

(No Model.)

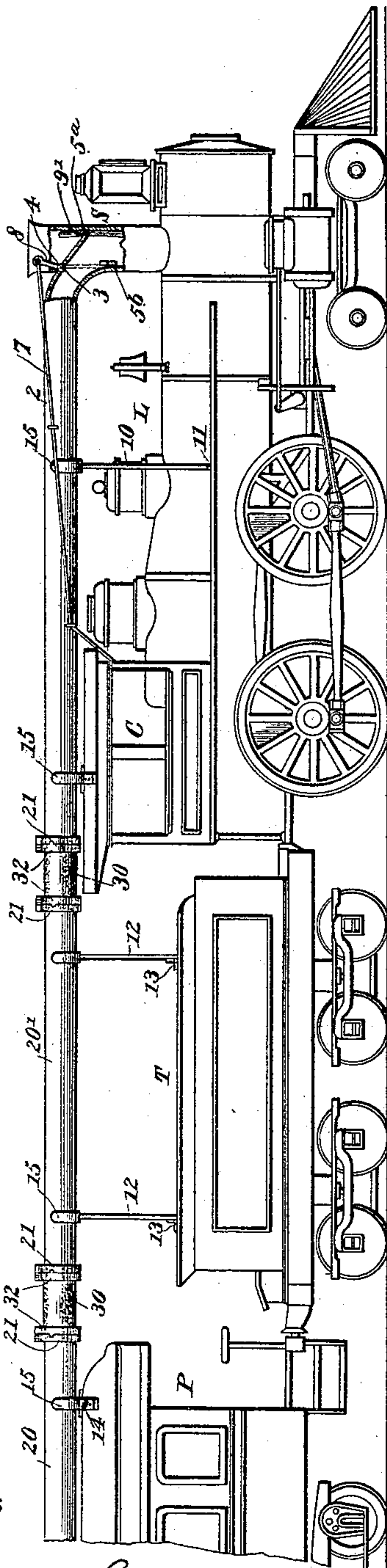
2 Sheets—Sheet 1.

F. C. LECHNER.  
SMOKE ARRESTER AND CONDUCTOR.

No. 487,949.

Patented Dec. 13, 1892.

Fig. 1.



Witnesses;

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Fig. 3.

