(No Model.) 3 Sheets—Sheet 1.

G. E. CARPENTER & A. F. TUCKER.

ALARM FOR RAILWAY TRAINS.

No. 354,302. Patented Dec. 14, 1886.

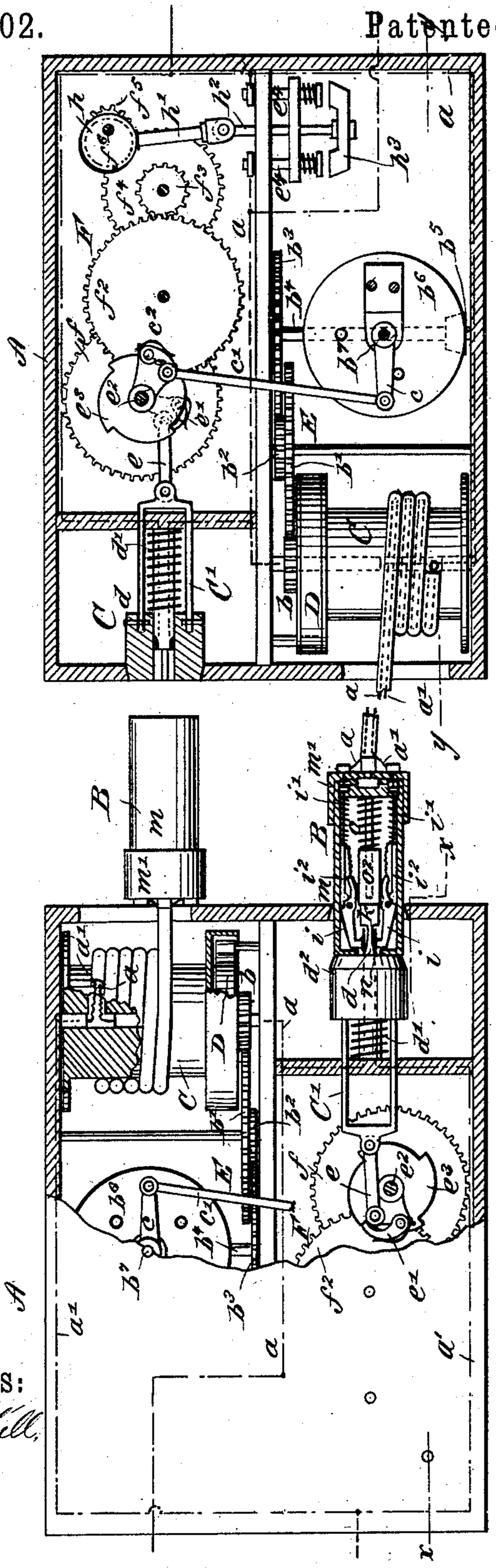

Fig. 1.

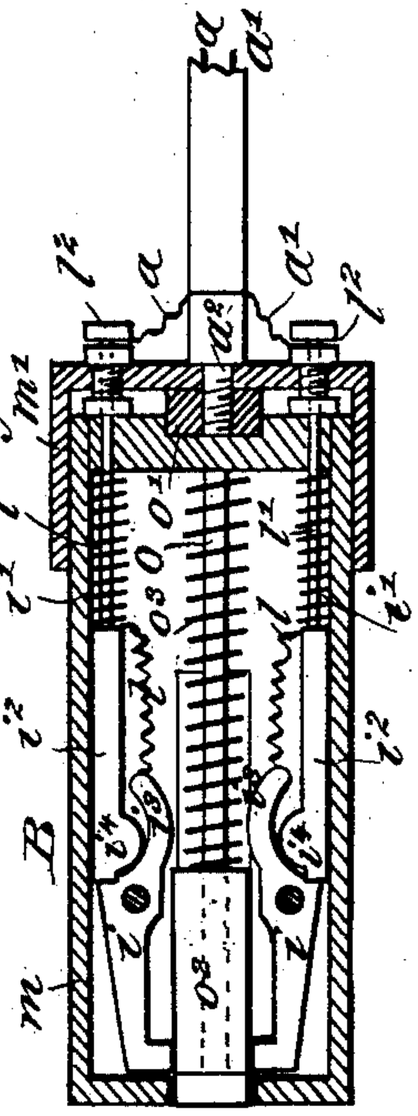

Fig. 3.

