patent.

Patented Jan. 14, 1913.

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To all whom it may concern:

Be it known that I, WALTER BASCOM ROGERS, a citizen of the United States, residing at Knoxville, in the county of Knox and State of Tennessee, have invented a new and useful Improvement in Sanders, of which the following is a specification, reference being had to the accompanying drawing.

My improvement relates particularly to sand traps for locomotive sanders in which the sand is driven by an air blast through a part of its course from the sand box or dome into and through the delivery pipe which extends to or nearly to the adjacent track rail, sanders of this type usually comprising a trap having a body within which is a sand-receiving chamber or compartment from which an air blast issuing from a nozzle carries the sand in a small stream diagonally upward against a deflecting member, the sand then falling by gravity and downward air movement into a delivery compartment from which it passes by gravity and in part by air movement into the delivery pipe.

The object of the improvement is to provide a sander which is easily manufactured and in which the tendency of sand to lodge or clog in the air nozzle is reduced to a minimum and in which the tendency to cut the nozzle mouth or outlet by means of sand is reduced to the minimum, and in which the stream of sand going from said nozzle to said deflecting member may always be straight and thus avoid contact with the walls of said body which intervene between said nozzle and said deflecting member.

A further object of the invention is to provide a construction whereby the deflecting member may readily be adjusted or renewed.

In the accompanying drawings, Figure 1 is a top view of an apparatus embodying my improvement. Fig. 2 is a front view of the same mechanism; Fig. 3 is an upright section on the line, 3—3, of Fig. 1; Fig. 4 is a horizontal section on the line, 4—4, of Figs. 2 and 3; Fig. 5 is a transverse, upright section on the line, 5—5, of Figs. 2 and 3.

In these figures the usual slight leaning of the sander away from the sand holder is ignored.

Referring to said drawings, A is the body of the sander. This is adapted to rest against the abutment, B, which is located at the base of the sand box or holder and through which extends the discharge port,

B¹, into the receiving chamber, A¹, of the body, A. Another discharge port, B², extends through the abutment, B, to the discharge chamber, A⁵, of the body, A. Valves of well-known form (not shown) control the flow of sand from the said box through said ports. Going outward from the sand dome, the abutment, B, is inclined downward, and the body of the trap is similarly inclined. Such inclination facilitates the flow of sand from the sand dome. The body, A, is secured to said abutment by means of three binding bolts, B³, extending through holes, A², in said body. Opposite the port, B¹, the outer wall of the body, A, has a port, A³, which is ordinarily closed by a screw cap, A⁴. The purpose of said port and cap is to afford access to the interior of said chamber, A¹.

Approximately horizontally opposite the receiving chamber, A¹, the body, A, has a discharge chamber, A⁵. In the front wall of said discharge chamber is a screw-threaded port, A⁶, into which is screw-threaded one end of the delivery pipe, D, the remainder of said pipe (not shown) leading along the drive wheel nearly to the adjacent track rail. Rising from said discharge chamber is a gravity passage, A⁷; and from the receiving chamber, A¹, a blast passage, A⁸, extends obliquely upward and meets the upper portion of the gravity passage, A⁷. Above the junction of said two passages, the wall of the body is raised obliquely to form a hollow and open cylindrical neck, A⁹. The exterior of said neck is screw-threaded and receives an interiorly screw-threaded cap, A¹⁰. Said cap has on its outer face a polygonal upward extension, A¹¹, to be engaged by a wrench for turning the cap. Within said cap is a circular deflecting member, A¹², the interior face of which is suitably concaved to receive the impact of the stream of sand driven by the air blast through the blast passage, A⁸, and deflect said stream downward into the gravity passage, A⁷, and through the latter into the discharge chamber, A⁵. The interior of the neck, A⁹, has a seat, A¹³, to receive the deflecting member. A disk of soft india rubber, R, is placed between the member, A⁹, and the cap to serve as a cushion and also as a sealing member to keep water from entering the trap when the sand has worn a hole through the cap. A set screw, A¹⁴, extends horizontally through the upper portion of the rim of the cap and

bears endwise against the edge of the deflecting member, A¹², to secure it within the cap. Said deflecting member is adapted to be turned on its central axis when not held by the set screw, A¹⁴. Hence, if the stream of sand strikes said deflecting member at one side of the center and there wears away the metal said member may be turned to cover the opening in the cap and present another portion for the impact of the stream. In this way said member may be turned several times. Whenever it is worn too much for further use, it may be taken out and a new member put into its place. And when a hole has thus been cut through the cap and the disk, R, the latter is turned on the neck axis to cover the hole in the cap to prevent water from entering the sander body.

