983,041.

C. E. GIERDING.

SAFETY BRAKE FOR STREET CARS.

APPLICATION FILED APR. 16, 1910.

Patented Jan. 31, 1911.

4 SHEETS—SHEET 1.

Fig. 3.

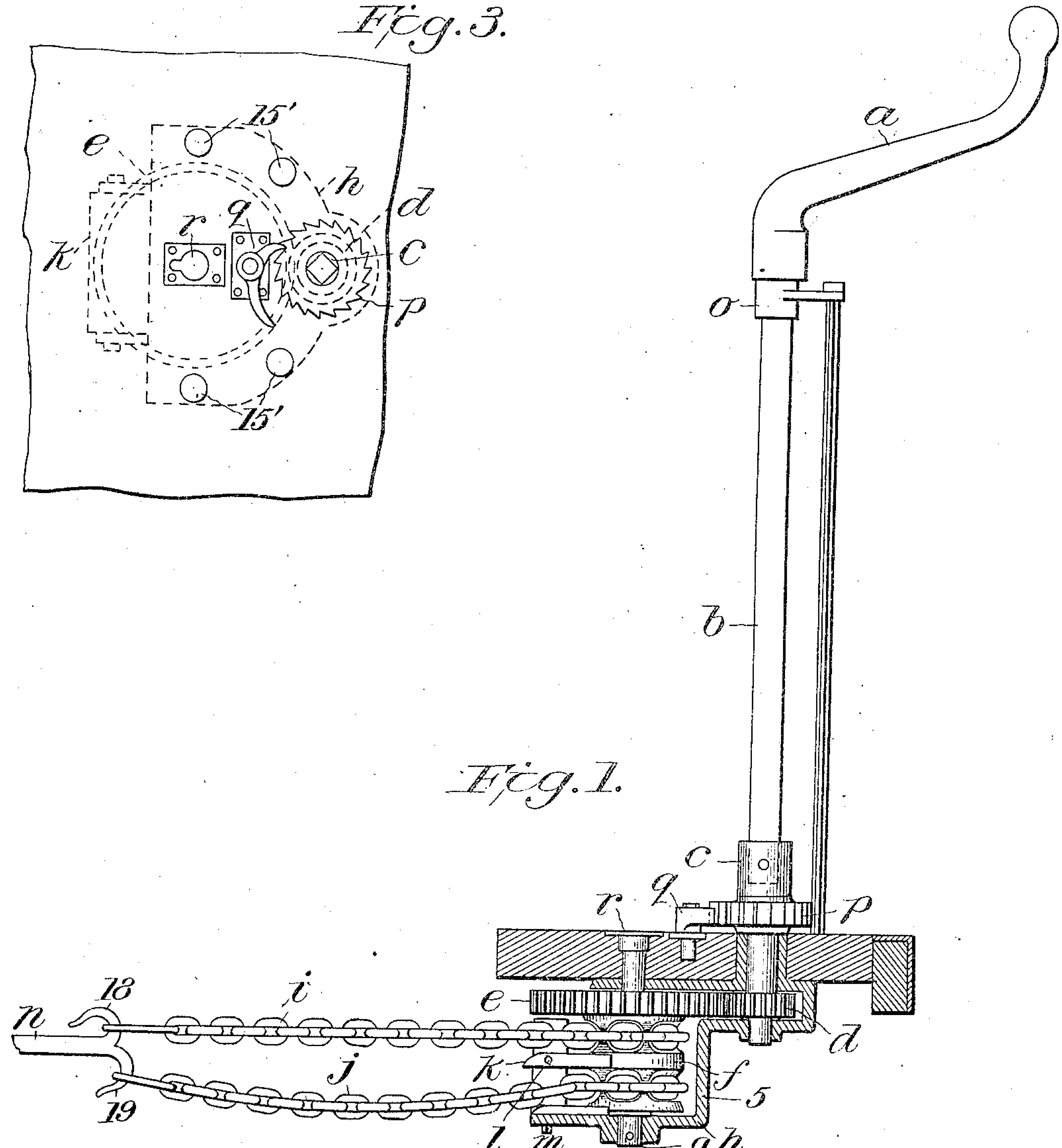
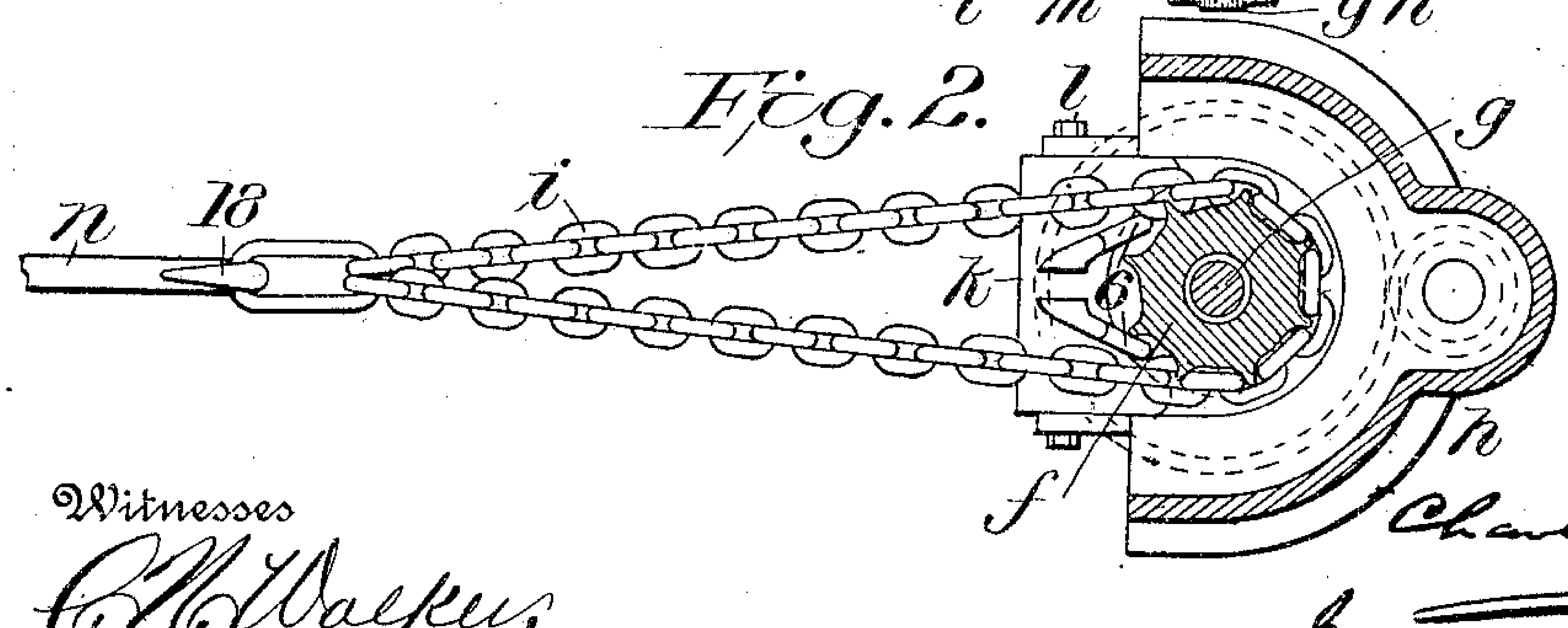