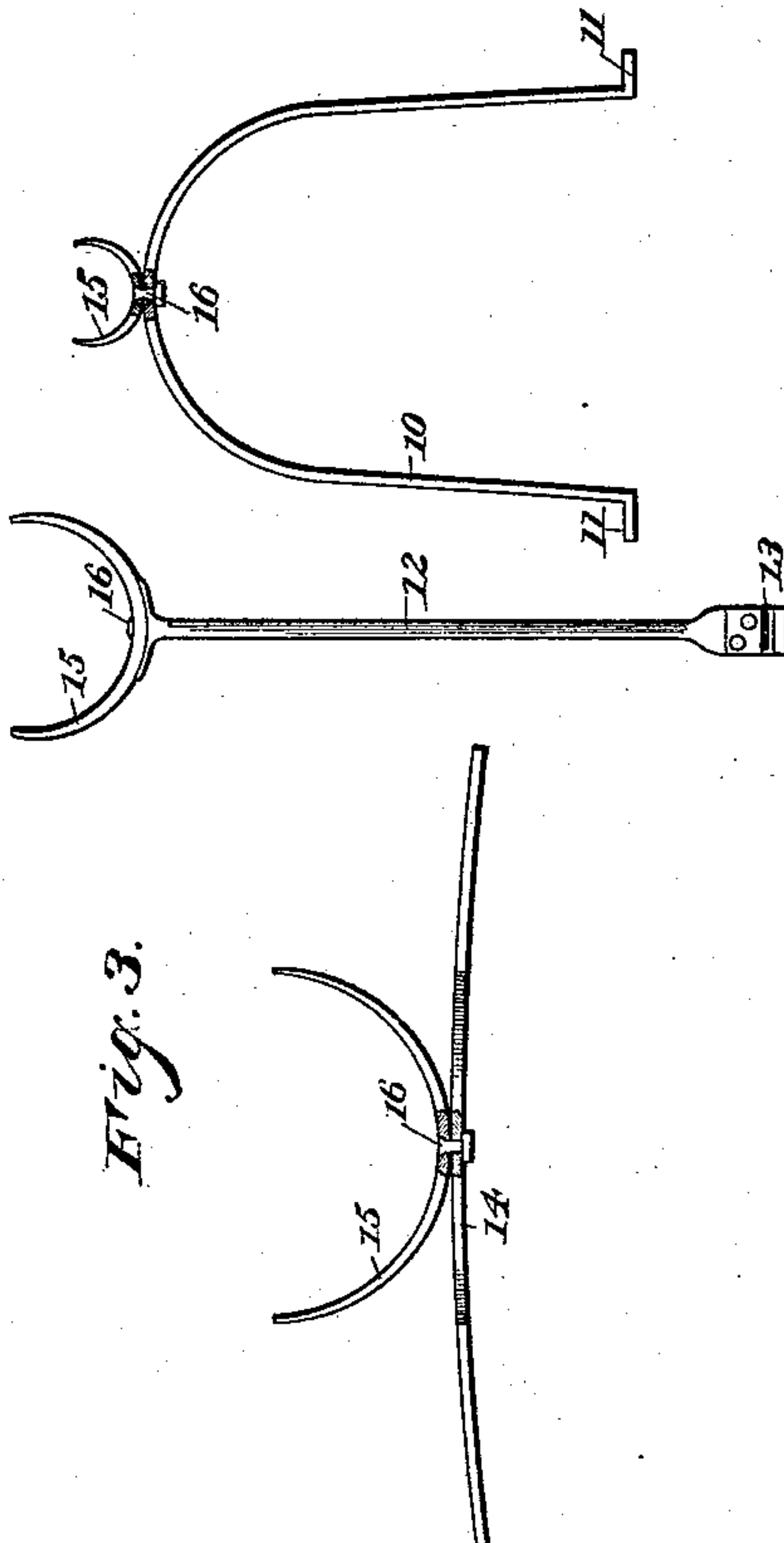
