

No. 675,150.

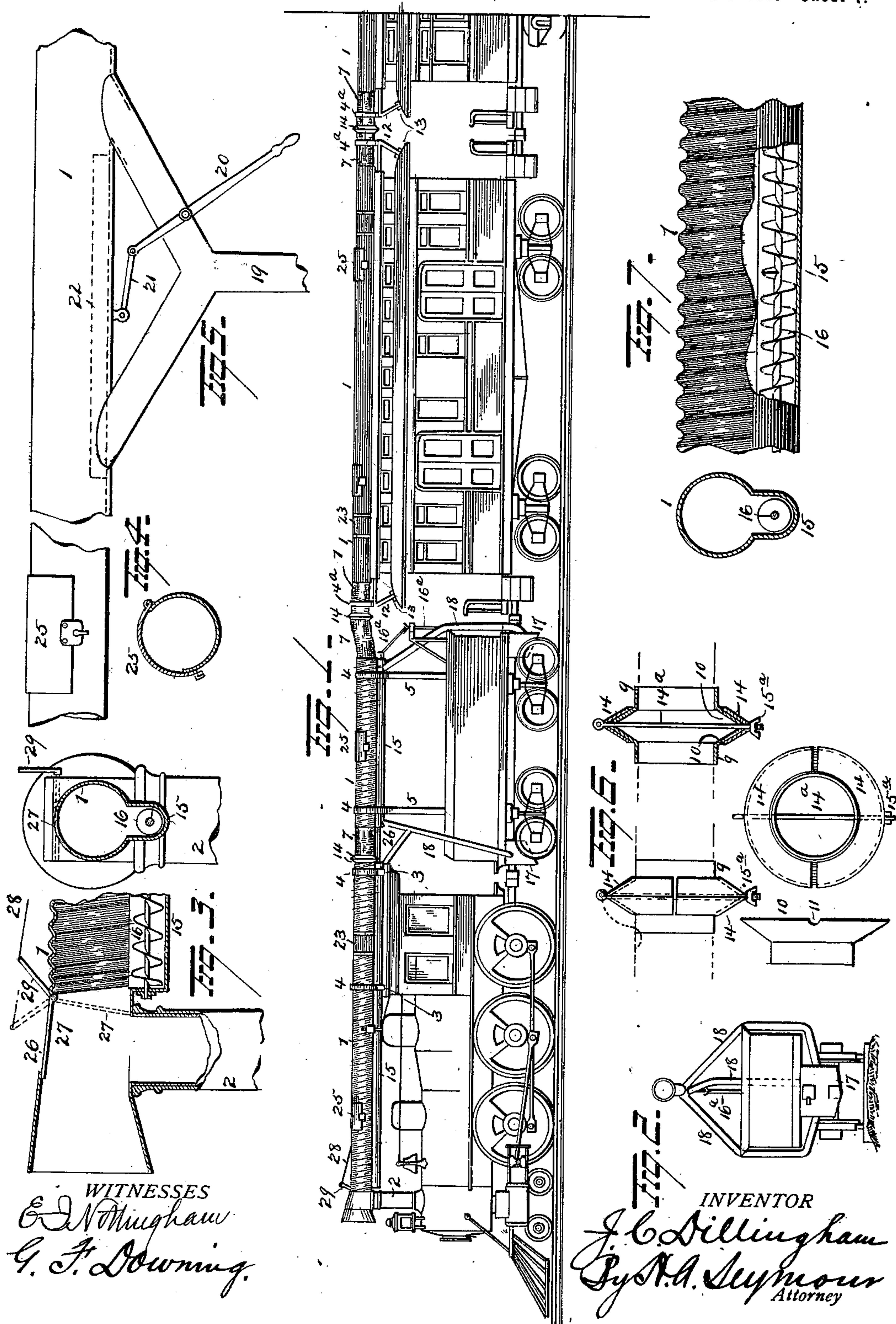
Patented May 28, 1901.

J. C. DILLINGHAM.
SMOKE AND SPARK CONVEYER.

(Application filed Mar. 12, 1901.)

(No Model.)

