

No. 640,359.

Patented Jan. 2, 1900.

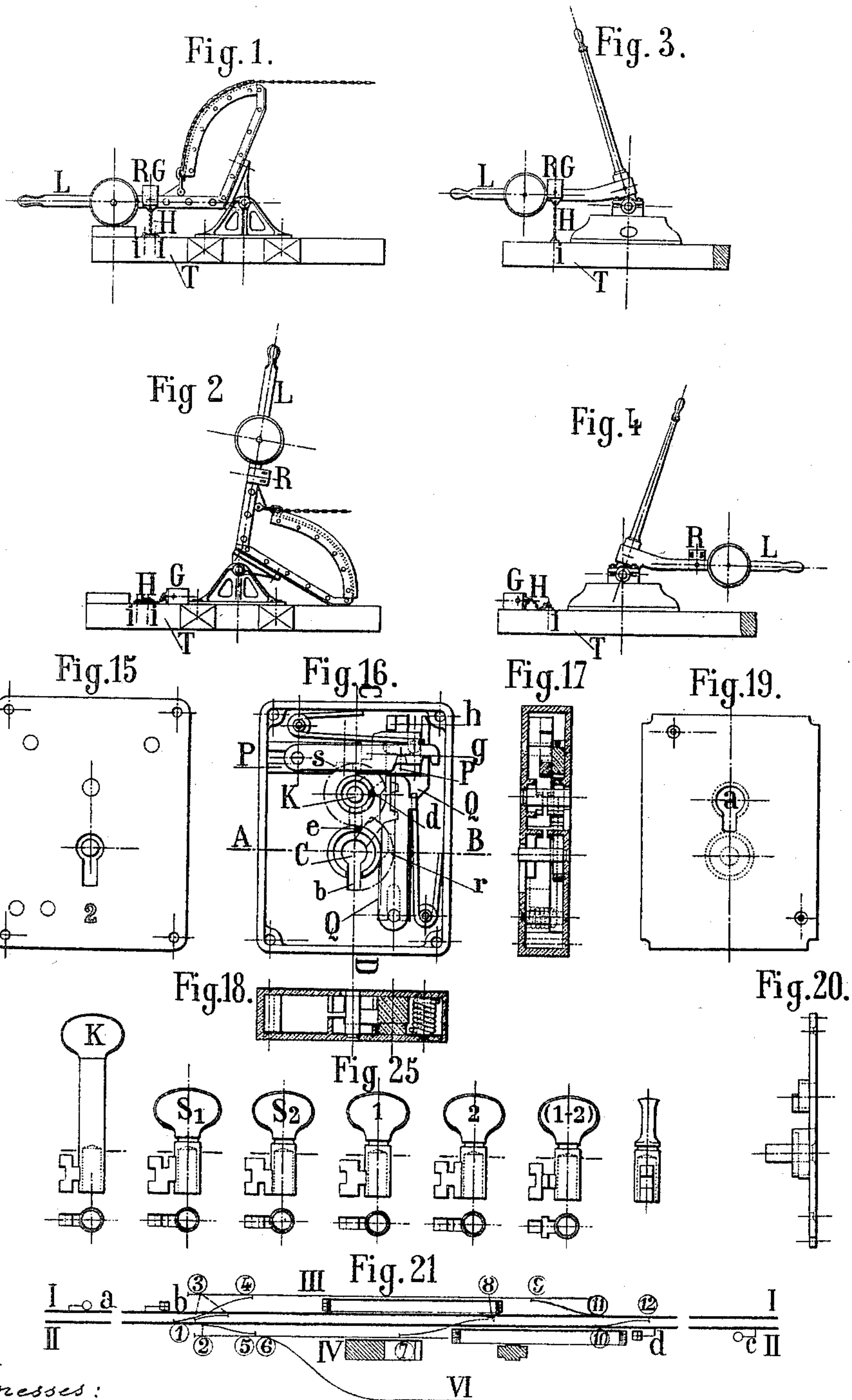
P. BOURÉ.

MEANS FOR CONTROLLING AND LOCKING RAILWAY APPLIANCES.

(Application filed Aug. 6, 1897.

(No Model.)

4 Sheets—Sheet 1.



Witnesses:

Eugène Deschamps.
Edward M. Lee

Inventor:

