

(No Model.)

2 Sheets—Sheet 1.

E. J. BRANDT.
SPARK CONDUCTOR.

No. 406,622

Patented July 9, 1889.

Fig. 1.

sig: n.

Fig: 3.

fig: 5.

Fig: 4.0 ³ ⁴ ⁰ ² ^N

INVENTOR:

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ATTORNEYS:

WITNESSES:

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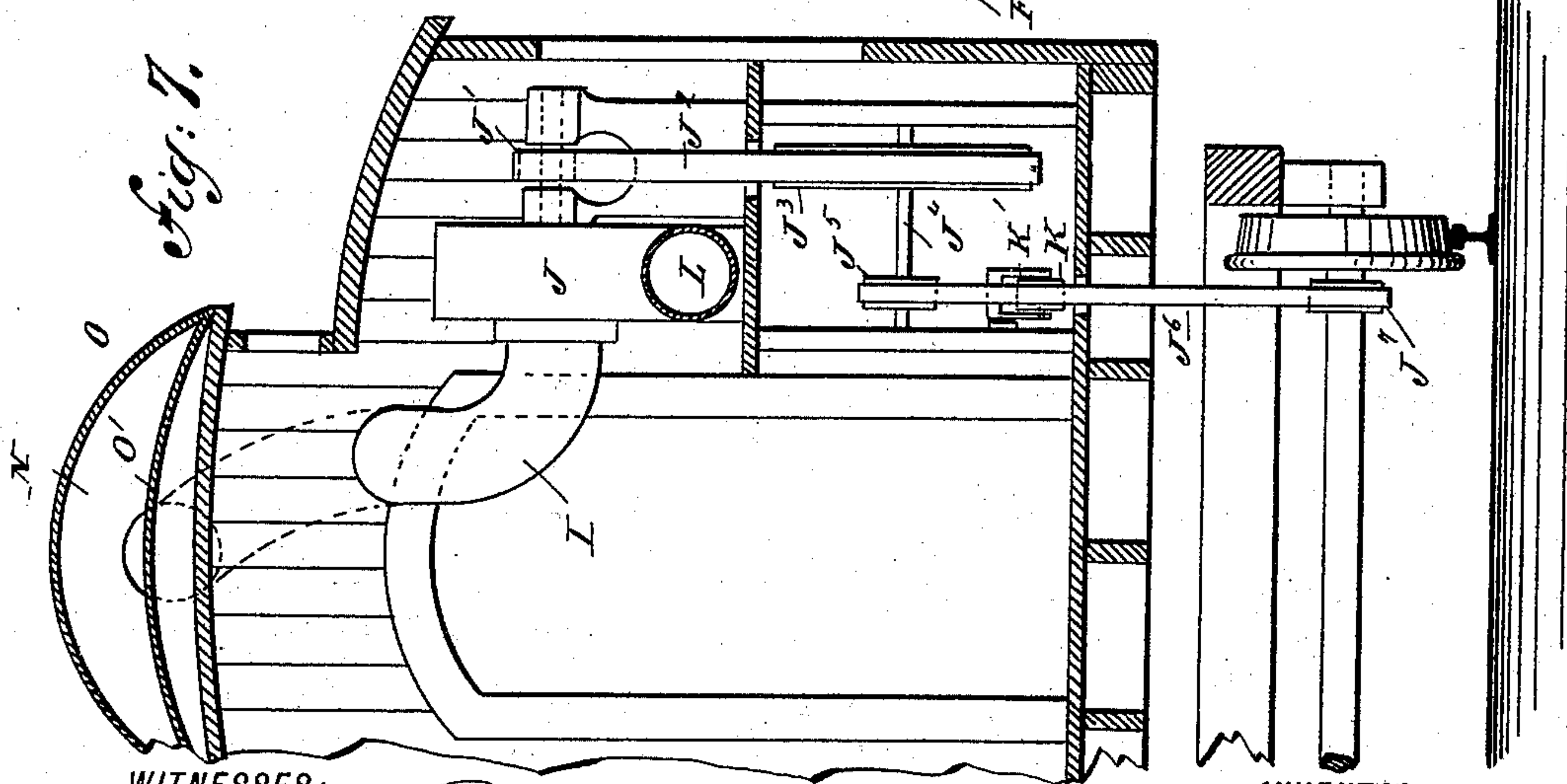
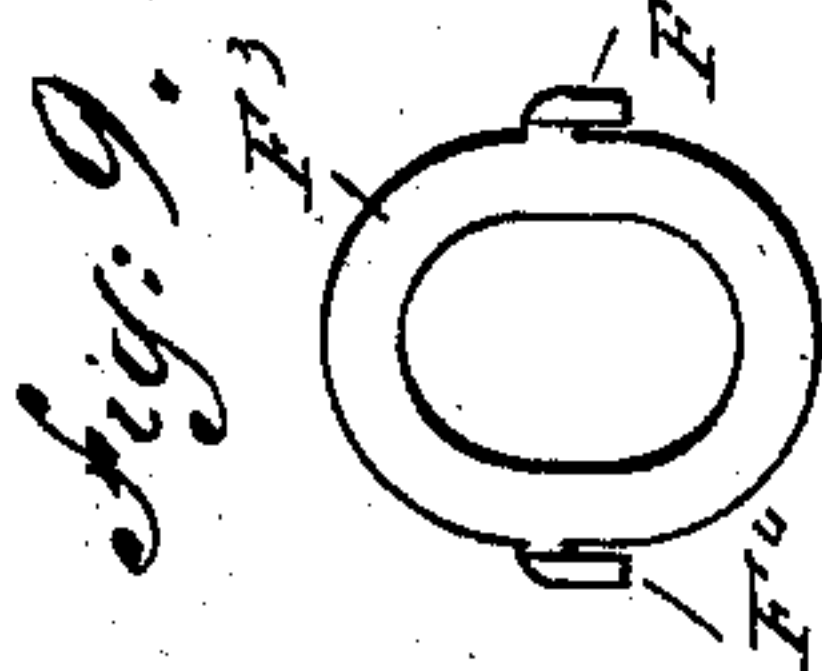
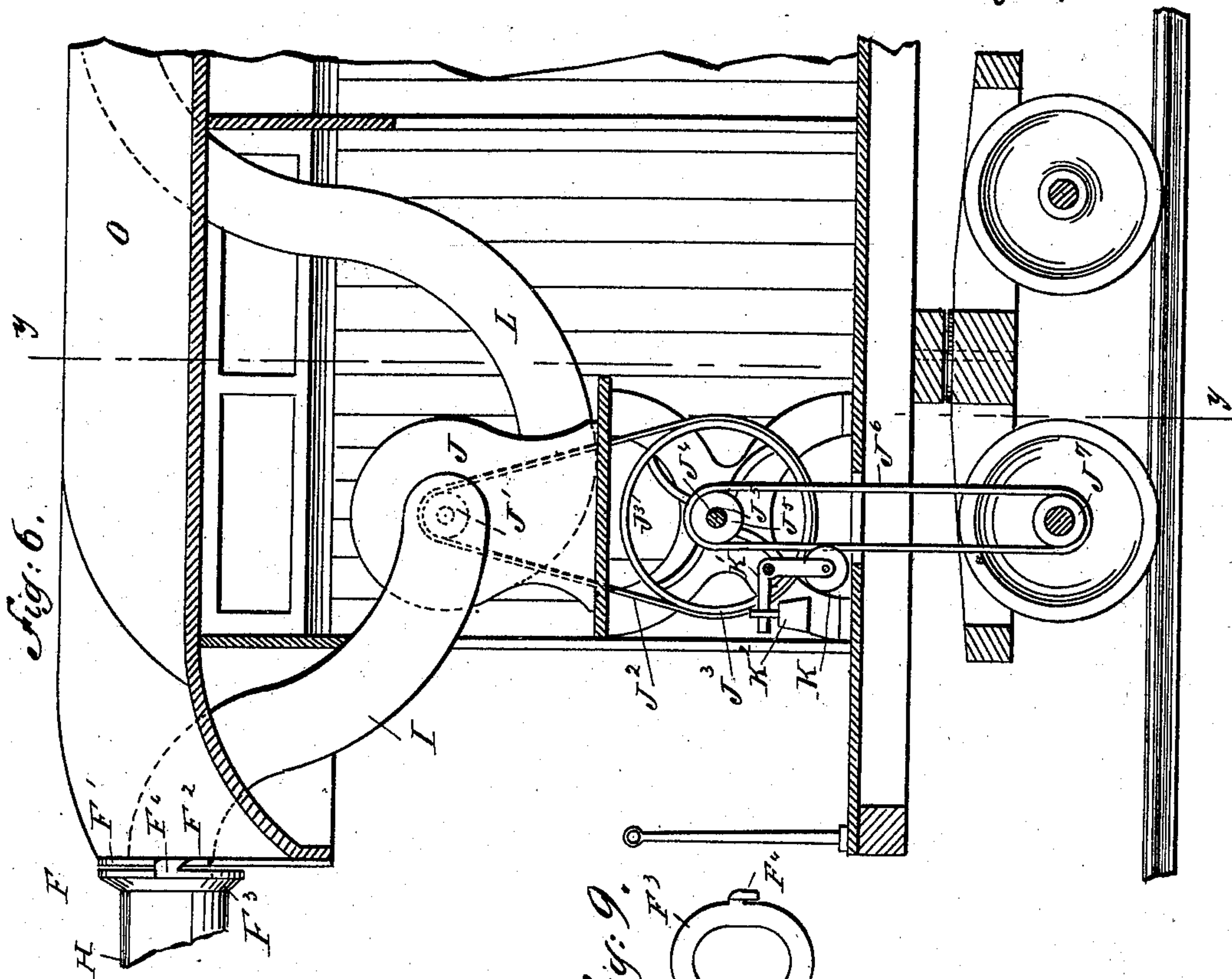
(No Model.)

