

(No Model.)

2 Sheets—Sheet 1

N. J. SMITH.
APPARATUS FOR OPERATING SEMAPHORES.

No. 446,479.

Patented Feb. 17, 1891.

Fig. 1.

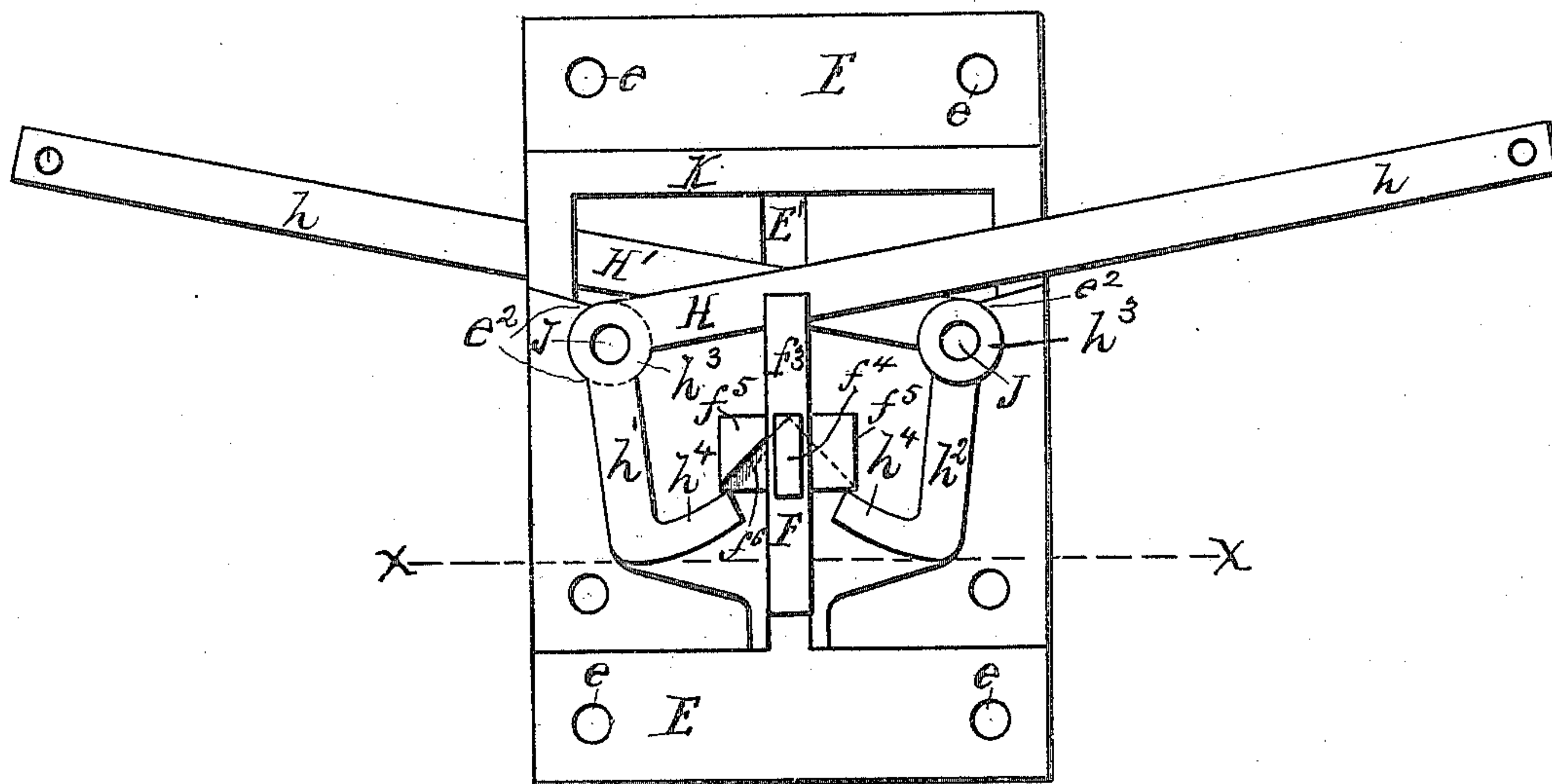


Fig. 2.