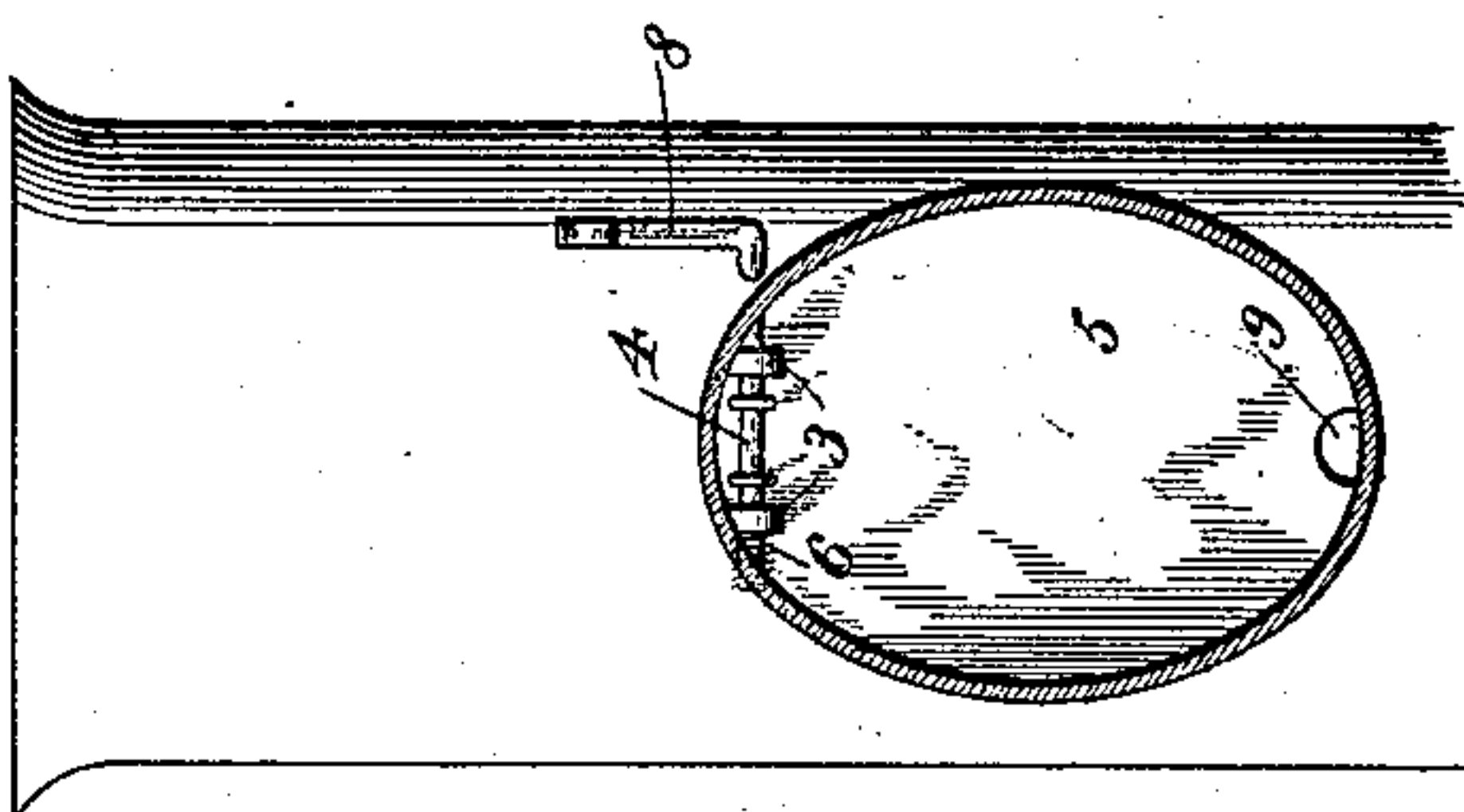


