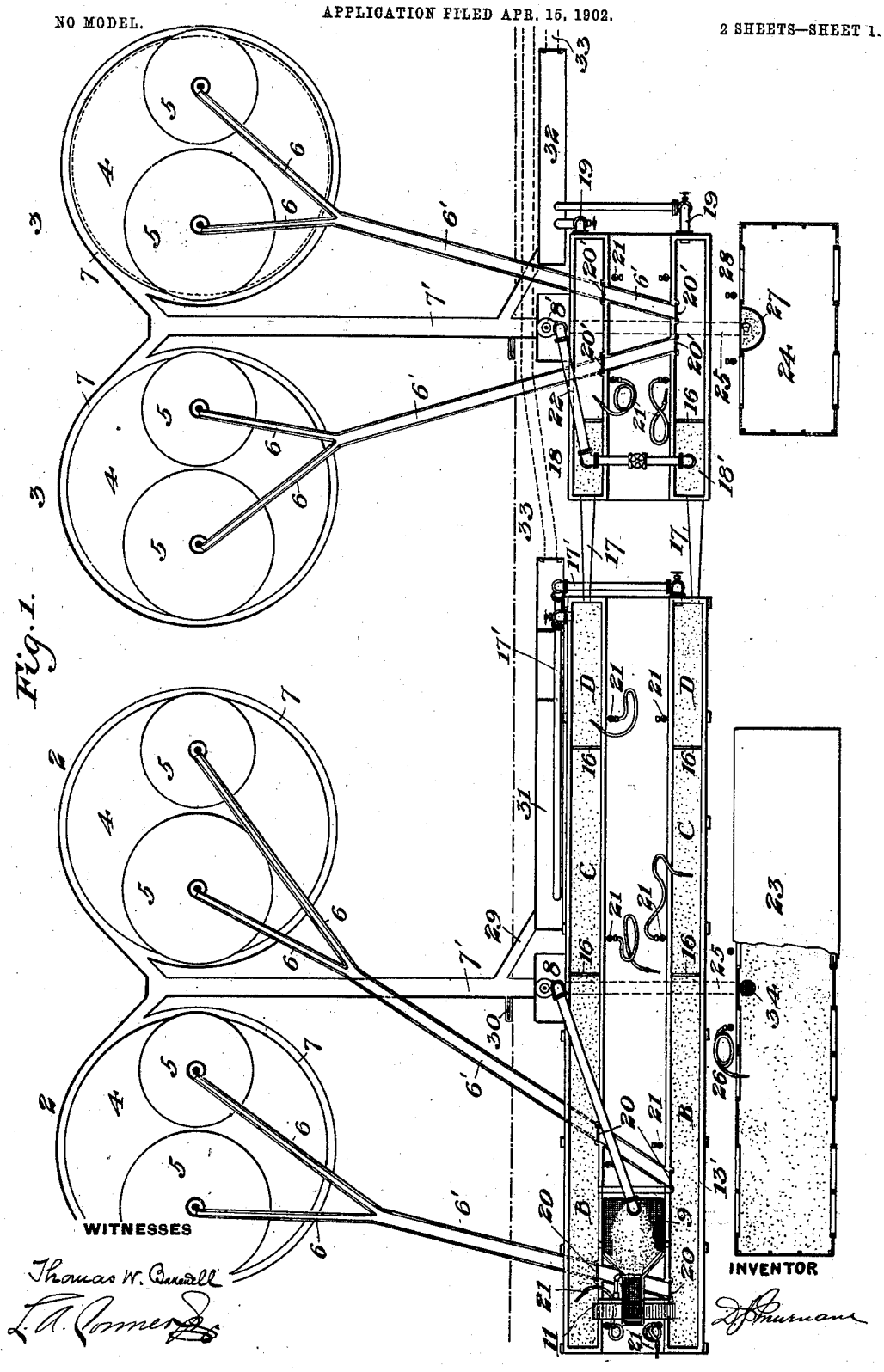
No. 719,978. PATENTED FEB. 3, 1903.

D. J. MURNANE.

APPARATUS FOR SUPPLYING ABRASIVE MATERIAL TO GRINDING OR SMOOTHING MACHINES.

NO MODEL. APPLICATION FILED APR. 15, 1902. 2 SHEETS—SHEET 1.

Fig. 1.



THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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Fig. 2.