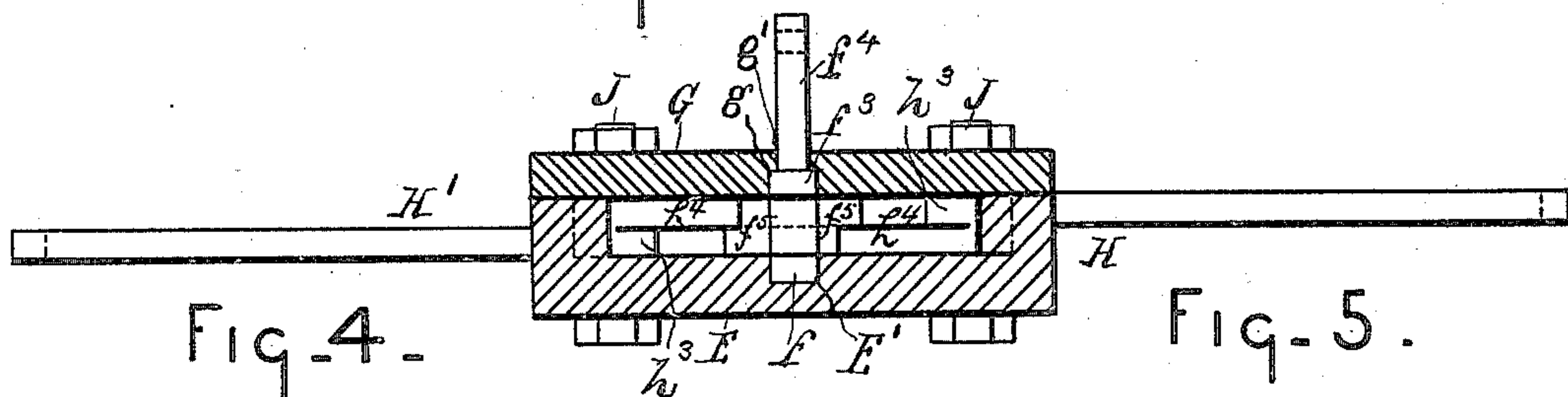
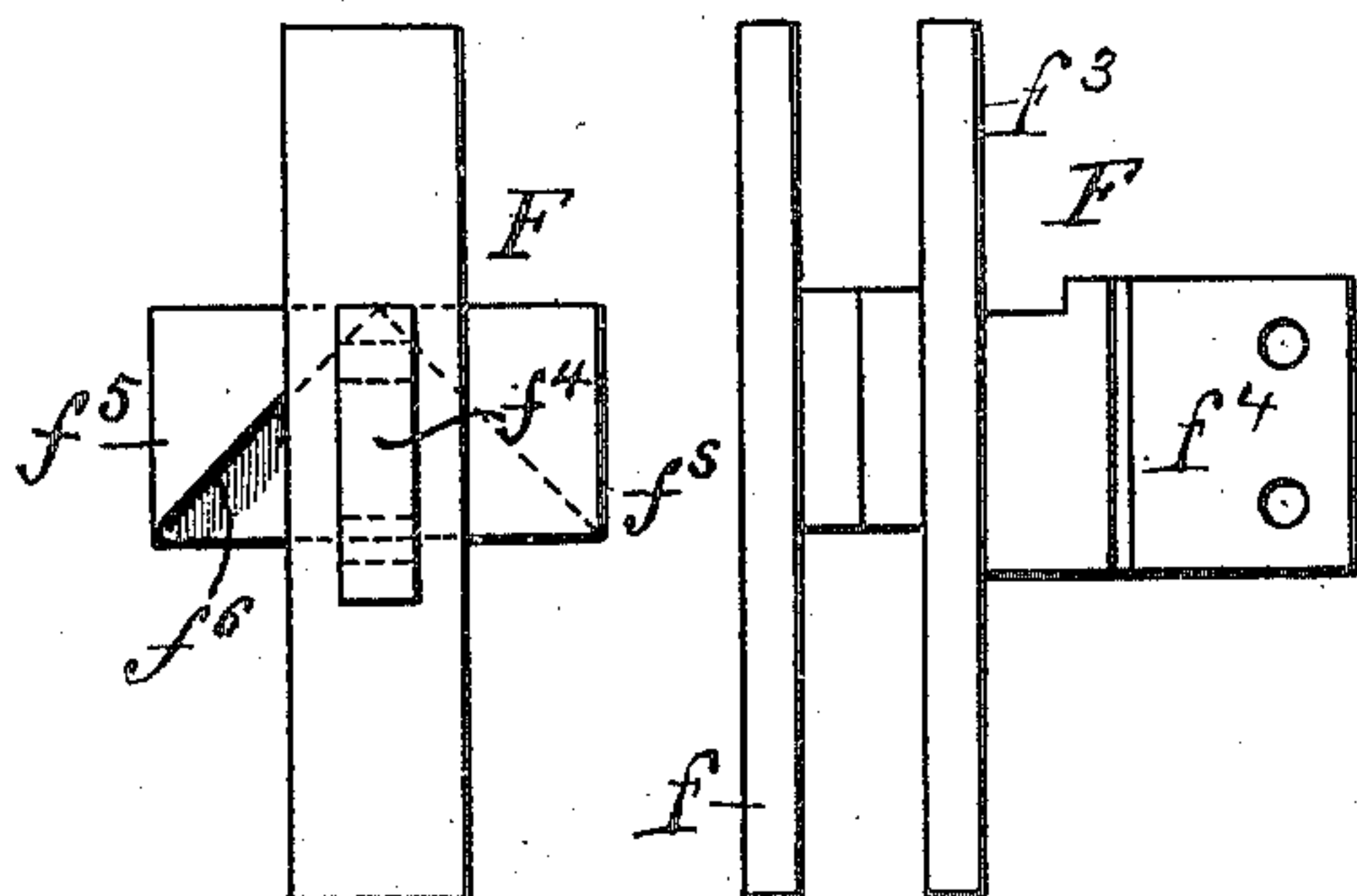