Fig. 1.

Fig. 2.



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4 SHEETS—SHEET 2.

Fig. 4.

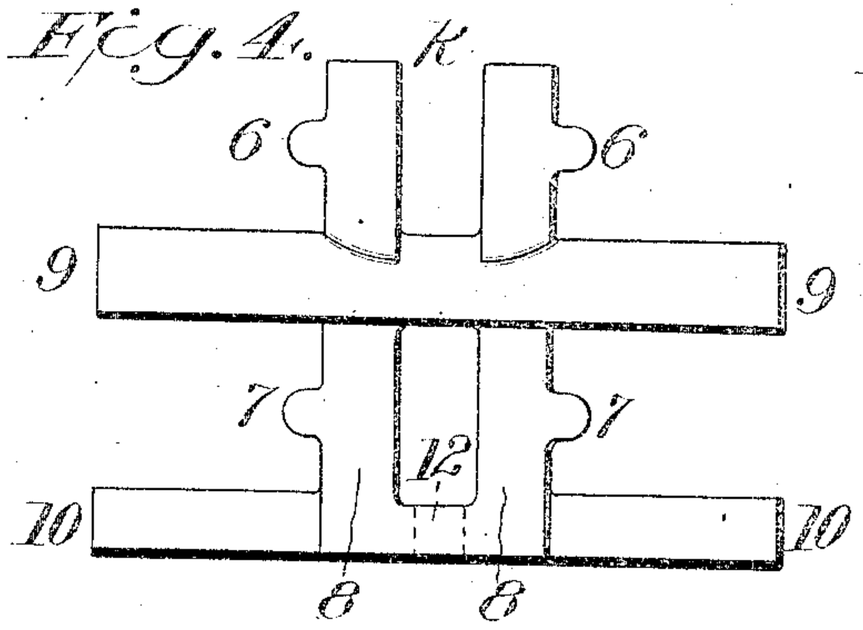

Fig. 5.

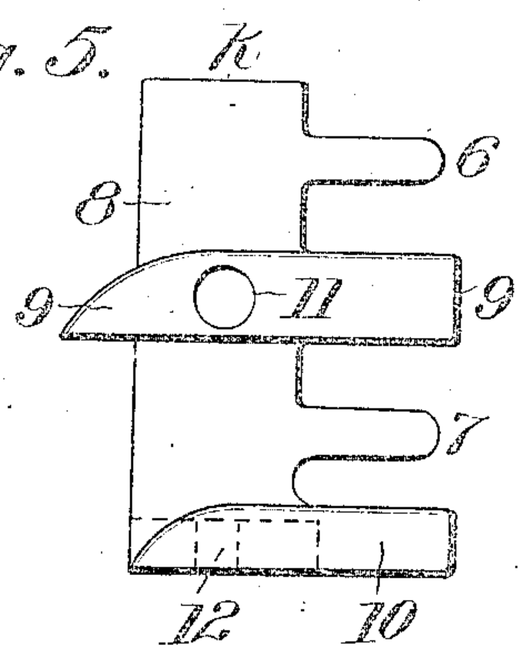

Fig. 6.

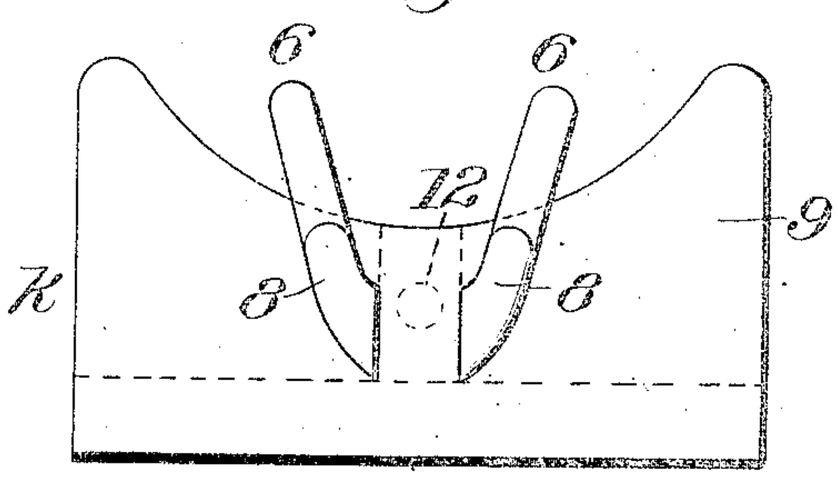

Fig. 7.