Paul Bouré

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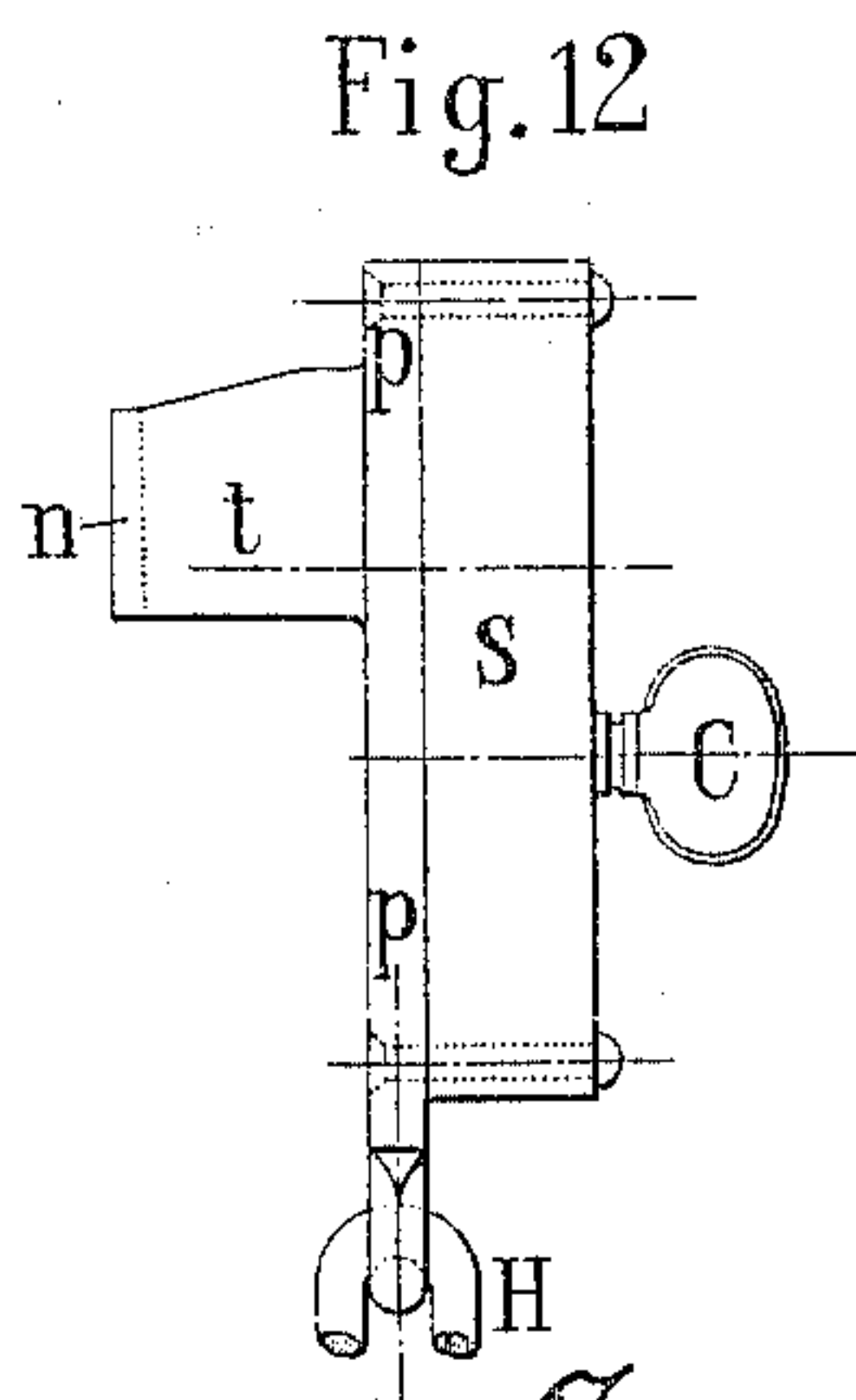
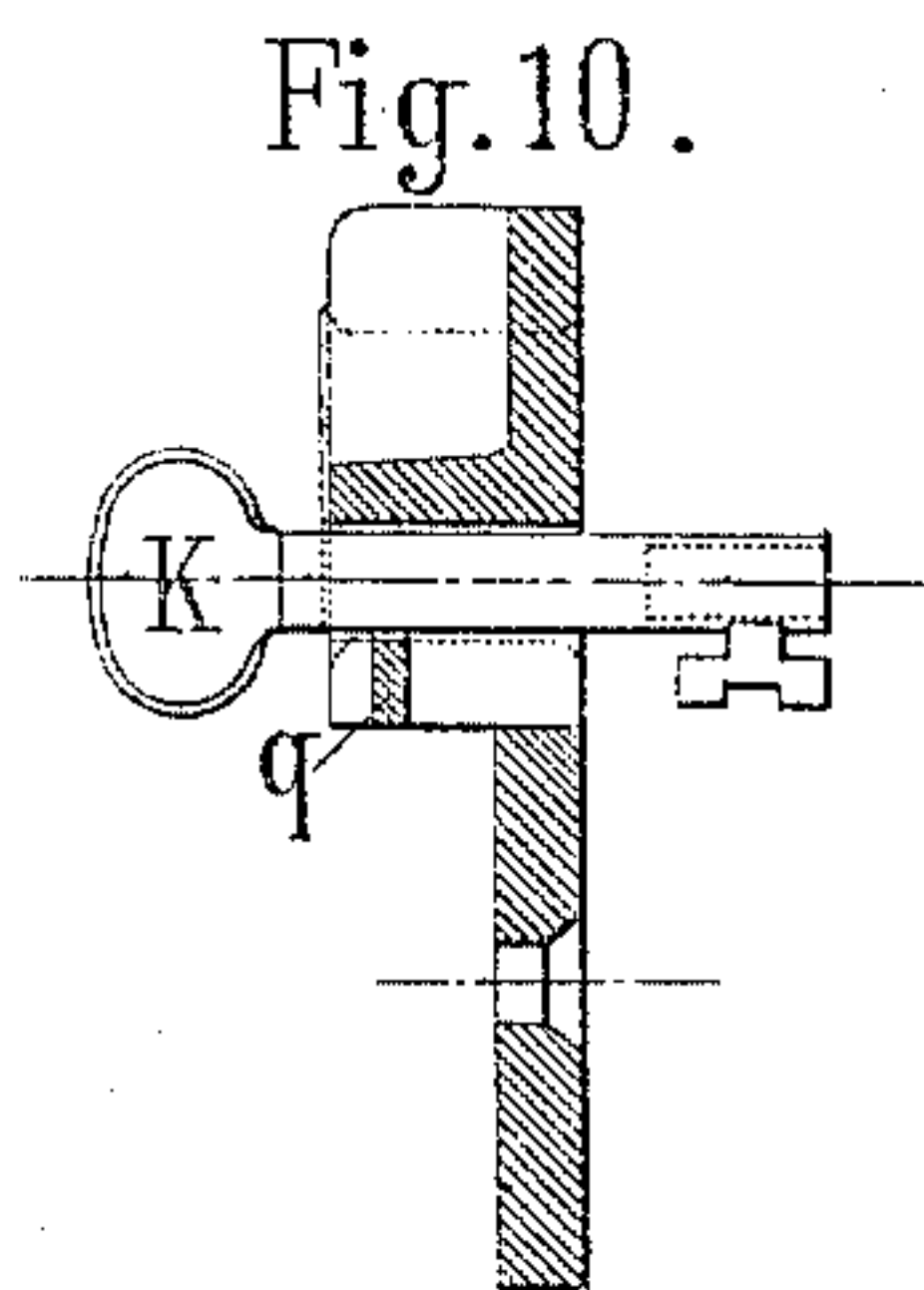
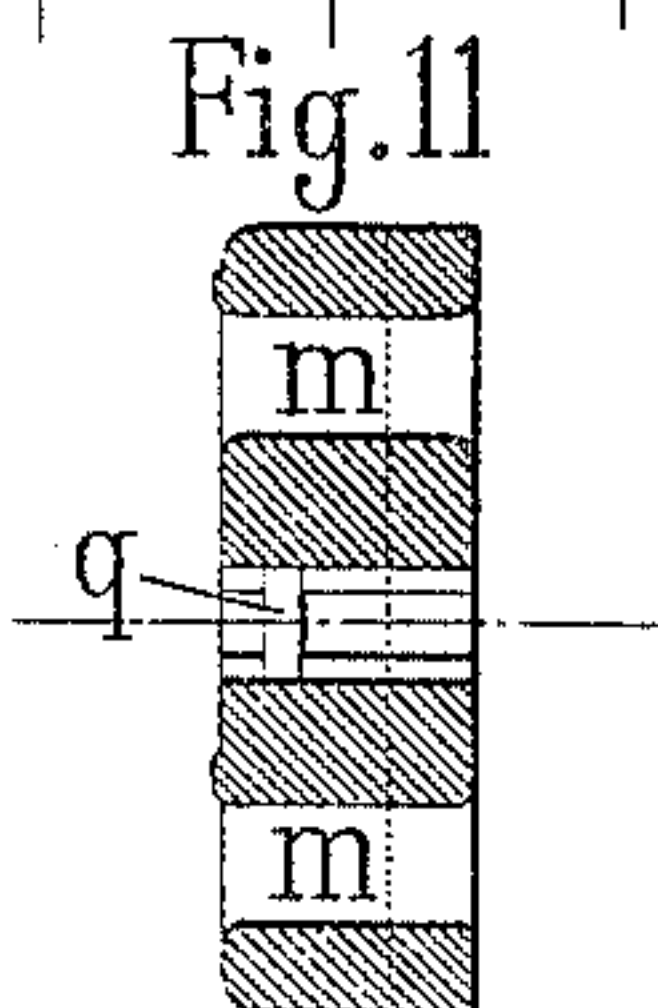
