

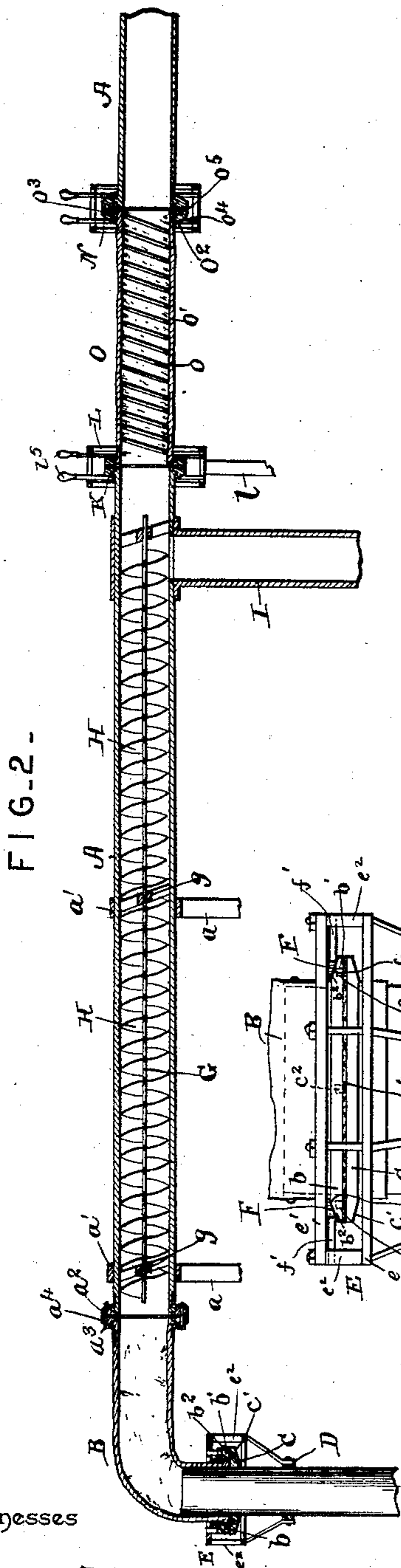
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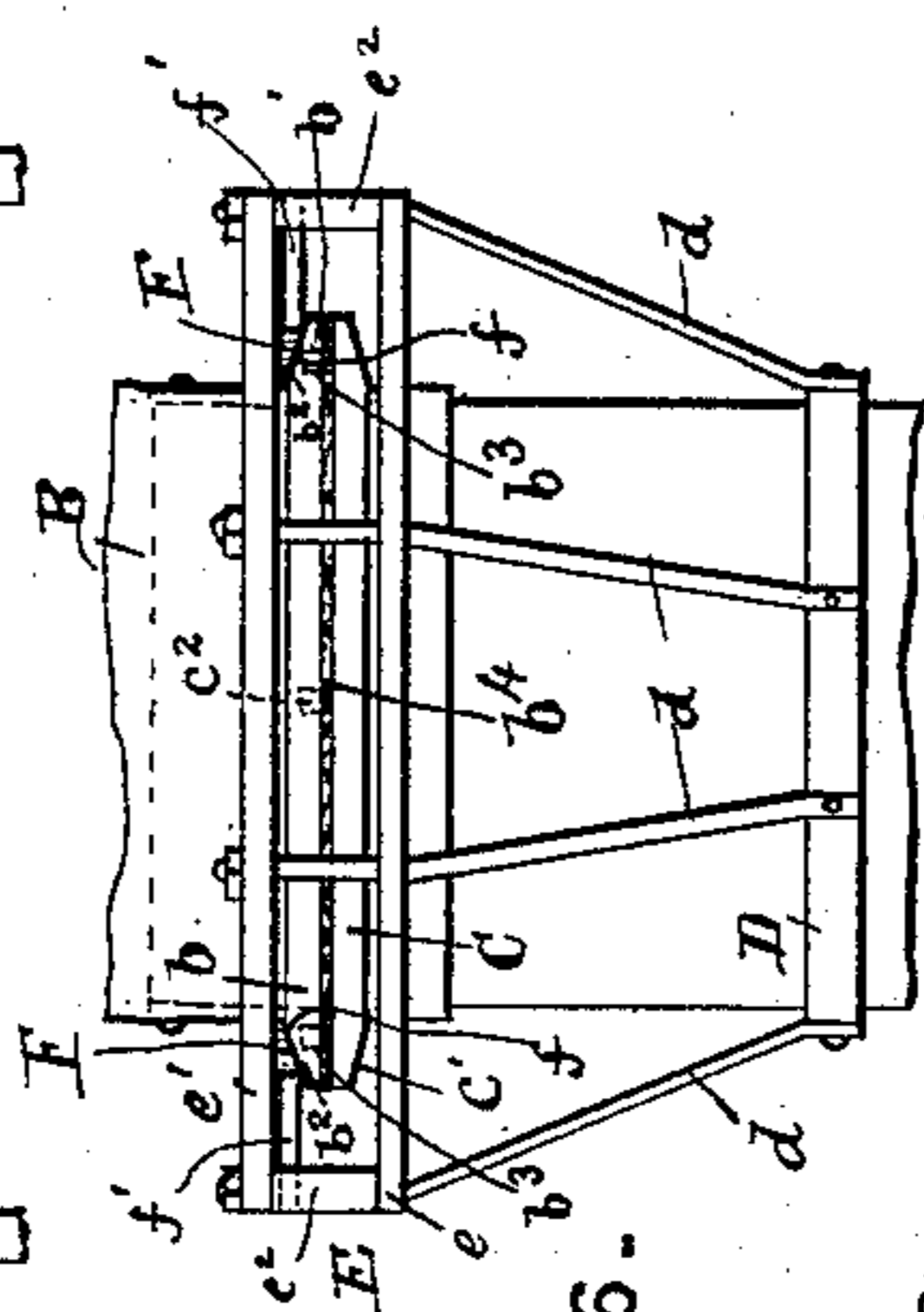
G. E. BELL.  
SMOKE CONVEYER.