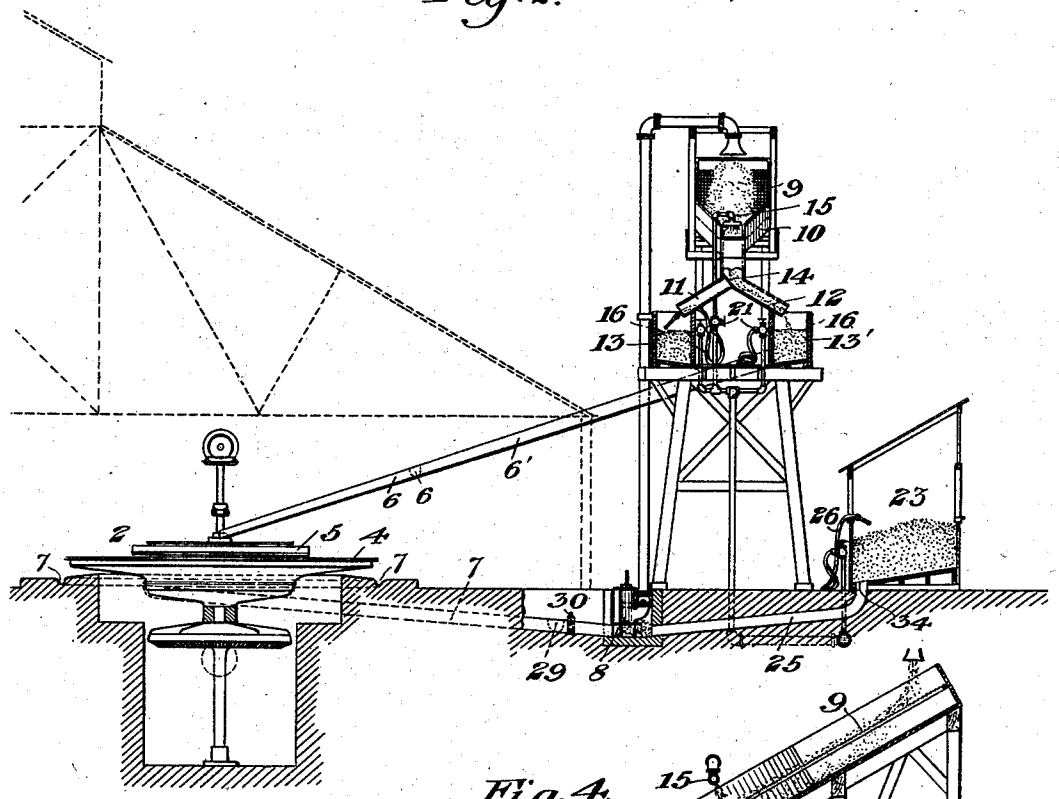


Fig. 4.

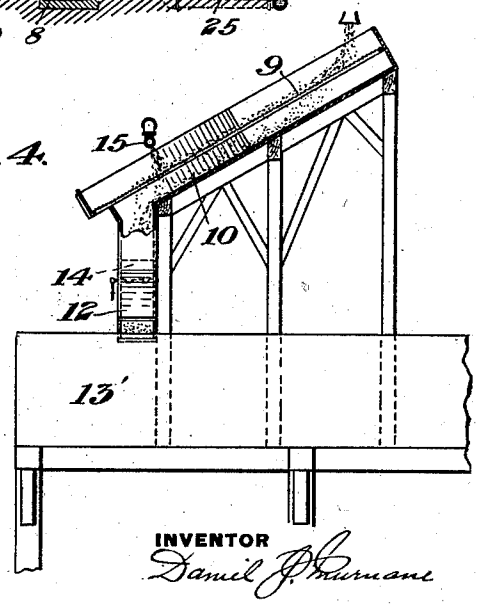
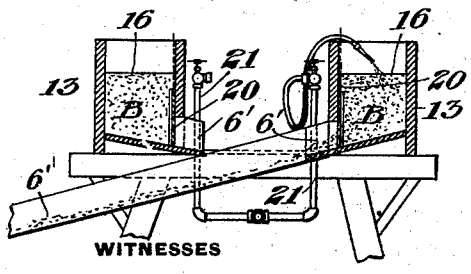


Fig. 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

DANIEL J. MURNANE, OF KIRKWOOD, MISSOURI, ASSIGNOR TO THE ST. LOUIS PLATE GLASS COMPANY, OF VALLEY PARK, MISSOURI, A CORPORATION OF MISSOURI.

APPARATUS FOR SUPPLYING ABRASIVE MATERIAL TO GRINDING OR SMOOTHING MACHINES.

SPECIFICATION forming part of Letters Patent No. 719,978, dated February 3, 1903.

Application filed April 15, 1902. Serial No. 102,980. (No model.)