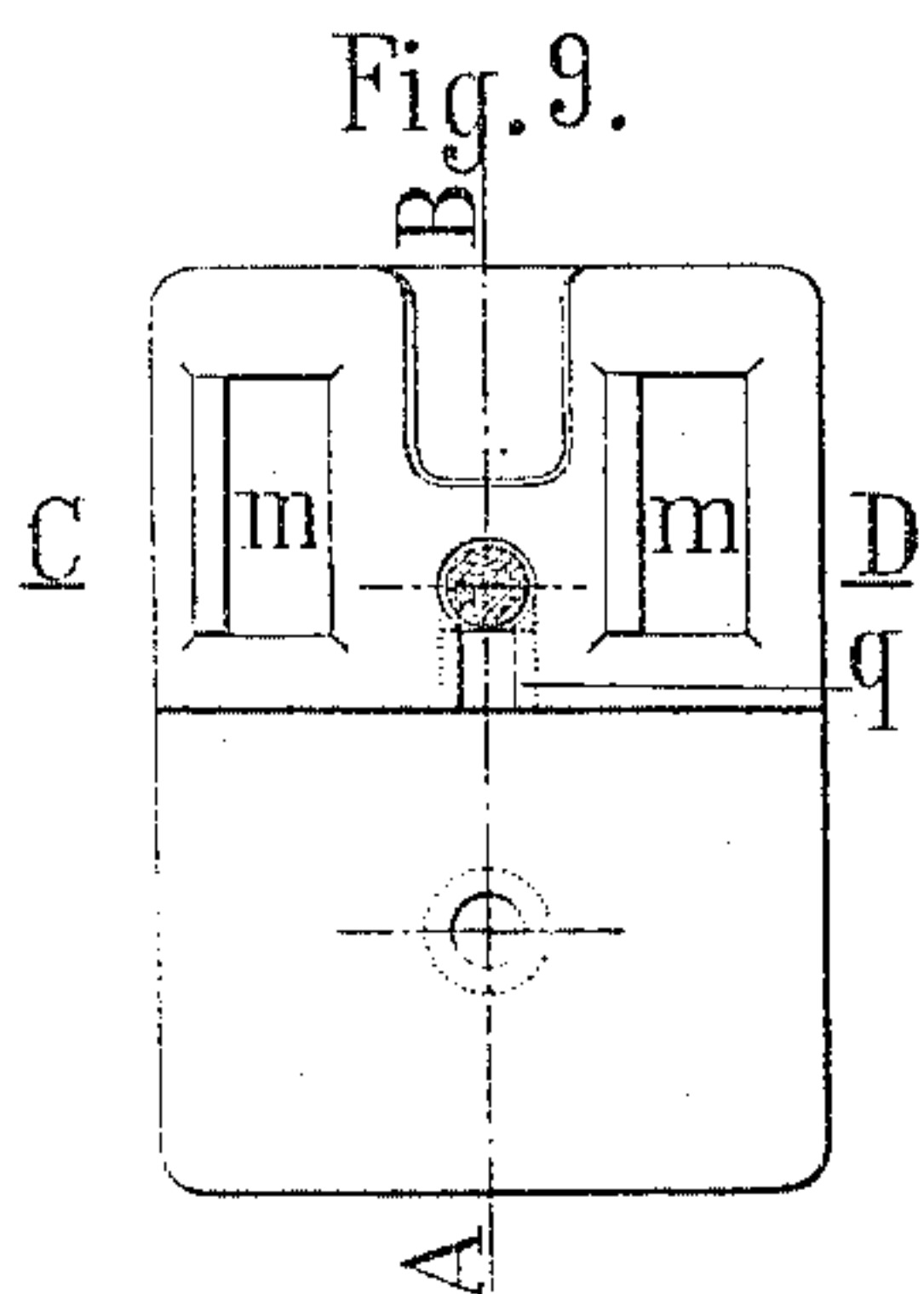
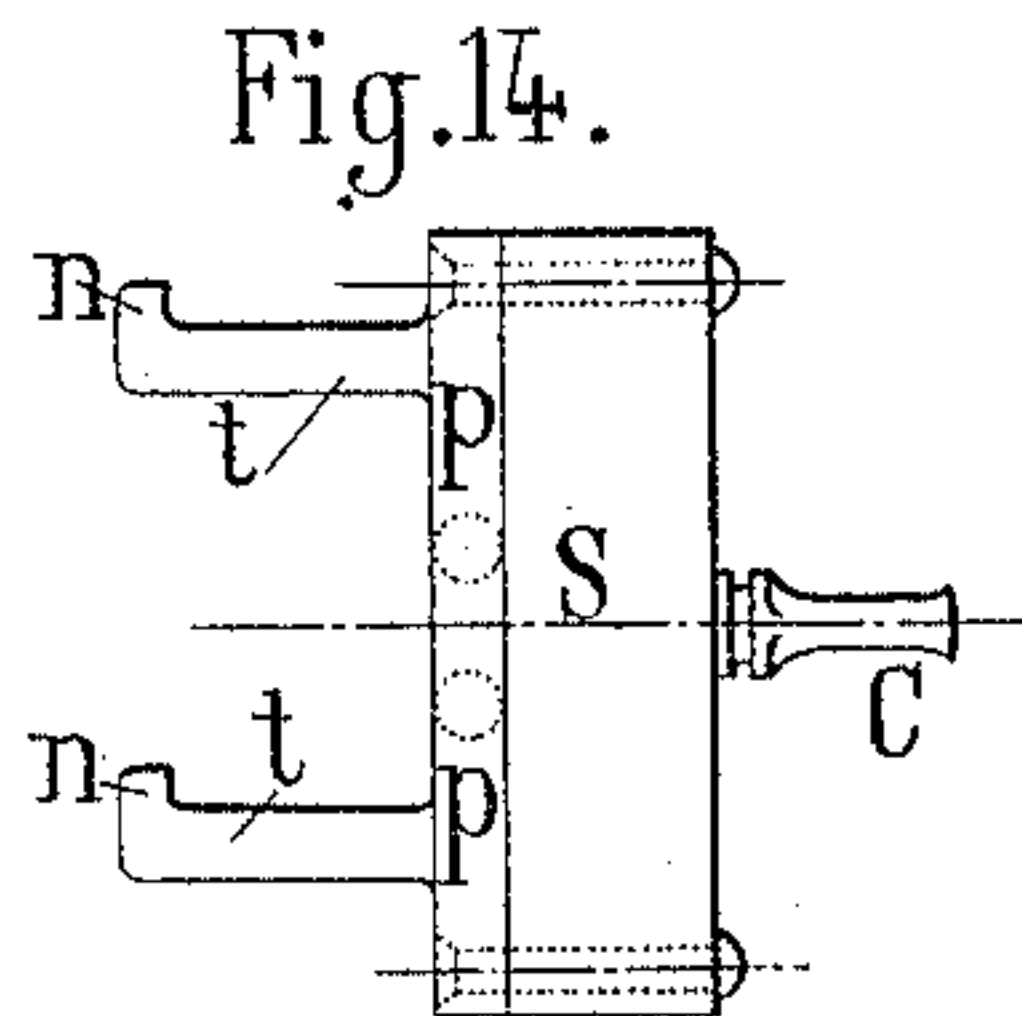
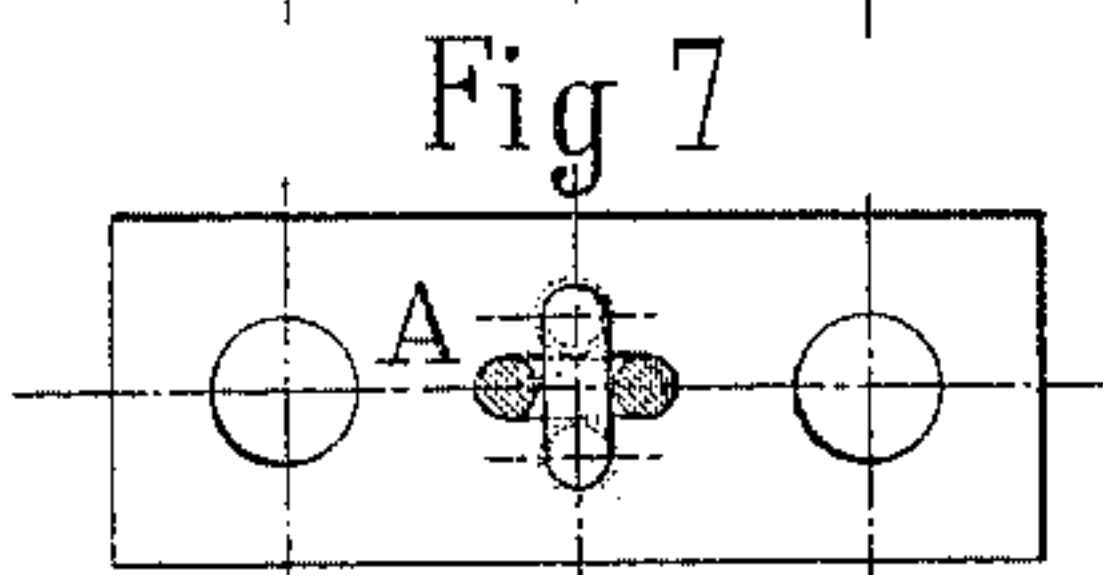
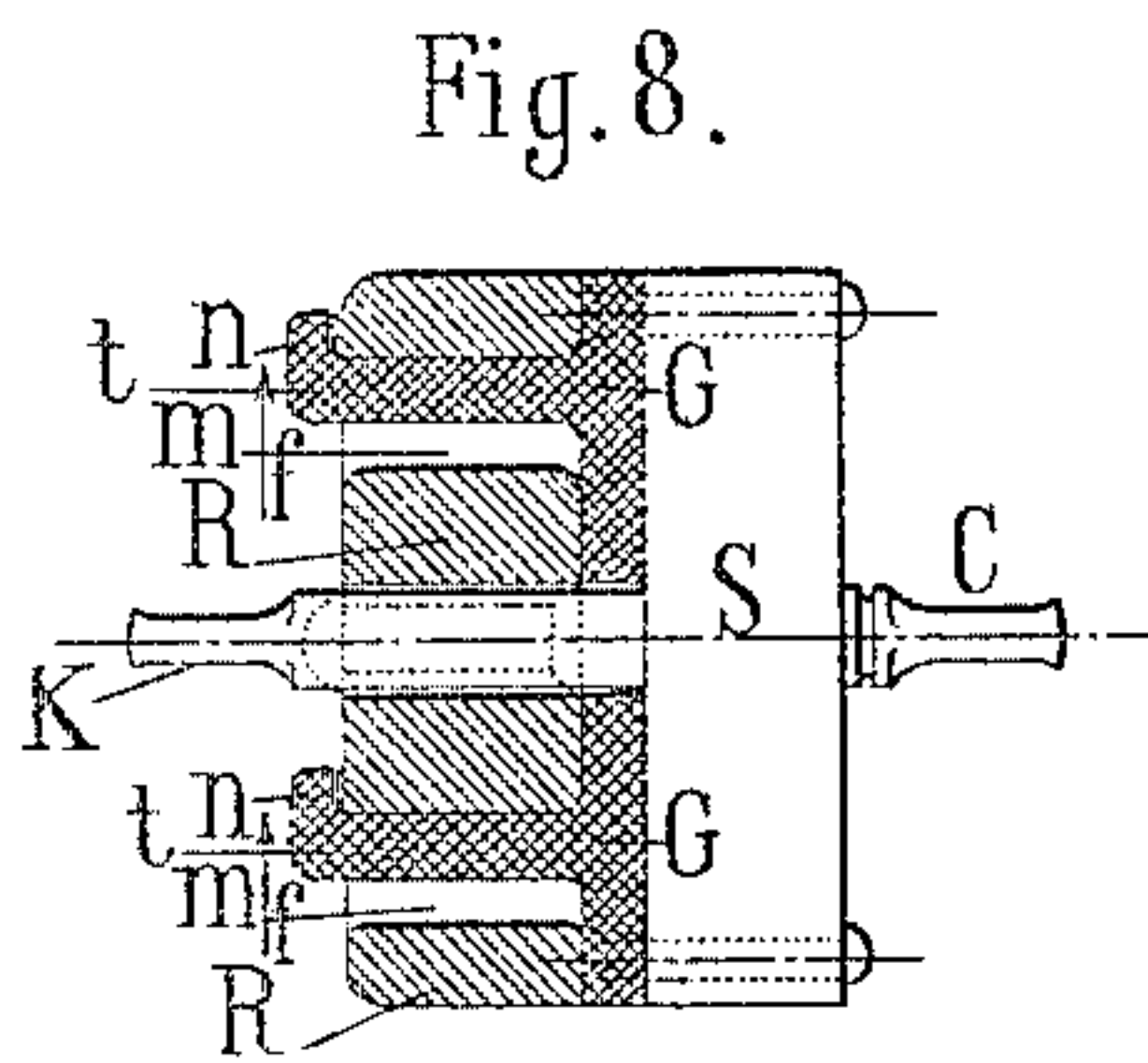
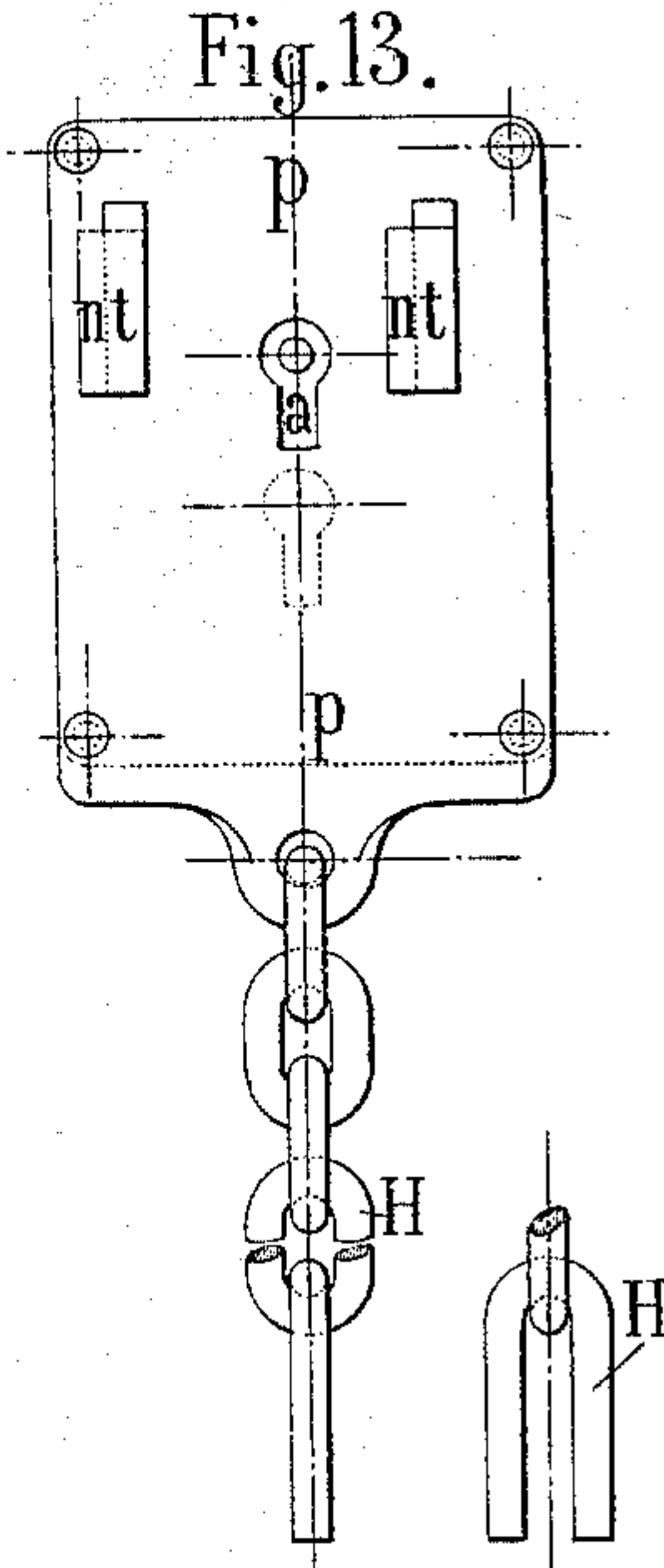