2 Sheets—Sheet 2.

E. J. BRANDT.
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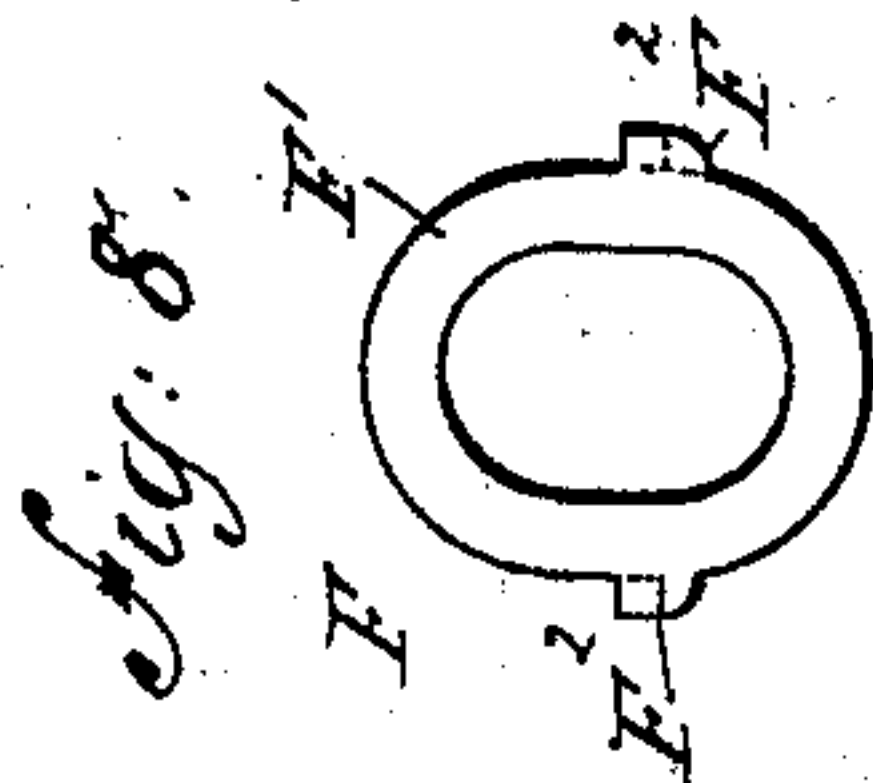
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WITNESSES:

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UNITED STATES PATENT OFFICE.

EDWARD JULIUS BRANDT, OF WATERTOWN, WISCONSIN.

SPARK-CONDUCTOR.

SPECIFICATION forming part of Letters Patent No. 406,622, dated July 9, 1889.

Application filed November 10, 1888. Serial No. 290,415. (No model.)

To all whom it may concern:

Be it known that I, EDWARD JULIUS BRANDT, of Watertown, in the county of Jefferson and State of Wisconsin, have invented a new and Improved Spark-Conductor, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved device for discharging the smoke of the locomotive at the rear of the train without said smoke annoying the passengers.

The invention consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improvement. Fig. 2 is an enlarged end elevation of the upper part of a car. Fig. 3 is a longitudinal sectional elevation of the same on the line $x x$ of Fig. 2. Fig. 4 is a transverse section of the same. Fig. 5 is an enlarged plan view of the car-ventilator on the line $z z$ of Fig. 4. Fig. 6 is an enlarged sectional elevation of the exhaust-fan located in one of the cars. Fig. 7 is a sectional end elevation of the same on the line $y y$ of Fig. 6. Fig. 8 is a face view of one part of the coupling, and Fig. 9 is a like view of the other part of the same.