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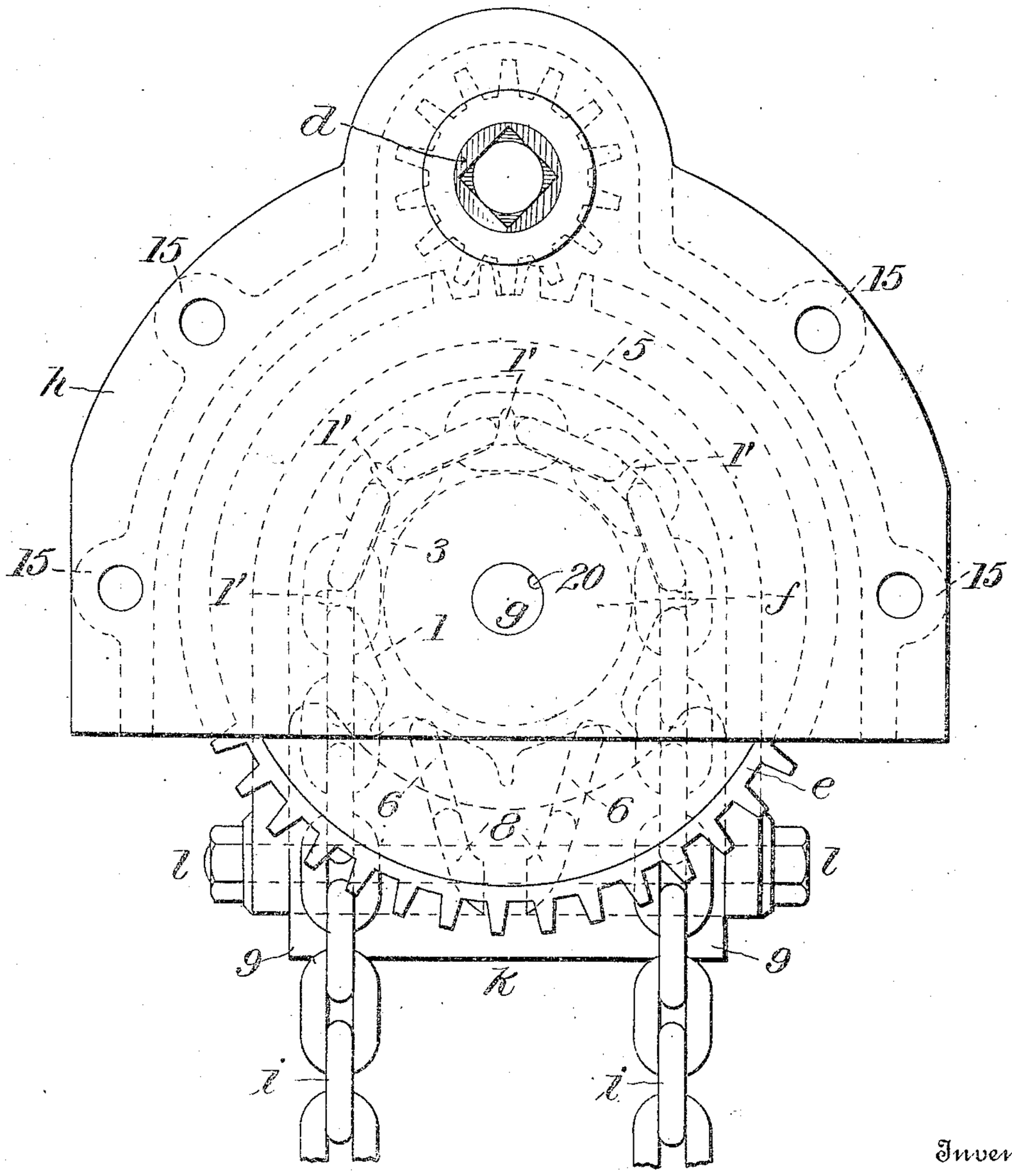
4 SHEETS—SHEET 3.

Fig. 8.



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4 SHEETS—SHEET 4.

Fig. 9.