2 Sheets—Sheet 1.



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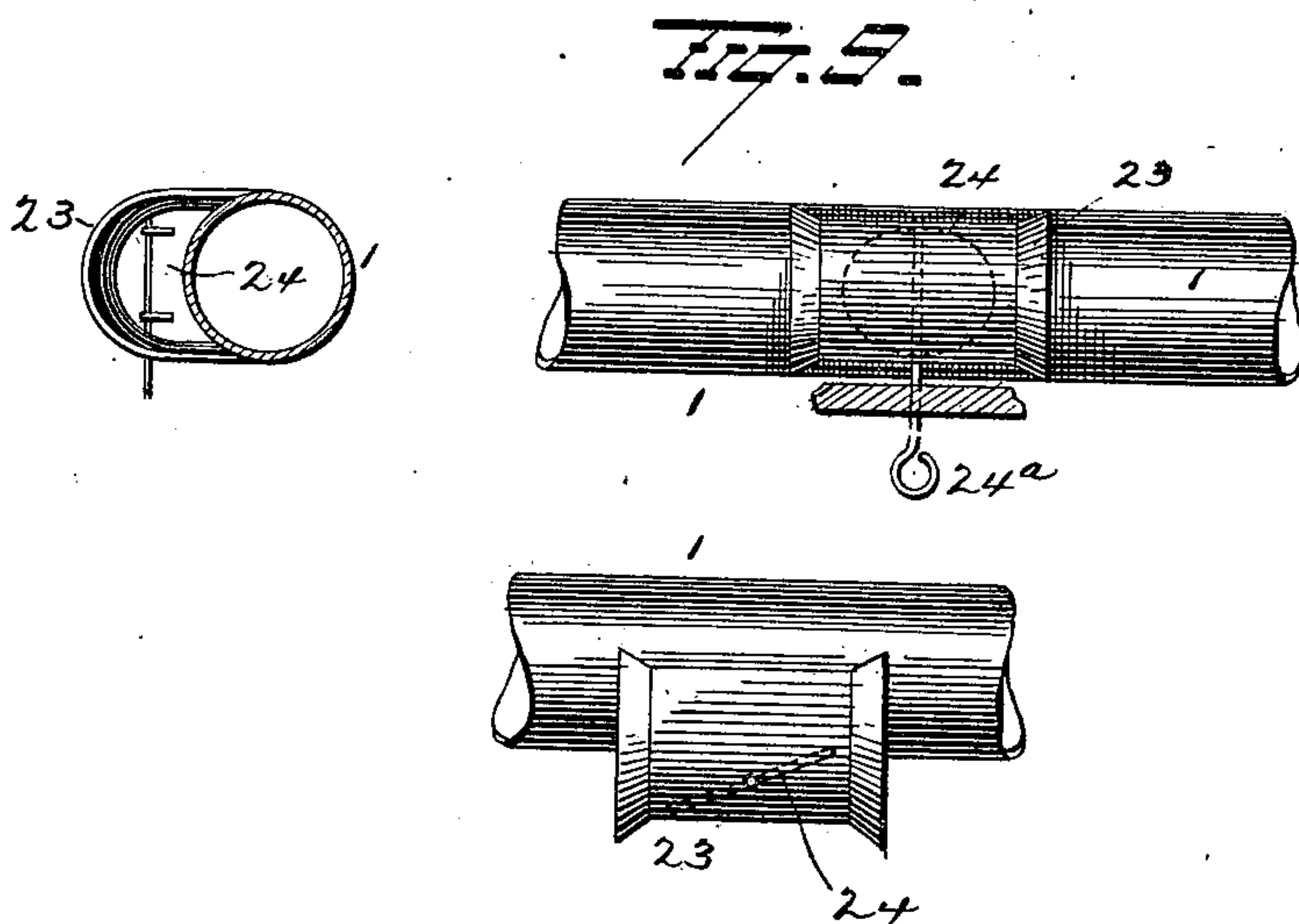