No. 472,650.

Patented Apr. 12, 1892.



F16.2.



**FIG. 6.**

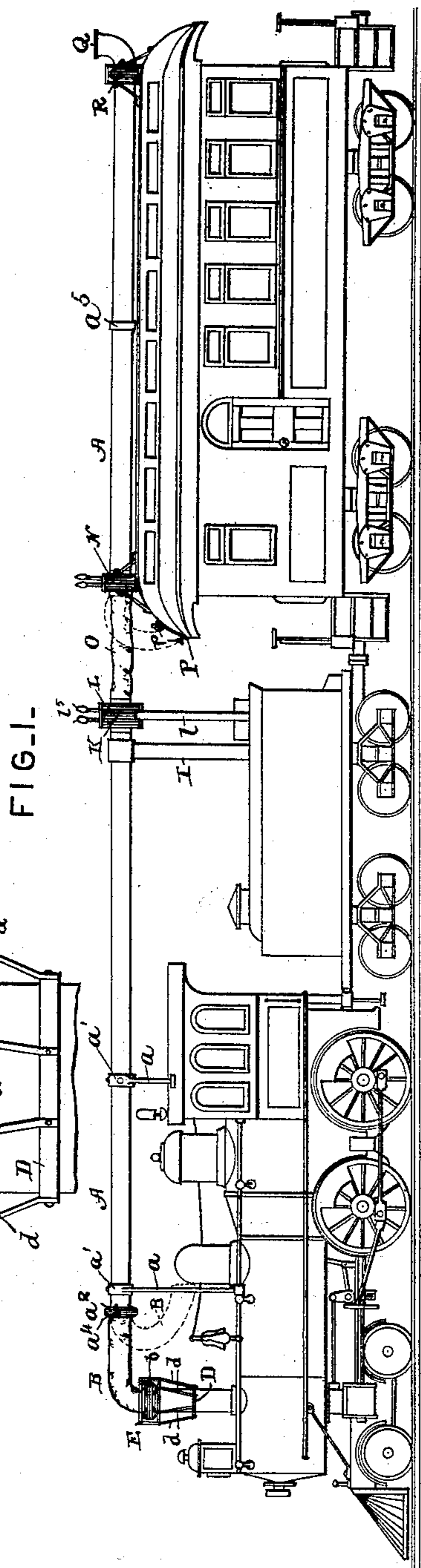


Fig-1-

Witnesses

Inventor

Jas. K. McClathran

By *his* Attorneys,

*George E. Bell*

L. F. Wolhaupter,

Chas. Snow & Co.