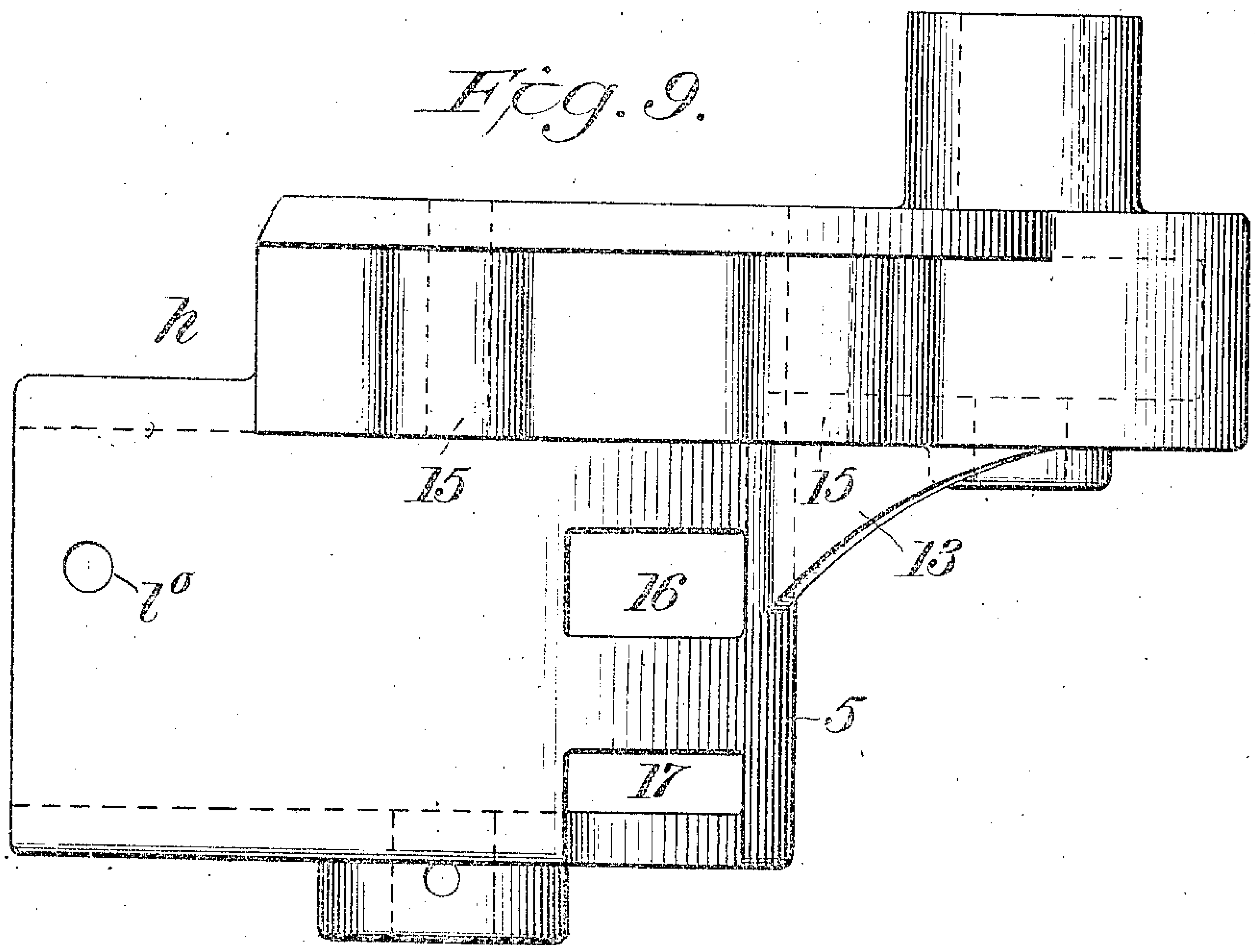