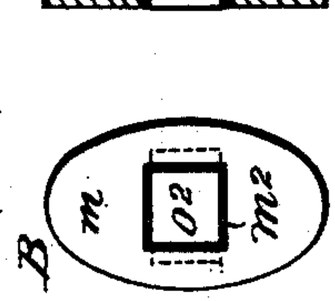

Fig. 4.

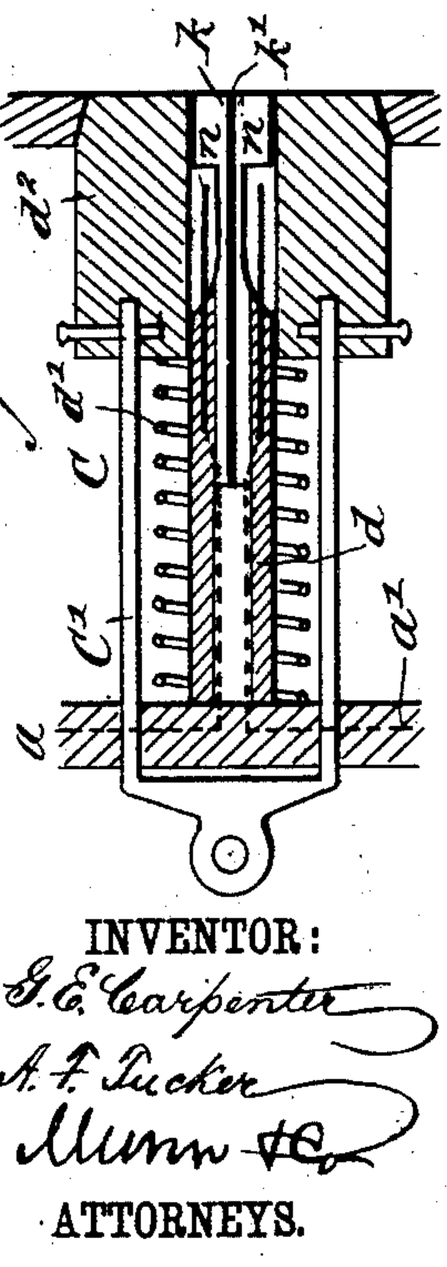

Fig. 2.

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Fig. 5.

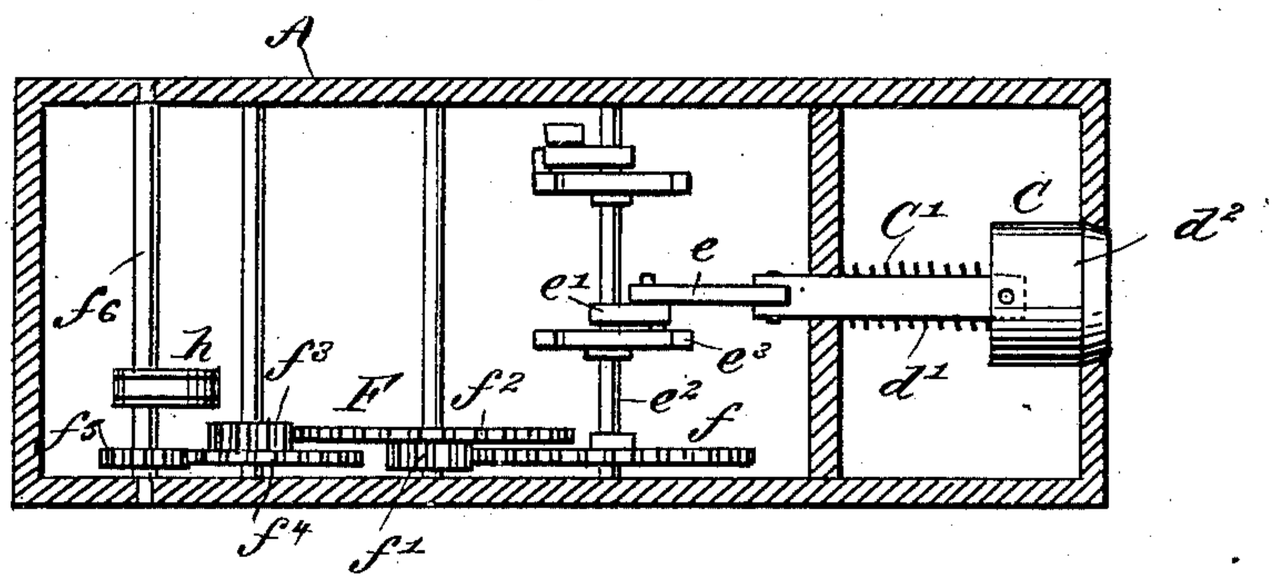

Fig. 6.