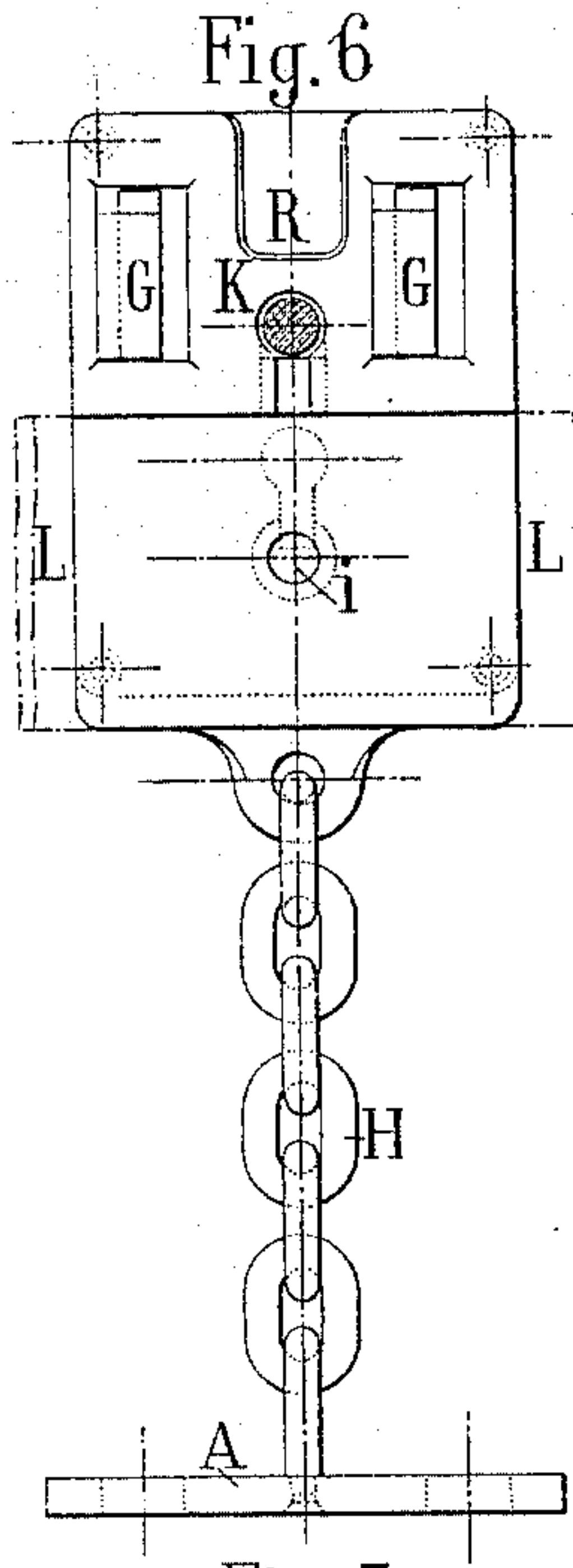
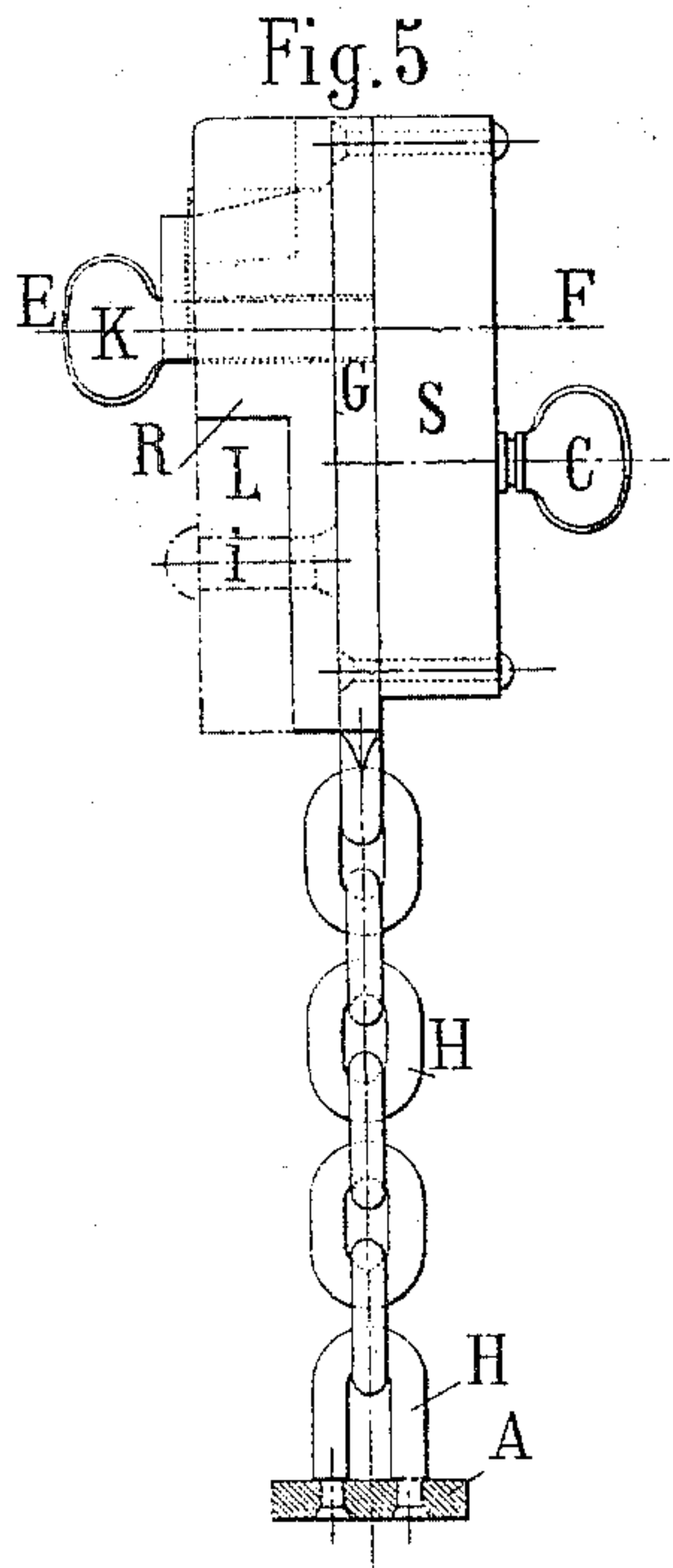
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(Application filed Aug. 6, 1897.