Fig. 2.



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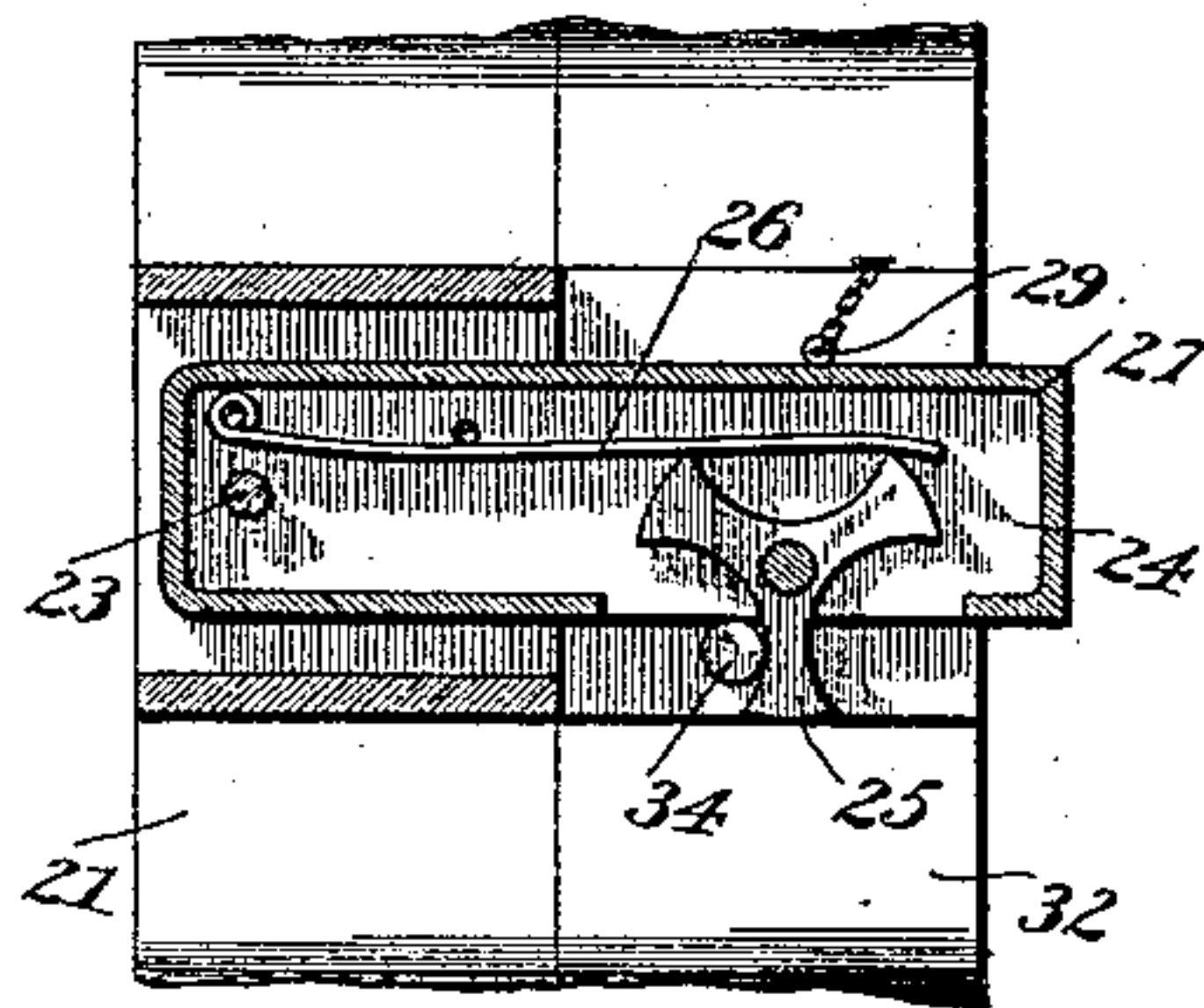
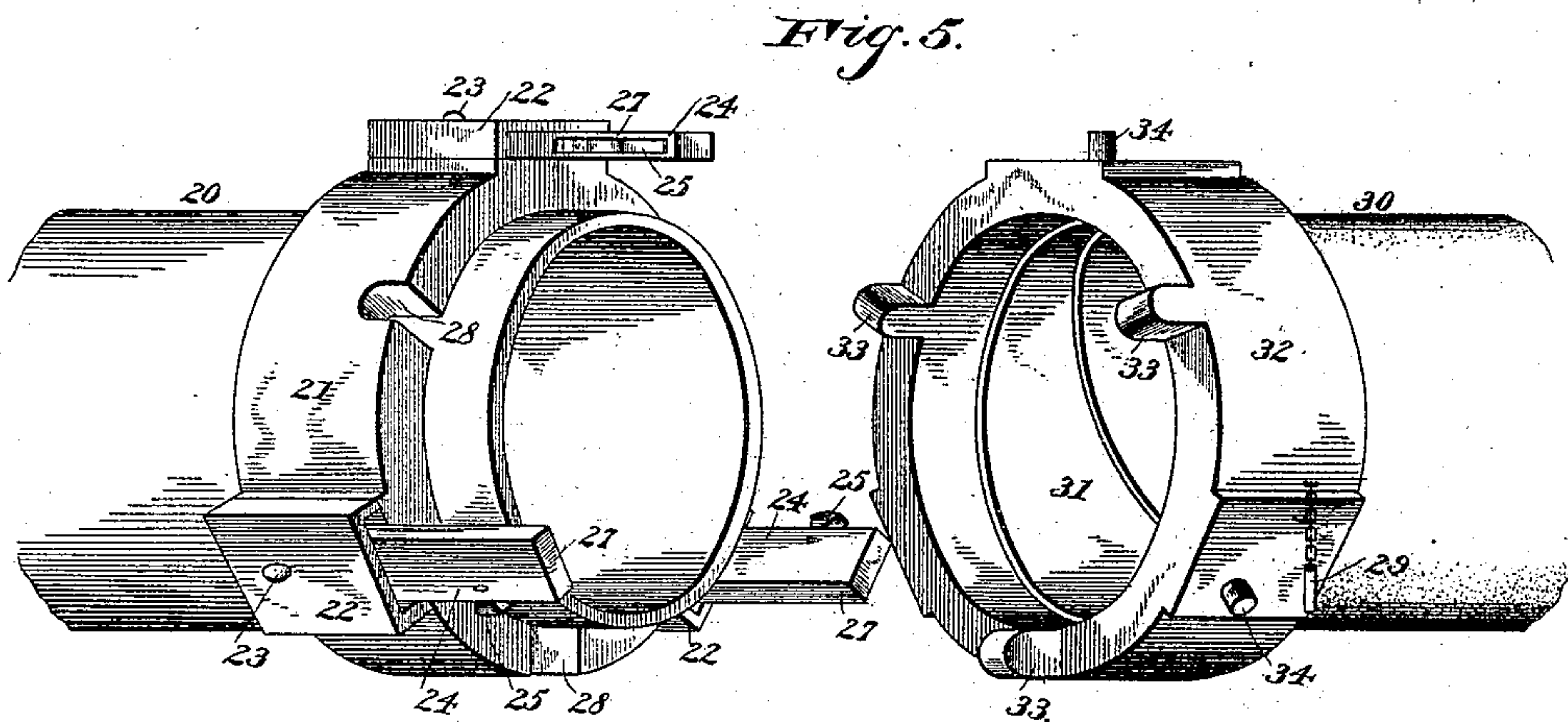