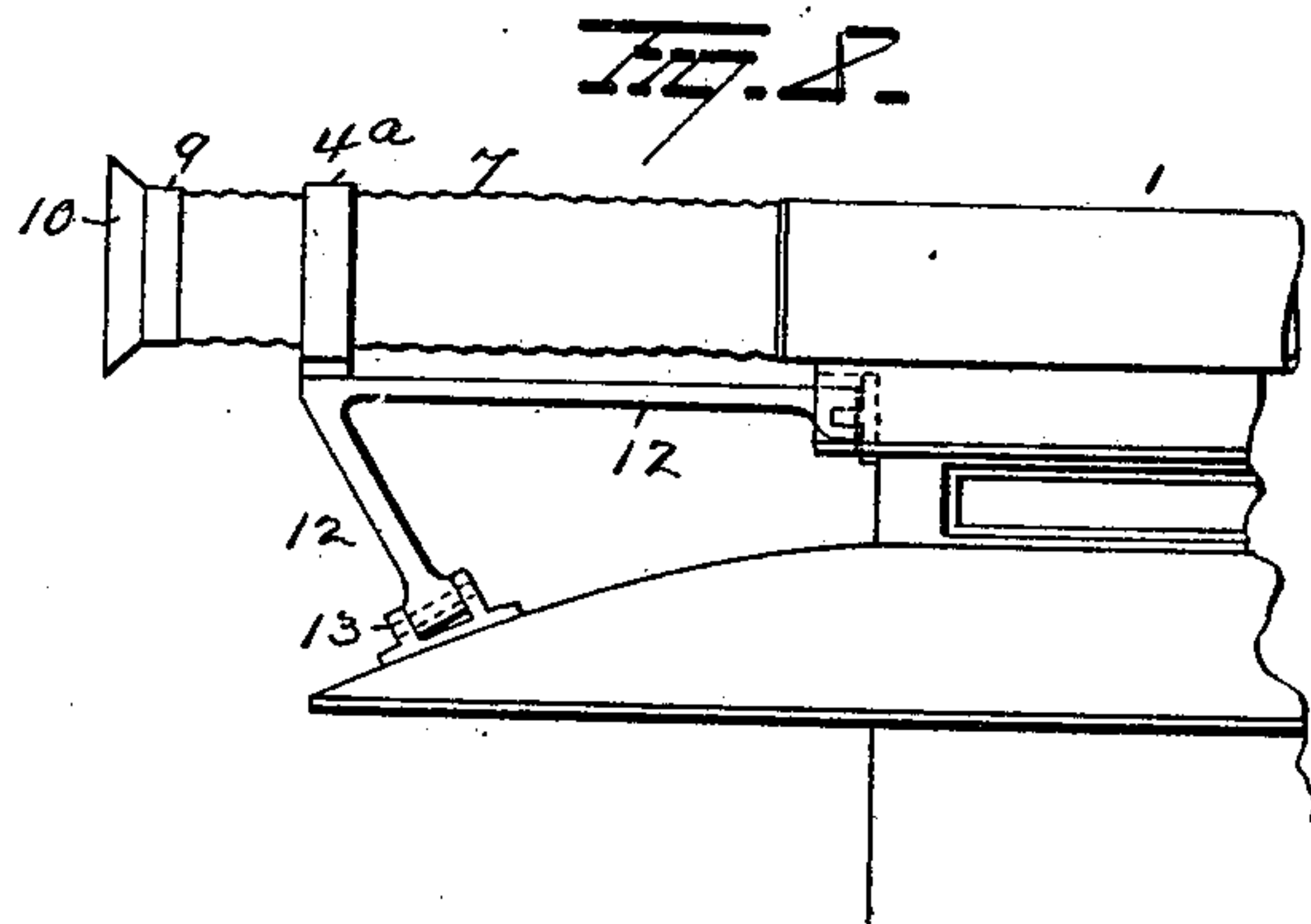
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2 Sheets—Sheet 2.