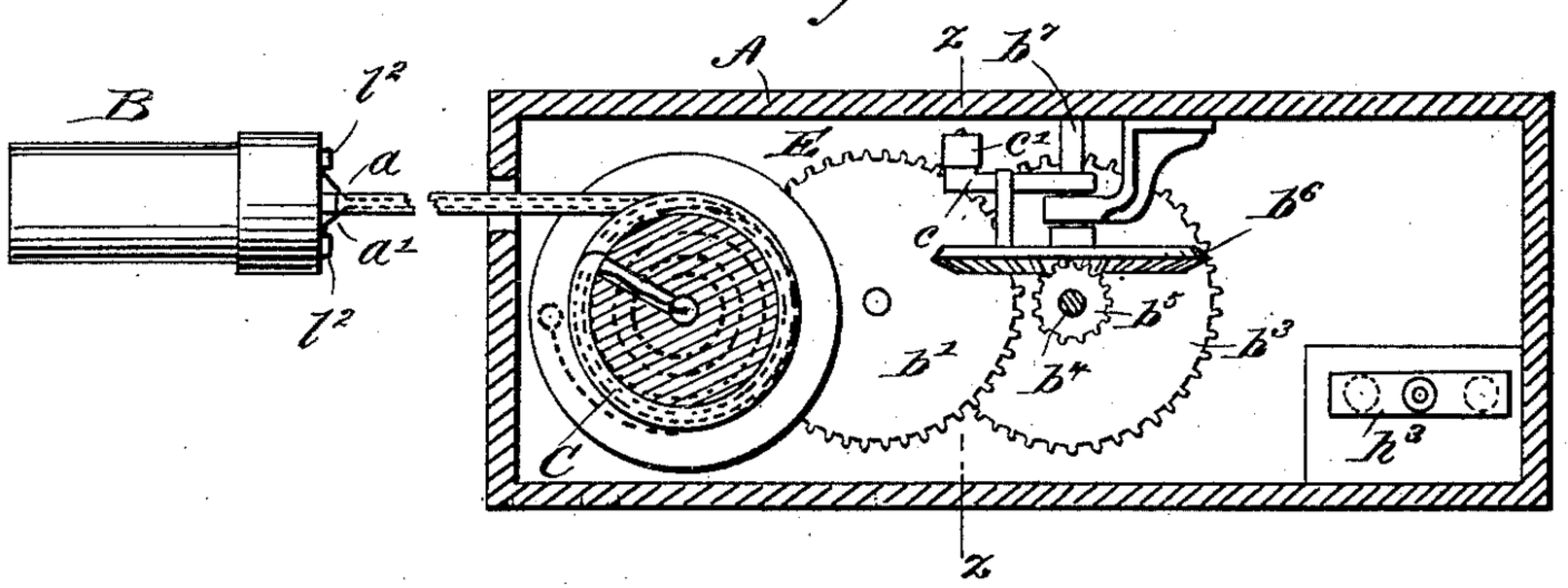

Fig. 7.