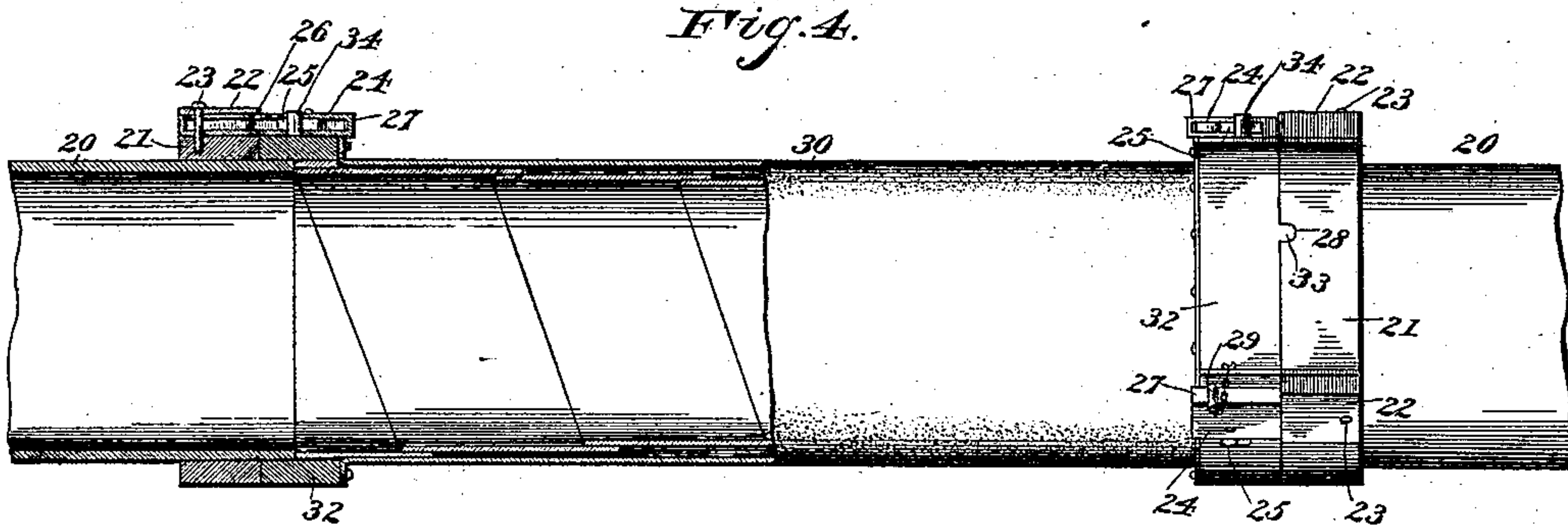
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2 Sheets—Sheet 2.