(No Model.)

4 Sheets—Sheet 2.



Witnesses:
Eugène Deschamps.
Edward MacLean

Inventor:
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No. 640,359.

Patented Jan. 2, 1900.

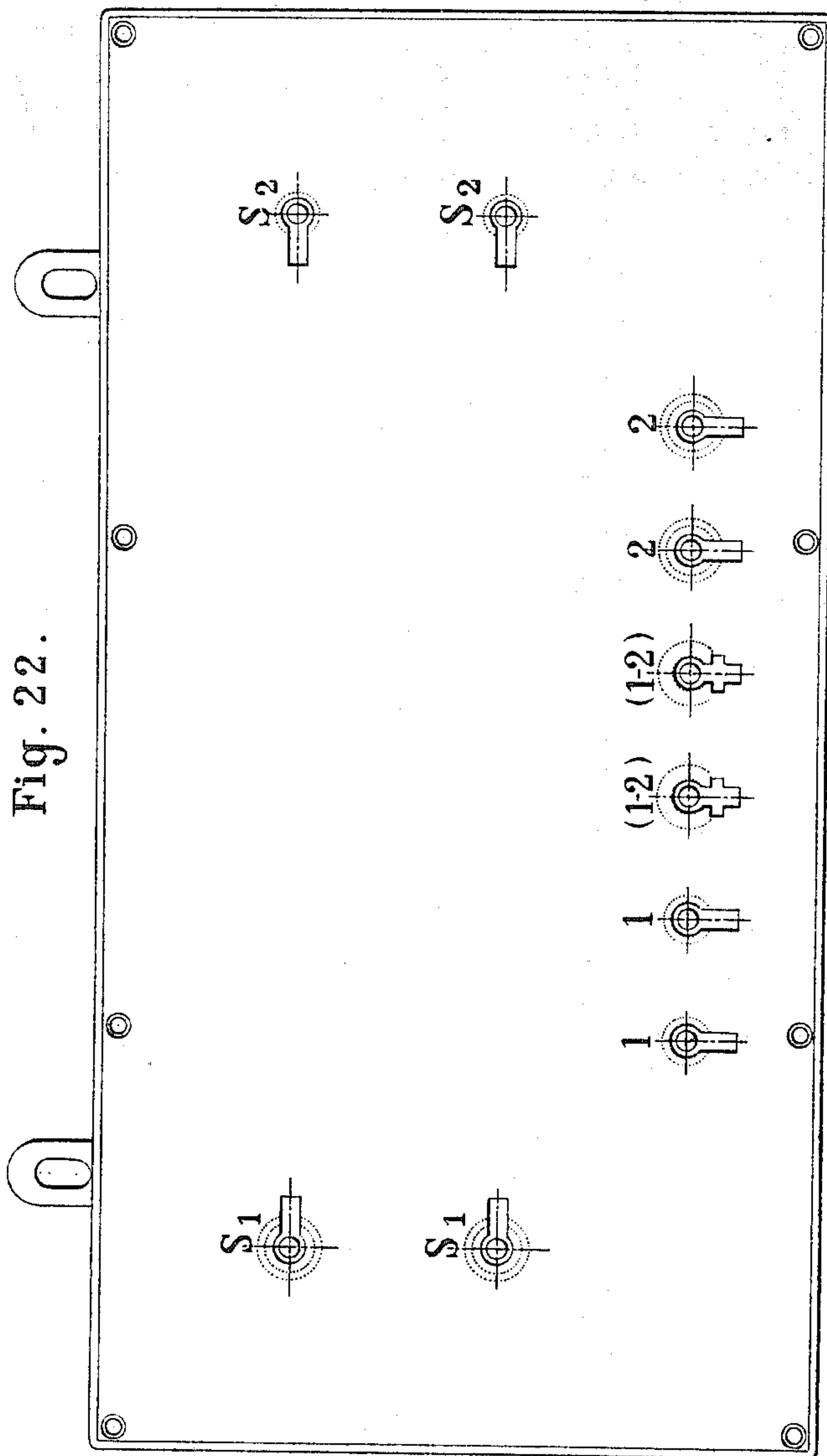
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(Application filed Aug. 6, 1897.)