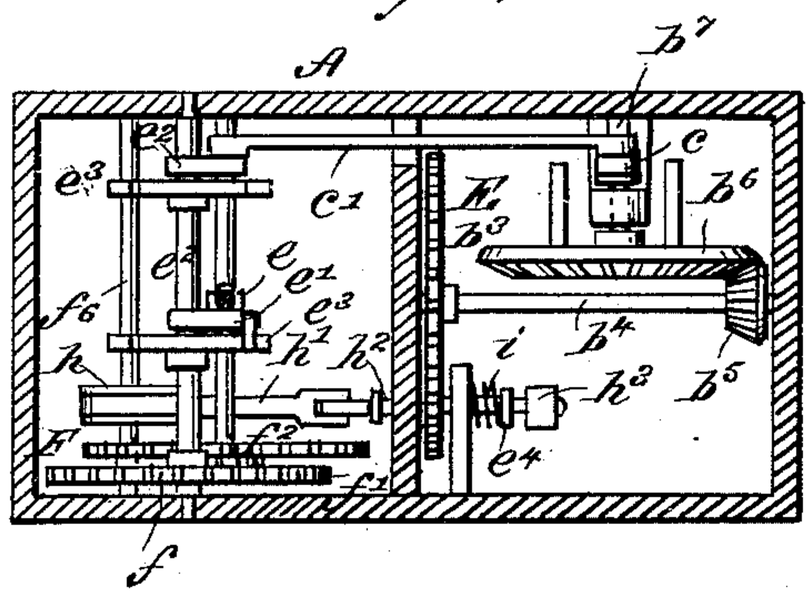

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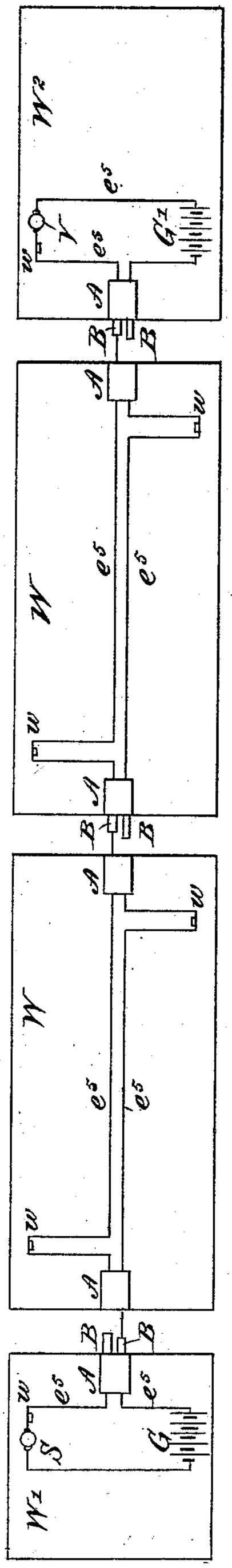
Fig. 8.



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UNITED STATES PATENT OFFICE.

GEORGE E. CARPENTER, OF PASSAIC, AND ALBERT F. TUCKER, OF JERSEY CITY, NEW JERSEY.

ALARM FOR RAILWAY-TRAINS.

SPECIFICATION forming part of Letters Patent No. 354,302, dated December 14, 1886.

Application filed March 23, 1886. Serial No. 196,251. (No model.)

To all whom it may concern:

Be it known that we, GEORGE E. CARPENTER, of Passaic, in the county of Passaic and State of New Jersey, and ALBERT F. TUCKER, of Jersey City, in the county of Hudson and State of New Jersey, have invented a new and Improved Alarm for Railway-Trains, of which the following is a full, clear, and exact description.

The object of our invention is to provide an alarm device to be used on railway-trains, whereby accidental separation of any of the cars from the train will be signaled to the engineer, and also to the caboose when used on freight-trains.

The invention consists of the construction, arrangement, and combination of parts, all as hereinafter described and claimed.

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 sectional plan view of two signaling devices to be placed in separate cars. Figs. 2 and 3 show, respectively, enlarged sectional views of the female and male coupling devices. Fig. 4 is an end elevation of the male coupling or hand-piece. Fig. 5 is a sectional elevation taken on the line $x\,x$ of Fig. 1. Fig. 6 is a sectional elevation on the line $y\,y$ of Fig. 1. Fig. 7 is a transverse sectional elevation taken on the line $z\,z$ of Fig. 6; and Fig. 8 is a diagram of a railway-train consisting of a locomotive, two cars, and a caboose, showing our invention applied for use.

