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PATENTED MAY 5, 1908.

H. M. WILLIAMS & E. ISAACS.

AUTOMATIC SANDER.

APPLICATION FILED JAN. 11, 1908.

2 SHEETS—SHEET 1.

FIG. 1.

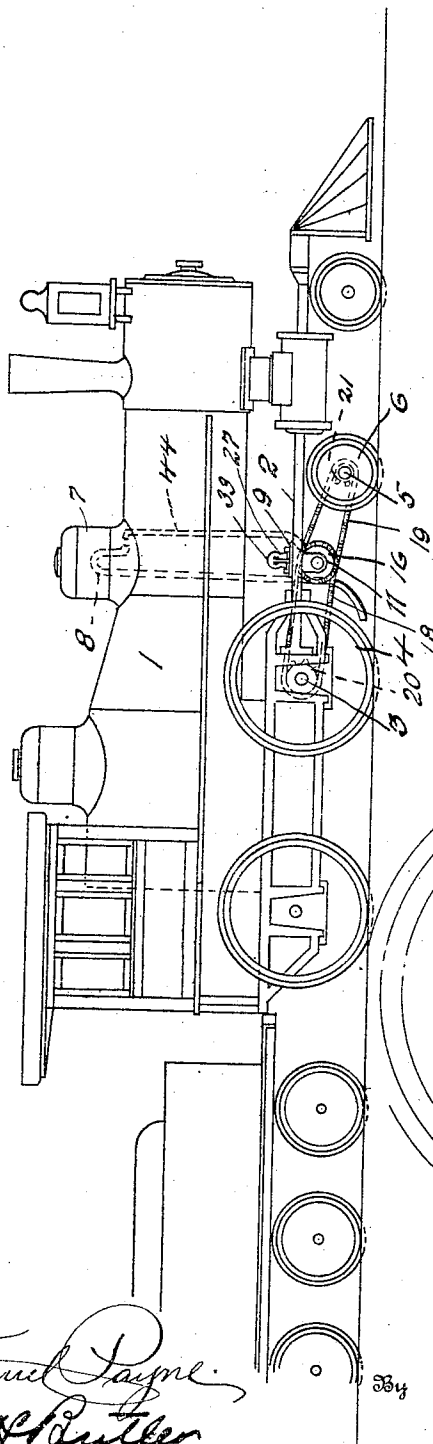
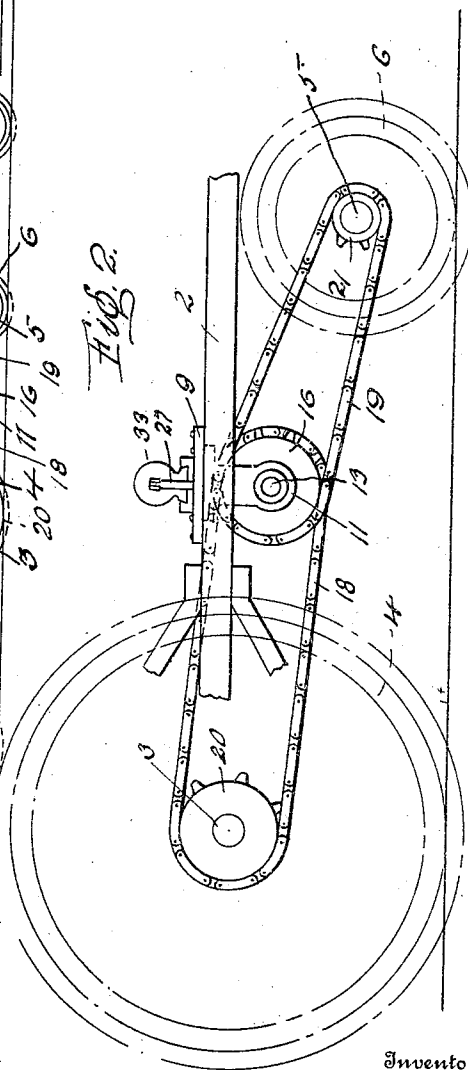


FIG. 2.