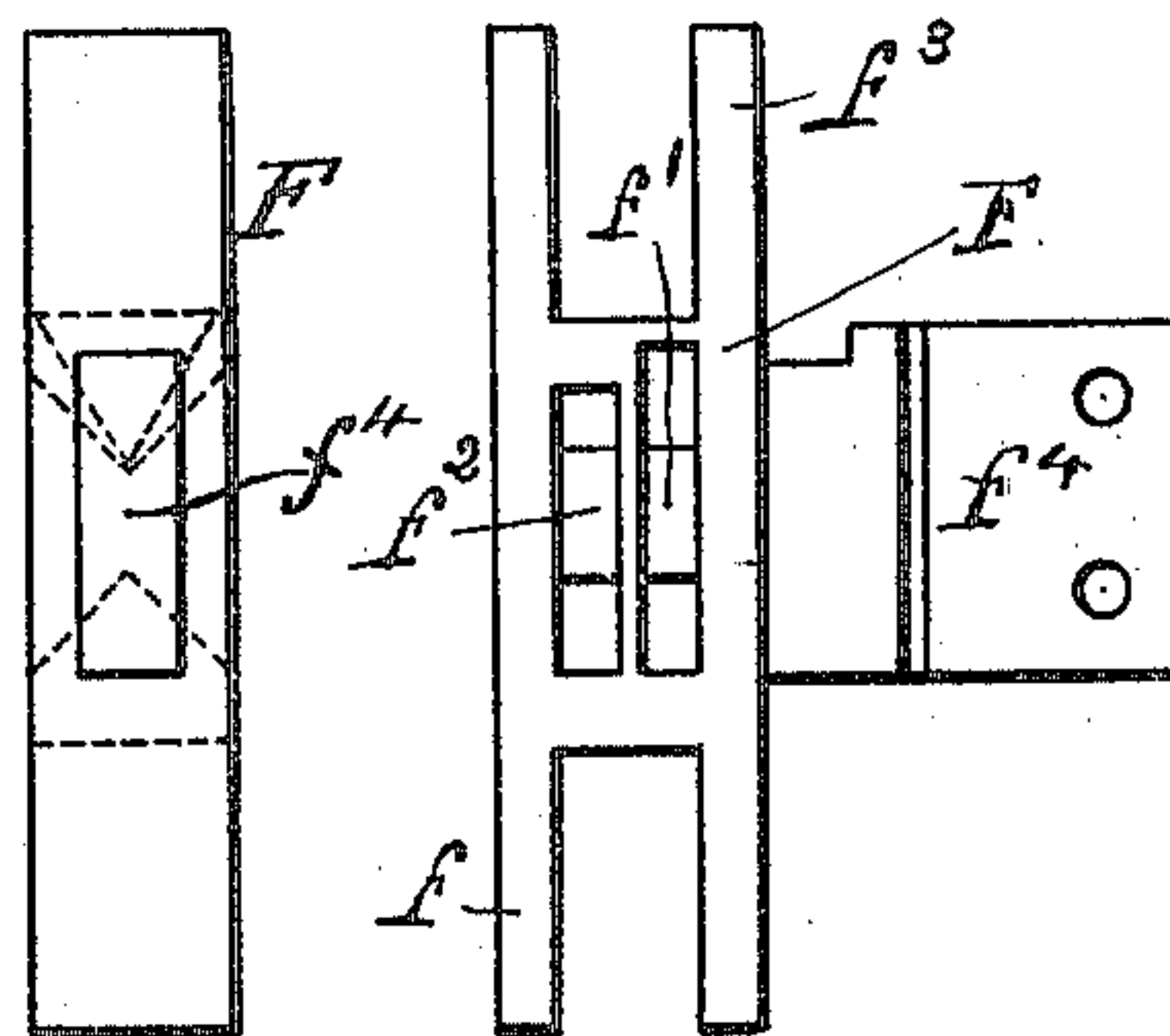