We use an alarm apparatus, A, in each car W, one in the locomotive W′, and one in the caboose W^2, and all of the alarms are duplicates of each other. Each alarm is inclosed in a suitable casing and provided with male and female couplings, (marked B C, respectively,) so that two of the alarms may be connected together between the cars in which they are placed. The coupler B in each alarm is connected to two insulated wires, $a\,a'$, which are wound upon a drum, C^2. A coiled spring, D, is attached to one end of the drum C^2 in such a manner that when the wires $a\,a'$ are pulled they will revolve the drum C^2 and wind up the spring D to increase its tension, so that when the male coupler is released from the female, as hereinafter described, the spring D will impart motion to the train of multiplying gearing E, consisting of the pinion b, large gear-wheel b', pinion b^2, gear-wheel b^3 on shaft b^4, beveled pinion b^5 on said shaft b^4, and beveled gear-wheel b^6 on the short shaft b^7. The shaft b^7 is provided with the arm c and connecting-rod c', for the purposes hereinafter described.

Each female coupler C, when connected with the coupler B, is forced inward from the position shown at the right in Fig. 1 to that shown at the left in said figure, and is provided with a yoke, C′, which is connected by the link e to a pawl, e', pivoted upon the shaft e^2 contiguous to the ratchet-wheel e^3, secured upon said shaft e^2, so the pawl will engage with the teeth of the ratchet-wheel, and on the spindle d of the female coupler (which is relatively stationary) is placed the spiral spring d', which is compressed by the inward movement of the female coupler, as shown at the left in Fig. 1, when the couplings are connected. When they are disconnected, as by the separation of the train, this spring d' forces the hollow head d^2 and the yoke C′ forward, which will cause the pawl e' to revolve the shaft e^2 from its engagement with the ratchet-wheel e^3. The revolution of the shaft e^2 will impart motion to the train of multiplying gearing F, consisting of large gear-wheel f, pinion f', gear-wheel f^2, pinion f^3, gear-wheel f^4, and pinion f^5, secured on shaft f^6, so that rapid motion from the spring d' will be imparted to the said shaft f^6.

On shaft f^6 is secured the eccentric h, which is connected by a wrist piece or strap that surrounds the eccentric and connecting rod h' and stem h^2 to the circuit-breaker h^3, so the revolution of the shaft f^6 will reciprocate the circuit-breaker in contact with the terminals e^4 e^4, and rapidly make and break the electric circuit between the wires $a\,a'$ within the casing of the alarm. From the terminals e^4 e^4 lead the wires e^5 e^5, (see Fig. 8,) which connect the two alarm apparatuses in each car, and which connect the cab apparatus with an electric alarm-bell, S, and with the two elements of the battery G, so that when the circuit-breaker h^3 is reciprocated a current of electricity will pass to the alarm-bell and give the

necessary alarm to indicate the accidental separation of one or more cars from the train. The wires e^5 e^5 also connect the alarm apparatus in the caboose with the alarm-bell V, and with the elements of the battery G′, so no matter where the train separates, an alarm will be given in both the cab and caboose.

The coupling of the male with the female coupler is effected by the jaws *i i*, pivoted in the male coupler B, engaging the locking-head *k* of the above-mentioned stationary spindle *d* of the female coupler, the jaws being caused to close upon the said head *k* by means of the spring *i′ i′*, arranged to force forward the slides i^2 i^2, which act against the heels of the jaws, as shown clearly in Fig. 3.

The stationary spindle *d* and the hollow movable head d^2 of the female coupler are of hard rubber or other insulating material. The head *k* is made of two notched strips of metal separated by a strip, *k′*, of insulating material, and in the forward end of the stationary spindle *d* are fitted the metal strips *n*, to which the wires *a a′* are connected, one to each plate, as shown in Fig. 2. The jaws *i i* of the male coupler are put in electrical connection with the wires *a a′* of its apparatus by the wires *l l*, the rods *l′ l′*, and the binding-posts l^2 l^2, so that when the jaws *i* engage with the head *k* and press upon the metal plates *n* the wires *a a′* of one instrument will be in electrical connection with the similar wires, *a a′*, respectively, of the other instrument or alarm apparatus.

The object of having two couplers, B C, for each alarm apparatus is, that in case one set should get out of order the other may be used, and so that no misconnection can be made when the cars are reversed, and the train of gearing E is arranged to transmit the motion of the spring D to the shaft e^2 to operate the circuit-breaker h^3 through the train of gearing F, while the spring *d′* acts directly through the train of gearing F to operate the circuit-breaker, so that whichever set of couplers be used the circuit-breaker will be operated and the alarm given if any of the cars become accidentally separated from the train.