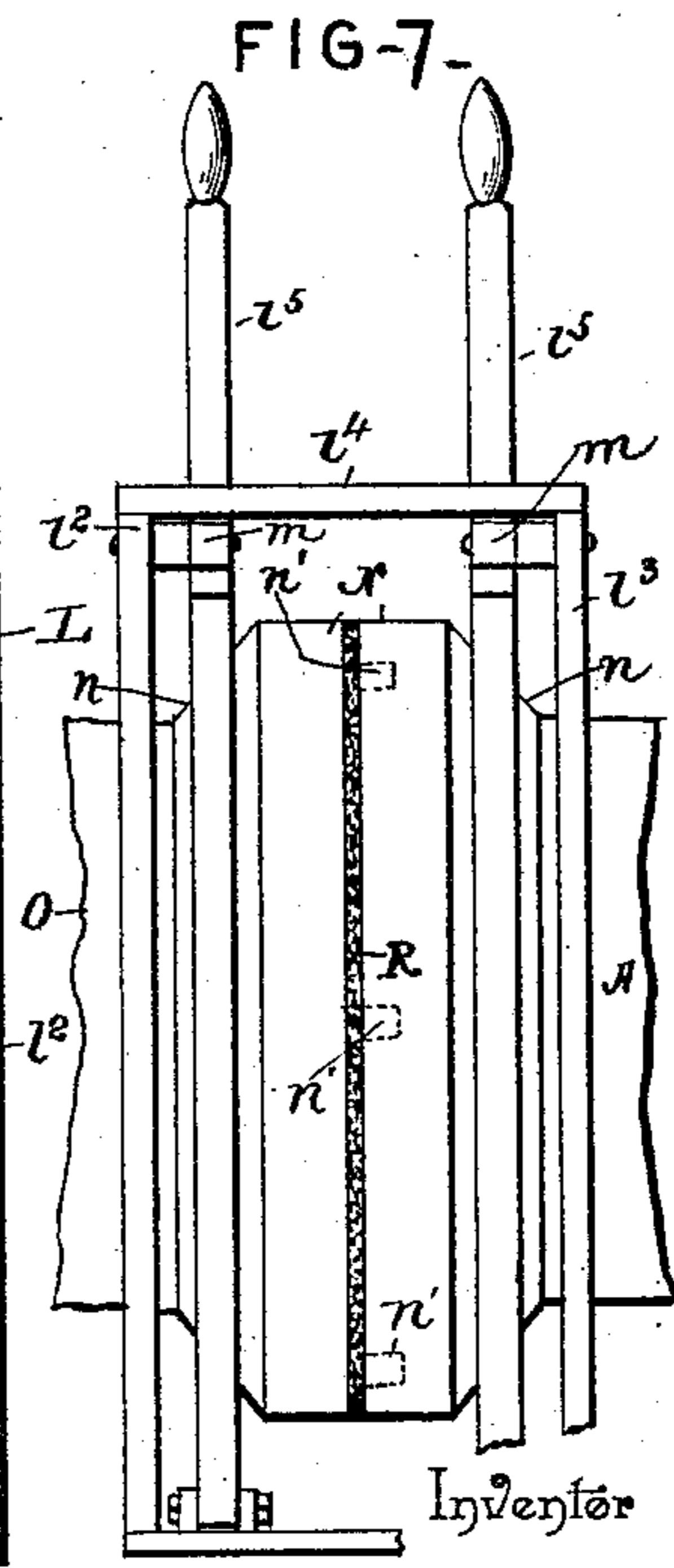
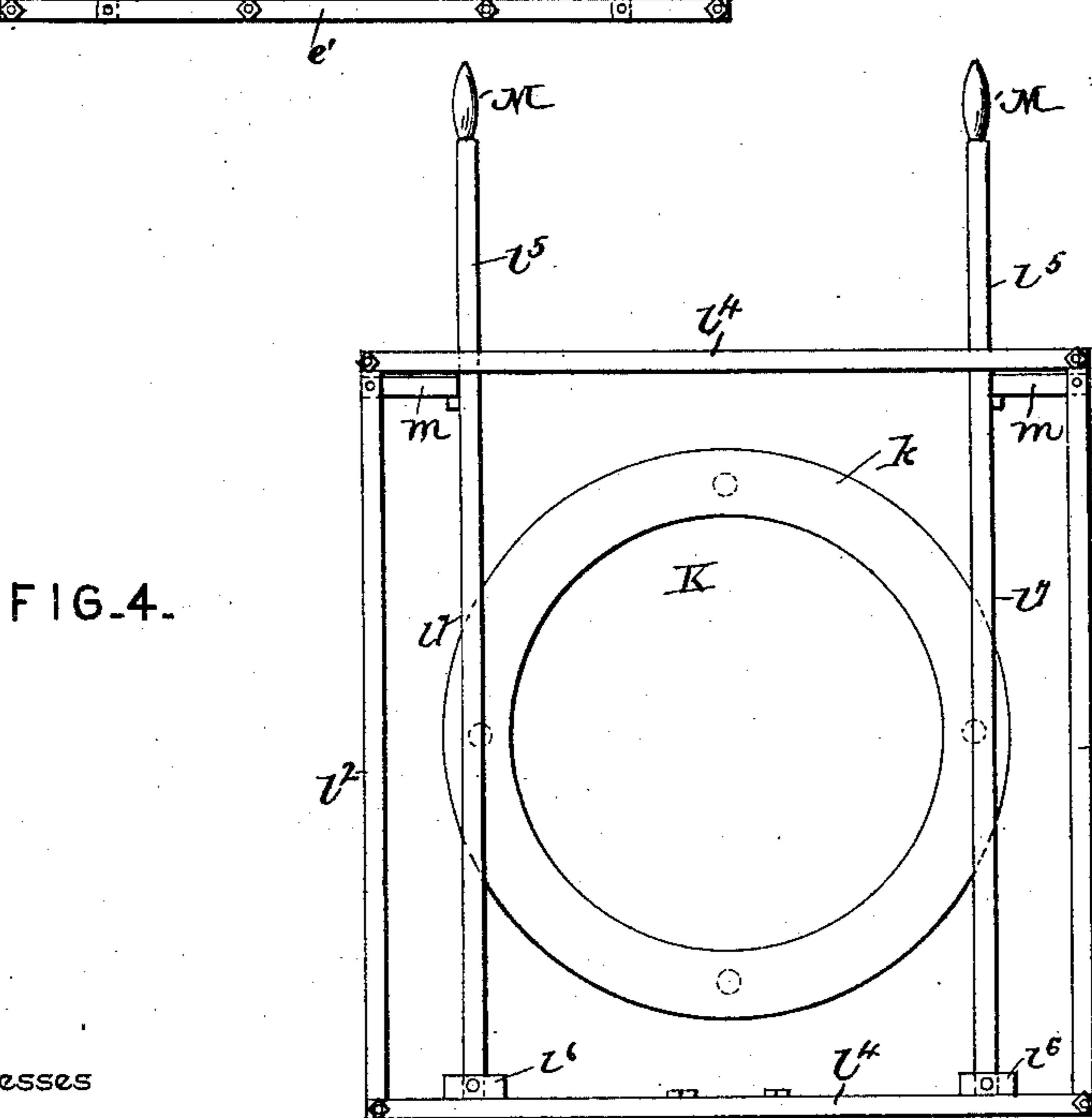