To all whom it may concern:

Be it known that I, DANIEL J. MURNANE, of Kirkwood, in the county of St. Louis and State of Missouri, have invented a new and useful Apparatus for Supplying Abrasive Material to Grinding or Smoothing Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan view of my improved apparatus for supplying abrasive material to grinding and smoothing machines. Fig. 2 is an irregular cross-section of the same. Fig. 3 is a detail cross-section of the settling-bins, and Fig. 4 is a detail of the screen and gutter for delivering the abrasive material to the settling-bins.

In the grinding and smoothing of plate-glass it is customary to collect and grade the sand as it is discharged from the tables of the machines and to use it for repeated operations; but the means for doing this work heretofore have been crude and expensive in their operation, requiring a large amount of manual labor and failing to return the sand to the machine in the condition and at the rate suitable for producing the most rapid grinding and smoothing of the glass. My invention facilitates and cheapens this part of the manufacture.

In the drawings I show my apparatus in what I believe to be its best form; but those skilled in the art by suitable changes of construction will be able to modify it in various ways without departure from my invention as defined in the claims.

In the drawings, 2 2 represent machines on which the plates of glass are ground, and 3 3 are machines on which they are smoothed with an abrasive material of finer grade.

4 4 are the decks on which the glass to be treated is held and which are preferably removable from one machine to the other, and 5 5 5 are the runners.

The abrasive sand is supplied to the grinding-machines 2 by gutters 6 6, which furnish a supply of mingled abrasive and water, preferably at the axis of each runner, through which it passes to the surface of the glass and is distributed between the glass and the runner by centrifugal action. It may, however, be supplied to other parts of the table outside the runner. The means for feeding the abrasive to the supply-gutters are described below. As the mixture of sand and water passes from the glass plates it collects in an annular trough 7 below the machine and flows thence through a gutter 7′ to the receiving basin or chamber of a sand pump or elevator 8, by which it is elevated to a screen 9, and it passes through the screen into a gutter 10, which delivers it through spouts 11 12 into settling-bins 13 13′. The bin which receives the material is determined by a valve 14, which may be turned to close either one of the spouts 11 12 and to open the other. The sand for the most part is carried through the meshes of the screen 9 by the water with which it is mixed, and the lumps which do not pass at once through the screen collect at the lower end thereof, where streams of water from a pipe 15 disintegrate them and carry them through the screen. From the screen the sand and water pass through a gutter 10 into a bin 13 or 13′. These bins are elongated and are preferably provided with cross partitions or dams 16, over which the water can flow toward spouts 17 and into final settling-bins 18 18′, which constitute, in effect, extensions of the bins 13 13′. The partitions 16 divide the bins into compartments B C D, of any desired number, in which the sand settles, the coarser sand settling in the first compartment and the finer sand settling in succeeding compartments, and in this way the sand is divided into different grades. The finer sand, which has been reduced to powder by the runners, is carried in suspension by the water through the spouts 17 into the settling-bins 18 18′, where it collects and from which it is removed for use in the smoothing-machines. Bins 13 13′ have overflows 17′, which may be used when required. The bins 18 18′ have overflows 19, through which any excess of water and powdered sand may flow, and, if desired, they may be provided with outlets at the base for the withdrawal of the coarser particles which may have been carried over from the bins 13 13′. The sand

which settles in the compartments B B may be discharged as required into gutters 6′, which lead to the supply-gutters 6 6, and for this purpose I provide those compartments with gates or valves 20 and with water-pipes 21, from which streams of water may be discharged into the bins to carry the sand to the machines. In like manner the bins 18 18′ are provided with valves 20′, enabling the discharge of the mixture of powdered sand and water into the troughs 6′ of the smoothing-machines. Each of the adjacent compartments B B, and the same is true of the adjacent bins 18, can discharge into each of the gutters of the machine which it supplies, so that I am enabled to use the bins alternately, one bin delivering the abrasive to the machines while the other bin is receiving and settling the abrasive from the machines; but the number of bins employed and their location may be varied as desired. Screens 34 are preferably provided for the automatic removal of foreign bodies from the abrasive.

The sand which is deposited in the compartments C D is generally too coarse to be used with advantage on the smoothing-machines and is too fine to be used on the grinding-machines. I therefore prefer not to use this deposit directly, but to remove it and then pulverize it to fine condition for use in the smoothing-machine.

The abrasive material, which comes from the smoothing-machines 3 3 in like manner as explained above with reference to the grinding-machines, is collected in the receiving chamber or basin of a pump 8′ and is elevated thereby and discharged into the bins 18 18′ through a pipe 22, where it mingles with the supply from the spouts 17.