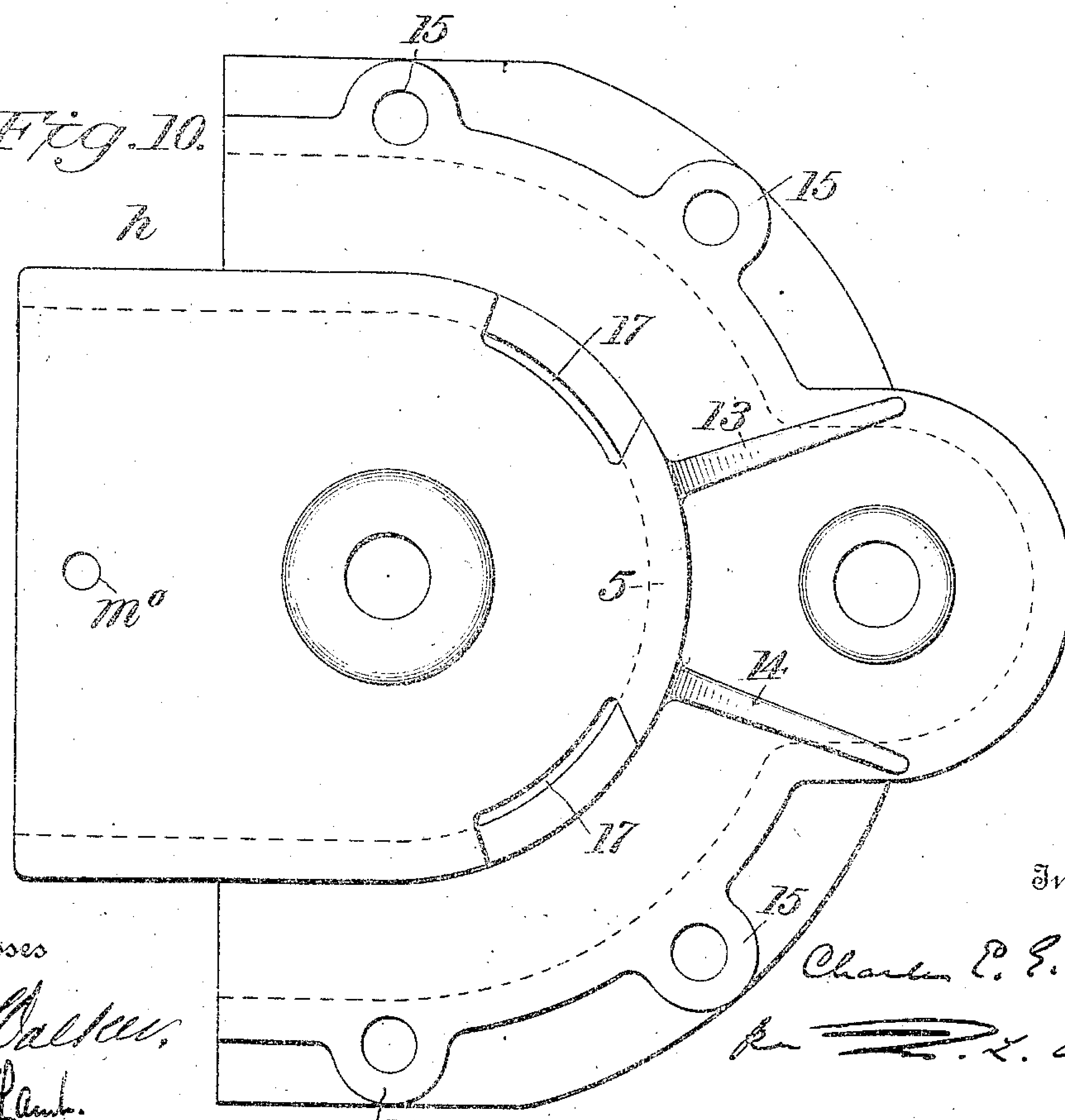