The nozzle pipe, C, extends downward through the wall of the body, A, adjacent the receiving chamber, A¹, the nozzle, C¹, projecting into said chamber and being directed toward the blast passage, A^s, and having its mouth, C², approximately in line with the axis of said passage. To meet these conditions in the form of the body shown by Figs. 1 to 6, inclusive, the air nozzle passage, C³, leading through the nozzle pipe, C, is curved forward at its lower portion and then directed obliquely upward to the mouth, and the entire pipe, C, assumes a form resembling an ordinary tobacco pipe, excepting that there is no bowl and the nozzle passage is substantially uniform in cross section from the mouth, C², throughout the length of the nozzle pipe. The lower end or foot of the nozzle pipe is shown provided at opposite sides with lugs, C⁴, which are adapted to rest on shoulders, A¹⁵, within the body, A, to limit the downward movement of the nozzle pipe. By this means, the position of the mouth, C², of the nozzle is definitely fixed.

A nut, C⁵, surrounds the nozzle pipe and is screw-threaded into the adjacent wall of the body, A. Within said nut the nozzle pipe has an annular shoulder, C⁶; and above said shoulder said nut is chambered and interiorly screw-threaded. Immediately above said shoulder, a packing ring, C⁷, surrounds said pipe. A packing nut, C⁸, surrounds the nozzle pipe and is screw-threaded into the chamber of the nut, C⁵, and bears against said packing ring, whereby said packing ring is pressed against the shoulder, C⁶, and also against the pipe, C, and the adjacent face of the nut, C⁵, whereby a seal is formed to prevent the passing of air and water around the nozzle pipe. Furthermore, the engagement of the nut, C⁵, in the body, A, and the engagement of the packing nut, C⁸, in the nut, C⁵, and the engagement of the packing ring, C⁷, with said nut, C⁵, and said annular shoulder, C⁶, involves holding the nozzle pipe against upward movement.

Thus the lugs, C⁴, are made to bear against the shoulder, A¹⁵. From the upper or outer end of the nozzle pipe, C, a supply pipe, E, may lead to a source of air supply which is under the control of the locomotive engineer. For draining the space around the lower end of the nozzle pipe, a drain port, A¹⁶, is formed in the wall of the body, A, and said port is ordinarily closed my means of a screw-plug, A¹⁷. The opening for receiving the nozzle pipe and the nut, C⁵, is easily formed, and said nozzle pipe is easily removed and replaced.

In air nozzles heretofore used in similar apparatus, the nozzle contained a chamber extending closely to the mouth of the nozzle. This made possible the accumulation of a relatively large quantity of sand passing from the receiving chamber through the mouth of the nozzle when the air blast was not being driven through the nozzle. And it has been found that the sand thus present in said nozzle chamber tended to mass and adhere and thus prevent outward movement through the mouth of the nozzle. In this way such apparatus has frequently been rendered inoperative, a partial dismantling of the apparatus being necessary in order to clear the interior of said nozzle of such massed or adhering sand. At the round-house of one railroad division point with which I am familiar records have been made of more than five hundred such failures per month in the sanders of locomotives making runs out from said shops. Such failure of the apparatus during a run of the locomotive bearing the apparatus is a serious matter, with reference to economy and also with reference to safety. In my improved nozzle, there is no chamber within the nozzle. There is merely a passage which is not of greater diameter than the mouth of the nozzle. Hence only a few grains of sand can fall into such nozzle, and there is no place for massing or bridging of the sand; and if grains of sand should adhere to each other, they would form a body no larger than the interior of the mouth of the nozzle and adapted to movement by the air blast forward through the mouth of the nozzle. It is to be noted, however, that the air nozzle passage, C³, might be of larger diameter above the highest point reached by the sand which enters the mouth of the nozzle. In such a passage the sand will not reach the level of the sand in the holder or dome, as would be the case with water. It has been found by tests that a relatively short column of sand in such a passage will resist a much higher column of sand. I estimate, that ordinarily in the nozzle pipe, above described, the sand will rise no higher than the sand in the trap and probably not so high. It will be observed that meeting this condition

should bring the nozzle pipe as high as the sand-receiving portion of the trap. For convenience, I extend said pipe upward through the upper wall of the trap and
 5 secure it in said wall. The movement or flow of the sand into the nozzle may be termed the "nozzle flow" of the sand, and the height to which said flow extends may be termed the "nozzle flow level." The por-
 10 tion of the nozzle passage, C³, through which the air blast descends may be termed the descending portion of said passage while the portion of said passage through which the air blast rises to reach the mouth, C², is
 15 termed the rising portion of said passage.

It has been found by practice, that in nozzles which have an interior chamber larger than the mouth of the nozzle, sand at times lodges adjacent the mouth and at
 20 one side of the latter and operates to deflect the sand passing out with the air blast, so that such sand impinges against one side of the mouth and gradually cuts away the metal along such side, whereby the nozzle
 25 is permanently rendered incapable of sending the stream of sand in a straight line midway through the oblique blast passage, A⁸. By the striking of the sand against said walls, the latter are soon cut sufficiently to
 30 produce leakage.

By practice I have found that in my improved nozzle there is no such lodging or packing of sand and no such deflection of the stream of sand, the latter keeping to the
 35 middle of the blast passage, A⁸, and properly striking the concave face of the deflecting member and then moving downward into the discharge chamber, A⁵.