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JOSEPH C. DILLINGHAM, OF CHARLESTON, SOUTH CAROLINA.

SMOKE AND SPARK CONVEYER.

SPECIFICATION forming part of Letters Patent No. 675,150, dated May 28, 1901.

Application filed March 12, 1901. Serial No. 50,851. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH C. DILLINGHAM, of Charleston, in the county of Charleston and State of South Carolina, have invented certain new and useful Improvements in Smoke and Spark Conveyers; and I do hereby 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.

My invention relates to an improvement in smoke and spark conveyers for locomotives, and particularly to that class of conveyers wherein the larger sparks and cinders are conducted to a point or points beneath the tender of a locomotive and the lighter particles and smoke to a point in rear of the train to which the locomotive is coupled, the object of the invention being to provide means for retarding and collecting the cinders ejected through a locomotive smoke-stack and for conducting the smoke and finer sparks passing through said stack to the rear of a train, thus avoiding to a large extent the dirt and odor incidental to a railway trip on trains as at present equipped and reducing to a minimum the danger of accidental fires from larger sparks ejected from the stack.

With these ends in view my invention consists in certain novel features of construction and combinations of parts, as will be hereinafter more fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 represents a side elevation of a train of cars provided with my improved smoke and spark conveyer. Fig. 2 is a view in end elevation of a locomotive-tender; and Figs. 3, 4, 5, 6, 7, 8, and 9 are enlarged views representing in detail the construction shown in Fig. 1.

1 represents the main conducting tubes or pipes, which are supported on the locomotive and tender and on each separate car, respectively. The section of pipe over the locomotive is supported in rear of its funnel-shaped open end by the stack 2, which latter is in open communication with said tube or pipe, and at points adjacent to its opposite end by the brackets 3 3, supporting the ring-clamps 4 4, which encircle said tube or pipe, the said brackets being secured to the roof of the locomotive-cab. The section of pipe

over the tender is supported by the posts or standards 5 5 and their attached ring-clamps 4 4, while the section passing over each car rests upon the dome of the roof thereof and is firmly secured thereto in any desired manner. The respective ends of each of the main conducting pipes or tubes, with the exception of the pipe or tube carried by the locomotive, are provided with short sections of flexible tubing 7, constructed of any suitable material and having on their outer ends collars 9, provided with flaring mouths 10, said flexible tubings being supported near their outer ends by the rings 4^a, carried by the brackets 12, the long arms or members of which being seated in recesses formed in the roof of the dome portion of the cars, while the short arms or members thereof are pivotally connected to a plate 13, fixed to the sloping front sections of the car-roof. The rings carried by these supporting-brackets 12 loosely embrace the flexible tubes 7. Hence it will be apparent that the latter will be free to expand and contract throughout their entire length and to swing laterally on curves, thus providing for a wide range of movement of the adjacent end of the cars. The flaring mouths 10 of these flexible tubes are locked together and the pipes 1 made continuous by means of the two-part angular locking-clamp 14. This clamp 14 consists of two semicircular angular plates, conforming in shape to the angular rib formed by the flaring mouths 10 when in their normal position, and a rod 14^a, extending centrally through said sections and having an eye formed at its upper outer end for its attachment to the car-roof, and screw-threads formed on its lower projecting end for the reception of a thumb-screw 15^a, by means of which latter the angular sections of said locking-clamp are brought into engagement against the outer faces of the abutting flaring mouths 10. It will be observed that the outer edge of each flaring mouth is provided with oppositely-located notches 11, so that when the mouths of two flexible couplings are brought together the notches of each will aline and form a pair of oppositely-disposed circular openings for the rod 14^a, thus permitting said flaring mouths to firmly rest against each other, thereby forming a tight joint. The rear and forward ends of the main

conducting-pipes carried by the locomotive and tender, respectively, are coupled together by a single flexible tube 7 and the locking-clamp 14, and each is provided with a depending trough 15, which troughs are in open communication with said pipes. Within each of the troughs is mounted a revolving screw conveyer 16 for conveying of the larger sparks passing through pipes 1 to the receptacles 17 17, located under the respective ends of the locomotive-tender, the connection between the troughs 15 and the receptacles 17 17 being effected by a series of discharge-pipes 18. By locating the screw conveyer in the manner described—that is to say, below the main conducting-pipes—a free and unobstructed passage-way is provided for the passage of the currents of air entering through the funnel-shaped end of the pipe-section carried by the locomotive and likewise for the smoke, gases, and finer sparks emitted from the smoke-stack, which latter by reason of the force of said air-currents will be rapidly conveyed through the succeeding sections of the main conducting-pipe to the end of the train, from which point said smoke, gases, and finer sparks will be discharged into the outer air. The larger sparks during their passage through the main conducting-pipes carried by the locomotive and tender will by reason of their weight and by their contact with the pipe, which is spirally corrugated to retard the sparks and cinders, fall within either of the troughs, from which place they will be conducted to either of the receptacles 17 by the action of the screw conveyer 16, which latter is kept continuously in motion during the running of the locomotive by means of the jointed shaft 16^a, leading from one of the axles of the tender up to the rear end of the conveyer-shaft, the sections of said jointed shaft being coupled up by universal gimbal-joints.