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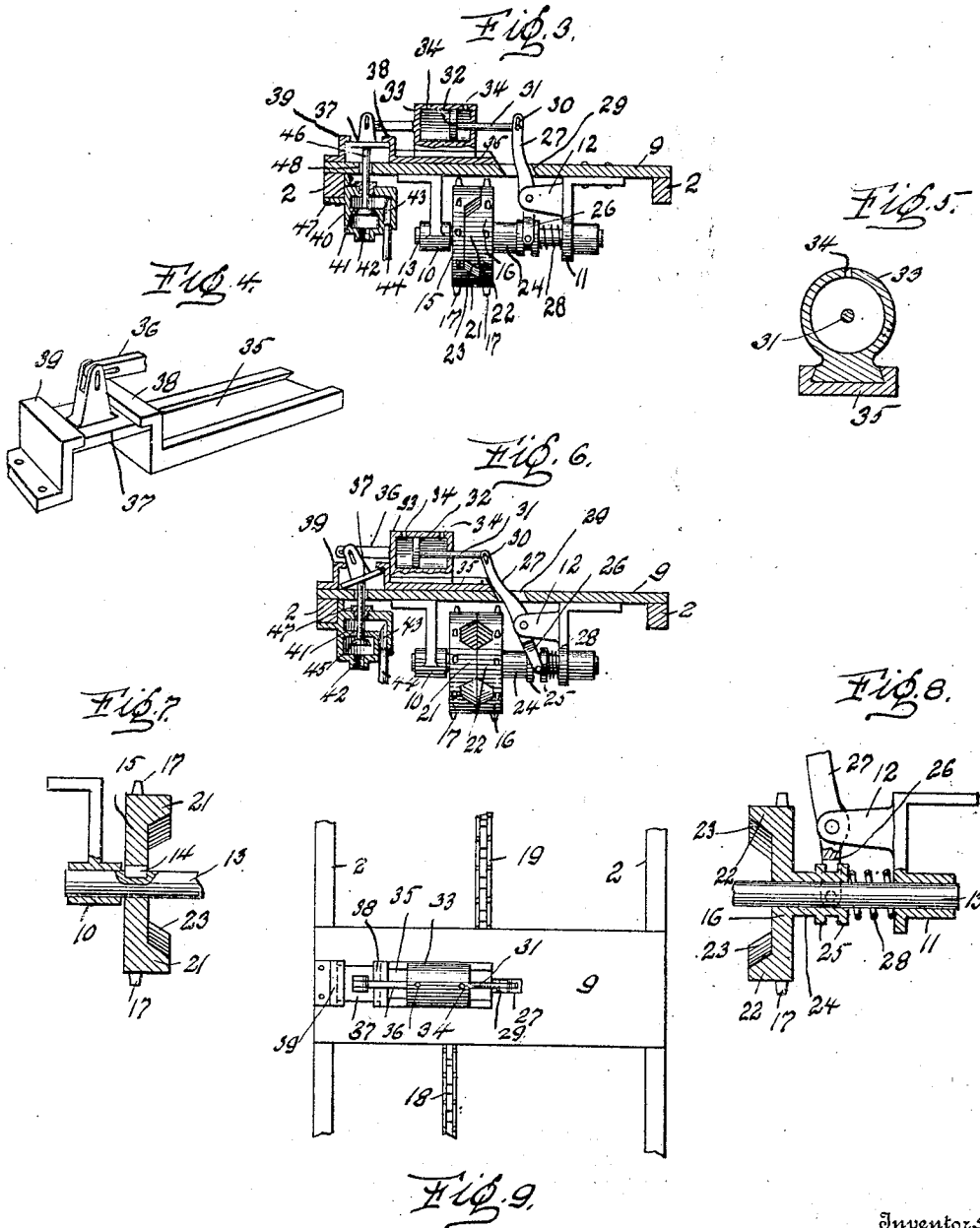
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

HENRY M. WILLIAMS AND ELEAZER ISAACS, OF PITTSBURG, PENNSYLVANIA.

AUTOMATIC SANDER.

No. 886,910.

Specification of Letters Patent.

Patented May 5, 1908.

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To all whom it may concern:

Be it known that we, HENRY M. WILLIAMS and ELEAZER ISAACS, citizens of the United States of America, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Sanders, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to an automatic sanding device, particularly designed for locomotives.

The primary object of our invention is to provide a novel device for locomotives by which sand will be automatically forced from the sand dome of the locomotive upon the rails over which the locomotive travels.

Another object of this invention is to provide an automatic sanding device that will deliver sand to the rails of a track when the wheels of a locomotive are skidding.