Fig. 10.



Witnesses

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UNITED STATES PATENT OFFICE.

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SAFETY-BRAKE FOR STREET-CARS.

983,041. Specification of Letters Patent. Patented Jan. 31, 1911.

Application filed April 16, 1910. Serial No. 555,771.

To all whom it may concern:

Be it known that I, CHARLES E. GIERDING, a citizen of the United States of America, and a resident of Belleville, in the State of New Jersey, have invented a new and useful Improvement in Safety-Brakes for Street-Cars, of which the following is a specification.

This invention relates primarily to power-multiplying hand brakes for street railway cars, of the type patented February 26, 1895, by United States Letters Patent No. 534752 to Thomas Millen; in which type a "safety" chain, with its appurtenances, is superadded, as an emergency device, to become automatically effective in the event of the parting of the working chain or the failure of any of its links or connections. The improved construction, however, may be embodied in part in other street-car brakes in which a sprocket hub having a vertical axis interacts with a chain or chains in substantially like manner. In the use of such brakes, if the sprockets and chains are not cleaned occasionally grease and dirt accumulate on them and prevent the best work; sometimes causing those portions of the endless chains or one of them escaping from the socketed sprocket hub to stick in the sockets and "carry around" so as to block the entrance of the chain or chains on the other side of the hub.

The present invention consists in certain novel combinations of parts, and in an improved street-car brake embodying such combinations or any of them, as hereinafter particularly described and claimed.

The leading objects of this invention are to keep both chains from carrying around as above mentioned; to avoid any kinking or chocking of either chain; and to keep the two chains separate at and in the vicinity of the sprocket hub.

Other objects will be set forth in the general description which follows.

Four sheets of drawings, showing the present invention embodied as a whole in an improved safety brake for street cars, accompany this specification as part thereof.

Figure 1 is a sectional side view of the improved brake; Fig. 2 represents a horizontal section in the plane of the working chain; Fig. 3 is a fragmentary plan view showing the parts at the top of the car platform as in Fig. 1; Figs. 4, 5 and 6 are respectively face, side and top views of the chain guide, detached, on a larger scale; Fig. 7 represents a vertical longitudinal section through those parts of the brake to which the present invention relates, and a side view of the pinion shaft interacting therewith, on the same scale as Figs. 4, 5 and 6; Fig. 8 represents a top view on the same scale as Fig. 7, showing the same parts except the pinion shaft; and Figs. 9 and 10 are respectively side and bottom views of the housing of the improved brake, on the same scale as Figs. 4 to 8 inclusive.