In order to assist the passage of the smoke, gases, and finer sparks through the main conducting-pipes, or, in other words, to create a forced draft through said pipes, I may employ a blower, (not shown,) which may be located in the baggage-car or other convenient place and operated by power derived from the locomotive or from any other approved source. This blower is connected to one of the sections of the main conducting-pipe by a Y-shaped pipe 19, to one arm or member of which is pivotally connected a lever 20. The free end of the short member of this lever is pivotally connected with one end of pitman 21, which latter is pivotally connected at its opposite end to a depending bracket carried by a slide 22, located within said main conducting-pipe, and which is adapted to be moved back and forth to close either of the openings formed therein. By connecting the blower with the main conducting-pipe in the manner described it will be apparent that when making up a train the sliding valve 22 can readily be adjusted to cover the forward

discharge from the blast-pipe, and thus direct the blast toward the rear end of the car. In addition to the blower it might also be desirable to provide the main conducting pipes or tubes carried by the cars, at points adjacent to their ends, with outwardly-projecting air ports or inlets 23, each provided at a point between its ends with a valve or swinging partition 24, which latter is adapted to be controlled from within the car by the depending rod 24^a. When these air ports or inlets are used to increase the draft within the main conducting-pipes, the rod 24^a is turned so as to bring the valve or partition 24 into a position to open the end toward the locomotive, whereby the air entering through said open front end will by reason of the position of said valve be deflected into said conducting-pipes and assist in carrying the smoke and other substances therethrough.

When the air-ports are used, it will not be necessary to operate the blower, and under some conditions the use of either or both of these auxiliary means may be dispensed with, as the draft through the pipes caused by the rapid entrance of air through the funnel-shaped end of the section of pipe carried by the locomotive, due to the speed of the latter, will be sufficient to carry the smoke and gases to the end of the train.

Each of the main conducting-pipes is provided with a hinged door or doors 25 for enabling the pipes to be readily cleaned, and the doors are provided with suitable locking devices for securing them against accidental displacement when in their closed position.

The conveyer over the tender is connected to the one over the locomotive by a sleeve or jointed shaft 26, and the short arm of the forward discharge-pipe 18, which leads from the trough over the locomotive to the discharge-pipe on the tender, is made flexible in order to accommodate itself to the movements of the said locomotive and tender.

When the locomotive is at rest or under slow speed, a direct draft through the smoke-stack is necessary, and in order to arrange for same I have provided the main conducting pipe or tube, at a point directly over the open end of the smoke-stack, with an opening 26, adapted to be normally closed by an inwardly-swinging door 27. This door is so connected with pipe 1 that when in its elevated or locked position it closes the opening 26 and when in its lowest position rests in the same vertical plane with the rear side of the smoke-stack and constitutes a partition in said tube whereby a straight draft for said smoke-stack is provided. The movements of the door 27 are controlled by pulling on or slacking the rope or chain 28, one end of which is attached to the projecting end of lever 29, fixed to said door, while the opposite end of said rope is located within the engine-cab and within easy reach of the engineer.

While I have provided means for supplying additional air-blasts through the contin-

uous flue formed by the main conducting-pipes and their attached couplings, it will be seen that in trains of moderate length their use will not be required, as a fair rate of speed
 5 on the part of the locomotive will be sufficient to cause a requisite amount of air to enter through the funnel-shaped mouth of the section carried by the locomotive to insure a continuous draft throughout all of said sections,
 10 whereby all smoke, gases, and finer sparks from the locomotive-stack will be rapidly conveyed to the end of the train, the larger and live sparks, by reason of their weight and form of the section and pipe carried by the locomotive and tender, being deposited within the
 15 depending trough, and from thence they will be quickly conveyed by the action of conveyers 16 to the receptacles beneath the locomotive-tender.