The railroad-train A consists of the locomotive B, connected in the usual manner with the cars C C', &c. The locomotive B is provided in front with the usual smoke-box B', from which lead the rearwardly-extending pipes D, discharging into the channel E, formed in the roof of the cab of the locomotive, the rear end of the channel E being connected by a coupling F with a pipe G, in which telescopes one end of a flexible tube H, connected at its rear end by a second coupling F with one end of a pipe I, held in the front end of the first car C. This car is usually the baggage-car, and is provided in front, near one side, with an exhaust-fan J, into which leads the pipe I, as is plainly illustrated in Figs. 6 and 7.

The fan J is driven from the front axle of the car C, and is provided for this purpose with a pulley J' on the axle of the fan. Over this pulley J' passes a belt J², passing over a large wheel J³, secured on a shaft J⁴, mounted to rotate in suitable bearings in the frame supporting the fan J. On the shaft J⁴ is secured a small pulley J⁵, over which passes a belt J⁶, also passing over a pulley J⁷, fastened on the front axle of the car C. The slack of the belt J⁶ is taken up by a pulley K, resting against one side of the belt and mounted to turn on the end of a lever K', fulcrumed on the frame supporting the fan J. The lever K' is weighted by a weight K², so that the pulley K is thrown in frictional contact with the belt J⁶, thereby taking up any slack occurring in the latter.

When the car is moved forward, the axle imparts, by means of the pulleys J⁷ and J⁵ and the belt J⁶, a rotary motion to the shaft J⁴, which by its wheel J³ and the belt J² rotates the pulley J' on the shaft of the fan-wheel of the fan J. A suction is thus created in the pipe I, so that the smoke from the locomotive smoke-box B is drawn through the pipes D, the channel E, and the pipe H into the pipe I, and discharged by the fan or blower J into the pipe L. The latter leads upward from the blower J and discharges into a channel N, formed longitudinally on top of the clear story O of the car C. The channel N is for this purpose made of sheet metal and has a bottom O', over which arches the top O², as is plainly illustrated in Figs. 4 and 7. Between the arched top O² and the bottom O' are held longitudinally-extending braces O³, for strengthening the channel. This channel N forms the rounding top of the clear story O of the car. At suitable intervals in the latter are formed tubes O⁴, through which pass ventilators P, extending from the interior of the car to the outside, so as to carry off the foul air and gases from the lamps in the car. The tubes O⁴ are preferably almond-shaped, as illustrated in Fig. 5, the points being located longitudinally so as to offer the least resistance against the smoke passing through the channels N.

The couplings F, before mentioned, are

illustrated in Figs. 8 and 9, and consist principally of a fixed plate F' , secured either to the top of the cab or to the top of the first car, as illustrated in Fig. 1. The plate F' is provided on each side with a lug F^2 , and against the plate fits a correspondingly-shaped plate F^3 , provided with hooks F^4 , hooking over the lugs F^2 . Thus the plate F^3 can be easily hooked or unhooked, so as to disconnect the pipes G or H from the locomotive or the first car.

The channels N of two succeeding cars C and C' are connected with each other by couplings Q , illustrated in detail in Figs. 2 and 3. Each coupling Q is made of two parts, which are alike in construction, and of which one part is fastened on one end of the car and the other on the end of the next following car. Each part of the coupling Q is provided with a flexible tube R , extending from the end of the channel N to a projecting plate R' , connected by a flexible casing R^2 with a metallic plate S , secured to the end of the clear story of the car. Through this plate S passes the above-mentioned flexible tube R , and the front plate R' can move toward or from the said plate S on account of the flexible casing R^2 .

From the inside of the plate R' , outside of the flexible tube R , project a number of tapering pins T into closed sockets U , formed on the rear of the plate S . In the sockets U are held coiled springs V , against which presses the plate R' , so that the latter is always held in an extended outermost position unless pressed inward by the opposite plate R' of the other half of the coupling Q . It is understood that the two plates R' of the coupling fit one on the other, and when the two succeeding cars are coupled in the usual manner the two plates R' rest one on the other and are pressed inward slightly, as the plate R' would project a few inches out of the normal central line before the two parts were coupled. The tapering pins T hold the plate R' in line with the plate S on account of their tapering form, permitting the plate R' to incline sufficiently to one side or to the top or bottom for any angle when the train is on a curve or grade in the track.