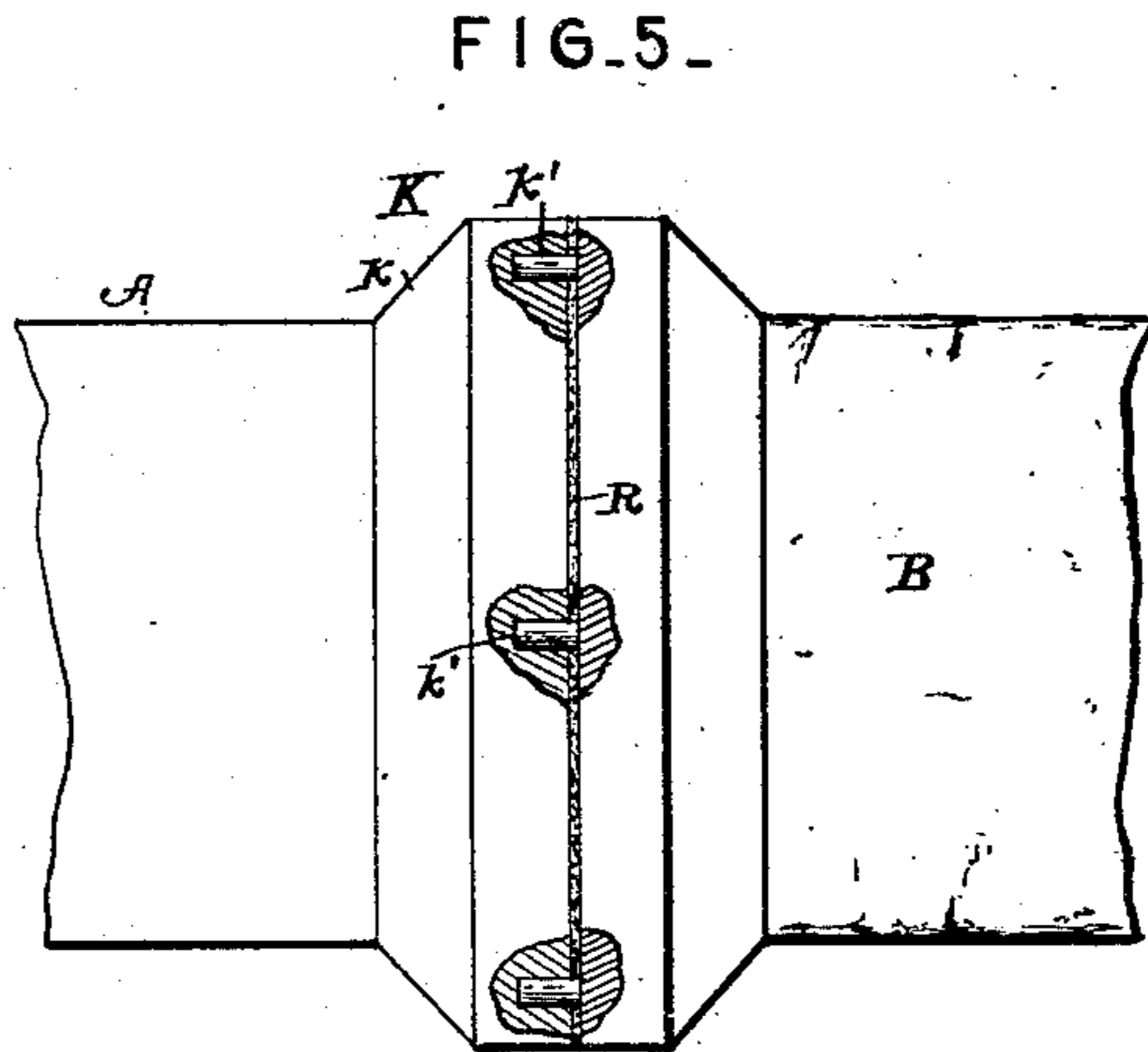
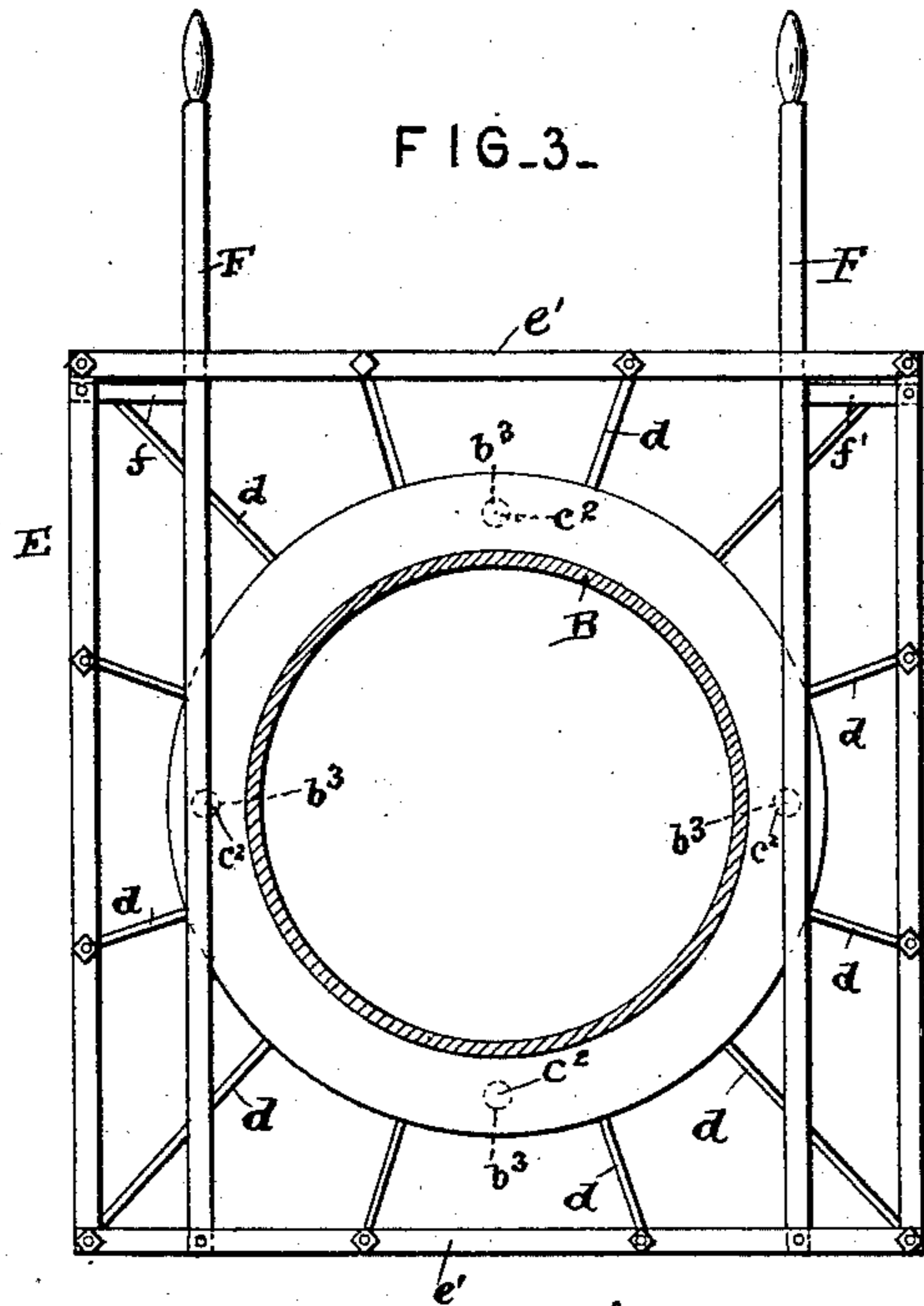
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2 Sheets—Sheet 2.