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No. 487,949.

Patented Dec. 13, 1892.



Witnesses;

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# UNITED STATES PATENT OFFICE.

FRANK C. LECHNER, OF TIMMONSVILLE, SOUTH CAROLINA.

## SMOKE ARRESTER AND CONDUCTOR.

SPECIFICATION forming part of Letters Patent No. 487,949, dated December 13, 1892.

Application filed February 12, 1892. Serial No. 421,315. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK C. LECHNER, a citizen of the United States, residing at Timmons-ville, in the county of Florence and State of South Carolina, have invented a new and useful Smoke Arrester and Conductor, of which the following is a specification.

This invention relates to improvements in spark-conductors for cars; and the object of the same is to produce an improved smoke-conduit for passenger-trains, whereby all the smoke, sparks, and products of combustion issuing from the furnace of the locomotive will be passed completely over the train and within a close conduit.

To this end the invention consists of the construction hereinafter more fully described and claimed, and as illustrated on the two accompanying sheets of drawings, wherein—  
Figure 1 is a side elevation of a locomotive, tender, and a portion of a car, all provided with my improved device. Fig. 2 is a cross-section of the conduit and a rear elevation of the smoke-stack. Fig. 3 is an elevation of the different forms of supports as used on the cab, tender, and cars. Fig. 4 is an enlarged elevation of one end of one main pipe connected with the coupling and a section of the other half of the coupling and the end of another main pipe. Fig. 5 is an enlarged perspective detail of the meeting ends of a main pipe and coupling, showing the latches, pins, notches, and projections thereon and with said ends disconnected. Fig. 6 is a detail sectional view of one of the latches.

Referring to the said drawings, L is the locomotive, having a smoke-stack S and a cab C.

T is the tender, and P designates a portion of a passenger-car.

It is the purpose of the present invention to provide a conduit for the smoke and other products of combustion usually passed through the smoke-stack, whereby they will be led over the locomotive, above its cab, over the tender, and over the roofs of the cars of the train, entirely to the rear ends of the latter, so that not only will the passengers be relieved of the annoyance and discomfort which result from flying smoke and cinders, but the cars themselves will not be dirtied and injured thereby, and the sparks will not be spread

broadcast over the land along the railroad line. This same general end has been accomplished heretofore; but the device hereinafter described possesses advantages in its specific construction of details, which will be obvious to those skilled in the art.

The smoke-stack used in connection with this device is preferably small and cylindrical, as shown, and need have no gauze or other spark-arrester. Opening from the rear side of this stack and curving to the rear, as at 1, is a pipe 2, of probably a little less diameter than the stack, this pipe leading along over the locomotive, as shown. Mounted in eyes 3 at the upper side of the joint is a shaft 4, carrying a damper-plate 5, and 6 is a spring holding this plate normally vertical, while 7 is a cord leading from a crank 8 on one end of the shaft back to the cab C, so that the engineer can move the damper at will. As shown in full lines in Fig. 1, the engineer has so moved the damper and the smoke will pass through the conduit over the train; but the dotted lines indicate the position the parts assume when tension on the cord is released, and at that time the smoke passes out the stack. In the free edge of the damper-plate 5 is formed a notch 9, and 9' is the steam-exhaust pipe which leads up within and at the front side of the smoke-stack, the notch permitting the damper-plate 5 to close tightly over this exhaust-pipe. If the exhaust-pipe should not extend up to the damper, the latter will not be notched. The damper when raised to close the smoke-stack has its free end abutting against a flange 5<sup>a</sup>, and when it is closed it is supported by a shoulder 5<sup>b</sup>.

In Fig. 3 are shown the various forms of supports which are used in my improved conduit. 10 is an arch standing over the boiler and having its feet 11 bolted to a suitable stationary part of the locomotive. 12 is an upright hinged, as at 13, to the tender, or, if it is not desired to locate this hinge at the transverse center of the tender, I may employ arches 10; but I prefer to hinge their lower ends in order to give the conduit above the tender a slight longitudinal motion, and 14 is the top of a car or a metal strap or sill secured across the same. 15 is a crescent, which directly supports the conduit, and the latter is



secured therein in any suitable manner, while the crescents are bolted, as at 16, to the arch 10, the upright 12, and the strap 14, and along the transverse center of the entire train.