20 In order to guard against injury to the conducting-pipe, discharge-pipes, and other parts carried by the locomotive-tender when the latter is being recoaled, I use a cover (not shown) which is so constructed and arranged as to completely cover all parts exposed to the fuel during the aforesaid operation.

It is evident that changes in the form and construction of the several parts might be
 30 made without avoiding my invention, and hence I would have it understood that I do not restrict myself to the particular construction and arrangement of parts shown and described; but,

35 Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a smoke and spark conductor, the combination with a conducting-flue in communication with the smoke-stack of a locomotive, of a trough located below said flue and in communication therewith and provided with a discharge-outlet, and a screw conveyor mounted in said trough, substantially as set forth.

2. In a smoke and spark conductor, the combination with a conducting-flue in communication with the smoke-stack of a locomotive, said conducting-flue or a part thereof located over the locomotive and being corrugated, of a trough located below said flue and in communication therewith and provided with a discharge-outlet, and a screw conveyor mounted in said trough, substantially as set forth.

3. In a smoke and spark conductor, the combination with a series of conducting pipes or tubes connected together so as to form a continuous conducting-flue, said flue, adjacent to its forward open end, being in communication with the smoke-stack of a locomotive, of a trough depending from and in communication with a portion of said flue and provided with a discharge-outlet, and a revolving screw mounted in said trough, substantially as set forth.

4. In a smoke and spark conductor, the

combination with a continuous flue for conducting smoke and fine sparks from the smoke-stack of a locomotive to the discharge
 70 end thereof, a trough depending from a portion of said flue and in open communication therewith, said trough having a discharge-outlet, of a screw conveyor mounted to revolve within said trough and adapted to discharge large sparks through the discharge-outlet of the trough, and means for creating a forced draft throughout the continuous flue to assist the transit and discharge of the smoke and sparks therein, substantially as
 80 set forth.

5. In a smoke and spark conductor, the combination with a conducting-flue in communication with the smoke-stack of a locomotive, a trough located below and in open
 85 communication with said flue and having a discharge-outlet, of a screw conveyor mounted in said trough and means for providing a direct draft either to the flue or smoke-stack, substantially as set forth.

6. The combination with a pipe having its interior fluted or roughened to retard the movement of cinders and having an opening in its bottom, of a trough located below said opening and a screw conveyor in said trough.

7. The combination with a pipe having an opening in its bottom, of a trough below said bottom, a screw conveyor in said trough, a cinder-tank carried by the tender, and a conducting-pipe leading from the trough to the
 100 tank.

8. The combination with a sectional pipe each section being carried by a car and flexible sections connecting the main sections to form one continuous flue, of blast-openings
 105 in one or more sections valves for directing the blast rearwardly through the continuous flue, and blast-pipes communicating with the blast-openings and adapted to admit air to either side of the valves.

9. The combination with a pipe for conveying the smoke and cinders rearwardly, of a blast-pipe branched at its upper end, both of the branches thereof leading to the main pipe and a sliding valve for closing either branch.

10. The combination with a sectional pipe each section being secured to a car and flexible sections for coupling up the several pipes, of swinging brackets supporting the flexible sections, each of said brackets comprising a
 120 horizontal arm parallel with the flexible pipe-section and attached to the car, a depending arm pivoted to the car and a collar at the juncture of said arms for embracing the flexible pipe-section.

11. The combination with a sectional pipe each section being secured to a car and terminating at its ends in flexible sections, each flexible end having a flaring mouth, of a coupling comprising two sections V-shaped in cross-section and overlapping the flaring mouths
 130 of two flexible pipes and means for locking the sectional coupling in position.

12. The combination with a conducting-

flue over and in communication with the
smoke-stack of a locomotive, an inwardly-
swinging door constituting a part of the flue
and located over the smoke-stack and means
5 for actuating said door, of a trough located
below the flue and a screw conveyer in said
trough.

In testimony whereof I have signed this
specification in the presence of two subscrib-
ing witnesses.

JOSEPH C. DILLINGHAM.

Witnesses:

GUS. H. KLINCK,
ALEX. M. MOORE.