Fig. 4.



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Fig. 5.



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(No Model.)

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Fig. 3.

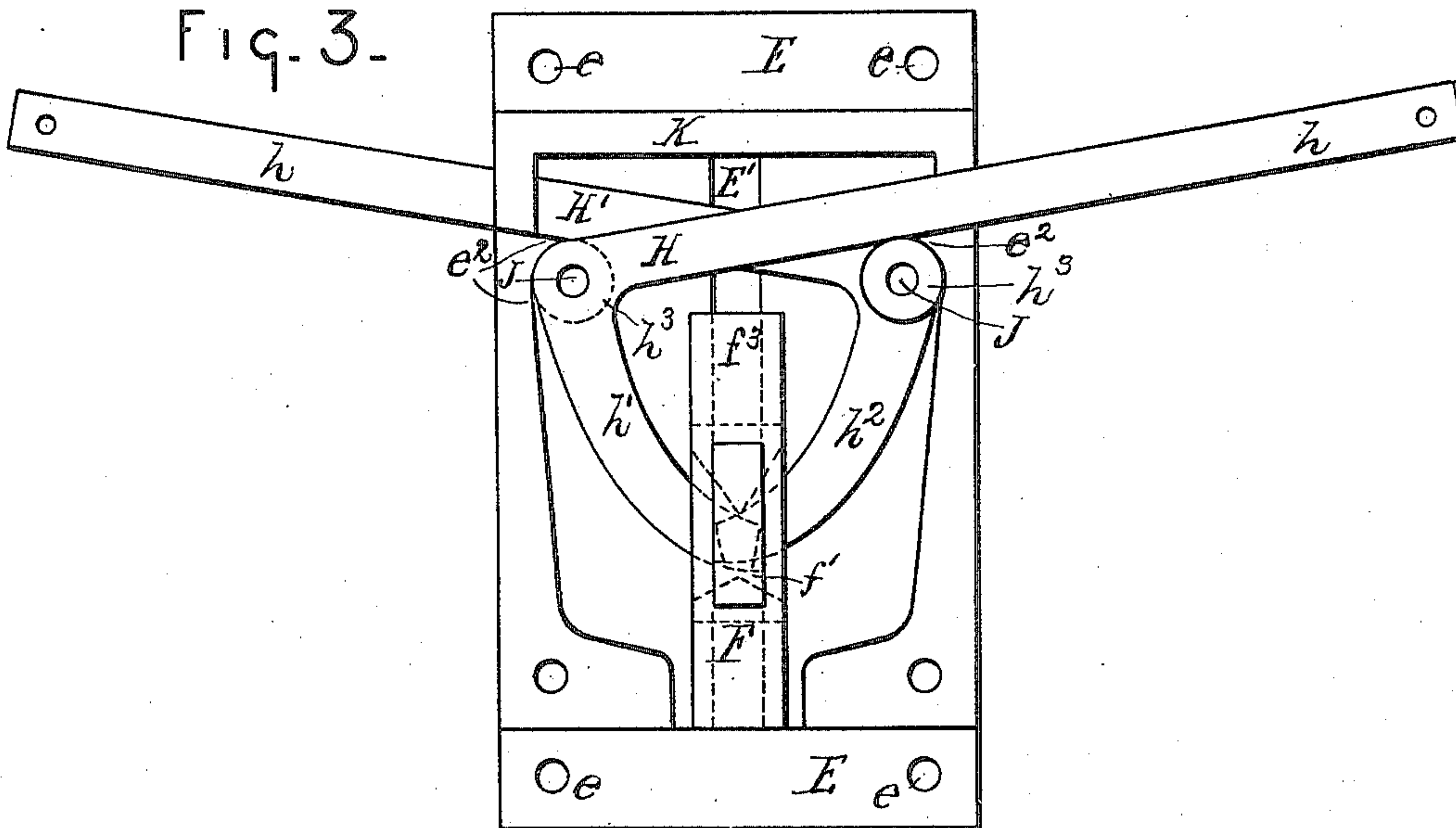


Fig. 6.