Our invention aims to provide a simple and inexpensive sanding device that can be used in connection with various types of locomotives, the device being located in an accessible position and of such a construction as to insure a positive operation when actuated. To this end, we depend upon the skidding of locomotive wheels for actuating our device, it being a well known fact that sand is used upon such occasions, when the wheels of a locomotive skid due to a heavy load, or to the presence of ice and frost upon the rails of a track.

Our invention will be presently described in detail, and then specifically pointed out in the appended claims.

Referring to the drawings forming a part of this specification, Figure 1 is a diagrammatic view of a locomotive equipped with our device, Fig. 2 is an enlarged diagrammatic elevation of the device illustrating a portion of a locomotive in dotted lines, Fig. 3 is a longitudinal sectional view of the device partly in elevation, showing the mechanism in an inactive position, Fig. 4 is a perspective view of a cylinder or dash pot guide, Fig. 5 is a cross sectional view of a movable cylinder or dash pot, Fig. 6 is a longitudinal sectional view of our device, illustrating the mechanism in an active position, Fig. 7 is a vertical sectional view of a fixed interlocking member constituting a part of the mechanism, Fig. 8 is a similar view of another interlock-

ing member constituting a part of the mechanism, and Fig. 9 is a plan of our device.

In the accompanying drawings, 1 designates a locomotive, 2 the side frames thereof, 3 the axle of the forward drive wheels, 4, 5 the rear axle of the pilot wheels, 6, and 7 a sand dome having discharge pipes 8 extending downwardly in close proximity to the tread of the forward drive wheels 4.

Our device is located transversely of the locomotive 1 in front of the forward drive wheels 4, and upon a plate 9 suitably secured to the side frames 2. This plate is provided with hangers 10 and 11, the hanger 11 having a bracket 12, the object of which will presently appear. In the hangers 10 and 11 is journaled a shaft 13, and upon said shaft is fixed by a key 14 an interlocking clutch-member 15, this member coöperating with a movable interlocking clutch-member 16, slidably mounted upon the shaft 13. These members conform to disks having their periphery provided with teeth 17, whereby said members will serve functionally as sprocket wheels in connection with sprocket chains 18 and 19, these chains passing over said members and sprocket wheels 20 and 21 mounted upon the axle 3 and 5 respectively, of the locomotive.

The members 15 and 16 have their confronting faces provided with lugs 21 and 22 respectively, said lugs having beveled faces 23. The lugs 22 of the member 16 are adapted to confront and frictionally engage the lugs 21 of the member 15, when our device is in an active position, and when in an inactive position, the lugs 22 of the member 16 are adapted to loosely fit in the spaces between the lugs 21 of the member 15.

The member 16 carries a sleeve 24, surrounding the shaft 13. This sleeve is provided with collars 25 and loosely engaging said collars is the yoke end 26 of a lever 27, said lever being fulcrumed in the bracket 12. A coil spring 28 is interposed between the collar end of the sleeve 24 and the hanger 11, this spring encircling the shaft 13, and normally holding the member 16 in engagement with the member 15.

The lever 27 extends upwardly through a slot 29 provided therefor in the plate 9. This lever is loosely connected as at 30, to the piston rod 31 of a piston 32, operating in the cylinder or dash pot 33. The cylinder or dash pot 33 is slidably mounted in a guide plate 35 fixed upon the plate 9, and is loosely

connected by an extension 36 to a tilting head 37, said head being arranged between guides 38 and 39, the former being carried by the guide plate 35, while the latter is fixed upon the plate 9.

Secured to the side frame 2 of the locomotive beneath the guides 38 and 39 is a valve casing 40, this valve casing having a valve seat 41 formed therein, an air inlet port 42 and an air exhaust port 43. The port 42 is adapted to be connected to a suitable supply of air under pressure, this supply being carried by the locomotive and commonly used in connection with air brakes. The air exhaust port 43 is connected by a pipe 44 to the sand dome 7, the pipe 44 extending into said dome in close proximity to the end of the discharge pipe 8.

In the valve casing 40 is mounted a valve 45 having a stem 46, extending upwardly through a stuffing box 47, carried by the valve casing 40, and through an opening 48 provided therefor in the plate 9. The valve stem 46 is adapted to engage the under side of the tilting head 37.