As the means above described are not alone sufficient to supply all the abrasive required by the machines I provide bins 23 24 for supplying fresh sand and powder, respectively, and I connect them by gutters or pipes 25 with the receiving-chambers of the respective pumps 8 8′. I also arrange a water-pipe 26 for the discharge of water into the bin 23 to wash the sand as required through the gutters 25, and I provide the bin 24 with a hopper 27, and by putting into this bin quantities of the powdered material and washing it through the gutter by water from a supply 28 it can be supplied to the smoothing-machines in regulated quantities, as desired.

It will be seen that the supply of abrasive to the machines can be rendered automatic, or nearly so, very little labor is required in attending the machines, the rate of supply may be regulated accurately, and as the abrasive is received from the machine in a wet condition and returned thereto in the same condition it is better suited for the purpose required, for the reason that the water keeps the particles separated, it can be automatically screened, foreign matter is separated, and the sand cannot aggregate in lumps. By utilizing gravity for the purpose both of collecting the abrasive from the machines and returning it thereto I can conduct the operation with the least complication of apparatus.

In case the sand-pumps should be stopped, or if for any reason it is desired to discontinue temporarily the feeding of sand to the bins 13 13′ or 18 18′, it will become desirable to divert the current of abrasive and water which comes from the gutters 7′, so that it shall not pass to the receiving-chambers of the sand-pumps, and for this purpose I provide the gutters 7′ with branches 29 and gates or valves 30, by which the current can be directed into settling-bins 31 32, which are set at a lower level than the gutters and are provided with overflows 33 for the removal of the surplus water. The materials which settle in these bins 31 32 may be removed by shovels or suitable lifting devices.

My improvement is adapted not only to the supply of sand, but may be operated with smoothing-machines using pumice or other fine abrasive.

I claim—

1. Apparatus for supplying abrasive to grinding or smoothing machines, comprising in combination with a machine using an abrasive with water, a conductor leading the discharged mixture of abrasive and water to a lifting device, a lifting device, an elevated bin into which the said mixture is discharged, and a return-conductor leading to the machine; substantially as described.

2. Apparatus for supplying abrasive to grinding or smoothing machines, comprising in combination with a machine using an abrasive with water, a conductor leading the discharged mixture of abrasive and water to a lifting device, a lifting device, a plurality of elevated bins into which the said mixture can be discharged, conducting means connecting the bins with the machine to be supplied, and means adapted to connect said bins alternately with the supply and the return connections; substantially as described.

3. Apparatus for supplying abrasive to grinding or smoothing machines, comprising in combination with a machine using an abrasive with water, a conductor leading the discharged mixture of abrasive and water to a lifting device, a lifting device, an elevated bin into which the said mixture is discharged, a return-conductor leading to the machine to be supplied, and a receptacle adapted to contain fresh abrasive material and connected with the lifting device; substantially as described.

4. Apparatus for supplying abrasive to grinding or smoothing machines, comprising in combination with a machine using an abrasive with water, a conductor leading the discharged mixture of abrasive and water to a lifting device, a lifting device, an elevated bin into which the said mixture is discharged, a screen provided with a water-supply through which the mixture passes on its way to the bin,

and a return-conductor leading to the machine; substantially as described.

5. Apparatus for supplying abrasive to grinding and smoothing machines, comprising in combination with a machine using sand or like coarse abrasive with water, a conductor leading the discharged mixture of sand and water to a lifting device, a lifting device, an elevated bin, comprising compartments in which the sand is graded, a return-conductor leading from the first compartment to a grinding-machine, and a return-conductor leading from a later compartment to a smoothing-machine; substantially as described.

6. Apparatus for supplying abrasive to grinding or smoothing machines, comprising in combination with a machine using an abrasive with water, a conductor leading the discharge mixture of abrasive and water to a lifting device, a lifting device, an elevated bin into which the said mixture is discharged, a return-conductor leading to the machine to be supplied, and a water-supply adapted to carry the abrasive to the machine; substantially as described.

7. Apparatus for supplying abrasive to grinding or smoothing machines, comprising in combination with a machine using an abrasive with water, a conductor leading the discharged mixture of abrasive and water to a lifting device, a lifting device, an elevated bin into which the said mixture is discharged, a return-conductor leading to the machine, and a screen in the path of the return-conductor adapted to screen the abrasive automatically; substantially as described.

In testimony whereof I have hereunto set my hand.

DANIEL J. MURNANE.

Witnesses:
GEO. B. BLEMING,
H. M. CORWIN.