Like reference characters refer to like parts in all the figures.

In the improved safety brake represented by the drawings, suitably multiplied power is transmitted from the customary hand crank or brake handle, *a*, and its vertical staff, *b*, by a subjacent "pinion shaft", *c*, a pinion, *d*, preferably of 14 teeth, and a spur gear, *e*, preferably of 44 teeth in mesh with said pinion, to a sprocket hub, *f*, which is preferably and conveniently integral with said gear, being carried beneath it, and rotatable therewith around a "sprocket shaft", *g*, within a housing, *h*, which is bolted fast beneath the platform of a car, as represented in Figs. 1 and 3.

A working chain, *i*, and a subjacent safety chain, *j*, interact respectively with two circumferential sprocket portions, 1—1 and 2—2, of the hub *f*. Each of these sprocket portions includes series of peripheral sockets, preferably 8 in number, loosely fitted to alternate links of the chain; separated in circumferential series by sprocket projections, 1′, which interact with the ends of the socket-inclosed links; and bisected by deep circumferential grooves, 3 and 4, which admit edgewise the other links of the respective chains *i* and *j*, as in Fig. 7. Owing to this construction, five links of each chain are in direct contact with the sprocket projection 1′ of the sprocket hub *f* at all times when the brake shoes are being applied. A concentric front portion, 5, of the housing *h* embraces a sufficient portion of the periphery of the sprocket hub *f* to keep the chain links within its effective sockets; and the opposite side or rear end of the housing is open and extended rearward as regards that portion which incloses the sprocket hub

f. Compare Fig. 1 and Figs. 7–10. Into said rear end of the housing *h* is fitted a chain guide, *k*, of novel construction, shown detached by Figs. 4, 5 and 6. This chain guide includes two pairs of divergent rigid fingers, 6—6 and 7—7, which project horizontally from vertical connecting portions, 8—8, and two horizontal shelves, 9 and 10, below the planes of the respective pairs of fingers. A horizontal bolt hole, 11, Fig. 5, extends endwise through the upper shelf, 9, which also projects rearward beyond the remainder of the chain guide, and a vertical bolt hole, 12, is provided centrally in the lower shelf 10. When the parts are assembled as in Figs. 1–3 and Figs. 7 and 8, said fingers 6—6 and 7—7 of the chain guide *k* project in the planes of said circumferential grooves 3 and 4 in the sprocket hub *f*, and between the entering and leaving portions of the respective chains *i* and *j*, as best shown in Figs. 7 and 8, so that neither chain can "carry around;" said shelves 9 and 10 are located beneath the respective chains *i* and *j*, as best shown in Fig. 1, and so as to effectively support the chains at and adjacent to the sprocket hub; and the protruding upper shelf 9 serves additionally to keep the two chains separated. The chain guide *k* is fastened in place by a horizontal through bolt, *l*, and by a short vertical bolt, *m*, fitted respectively to said bolt holes 11 and 12; the latter preferably secured by a cotter pin, *m'*, beneath the lower floor of the housing *h*, as in Fig. 7. The housing *h* is further constructed with a pair of divergent webs, 13 and 14, bracing the pinion end of the housing. Compare Figs. 7, 9 and 10. Also with vertical sockets, 15, two on each side, for the bolts, 15', Fig. 3, by which the housing is bolted to the car platform. Also with holes, 16 and 17, preferably two in each side, as shown in Figs. 7, 9 and 10, located in said concentric front portion 5 of the housing, but out of the planes in which the chains *i* and *j* travel, as shown in Fig. 7. These holes admit the air to blow out dust and the like from within the housing, so as to prevent accumulations of the same within the housing. The brake chains *i* and *j* are shown in Figs. 1 and 2 as connected in common to a single brake rod, *n*, by means of a pair of hooks, 18 and 19; the hook 19 for the safety chain *j* being half an inch longer than the other, to give the safety chain the needed slack to insure its freedom from tension when power is applied. On some cars two brake rods are used, one slightly longer than the other; each chain in that case having its own rod. Other customary accessories represented in Figs. 1 and 3 are an upper brake-staff bearing, *o*, supported by the dashboard or its equivalent on the platform; a ratchet wheel, *p*, on the upper of the two squares of the pinion shaft *c*; a foot-operated dog, *q*, to interact with said ratchet wheel, pivoted to the car platform; and an oil cup, *r*, flush with the top of the platform, above the sprocket shaft *g*. The oil-cup hole is packed with cotton waste, and filled with oil, which flows therefrom through a groove, 20, in the sprocket shaft *g* into an oil space, 21, around that shaft in the sprocket hub *f*.