The normal or inactive position of our device is illustrated in Fig. 3 of the drawings, where it will be observed that the members 15 and 16 are interlocked, and when in such position these members will rotate with the axles 3 and 5 of the locomotive. Should the wheels 4 skid or slide the beveled faces 23 of the lugs 21 immediately cause the lugs 22 to ride upwardly upon the lugs 21, until the members assume the position as shown in Fig. 6. This is due to the fact that the wheels 4 rotate with greater rapidity than the wheels 6, and while the member 15 rotates according to the speed of the wheels 4, the member 16 maintains the speed of the wheels 6. This is accomplished by making the sprocket wheels 20 and 21 of such size relative to the driving wheels 4 and the pilot wheel 6 that the disks 15 and 16 will be driven at the same rate of speed when all the locomotive wheels are revolving and some are not skidding. The lugs 21 and 22 confront one another and are maintained in this position by the coil spring 28, arranged between the member 16 and the hanger 11.

The outward movement of the member 16 actuates the lever 27, and causes said lever to immediately move the cylinder or dash-pot 33 forward, or to the left in Fig. 3. Instead of connecting the lever 27 directly to the tilting head 37, we interpose the cylinder or dash-pot to retard the spasmodic movement that would be imparted to the tilting head 37 by the lever 27. The ports 34 of the cylinder or dash pot are made of such a size as to allow the air within the cylinder or dash pot 33 to cushion the movement of the lever 27, and prevent a sudden or jerking movement of the cylinder or dash pot when moving the tilting head 37.

Immediately upon the tilting head 37 being moved, the valve stem 46 is depressed, opening a valve 45, and allowing air to pass through the valve casing into the pipe 44. The air being under pressure, will force a quantity of sand from the sand dome 7 into the discharge pipe 8, from where it passes on to the rails upon which the locomotive is traveling.

Immediately upon the wheels 4 assuming their normal rotation, the lugs 22 of the member 16 are returned to their normal position between the lugs 21 of the member 15, but upon the wheels 4 again skidding, the same operation takes place, and at this time the cylinder or dash pot 33 is moved to the right, allowing the tilting head 37 to assume its normal position and the valve 45 to close. Assuming that the wheels 4 again skid, the dash-pot or cylinder 33 is moved further to the right, and the tilting head 37 tilted in the opposite direction from the first operation. It will thus be observed that the dash pot or cylinder 33 has three positions, this being permissible by the guide plate 35 and the arrangement of the ports 34, these ports through the medium of the cylinder and the piston 32 cushioning the lever 27 however moved.

The pressure of air in the valve casing 40 will normally hold the valve 45 in a closed position, and the valve is then opened by the wheels 4 skidding; the normal operation of the locomotive maintaining the members in an interlocked position, whereby they will rotate in unison.

It is thought that the construction and operation of our automatic sanding device will be apparent from the foregoing description, and we reserve the right to make such structural changes as are permissible by the appended claims.

Having now described our invention what we claim as new, is:—

1. In an automatic sanding device, the combination with a locomotive, the sand dome and axles thereof, and a discharge pipe leading from said sand dome, of a plate carried by said locomotive, a shaft revolvably supported by said plate, a toothed member mounted upon said shaft, and adapted to be driven by one of said axles, a toothed member adjustably mounted upon said shaft and adapted to be driven by the other of said axles, lugs carried by the confronting faces of said members and adapted to interlock, a fulcrumed lever actuated by said adjustable member, a tilting head arranged upon said plate and actuated by virtue of said lever, a valve casing located beneath said plate, a normally closed valve mounted in said casing and adapted to be opened by said tilting head, a pipe communicating with said casing and with said sand dome, means mounted upon said plate for retarding the movement

of said lever, and means for normally holding said adjustable member in engagement with the other member.

2. In a sanding device, the combination
5 with a locomotive, the sand dome and axles thereof, and an air supply pipe communicating with said dome, of a plate carried by said locomotive, a shaft revolubly supported by
10 said plate, a toothed member fixed upon said shaft and adapted to be driven by one of said axles, a toothed member adjustably mounted upon said shaft and adapted to be driven by
15 the other of said axles, lugs carried by the confronting faces of said toothed members and adapted to interlock, a lever actuated by said adjustable member, a tilting head
20 actuated by said lever, a valve casing arranged beneath said plate and connecting with said supply of air, a valve arranged within said valve casing, and actuated by
said tilting head, a pipe connecting said valve casing with said sand dome, and means to retard the movement of said lever.