(No Model.)

4 Sheets—Sheet 3.



Witnesses:
Eugène Delchamps.
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Inventor:
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No. 640,359.

Patented Jan. 2, 1900.

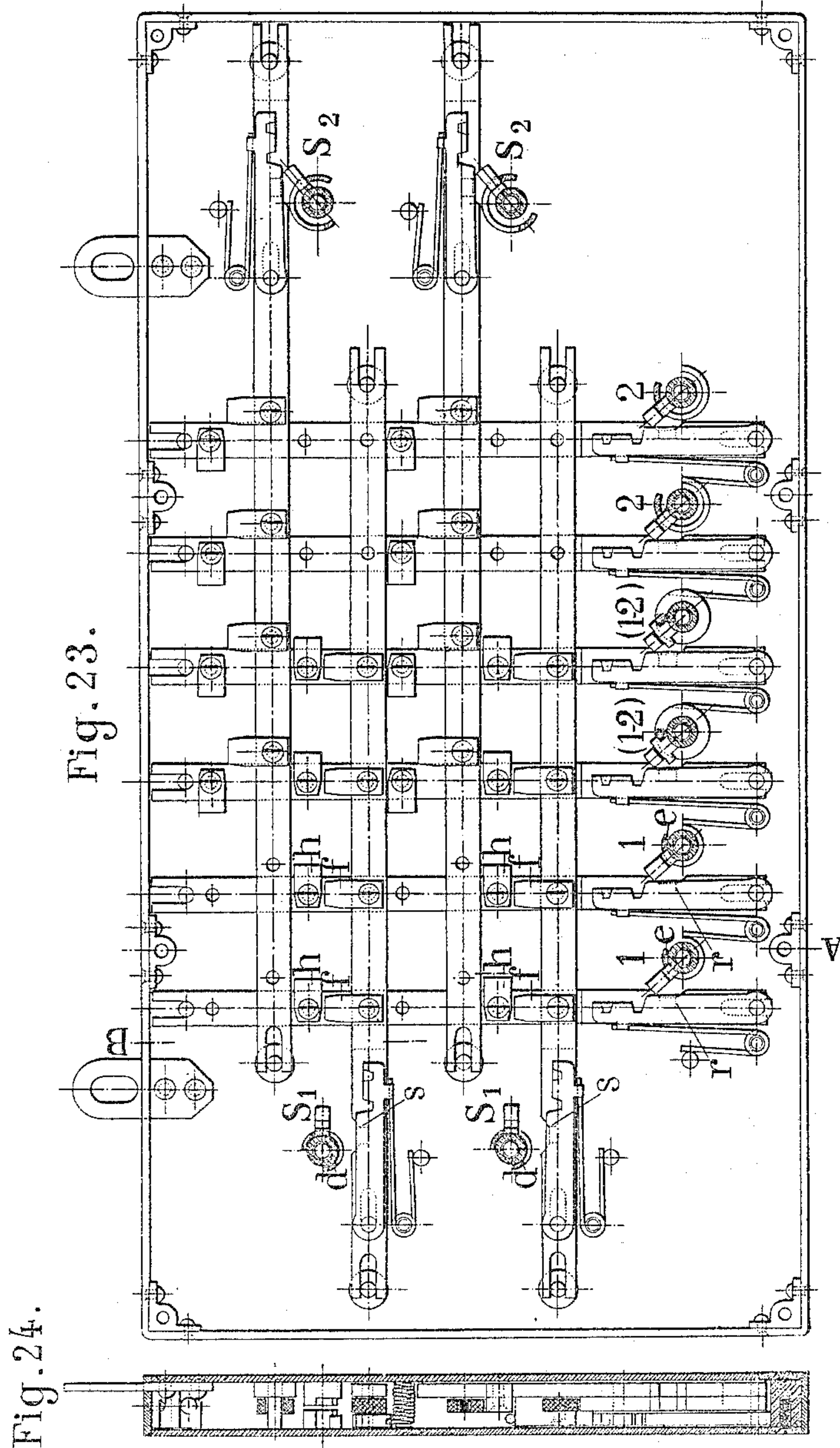
P. BOURÉ.

MEANS FOR CONTROLLING AND LOCKING RAILWAY APPLIANCES.

(Application filed Aug. 6, 1897.

(No Model.)

4 Sheets—Sheet 4.



Witnesses:
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UNITED STATES PATENT OFFICE.

PAUL BOURÉ, OF PARIS, FRANCE.

MEANS FOR CONTROLLING AND LOCKING RAILWAY APPLIANCES.

SPECIFICATION forming part of Letters Patent No. 640,359, dated January 2, 1900.

Application filed August 6, 1897. Serial No. 647,329. (No model.)

To all whom it may concern:

Be it known that I, PAUL BOURÉ, a citizen of France, residing at 20 Boulevard Diderot, Paris, France, have invented a new Means for Controlling and Locking Railway Appliances, (for which I have obtained a patent in France, No. 238,803, bearing date May 26, 1894; in Belgium, No. 112,772, bearing date November 20, 1894; in Spain, No. 16,628, bearing date November 26, 1894; in Italy, No. 37,687, bearing date December 31, 1894; in Germany, No. 90,827, bearing date February 21, 1895, and in Austria, No. 2,086, bearing date June 11, 1895,) of which the following is a specification.

The object of my invention is to realize simply and economically that solidarity which should exist among the signals, points, and other appliances of a railway-station in order that any collision between trains, engines, or wagons may be rendered materially impossible.

This invention consists, first, in the fixing in the position desired of signal-levers, point-levers, and all other appliances by means of an arrangement composed of two pieces fitting one another, fastened the one to the lever and the other to a stable object and fitted the one with a lock for two keys and the other with a key of this lock, the second key of the same lock, called the "key" of the lock, being independent of the pieces; second, in arranging the aforesaid lock in such a manner that when the key (the one independent of the pieces) is withdrawn from the lock the two pieces of the arrangement are inseparable from one another and that when these pieces are separated from one another the key is fast in the lock, and, third, in making use of a special lock, called the "central" lock, in which the keys of the lever-locks may be inserted, this special lock being arranged in such a way as to establish among these keys the relationships necessary for the realization of the required solidarity among the levers.

Figure 1 represents a signal-lever, and Fig. 3 a point-lever, fixed in the aforementioned conditions. Figs. 2 and 4 represent the same levers in their other position—that, namely, in which they are free. A piece R is riveted onto the lever L, and another piece G in the form of a cramp is fastened by the chain H

to the sleeper T on which the lever is fixed. The chain H is of such a length that when the piece G is fastened in the piece R the lever cannot be moved from the position it occupies. The chain H may be fixed in any way whatever to the sleeper T or to any other stable object. Figs. 1, 2, 3, and 4 show it riveted to an iron plate, which is itself fixed to the sleeper T by means of two screws that have a long rivet traversing both their heads to prevent them from being unscrewed. The iron plate A onto which the chain is riveted is represented by Figs. 5, 6, and 7.

The pieces R and G are represented united by Figs. 5, 6, and 8 and separated by Figs. 9 to 11 and 12 to 14. Fig. 5 represents the side view, Fig. 6 the elevation, and Fig. 8 the section by E F, Fig. 5, of the two pieces R and G united. Fig. 9 represents the elevation, Fig. 10 the section by A B, Fig. 9, and Fig. 11 the section by C D, Fig. 9, of the piece R. Fig. 12 represents the side view, Fig. 13 the elevation, and Fig. 14 the top end view, of the piece G and the lock S, which is riveted to it.