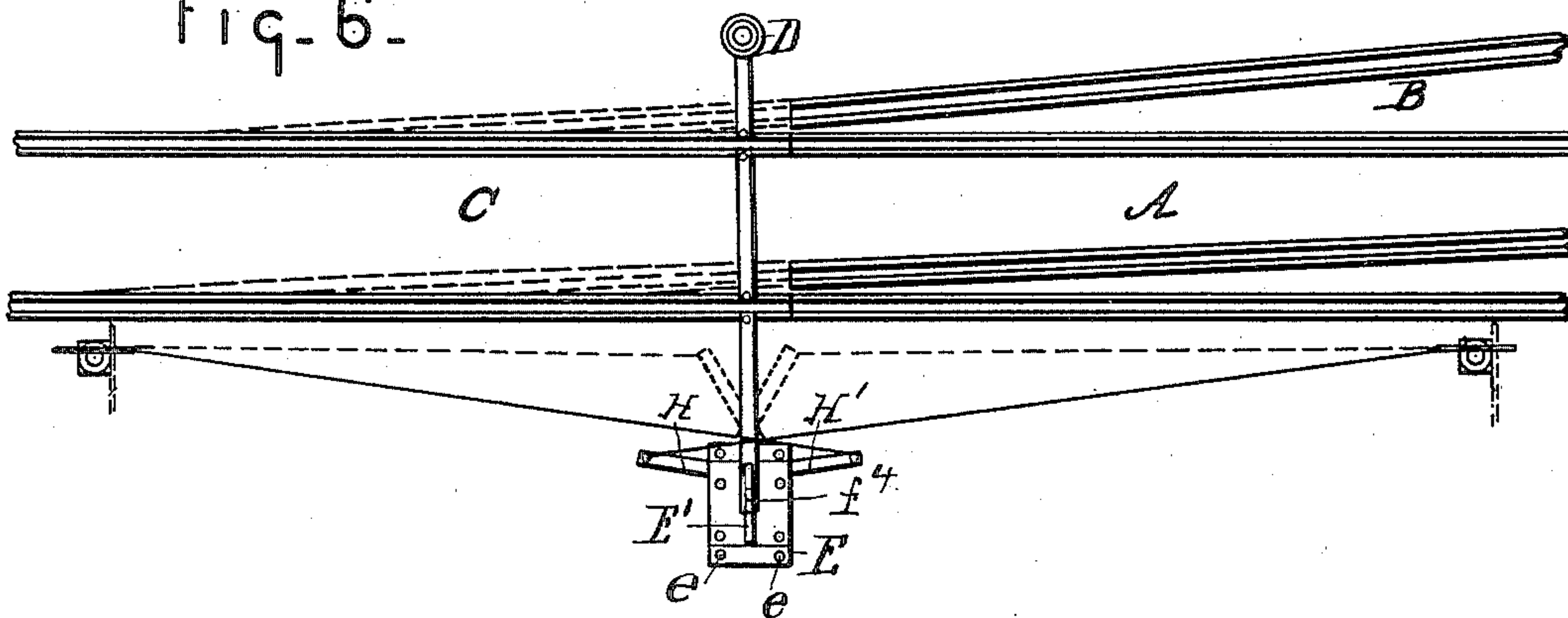
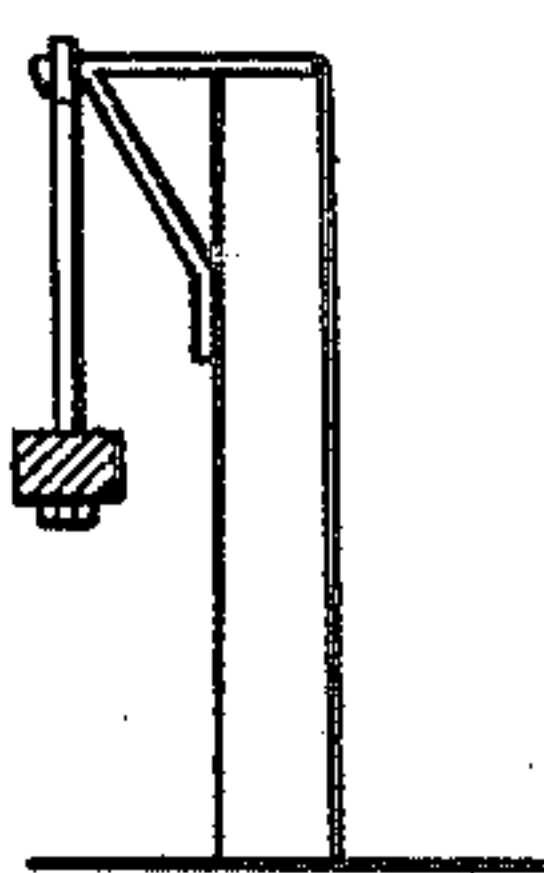