Each coupler B is inclosed by a shell, *m*, of hard rubber, and this shell is placed loosely in another shell, *m′*, also of hard rubber, and the latter is connected, by a rod, *o*, and nut *o′*, to the wires *a a′*, or to the spindle a^2, to which said wires on the covering thereof are connected. The rod *o* is provided near its outer end with the block o^2, of hard rubber, which is adapted to slide upon the rod *o*. It is normally forced outward by the coiled spring o^3, to occupy a position between the jaws *i i*, to insulate them from each other when not connected with the head *k* of the female coupler; but when so connected the block o^2 will be pressed back upon the rod *o*, as shown at the left in Fig. 1. The block o^2 not only insulates the jaws *i i*, but it serves also to close the opening m^2 of the casing *m*, as shown in Fig. 4.

The rods *l′*, to which the slides i^2 i^2 are attached, are made fast to the shell *m′*, and the combined force of the springs *i′ i′* and the spring o^3 is greater than the force of the spring D in its distended state, and will remain so until the spring D is wound up to a considerable extent by an outward draw or pull upon the coupler B. When the force of the spring D being thus wound up exceeds that of the springs *i′ i′* and o^3, the shell *m* will be drawn somewhat out of the shell *m′*, and this movement will bring the tail-pieces i^3 of the jaws *i* against the inwardly-projecting cams i^4 of the slides i^2, which will spread the outer ends of the jaws *i* and cause them to release the head *k*.

The action is as follows: The couplers B C being connected, as shown in Figs. 1 and 8, throughout the train, a complete circuit is formed with the batteries G G′ and alarm-bells S V by the wires *a*, *a′*, and e^5. In case the train should accidentally separate, as the cars spread or leave each other, a drawing action will be exerted upon the male and female couplers B C, which will cause the wires *a a′*, wound upon the drum C^2, to turn said drum and wind up the spring D. As soon as the tension on spring D exceeds that of the springs *i′ i′* and o^3 the shell *m* will slide outward and carry the jaws *i* with it until the cams i^4 cause the jaws to open and release the head *k* of the female coupler. The head being thus released, the main circuit through the train will be broken, and at this time the spring D will react, and, through the multiplying gearing E, connections *c*, *c′*, and c^2, and the multiplying gearing F, reciprocate the circuit-breaker h^3, and alternately make and break the circuit to the rear of the train and cause the bell V in the caboose to ring. The instant the coupler B releases the head *k* the spring *d′* will react, and through the multiplying gearing F reciprocate the circuit-breaker of the other alarm apparatus, and alternately make and break the circuit to the front of the train and cause the bell S in the engine-cab to ring.

In each car and in the caboose may be placed push-buttons *w w*, arranged to make the circuit through the wires e^5 e^5, so that by pressing on these buttons signals from either car may be given to the engineer and to the trainmen in the caboose.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In an alarm apparatus for cars, the combination, with electric terminals, a circuit-breaker, and two couplers arranged to contract the springs D *d′*, of the train of gearing F, connections *c c′ c²*, shaft f^6, and eccentric *h*, for reciprocating the circuit-breaker, substantially as described.

2. The coupling C, composed of the stationary spindle *d*, sliding hollow head d^2, yoke C′, and coiled spring *d′*, arranged to be compressed by the head d^2, substantially as and for the purposes described.

3. The coupler B, provided with jaws and

attached to the wires *a a'*, in combination with the drum C² and spring D, the wires *a a'* being arranged to turn the drum, substantially as described.

4. The coupler B, having jaws *i* and jaw-openers *i²*, in combination with the shell *m'*, connected to the jaw-openers, the springs *i'*, and the sliding casing *m*, to which the jaws are pivoted, substantially as and for the purposes described.

5. The coupler B, having jaws *i* and jaw-openers *i²*, in combination with the shell *m'*, connected to the jaw-openers, the springs *i'*, the sliding casing *m*, and the spindle *o*, insulating-head *o²*, and the spring *o³*, substantially as and for the purposes set forth.

6. The coupler C, having sliding head *d²*, in combination with the spindle *d*, metal plates *n*, and coiled spring *d'*, placed upon the spindle, substantially as described.

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C. SEDGWICK.