The piece R, Figs. 9, 10, and 11, permanently fixed onto the lever L, Figs. 5 and 6, by means of the rivet I, Fig. 5, has two little windows or mortises *m m*, Figs. 9 and 11, and is fitted with a key K, Fig. 10. The key K can slide longitudinally in the keyhole in which it is contained, so as to be free to have its key-bit either within the piece R or without it; but a catch Q, Figs. 9, 10, and 11, prevents it from being withdrawn from the said keyhole. The key K is thus inseparable from the piece R.

The piece G consists of a plate *p*, Figs. 12, 13, and 14, fitted with two appendices or tenons *t n t n*, hooked at their extremity *n*. On the plate *p* and on the side of it opposite to the tenons *t n* is riveted a lock S, in which, as we shall see, the key K of the piece R may be inserted by a keyhole situated directly opposite the opening *a*, Fig. 13, that has been contrived in the plate *p*.

By placing the piece G, Figs. 12 and 14, face to face with the piece R, Figs. 10 and 11, after having, if need be, slid the key K from right to left, Fig. 10, so as to make it enter entirely into the piece R, the tenons *t n t n* may be inserted in the mortises *m m*

of the piece R, so that the plate *p* may be applied to this piece R. The piece G, Fig. 8, may then be moved in the direction of the arrows *ff* in Fig. 8, so as to give the tenons *t n t n* that position in the mortises which is indicated by Fig. 8. In this position of the piece G, and in this position only, the key-hole *a*, Fig. 13, is directly opposite the key K, and this key after passing through the plate *p*, Figs. 12, 13, and 14, can be inserted in the lock S, Fig. 8.

When the key K is in the lock S, it prevents the piece G from being moved in the direction opposite to that of the arrows *ff* in Fig. 8. The little hooks *nn* cannot therefore be brought back face to face with the mortises *mm*, and it becomes impossible to separate the piece G from the piece R, Fig. 8. Thus so long as the key K is in the lock S the lever L, Figs. 1, 2, 3, 4, 5, and 6, is necessarily fixed. Consequently for this lever L to remain fixed in the position in question all that is required is that it should be impossible to withdraw the key K from the lock S. This result is obtained by means of a second key C, Figs. 5, 8, 12, 14, and 16, which is introduced into the lock S on the side opposite to the piece G. The lock S establishes such a solidarity between the keys K and C that when one of these keys is withdrawn from the lock the other is necessarily fast in it.

Fig. 15 represents the exterior view of the lock S. Fig. 16 shows the interior mechanism of this lock. Fig. 17 represents a section by C D, Fig. 16, and Fig. 18 a section by A B, Fig. 16. Fig. 19 represents the elevation, and Fig. 20 the side view, of the cover of the lock S.

When the lock S is riveted to the piece G, the cover is against this piece. In this lock the keys K and C work each of them a bolt. The mechanism corresponding to each bolt is that of an ordinary lock. The bolts P and Q, Fig. 16, worked, respectively, by the keys K and C, are set at right angles to one another. In the part where they cross their thickness is reduced by half. The turning movement of the keys is limited in the case of the key K by the stop *d*, Fig. 16, and in the case of the key C by the stop *e*, Fig. 16. The bolt P has a notch *g*, into which the catch *h* of the bolt Q may enter.

Fig. 16 represents the bolt P in the position it occupies when the key K is withdrawn from the lock. The bolt Q cannot then be moved downward, for the notch *g* is not face to face with the catch *h*, and consequently this catch is stopped by the bolt P. The result is that the corresponding key C is fast in the lock, for its key-bit cannot be brought face to face with the opening *b*, through which it can be withdrawn, because if we try to turn the key in one direction or the other the said key-bit is stopped on one side by one of the toes *r* of the bolt Q, which cannot move, and on the other side by the stop *e*. Thus when the key K is withdrawn from the lock S or can be

withdrawn therefrom the key C is necessarily fast in it. If, the key K being put into the lock S, it is turned therein, the bolt P moves from left to right, Fig. 16, and the notch *g* comes face to face with the catch *h* of the bolt Q. Then on turning the key C this bolt Q moves downward, its catch *h* entering into the notch *g*, and the key C can be withdrawn from the lock; but then the key K is fast in it, for if we try to turn it to bring it face to face with the opening *a* its key-bit is stopped on one side by the stop *d* and on the other by one of the toes *s* of the bolt P, which cannot move from right to left, because the catch *h* of the bolt Q occupies the notch *g*, wherefore when the key C is withdrawn from the lock S the key K is necessarily fast in it. From this relationship between the keys K and C it results, in accordance with what has previously been said, first, that the lever L will remain fixed so long as the key C shall be out of the lock S, since the key K will then be fast in it, and, second, that when the lever L is removed from the position in which it may be fixed, which can only take place if the key is withdrawn from the lock S, the key C will be fast in the lock S.

I will give the name of "fixed key" to the key K which is inseparable from the piece R, and the name of "independent key" or simply "key" to the key C.

The piece R instead of being riveted onto the lever L may be attached to it by a chain or by any other organ of connection.

Instead of attaching the piece containing the key to the lever and the piece fitted with the lock to a stable object it is possible to proceed inversely.

The form given to the piece R and the form given to the piece G may, moreover, be modified if in certain cases it be necessary. It suffices that they should so fit one another that when they are united it is impossible to move the lever from the position it occupies. This being stated, let us consider a station at which the lines are arranged, for example, as indicated in Fig. 21. Each line on the figure represents a railway-line. Lines I and II are the main lines, on which the trains circulate. Lines III, IV, and VI are the sidings. I propose to establish a solidarity among the signal-levers and point-levers of this station in such a manner that it may be impossible for a train, an engine, or some wagons to pass from a siding onto a main line I or II unless the signals of this latter are at "danger." In order to do so, I supply the signal-levers *a b c d* and the point-levers (1), (2), (3), (4), (5), (7), (8), (9), (10), (11), and (12) with the arrangement I have just described, enabling me to fix, first, the signal-levers *a* and *b*, line I, and *c* and *d*, line II, in the position they occupy when the signal is at "danger;" second, the point-levers (4), (5), (7), and

⑨ in the position they occupy when these points do not give access to the main lines I and II; third, the point-levers ①, ②, ③, ⑧, ⑩, ⑪, and ⑫ in the position they occupy when these points insure the continuity of the main lines I and II.

I will designate by S' the locks of the signal-levers a and b , line I.

I will designate by S^2 the locks of the signal-levers c and d , line II.

I will designate by 1 the locks of the point-levers ⑨ and ⑫, giving access to line I.

I will designate by 2 the locks of the point-levers ② and ⑤, giving access to line II.

I will designate by 1-2 the locks of the point-levers ①, ③, ④, ⑦, ⑧, ⑩, and ⑫, giving access to the lines I and II.

I will likewise designate by S' the key (key C in the description) of the lock S' , by S^2 the key of the lock S^2 , by 1 the key of the lock 1, by 2 the key of the lock 2, by 1-2 the key of the lock 1-2, these keys S' , S^2 , 1, 2, and 1-2 naturally differing from one another. Then, to obtain the required result, I establish a solidarity between the keys S' , S^2 and the keys 1 2 1-2 by means of a central lock in which, first, the keys S' are fast when the keys 1 or the keys 1-2 are withdrawn from it, and inversely, and, second, the keys S^2 are fast when the keys 2 or 1-2 are withdrawn from it, and inversely. This solidarity between the keys S' and the keys 1, for example, is, moreover, realized in the central lock in the same manner as the solidarity between the keys K and C in the lock of the S type in the above-described fixing arrangement.

Let us therefore consider the central lock. (Represented by Figs. 22, 23, and 24.) Fig. 22 represents the exterior view, and Fig. 23 the interior view, of the lock. Fig. 24 represents the section of the lock by A B. Each of the two keys S' is fast in it when any one whatever of the keys 1 is withdrawn from it, and, inversely, each of the two keys 1 is fast in it when any one whatever of the keys S' is withdrawn from it. The bolts worked, respectively, by the keys S' and by the keys 1 are set at right angles to one another. They are fitted with catches f and h . On the other hand, the turning movement of the keys is limited in the case of the keys S' by the stops d and in the case of the keys 1 by the stops e .