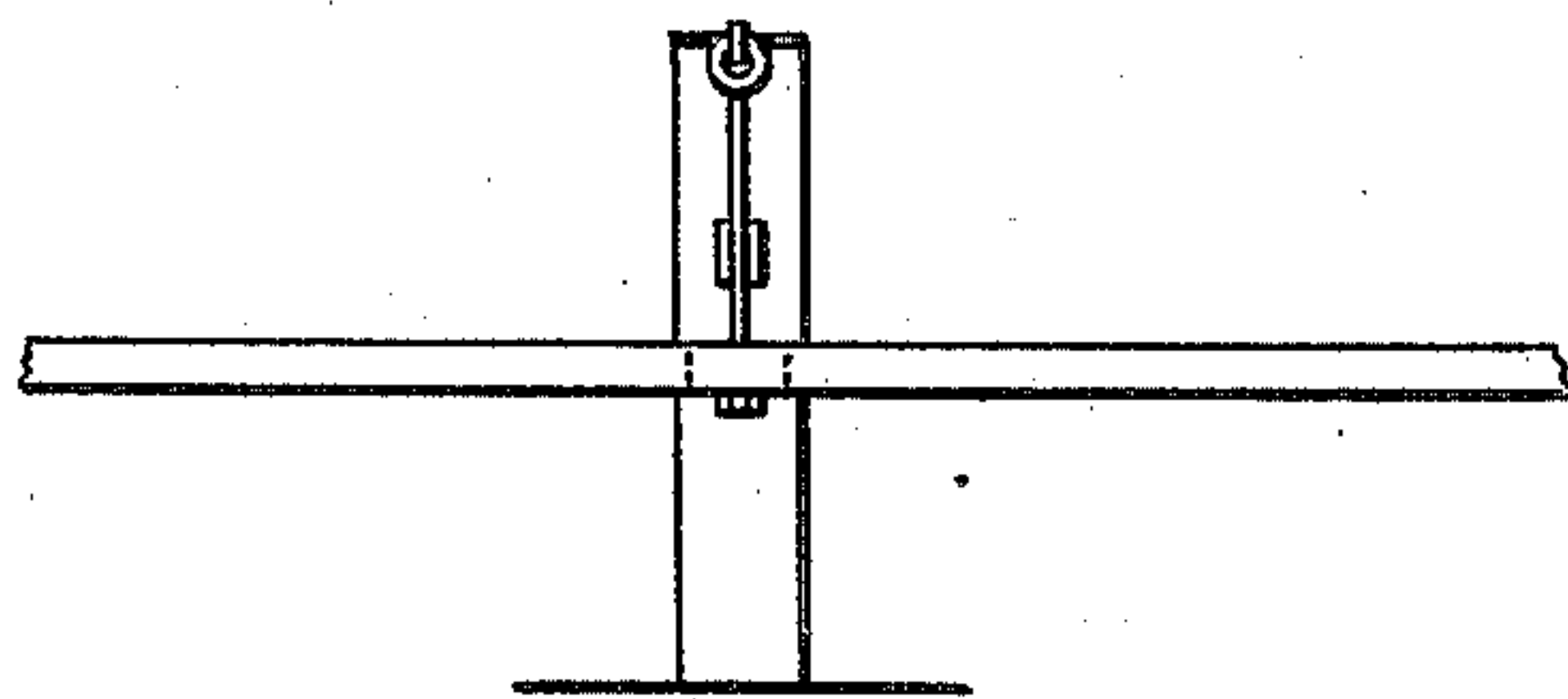