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*Jas. H. McLathran*

By his Attorneys,

*D. P. Holchamper.*

*George E. Bell*

*C. A. Snow & Co.*

# UNITED STATES PATENT OFFICE.

GEORGE ELLSWORTH BELL, OF WEST SOMERVILLE, MASSACHUSETTS.

## SMOKE-CONVEYER.

SPECIFICATION forming part of Letters Patent No. 472,650, dated April 12, 1892.

Application filed August 20, 1891. Serial No. 403,212. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE ELLSWORTH BELL, a citizen of the United States, residing at West Somerville, in the county of Middlesex and State of Massachusetts, have invented a new and useful Smoke-Conveyer, of which the following is a specification.

My invention relates to smoke and spark conductors; and it has for its object to conduct the smoke and sparks from the smoke-stack of a locomotive, so that the disagreeable effects of having the smoke and cinders getting into the cars through the doors and windows are avoided; and it has for a further object to provide a conductor whereby the large cinders are caught and conducted back to the tender of the locomotive to be reburned, thus saving and utilizing what would otherwise be but waste material, and at the same time conducting off the smoke and finer sparks; and with these objects in view the invention consists in providing the locomotive and cars with tubes for conducting the smoke and sparks over the train and discharging the same at the rear thereof, and which is provided with novel connections and arrangements, hereinafter more fully described, illustrated, and claimed.

In the accompanying drawings, Figure 1 is a side elevation of a locomotive and a car provided with a smoke and spark conductor constructed in accordance with my invention. Fig. 2 is a longitudinal sectional view of the same removed from the train. Fig. 3 is a top view of a locomotive smoke-stack provided with a clamping device constructed in accordance with my invention. Fig. 4 is a front view of one end of the flanged conducting-tube having the clamping-frame located thereover. Fig. 5 is a plan view of the meeting faces of the opposing sections of the conducting-tubes at their joints. Fig. 6 is an enlarged elevation of the smoke-stack coupling frame. Fig. 7 is a similar view of the main conducting-tube coupling frame.

Referring to the accompanying drawings, A represents the main conducting-tubes, which are secured upon the locomotive and tender and each separate car, respectively, and one section is secured upon or over the top of the locomotive and tender by means of the rods  $a$ , supporting the circular clamps or bands  $a'$ , en-

circling said tube or pipe and securely holding it in its position over and upon the locomotive and tender. The front end of the section of piping over the locomotive and tender is provided with the flange  $a^2$ , that is adapted to be jointed by means of suitable bolts  $a^3$  with the flanged section  $a^4$ , which carries the short section of flexible tubing B, that is adapted to be removably connected to the smoke-stack of the engine. Said flexible section is constructed of any suitable material, preferably of asbestos, as being the best fire-proof material, and is provided at its free end with the cap  $b$ , which is provided with a flange  $b'$ , having an inner beveled face  $b^2$ , and a series of perforations  $b^3$ , located in its front engaging face. The said flange is further provided with a facing of asbestos  $b^4$  or other suitable material that is designed to make a secure and smokeless joint between the same and the opposing flange or shoulder C, which is securely riveted to the smoke-stack of the engine and is itself provided with an inner beveled face  $c'$  and a series of lugs or pins  $c^2$ , that when the two opposing shoulders or flanges meet are adapted to engage the recesses or perforations in the shoulder or flange secured to the flexible tube B, and thus firmly and accurately hold the two flanges, exactly registering with each other, while the same are clamped and held together by means of the clamping device, also secured to the locomotive smoke-stack.