In the position of the mechanism represented by Fig. 22 the keys S' can be withdrawn from the central lock. The catches f of the bolts worked by the keys S' are face to face with the catches h of the bolts worked by the keys 1. These latter bolts cannot, therefore, move, and consequently the keys 1 are fast in the central lock. It is impossible, in fact, to bring the key-bits of these keys

face to face with the openings through which they can be withdrawn, for if we try to turn them they are stopped on the one side by the stops e and on the other by one of the toes r of the corresponding bolt. Thus when a key S' is withdrawn or can be withdrawn from the central lock the keys 1 are necessarily fast in it.

If we turn the keys S' in the central lock, the bolts which they work move from right to left, and their catches f are no longer face to face with the catches h of the bolts worked by the keys 1. Then on turning any one whatever of these latter (keys 1) we move its bolt downward, the catches h passing to the right of the catches f , and we can withdraw the key from the lock; but then the keys S' are fast in this lock, for if we try to turn them their key-bits meet with the stops d on the one hand and on the other one of the toes s of the corresponding bolt, which cannot move, because one of its catches f is stopped to the right by the catch h of the bolt of the key in question. Therefore when a key 1 is withdrawn or can be withdrawn from the central lock the keys S' are necessarily fast in it.

On examining Fig. 23, it will be seen that the same relationship exists between the keys S' and the keys 1-2, and also between the keys S^2 on the one hand, and the keys 2 and 1-2 on the other.

Instead of working bolts perpendicular to one another the keys S' and 1, heretofore taken into consideration, might work parallel bolts. It would be sufficient to attach a perpendicular bolt to the bolt of each of the keys S' by means of a rectangular piece.

The keys S' , S^2 , 1, 2, and 1-2 are represented in Fig. 25 with the fixed key K, which is the same for all the locks.

The relationships established by the central lock among the keys S' , S^2 , and 1, 2, 1-2 are sufficient to insure the protection of the movements of trains, engines, or wagons occupying the main lines. This fact is easily realized by an examination of the working of the system.

Operation: Normally the signal-levers of the main lines are free. The keys S' and S^2 are then fast in the locks of these levers. Consequently the keys 1, 2, and 1-2 are fast in the central lock, and the result is that all the appliances controlling the access to the lines I and II are fixed in that position in which they render the said access impossible. Let us suppose, for example, that we wish to move a train shunted on the line III onto the line II. In order to do so, the two keys 1-2 necessary to set the point-levers ① and ④ free and to change their position must be withdrawn from the central lock; but in order to have these keys 1-2 we must bring the keys S' and S^2 to the central lock. We therefore set the signals of the lines I and II at "danger," if they are not so already. We withdraw the keys

S' and S² from the locks of their respective levers, thus fixing the signals at "danger." We take them to the central lock, we turn them in it, and can then withdraw the two keys 1-2, of which we have need. These keys 1-2 being withdrawn, the keys S' and S² are fast in the central lock. We carry these two keys 1-2 to the locks of the point-levers (1) and (4). We set these levers free and change their position. The position of the levers having been changed, the two keys 1-2 are fast in their locks. Consequently so long as the points (1) and (4) are in the position that opens the passage from the line III to the line II the signals of the lines I and II will be necessarily at "danger." The passage having taken place, we put the point-levers (1) and (4) back in their normal position. We withdraw the keys 1-2 from their locks, thus fixing the levers in their normal position. We take the keys 1-2 back to the central lock, and we take from it the keys S' and S², which will enable us to set the signal-levers free, and which when this has been effected will once more be fast in the locks of the said signal-levers.

I claim as my invention—

1. An apparatus serving to fix a point-lever, or a signal-lever, in one of its positions, and consisting of two metallic pieces, fastened one to the lever, and the other to a fixed object, which fit one another in such a manner that when they are joined the lever is fixed; one of the pieces containing a key which is inseparable from it, and the other being fitted with a lock with two keys, one of these keys being that contained in the first piece, and the other key an independent one.

2. An apparatus serving to fix a point-lever, or a signal-lever, in one of its positions, and consisting of two metallic pieces, fastened one to the lever, and the other to a fixed object, which fit one another in such a manner that when they are joined the lever is fixed; one of the pieces containing a key which is inseparable from it, and the other being fitted with a lock with two keys, one of these keys being that contained in the first piece, and the other key an independent one; the said keys working bolts placed at right angles to one another in the lock, which bolts stop one another mutually in such a manner that when one of them is at one end of its run, because the corresponding key is withdrawn from the lock, the other bolt cannot be moved; and, consequently, prevents the key that works it from turning in one direction.

3. An apparatus serving to fix a point-lever, or a signal-lever, in one of its positions, and consisting of two metallic pieces, fastened one to the lever, and the other to a fixed object, which fit one another in such a manner that when they are joined the lever is fixed; one of the pieces containing a key which is

inseparable from it, and the other being fitted with a lock with two keys, one of these keys being that contained in the first piece, and the other key an independent one; the said keys working bolts placed at right angles to one another in the lock, which bolts stop one another mutually in such a manner that when one of them is at one end of its run because the corresponding key is withdrawn from the lock, the other bolt cannot be moved, and consequently, prevents the key that works it from turning in one direction, this key being moreover unable to turn in the other direction in consequence of the existence, in the lock, of a catch against which the key-bit strikes; so that when one of the keys is withdrawn from the lock, the other is necessarily a prisoner in it.

4. An apparatus serving to fix a point-lever, or a signal-lever, in one of its positions, and consisting of two metallic pieces, fastened one to the lever, and the other to a fixed object, which fit one another in such a manner that when they are joined the lever is fixed; one of the pieces containing a key which is inseparable from it, and the other being fitted with a lock with two keys, one of these keys being that contained in the first piece, and the other key an independent one; the said keys working bolts placed at right angles to one another in the lock, which bolts stop one another mutually in such a manner that when one of them is at one end of its run because the corresponding key is withdrawn from the lock, the other bolt cannot be moved, and consequently, prevents the key that works it from turning in one direction, this key being moreover unable to turn in the other direction, in consequence of the existence, in the lock, of a catch against which the key-bit strikes; so that when one of the keys is withdrawn from the lock, the other is necessarily a prisoner in it; whence it results, first that when the independent key is withdrawn from the lock, the key contained in one of the pieces is a prisoner in that lock, which prevents the separation of the two pieces, and second, that when the key contained in one of the pieces is withdrawn from the lock, which allows of the separation of the two pieces, the independent key is a prisoner in the said lock.

5. A lock called the "central lock" admitting a certain number of keys, each of these keys, on being withdrawn from the lock, pushing a bolt fitted with catches, and placing this bolt in a position in which each of the said catches fixes another bolt likewise worked by a key, and, consequently, prevents this last-named key from being withdrawn from the lock, so that when one key is withdrawn from the lock, one or several others are necessarily made fast in it.

6. A lock called the "central lock" admitting a certain number of keys, each of these keys having its turning movement limited in one direction by a stop by which its key-bit

is stopped and working a bolt which, when
free to move, allows of the key being turned
till it comes face to face with the opening
that corresponds to it, and, consequently, en-
5 ables it to be withdrawn from the lock; but
which, when it is stopped in its movement, pre-
vents the key from coming face to face with the
opening that corresponds to it, and, conse-
quently, prevents it from being withdrawn
10 from the lock; the bolt worked by each key
being fitted with one or several catches which,
on the key being withdrawn from the lock,

take and occupy their respective positions
against the catches with which the bolts
worked by other keys are fitted, and, conse- 15
quently, fix these bolts, thus preventing these
last-named keys from being withdrawn from
the lock; so that, when one key is withdrawn
from the lock one or several others are nec-
essarily made fast in it.

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Witnesses:

EUGÈNE DESCHAMPS,
EDWARD P. MACLEAN.