Fig. 7.



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UNITED STATES PATENT OFFICE.

NATHAN J. SMITH, OF PONTIAC, MICHIGAN.

APPARATUS FOR OPERATING SEMAPHORES.

SPECIFICATION forming part of Letters Patent No. 446,479, dated February 17, 1891.

Application filed March 14, 1890. Serial No. 343,911. (No model.)

To all whom it may concern:

Be it known that I, NATHAN J. SMITH, a citizen of the United States, residing at Pontiac, county of Oakland, State of Michigan, have
5 invented a certain new and useful Improvement in Apparatus for Operating Semaphores; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the
10 art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

It is the object of my invention to provide
15 suitable apparatus for simultaneously operating two railway semaphore-signals; and it consists in a combination of devices and appliances hereinafter described and claimed.

In the drawings, Figure 1 is a plan view of
20 my apparatus with the top covering-plate removed. Fig. 2 is a sectional view of the same on line *xx*. Fig. 3 is a plan view of a variation. Fig. 4 represents detail views of the form of actuating-block employed in the construction
25 illustrated in Fig. 1. Fig. 5 shows detail views of the form of actuating-block employed in the construction illustrated in Fig. 3. Fig. 6 is a plan view of the apparatus, showing connection with railway-track. Fig. 7 illustrates
30 the manner of supporting the connecting-rod.

In carrying out my invention I will describe the apparatus as shown in Fig. 6, where it is connected with the movable portion of a railway-track at the switch, and where the movement of this movable track, in being thrown
35 from the main track to the side track, or vice versa, operates, through the medium of my apparatus, to move the semaphores.

A represents the main track, and B the side
40 track.

C is the movable section of track, and D the switch-stand connected with this movable section and operating the same.

E is a suitable base-plate for my apparatus.
45 This may be anchored in any suitable manner, as, for instance, by the bolts *e*. On the upper face of this base-plate is a groove E', Figs. 1, 2, and 3.

F is a suitable block having an extended
50 bearing *f* at the base which fits in the groove

E'. This block is adapted to slide along this groove. In this block, as shown in Figs. 3 and 5, are two horizontal openings or slots *f'* *f*². The upper portion of the block has an extended bearing *f*³, which rides in a groove
55 *g* of the cover-plate G. This cover-plate is also provided with a slot *g'*. Extending from the top of the block F through this slot *g'* is a suitable projection *f*⁴. Instead of the slots *f'* *f*², the block F may be provided on opposite
60 sides with lateral projections *f*⁵, one of which is cut away on its upper side and the other on its lower side to form diagonal shoulders *f*⁶, Figs. 1 and 4, for engagement of the
65 projections *h*⁴ on the arms *h'* *h*², Fig. 1.

H H' are the actuating-levers. These levers are shaped substantially in the form of a bell-crank lever, the long arms *h* extending
70 out from between the base-plate E and cover-plate G.

As shown in Fig. 1, the short arms *h'* *h*⁴
75 and *h*² *h*⁴ project inward and engage the shoulders *f*⁶ on the projections *f*⁵ of the block F, Figs. 1 and 4, while in the construction shown in Figs. 3 and 5 the arms *h'* *h*² are adapted to
80 engage the horizontal orifices or slots *f'* *f*², the arm *h'* entering the slot *f'*, while the arm *h*² enters the slot *f*². Thus as the block F is moved along the base-plate it carries with it
85 the short arms of the levers, and thus actuates the long arms. As will be observed, each of the levers H H' has at its fulcrum the bearing or projection *h*³. When in position, this bearing or projection on the lever H bears
90 upon the base-plate and raises the lever, so that the arm *h'* can enter the slot *f'*, while in the lever H' the lever rests directly on the base-plate, while the bearing or projection *h*³, bearing on the cover-plate, holds the lever
95 firmly in position.

If desired, the pivots J may be in the form of bolts and be utilized to bind the base-plate and cover-plate together; or, if desired, other bolts might be used and these pivots be used
100 for that purpose alone. It will thus be seen that by connecting the projection *f*⁴ with the movable section of track the movement of the track will operate to slide the block along the base-plate, and thus operate the long arms of the levers H H'. These levers, being con-

nected by cables or otherwise with the sema-
 phores, will operate the latter at every move-
 ment of the switch. In practice I prefer to
 attach the cables which connect with the
 5 semaphores, as shown in Fig. 6, so that on the
 movement of the block F in retracting the
 levers and exerting a tension on the cables to
 move the semaphores the heaviest work comes
 on the levers at the end of their stroke. Thus
 10 as the block F is started back and the levers
 begin to exert a tension they begin to take
 the slack out of the cables, and by the time
 sufficient tension has been exerted to begin
 to operate the semaphores the levers have
 15 reached the position shown by the dotted
 lines in Fig. 6, and the heaviest part of the
 strain on the levers comes when they are
 nearly parallel with the cable on which they
 are exerting the tension, thus making it much
 20 easier to operate the cables than as though
 the heaviest strain came upon the levers when
 in their outer position.

In order to relieve the pivots J from as much
 strain as possible, I provide upon the sides
 25 of the base-plate the projection e^2 , against
 which the bearings or projections h^3 of the
 levers may bear as the strain comes upon the
 levers.