5 The conduit proper comprises the pipe 2 over the locomotive, the pipe 20' over the tender, and the pipes 20 over the cars, all of which are main pipes, and these are connected at their meeting ends by couplings 30. Around  
10 each main pipe near each end is a stout band 21, and on this band at three equidistant points are boxes 22, in each of which on a pivot 23 is mounted a latch 24, consisting of a catch 25, having three arms, a casing 27, in  
15 which the latch is pivoted, and a spring 26 to hold this catch in position, all as best seen in Fig. 6. At certain points in the ends of the bands are formed notches 28.

Each coupling consists of a spiral sheet 31,  
20 whose edges lap each other about two inches and can slip thereover to a moderate extent, the ends of this sheet being secured within encircling bands 32, which bands project beyond the ends of the coupling. The spiral  
25 sheet may be and preferably is covered with some non-combustible elastic fabric 30, such as rubber coated with asbestos, which covering also secures the spiral sheet by causing the lapped portions to hug each other. At  
30 certain points on the band 32 are lugs 33, which enter the notches 28 in the ends of the band 21, thereby preventing the coupling from turning axially on the pipe. On the band 32 at equidistant points are located radially-pro-  
35 jecting pins 34, so located with reference to the lugs and projections that when the latter interlock the pins will engage the catches 25, as will be clear. The latch-casings are piv-  
40 otally mounted in the boxes, and when the sections are coupled the casings are held against movement on their pivots by removable pins 29.

In the use of this improved device the main pipes on the locomotive and tender may be  
45 permanently connected by a quite-short coupling, which will permit the locomotive and tender to turn, as in rounding curves and in passing switches, but which will not allow the main pipe on the tender to fall forward around  
50 the hinges 13. When the tender is coupled to a passenger-car provided with a main pipe of my improved conduit, one of the couplers is placed between the adjacent ends of the pipes on the tender and car, and when the  
55 lugs on the coupler enter the notches on the end of the pipe the various pins 34 pass under the projecting arms of the several catches and the latter turn on their pivots, as per-

mitted by their springs. The coupling will thus be connected with each main pipe by a  
60 spring connection, which it is intended shall have sufficient strength to unite the parts under all ordinary circumstances, but which will automatically disengage when the cars are un-  
65 coupled. The smoke, sparks, cinders, and other products of combustion can then be directed from the locomotive-furnace entirely through this conduit and will issue at the rear end thereof, where a short piece of pipe can be  
70 connected with the main pipe to direct the smoke beyond the last car.

The parts of this improved device are of any desired sizes and materials best adapted for the purpose and considerable elaboration in the details can be made without departing  
75 from the spirit of my invention.

What is claimed as new is—

1. A flexible coupling for pipes, consisting of a spiral sheet of metal whose edges lap each other, bands secured around the ends of  
80 the tube thus formed, and a non-combustible covering for said tube, as and for the purpose set forth.

2. The combination, with a pipe, a band encircling the pipe near its end and provided  
85 with notches, equidistant boxes on the exterior of said band, latches pivotally mounted on radial pivots in said boxes and having a catch provided with three arms, and a spring bearing toward the center of each catch, of a  
90 flexible coupling, an exterior band projecting beyond the end thereof, lugs on the band adapted to engage said notches, and equidistant radial pins on the band adapted to en-  
95 gage said catches, as set forth.

3. The combination, with a pipe having notches at its end and equidistant latches hav-  
ing spring-actuated catches mounted on pivots, of a flexible coupling having lugs adapted to engage said notches and radial pins adapted  
100 to engage the catches, as set forth.

4. The combination, with a pipe, equidistant exterior latches pivotally mounted there-  
on, a catch mounted on a pivot and having three radial arms, and a spring whose free  
105 end bears toward the pivot, of a flexible coupling having equidistant pins adapted to engage said catches, as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in  
110 the presence of two witnesses.

FRANK C. LECHNER.

Witnesses:

I. H. MCKAUGHAN,  
R. J. ROLLINS.