I claim as my invention:

40 1. In an apparatus of the nature described, a body having an ascending blast passage and a sand port communicating with said passage and an opening for the insertion of a nozzle pipe, a nut threaded
 45 on said body at said opening, and a nozzle pipe extending through said nut and engaged by the latter to be pushed downward when said nut is turned forward, substantially as described.

50 2. In an apparatus of the nature described, a body having an ascending blast passage, a sand port leading into said passage, and a nozzle pipe rest, and a nozzle pipe extending through the wall of said
 55 body to the lower portion of said blast passage and engaging said rest, substantially as described.

3. In an apparatus of the nature described, a body having an ascending blast
 60 passage, a sand port leading into said passage, and a nozzle pipe rest, and a nozzle pipe extending through the wall of said body to the lower portion of said blast passage and engaging said rest and having an
 65 annular shoulder, and means surrounding

said pipe and engaging said shoulder for pressing said pipe downward, substantially as described.

4. In an apparatus of the nature described, a body having an ascending blast
 70 passage, a sand port leading into said passage, and a nozzle pipe rest, and a nozzle pipe extending through the wall of said body to the lower portion of said blast passage and engaging said rest and having a
 75 nozzle passage which has a descending portion and a rising portion opening through a mouth axially in line with the blast passage, said nozzle passage being of approximately
 80 uniform diameter from said mouth downward through said rising portion and then upward through said descending portion as high as the nozzle flow level, substantially as described.

5. In an apparatus of the nature described, a body having an ascending blast
 85 passage, a sand port leading into said passage, and a nozzle pipe rest, a nozzle pipe extending through the wall of said body to the lower portion of said blast passage
 90 and having a nozzle passage which has a descending portion and a rising portion opening through a mouth axially in line with the blast passage, said nozzle passage being of approximately uniform diameter from
 95 said mouth downward through said rising portion and then upward through said descending portion as high as the nozzle flow level, and means for holding the nozzle pipe to such rest, substantially as described.

6. In an apparatus of the nature described, a body having an ascending blast
 100 passage, a sand port leading into said passage, and a nozzle pipe rest, a nozzle pipe extending through the wall of said body to the lower portion of said blast passage and
 105 having a nozzle passage which has a descending portion and a rising portion opening through a mouth axially in line with the blast passage, said nozzle passage being of
 110 approximately uniform diameter from said mouth downward through said rising portion and then upward through said descending portion as high as the nozzle flow level, and a nut threaded into the wall of said
 115 body and surrounding and engaging said nozzle pipe, substantially as described.

7. In an apparatus of the nature described, a body having an ascending blast
 120 passage, a sand port leading into said passage, and a nozzle pipe rest, a nozzle pipe extending through the wall of said body to the lower portion of said blast passage and
 125 having a nozzle passage which has a descending portion and a rising portion opening through a mouth axially in line with the blast passage, said nozzle passage being of approximately uniform diameter from said
 130 mouth downward through said rising portion and then upward through said descend-

ing portion as high as the nozzle flow level, a nut threaded into the wall of said body and surrounding said nozzle pipe, and a packing nut and packing located within the first-mentioned nut, substantially as described.

8. In an apparatus of the nature described, a body having an ascending blast passage, a sand port leading into said passage, and a nozzle pipe extending through the wall of said body to the lower portion of said blast passage and having an annular shoulder and having a nozzle passage which has a descending portion and a rising portion opening into a mouth axially in line with the blast passage, said nozzle passage being of approximately uniform diameter from said mouth downward through said rising portion and then upward through said descending portion as high as the nozzle flow level, and a nut seated in the wall of said body and surrounding said nozzle pipe, substantially as described.

9. In an apparatus of the nature described, a body having an ascending blast passage and a nozzle passage having a mouth in alinement with said blast passage and having a neck above said blast passage, a cap secured to said neck, and a removable and turnable deflecting member located and secured within said cap, substantially as described.

10. In an apparatus of the nature described, a body having an ascending blast passage and a nozzle passage having a mouth

in alinement with said blast passage and having a neck above said blast passage, a cap secured to said neck, a removable and turnable deflecting member located within said cap, and a securing device for securing said deflecting member to said cap, substantially as described.

11. In an apparatus of the nature described, a body having an ascending blast passage and a nozzle passage having a mouth in alinement with said blast passage and having a neck above said blast passage, two superposed closing members for closing the opening through said neck, said members being relatively turnable on the axis of said neck, substantially as described.

12. In an apparatus of the nature described, a body having an ascending blast passage and a nozzle passage having a mouth in alinement with said blast passage and having a neck above said blast passage, three superposed closing members for closing the opening through said neck, the intermediate of said members being elastic and said members being relatively turnable on the axis of said neck, substantially as described.

In testimony whereof I have signed my name, in presence of two witnesses, this 7th day of March, in the year one thousand nine hundred and twelve.

WALTER B. ROGERS.

Witnesses:

CYRUS KEHR,
WM. BAXTER LEE.