Secured around the smoke-stack below the flange C, riveted thereon, is the encircling band or clamp D, to which is secured a series of supporting-rods  $d$ , diverging therefrom and supporting the double horizontal rectangular frame E, which encircles the said flange or shoulder secured to the smoke-stack. The said frame consists of the parallel rectangular frames  $e$  and  $e'$ , respectively connected together by the corner bars or blocks  $e^2$ , and accommodate the opposite clamping-levers F, pivoted horizontally within said frame to opposite sides of the same and are provided with the beveled engaging faces  $f$ , that when the two engaging flanges or shoulders on the smoke-stack and the supplemental tubing, respectively, meet are adapted to be pressed upon the beveled face of the removable shoulder or flange, and thus securely hold the two

together and make a smokeless joint, the said levers being held in their locked position by the pivoted dogs  $f'$ , pivoted to the sides of the frame and adapted to be thrown back of  
 5 said levers, and thus hold the same in engagement with the beveled flange or shoulder, against which the same bears. When the cars are disconnected, the said section or flexible tubing, as can readily be seen, may be easily  
 10 detached from the smoke-stack, and may be conveniently supported upon the front supporting-rods  $a$ , as illustrated in dotted lines, in any suitable manner, and thus permit the smoke and other gases to escape in the usual  
 15 manner. The section of piping located over and upon the locomotive and tender is further provided with the longitudinal shafts  $G$ , suitably journaled in boxes  $g$  at both ends of the pipe and in the center thereof and accom-  
 20 modate the revolving screw conveyers  $H$ , securely mounted on said shafts and adapted to revolve therewith. The action of the heat and the force of the smoke and gases omitted from the smoke-stack cause the said spirally-  
 25 arranged conveyers to revolve, and while leaving a free and uninterrupted passage to the smoke and other gases it breaks the force and flight of the heavy cinders and causes the same to fall down upon the bottom of the  
 30 tube, and the motion of said conveyers will carry the said cinders along to near the end of said section of piping located over the tender and discharge the same through the discharge-tube  $I$ , communicating with the inner  
 35 end of said pipe  $A$  and with the tender therebeneath, into which the said cinders fall and may be utilized again.

The inner end of the section of tubing located over the locomotive and tender terminates in a shoulder or flange  $K$ , having an inner beveled face, as  $k$ , and a series of perforations  $k'$ , located upon its flat engaging face and designed to make the coupling with the other sections of piping in substantially the  
 45 manner as the coupling made with the section of flexible tubing  $B$ , with the perforated flange secured upon the smoke-stack. Vertically supported around said flange  $K$  is the coupling or clamping frame  $L$ , suitably and  
 50 rigidly supported in its position over the inner end of the section of piping by means of the supporting bars or rods  $l$  and is of substantially the same construction as the clamping-frame  $E$ , secured horizontally around the  
 55 flange riveted to the smoke-stack, and to which the joint or coupling is made. Said rectangular frame comprises the parallel frames  $l^2$  and  $l^3$ , respectively, and are connected together by the corner-bars  $l^4$  in the  
 60 same manner as the frame  $E$  referred to. The said frame is also provided with the vertically-extending and laterally-operating clamping-levers  $l^5$ , which are pivoted at  $l^6$  to opposite sides of one of the rectangular frame-pieces comprising the coupling-frame, and are  
 65 also provided with the beveled edge  $l^7$ , adapted to take over the beveled face of the engag-

ing shoulder of the jointed sections of piping and are adapted to be operated by the supplemental handles or levers  $M$ , removably  
 70 connected with the top of said levers, which when thrown into engagement with the coupled shoulders are held securely in such locked position by means of the pivoted locking-pawls  $m$ , corresponding to the locking-  
 75 pawls  $f'$  previously described and operating in a manner similar thereto.

Each section of piping secured longitudinally along the top of the cars is suitably secured thereto by means of the encircling  
 80 bands  $a^5$ , which are rigidly secured to the top of the car, and each of said sections terminates at each end in the engaging shoulders  $N$ , corresponding to the other flanges previously  
 85 described, and the same are also provided with the inwardly-beveled edges or faces  $n$  and a series of perforations  $n'$ , located upon the engaging face of said flange to receive the coupling-pins of the section joined there-  
 90 to. Encircling each of the flanged ends of the conducting-pipe are the herein-described clamping-frames  $L$ , suitably secured to the top of the car and braced thereon by means of the braces  $l$ , being otherwise identical with  
 95 the described frames. When the train is made, the disconnected portions of the conducting-tube are connected together in a continuous tube by means of the flexible sections  $O$ , comprising a spiral spring  $o$ , covered over  
 100 with the covering  $o'$ , of asbestos or othersimilar fire-proof material, which allows for the turning of curves and the vibrating motion of the cars. The ends of said flexible sections  $O$  are  
 105 provided with caps  $o^2$ , terminating in coupling-flanges  $o^3$ , provided with inner beveled edges or faces  $o^4$ , and a series of coupling-pins  $o^5$ , located upon their flat engaging faces and adapted to engage the perforations or re-  
 110 cesses in the flanges of the stationary section of piping, and when in engagement therewith are held securely thereto and in position therewith by means of the clamping-levers secured within the stationary clamping-frame encir-  
 115 cling the jointed section. When the cars are disconnected, one end of said flexible connections  $O$  may be left in its locked position with the stationary tube or pipe along the top of one of the cars, while its released end may be  
 120 inserted within the flanged retaining-plate  $P$ , secured to one end of the car and provided with the thumb-screw  $p$ , that is adapted to engage the flange of the cap in the end of the flexible section and hold the same therein.  
 125 The extreme end of the conducting-tube upon the last car is provided with a supplemental discharge-outlet  $Q$ , provided with the usual engaging flange and coupled to the end of the discharge-tube by the clamps in the same  
 130 manner as described. As it has already been stated in one place that asbestos packing was used upon the engaging face of the clamping-flange upon the smoke-stack, similar packing or facings  $R$  are placed upon each of the coupling-flanges to insure a tight and smoke-