3. The combination with a locomotive,
25 the axles thereof, a sand dome having a suitable discharge pipe, and an air supply pipe communicating with said dome, of an automatic sanding device carried by said locomotive, said device comprising a plate, a shaft
30 revolubly supported by said plate, a toothed member fixed upon said shaft and adapted to be revolved by one of said axles, a toothed member adjustably mounted upon said shaft and adapted to be revolved by the other of
35 said axles, lugs carried by the confronting faces of said members and adapted to interlock, a lever actuated by said adjustable member, a tilting head actuated by said lever, a valve casing in communication with said
40 supply of air, a pipe connecting said valve casing with said sand dome, a valve located in said valve casing and actuated by said tilting head for controlling the admission of
45 air into said sand dome, means located upon said plate for retarding the movement of said lever, and means arranged upon said shaft for normally holding said adjustable member in engagement with said fixed member.

4. The combination with a locomotive,
50 the axles thereof, a sand dome having a suitable discharge pipe, and an air supply pipe communicating with said dome, of an automatic sanding device carried by said locomotive, said device comprising a plate, a shaft
55 revolubly supported by said plate, a toothed member fixed upon said shaft and adapted to be revolved by one of said axles, a toothed member adjustably mounted upon said shaft and adapted to be revolved by the other of
60 said axles, lugs carried by the confronting faces of said members and adapted to interlock, a lever actuated by said adjustable member, a tilting head actuated by said lever, a valve casing in communication with said
65 supply of air, a pipe connecting said valve

casing with said sand dome, a valve located in said valve casing and actuated by said tilting head for controlling the admission of air into said sand dome.

5. The combination with a locomotive, 70
the axles thereof, a sand dome having a suitable discharge pipe, and a pipe communicating with said dome for supplying air under pressure thereto, of a sanding device carried
75 by said locomotive, said device comprising a revoluble shaft, a member fixed upon said shaft and adapted to be driven by one of said axles, a member adjustably mounted upon said shaft and adapted to be driven by the
80 other of said axles, and adapted to interlock with said fixed member, a lever actuated by said adjustable member, a valve casing in communication with said sand dome, a valve located in said casing for controlling the ad-
85 mission of air to said sand dome, means actuated by said lever to open said valve, and means for preventing a spasmodic movement of the first mentioned means.

6. The combination with a locomotive, 90
the axles thereof, a sand dome having a suitable discharge pipe, and a pipe communicating with said dome for supplying air under pressure thereto, of a sanding device carried
95 by said locomotive, said device comprising a revoluble shaft, a member fixed upon said shaft and adapted to be driven by one of said axles, a member adjustably mounted upon said shaft and adapted to be driven by the
100 other of said axles, and adapted to interlock with said fixed member, a lever actuated by said adjustable member, a valve casing in communication with said sand dome, and a valve located in said casing for controlling the admission of air to said sand dome.

7. The combination with a locomotive, 105
the axles thereof, a sand dome having a suitable discharge pipe, and a pipe communicating with said dome for supplying air under pressure thereto, of a sanding device carried
110 by said locomotive, said device comprising interlocking members adapted to be separately driven by said axles, a lever actuated by one of said members, a valve casing connecting with said supply of air and with said
115 sand dome, a valve arranged in said casing and adapted to be opened by said lever, means for retarding the movement of said lever, and means for normally holding said members interlocked.

8. The combination with a locomotive, 120
the axles thereof, a sand dome having a suitable discharge pipe, and a pipe communicating with said dome for supplying air under pressure thereto, of a sanding device carried
125 by said locomotive, said device comprising interlocking members adapted to be separately driven by said axles, a lever actuated by one of said members, a valve casing connecting with said supply of air and with said
130 sand dome, a valve arranged in said casing

and adapted to be opened by said lever, and means for retarding the movement of said lever.

9. The combination with a locomotive, 5 the axles thereof, a sand dome having a suitable discharge pipe, and a pipe communicating with said dome for supplying air under pressure thereto, of an automatic sanding device carried by said locomotive, said device 10 comprising interlocking revoluble members adapted to be separately driven by said axles, a valve casing connecting with said supply of

air and with said sand dome, and a valve located in said casing and actuated by one of said members for admitting a supply of air to 15 said dome.

In testimony whereof we affix our signatures in the presence of two witnesses.

HENRY M. WILLIAMS.
ELEAZER ISAACS.

Witnesses:

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C. V. BROOKS.