The pipe D is of sheet metal, and the pipe H is preferably flexible and lined with heavy asbestos cloth, so as to withstand any heat of the gases passing through the same. When coal is to be thrown into the tender, the pipe H may be removed by uncoupling it at F . When the train A moves forward, the blower J draws the gases and smoke from the smoke-box B' and through the pipes D , H , and I into the blower, and through the same into the pipe L , which discharges the gases and smoke rearwardly into the longitudinal channels N , leading to the rear of the train A —that is, the last half-coupling Q on the last car opens into the open air, so that the smoke and gases are discharged in the rear of the train. When the latter is at a standstill at a station or other

place, the smoke and gases escape in the usual manner through the smoke-stack of the locomotive. The gases and smoke then usually rise directly in the air without annoying the passengers in the cars.

When the train runs at a very high rate of speed, the blower J discharges more than the amount of gas and smoke generated by the locomotive. This deficiency in volume is supplied by the air being drawn in through the smoke-stack into the smoke-box B' . It will be seen that as the smoke and gases generated in the locomotive are discharged at the rear of the train they do not annoy the passengers, even if the windows of the cars are open.

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

1. The combination, with a train, of pipes leading from the opposite sides of the smoke-box of the locomotive to longitudinal channels formed on the cars, a removable pipe between the locomotive-pipes and the said car-channels, and couplings for connecting the several channels with each other, substantially as shown and described.

2. The combination, with a train comprising a locomotive and cars, of pipes leading from the smoke-box of the locomotive, a fan or blower located in one of the cars and connected with the said pipes, and channels formed on the cars and into which the said blower discharges, substantially as shown and described.

3. The combination, with a train comprising a locomotive and cars, of pipes leading from the smoke-box of the locomotive, a fan or blower located in one of the cars and connected with the said pipes, channels formed on the cars and into which the said blower discharges, and flexible couplings for connecting the said channels of two succeeding cars with each other, substantially as shown and described.

4. The combination, with a train comprising a locomotive and cars, of a longitudinal channel formed on the clear story of each car and connected with the smoke-box of the locomotive, substantially as shown and described.

5. The combination, with a train comprising a locomotive and cars, of a longitudinal channel formed on the clear story of each car and connected with the smoke-box of the locomotive, and vertical pipes passing through the said channels for the passage of the ventilators of the cars, substantially as shown and described.

6. The combination, with a car provided with a channel N on its clear story, of a flexible tube connected with the end of the said channel, a metallic plate connected to the outer end of the said flexible tube, and a flexible casing connecting the said metallic plate with the end of the car, substantially as shown and described.

7. The combination, with a car provided with a channel N on its clear story, of a flexi-

ble tube connected with the end of the said channel, a metallic plate connected to the outer end of the said flexible tube, a flexible casing connecting said metallic plate with the
5 end of the car, and tapering pins secured to the said metallic plate and projecting into corresponding sockets at the end of the clear story of the said car, substantially as shown and described.

10 8. The combination, with a car provided with a channel N on its clear story, of a flexible tube connected with the end of the said channel, a metallic plate connected to the outer end of the said flexible tube, a flexible
15 casing connecting said metallic plate with the end of the clear story of the car, tapering pins secured to the said metallic plate and projecting into corresponding sockets at the end of the said car, and springs held in the said
20 sockets and pressing against the said metallic plate, substantially as shown and described.

9. The combination, with a locomotive, of
25 pipes leading from the smoke-stack of the said locomotive to a channel formed in the cab of

the locomotive, the coupling F, held on the rear end of the said cab of the locomotive, a pipe projecting from the rear of the said coupling F, a flexible tube telescoping in the said pipe, and a second coupling F, held at
30 the rear end of the said flexible tube and also secured on the front end of the first car, substantially as shown and described.

10. The combination, with a locomotive, of pipes leading from the smoke-stack of the said
35 locomotive to a channel formed on the cab of the locomotive, the coupling F, held on the rear end of the said cab of the locomotive, a pipe projecting from the rear of the said coupling F, a flexible tube telescoping in the
40 said pipe, a second coupling F, held at the rear end of the said flexible tube and also secured on the front end of the first car, and a pipe leading from the second coupling to a fan or blower, substantially as shown and de-
45 scribed.

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Witnesses:

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GRATZ BRANDT.