It will be obvious that the improved brakes may be made for some cars without the power-multiplying gearing, or more or less highly geared as required; and other like modifications will suggest themselves to those skilled in the art.

Having thus described said improvement, I claim as my invention, and desire to patent under this specification:

1. The combination, in a street-car brake, of a sprocket hub having a vertical axis, means for rotating said hub, a chain interacting with said hub, a housing partly embracing said hub and having an open side through which the chain enters and escapes, a chain guide having rigid fingers constructed and arranged to project between the entering and escaping portions of the chain so that neither of them can "carry around", and means for fastening said chain guide within said open side of the housing.

2. The combination, in a safety brake for street-cars, of a sprocket hub having a vertical axis and circumferential sprocket portions in two horizontal planes, means for rotating said hub, chains interacting with said sprocket portions respectively, a housing partly embracing said hub and having an open side through which the chains enter and escape, a chain guide having two pairs of rigid fingers constructed and arranged to project between the entering and escaping portions of the respective chains so that neither of them can "carry around", and means for fastening said chain guide within said open side of the housing.

3. The combination, in a safety brake for street-cars, of a working chain, a subjacent safety chain, a sprocket hub common to both chains having a vertical axis and circumferential sprocket portions in two horizontal planes, means for rotating said hub, a housing partly embracing said hub and having an open side through which the chains enter and escape, a chain guide having horizontal shelf portions constructed and arranged to support the entering and escaping portions of each of said chains at and in the vicinity of said hub, and means for fastening said chain guide within said open side of the housing.

4. The combination, in a safety brake for street-cars, of a working chain, a subjacent safety chain, a sprocket hub common to both chains having a vertical axis and a circumferential sprocket portion in two horizontal planes, means for rotating said hub, a hous-

ing partly embracing said hub and having an open side through which the chains enter and escape, a chain guide having horizontal shelf portions constructed and arranged to support the entering and escaping portions of each of said chains at and in the vicinity of said hub, the upper shelf portion protruding beyond the lower shelf portion and serving additionally to keep the two chains separate, and means for fastening said chain guide within said open side of the housing.

5. The combination, in a safety brake for street-cars, of a working chain, a subjacent safety chain, a sprocket hub common to both chains having a vertical axis and a circumferential sprocket portion in two horizontal planes, means for rotating said hub, a housing partly embracing said hub and having an open side through which the chains enter and escape, a chain guide having two pairs of rigid fingers constructed and arranged to project between the entering and escaping portions of the respective chains so that neither of them can "carry around", horizontal shelf portions constructed and arranged to support from beneath the entering and escaping portions of each of said chains at and in the vicinity of said hub and vertical connecting portions, said guide being provided with a horizontal bolt hole extending endwise through the upper shelf and a central vertical bolt hole in the lower shelf, and bolts fitted to said bolt holes for fastening said chain guide within said open side of the housing.

6. A safety brake for street-cars having, in combination, a hand-operated staff, a subjacent pinion shaft coupled thereto, power-multiplying gearing consisting of a pinion on said pinion shaft and a large gear in mesh therewith, a sprocket hub carried subjacently by said gear and having a vertical axis and circumferential sprocket portions in two horizontal planes, a working chain interacting with the upper of said sprocket portions, a safety chain interacting with the lower of said sprocket portions, a housing partly embracing said gearing and said hub and having an open side through which the chains enter and escape, a chain guide having two pairs of rigid fingers constructed and arranged to project between the entering and escaping portions of the respective chains so that neither of them can "carry around", and horizontal shelf portions constructed and arranged to support from beneath the entering and escaping portions of each of said chains at and in the vicinity of said hub, and means for fastening said chain guide within said open side of the housing, substantially as hereinbefore specified.

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