In Fig. 3 is illustrated a variation in the
 30 form of my apparatus, in which the project-
 ing portions h^4 of the arms are omitted.

A difficulty has heretofore been experienced
 in this style of apparatus in which the sema-
 phores have been connected directly with the
 35 switch, from the fact that the expansion and
 contraction of the cables used to connect the
 semaphores with the switch have interfered
 with the proper operation of the semaphores.
 In order to obviate this expansion and con-
 40 traction, I connect the semaphores with the
 switch by a wooden rod, suspending this rod
 at intervals by suitable chains, ropes, or the
 like, as illustrated in Fig. 7, so that the rod
 may have a suitable amount of longitudinal
 45 motion and yet be freely supported without
 friction.

As the block or plunger F, (shown in Fig. 1)
 is moved in a direction toward the bottom of
 the figure, it would impinge on the arms h^4
 50 and so operate to throw the semaphores in a
 direction across the track. On the return mo-
 tion, however, the weight upon the semaphore
 will act through the medium of the connect-
 ing-rods or cable to keep the arms h^4 snugly
 55 against the base of the block until the sema-
 phore-arms are in a vertical position. In the
 different construction shown in Figs. 3 and 5
 the slot in the forward end of the block F, as
 shown in Fig. 5, will permit the block to still
 60 move in the return direction after the sema-
 phores have reached their vertical position,
 the slot simply serving to embrace the arms
 h instead of causing the said arms to stop the
 movement of the block. In this way the
 65 switch-rails may be moved to the requisite

distance to bring them into their proper po-
 sition without liability of being stopped short
 of that position by reason of the block F com-
 ing into contact with the arms h or other ob-
 70 ject. So, also, in the modification shown in
 Fig. 3, where the arms h^4 are dispensed with.
 In this case the block F is simply a wedge-
 block that projects between the arms h^1 and
 h^2 and operates in all essential particulars
 the same as that shown in Fig. 4. 75

It is of course obvious that instead of op-
 erating the semaphores by means of the move-
 ment of the switch my apparatus may be util-
 ized to operate the semaphores by hand—that
 is, a suitable handle or lever may be provided
 80 on the block F, by means of which the oper-
 ator may move the block at will, and thus
 set the semaphores. This latter construction
 will be of use more particularly at railway-
 crossings, where by providing two sets of the
 85 semaphores, one for each track, and two sets
 of my operating mechanism suitable signals
 may be displayed for each track.

It will be observed that between the base-
 plate and the cover-plate is a strip or guard
 90 K, upon which the upper lever bears and
 which operates to prevent the two levers from
 interfering with each other or rubbing against
 each other.

I would have it understood that while I do
 95 not here lay specific claim to the wooden rods
 and their connections in lieu of the usual
 wire or cables for operating the semaphores,
 I regard the same as my invention.

What I claim is— 100

1. An apparatus for simultaneously oper-
 ating two semaphore-signals, consisting of
 two bell-crank levers, each having its long
 arm connected with a semaphore, an actu-
 ating block or plunger disengaged from but
 105 adapted to move in contact with the short
 arms of said levers, and means connecting
 said block with the switch mechanism, where-
 by the movement which shifts the rails is
 communicated to and caused to shift said
 110 block, substantially as described.

2. An apparatus for simultaneously oper-
 ating two semaphore-signals, consisting of
 two bell-crank levers, each having a long arm
 connected with the semaphore, and an actu-
 ating block or plunger disconnected from but
 115 adapted to move between and in contact with
 their short arms, said block adapted to move
 horizontally and engaged with a thrust-rod
 connected directly with the switch mechan-
 120 ism, whereby the movement which shifts the
 rails is communicated as a direct horizontal
 thrust, causing a like movement of the block
 or plunger, substantially as described.

3. The combination, with the bell-crank le-
 125 vers, each connected with the semaphore, of
 an actuating block or plunger disconnected
 from but adapted to move between and in
 contact with the short arms of the levers, and
 means connected with the switch mechanism, 130

whereby the movement of the switch is communicated as a thrust to said block or plunger, said block adapted by its impact against the short arms to move the semaphores while
5 thus in contact, and constructed and adapted on its return movement to move freely beyond the position it attains when the semaphores have reached their vertical position,

substantially as and for the purposes described.

In testimony whereof I sign this specification in the presence of two witnesses.

NATHAN J. SMITH.

Witnesses:

M. A. REEVE,

W. H. CHAMBERLIN.