less joint between the coupled ends of the section of the conducting tubes or pipes.

The construction and operation of the herein-described smoke and spark conductor are now thought to be apparent.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a smoke-conductor, the flue or pipe detachably connected with the smoke stack of a locomotive and a revolving screw-conveyer journaled within said flue or pipe, substantially as set forth.

2. In a smoke-conductor, the flue or pipe provided with a flexible section adapted to removably engage the top of the smoke-stack and a revolving screw conveyer journaled within said pipe, substantially as set forth.

3. In a smoke-conductor, the flue or pipe provided with a flexible section adapted to removably engage the smoke-stack of a locomotive, a revolving screw cinder-conveyer journaled within said pipe, and a discharge-tube connected with the inner end of said pipe and at the inner terminal of said conveyer, substantially as set forth.

4. In a smoke-conductor, a conducting-tube located above the top of the frame, the flexible section of tubing secured to the front end of said pipe and provided with a cap or flange, a corresponding flange rigidly secured to the smoke-stack of the locomotive, and means for clamping said cap or flange to the flange upon the smoke-stack, substantially as set forth.

5. In a smoke-conductor, the combination of a main conducting tube or flue, the flexible section of tubing rigidly secured to the front end of said flue and provided with a cap or flange, a corresponding flange rigidly secured to the smoke-stack of a locomotive, a double rectangular frame horizontally supported upon the smoke-stack and around the flange thereon, and clamping-levers pivotally secured within said frame and adapted to engage said flanges together, substantially as set forth.

6. In a smoke-conductor, the combination of the main conducting tube or flue, the flexible section of tubing rigidly secured to the front end of said flue and provided with a cap or flange, a corresponding flange rigidly secured to the smoke-stack, a double rectangular frame horizontally supported upon the smoke-stack and around the flange thereon, locking-levers pivotally secured within said frame and adapted to engage said jointed flanges, and pivoted dogs secured to said frame and adapted to hold said levers in their locked position, substantially as set forth.

7. In a smoke-conductor, the combination of the main conducting tube or flue, the

flexible section of tubing secured to the front end of said pipe and provided with a cap or flange having an inwardly-beveled edge, and a series of coupling-pins projecting from the flat engaging face thereof, a corresponding flange rigidly secured to the smoke-stack and provided with a series of circular perforations or recesses adapted to be engaged by said coupling-pins of the opposing flange, a clamping-frame, and locking-levers pivoted within said frame and provided with beveled edges adapted to engage the beveled edges or faces of said coupled flanges, substantially as set forth.

8. In a smoke-conductor, the combination of the tube or flue provided with a revolving screw conveyer and discharge-tube connected therewith, the flanges located at each end of the conducting-tube and provided with beveled edges or faces and a series of perforations or recesses in the engaging faces thereof, the flexible supplemental connecting section provided with caps or flanges having the beveled edges, and a series of coupling-pins adapted to engage the perforations of said stationary sections, a clamping-frame, and the beveled locking-levers pivoted within said frame and adapted to engage the beveled edges or faces of the coupled flanges, substantially as set forth.

9. In a smoke-conductor, the combination, with the connecting-tubes having the recessed flanges, of the supplemental flexible connecting-sections comprising a fire-proof cloth-covered spiral spring and provided with caps or flanges having inwardly-beveled edges, and a series of pins projecting from the engaging-faces thereof, adapted to couple with said recessed stationary flanges, and a clamping-frame and levers adapted to removably couple said flanges together, substantially as set forth.

10. In a smoke-conductor, the combination, with the conducting flues or pipes having the registering and engaging flanges, of the clamping-frame supported around said flanges, the same comprising parallel rectangular frames spaced and held apart by connecting-bars, beveled locking-levers pivotally secured within and to opposite sides of said flange, and locking-dogs pivoted to opposite sides of said frame and adapted to engage said locking-levers, substantially as set forth.

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

GEORGE ELLSWORTH BELL.

Witnesses:

WILLIAM T. GIFFORD,  
MILTON L. TUKESBURY.