

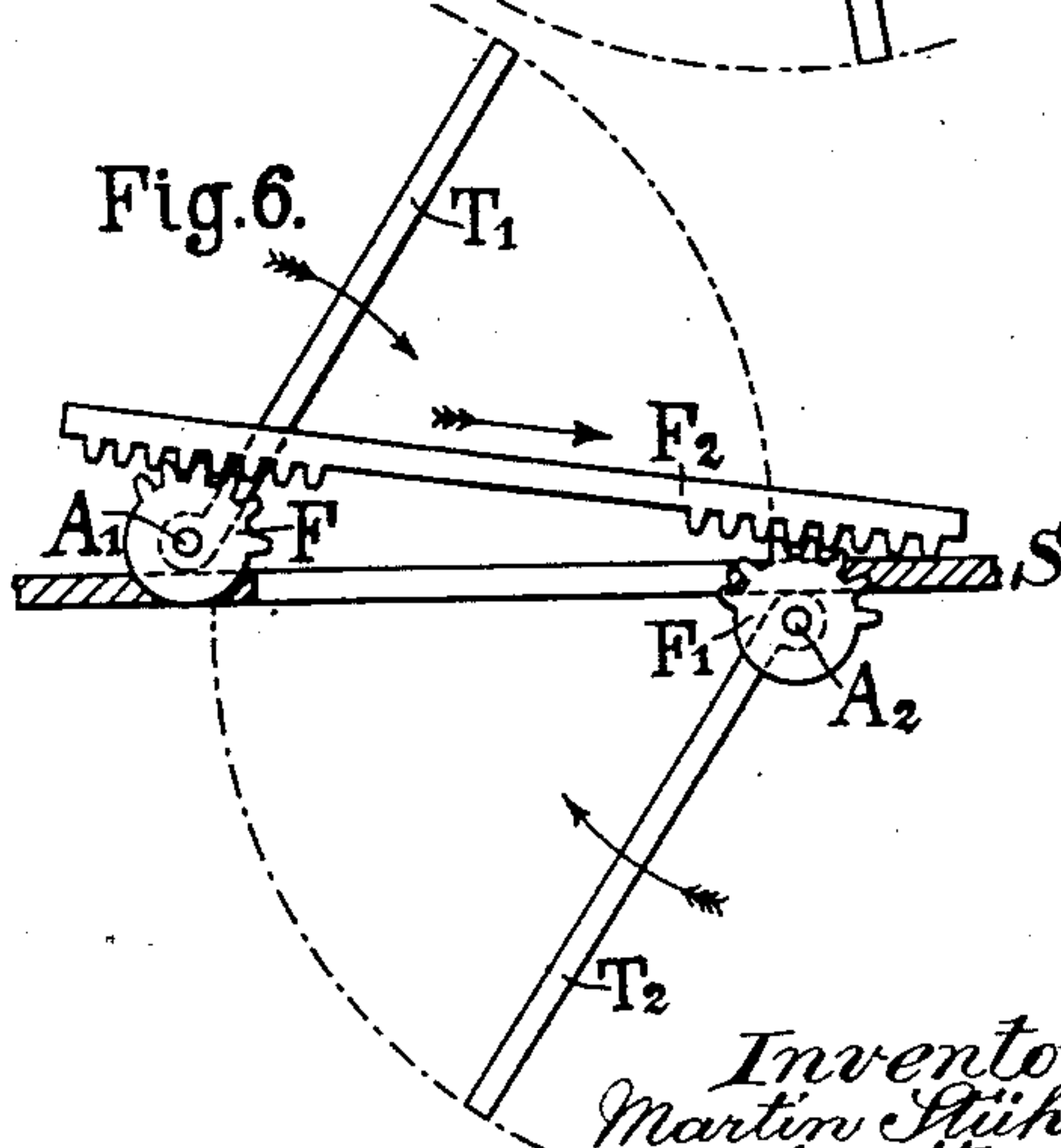
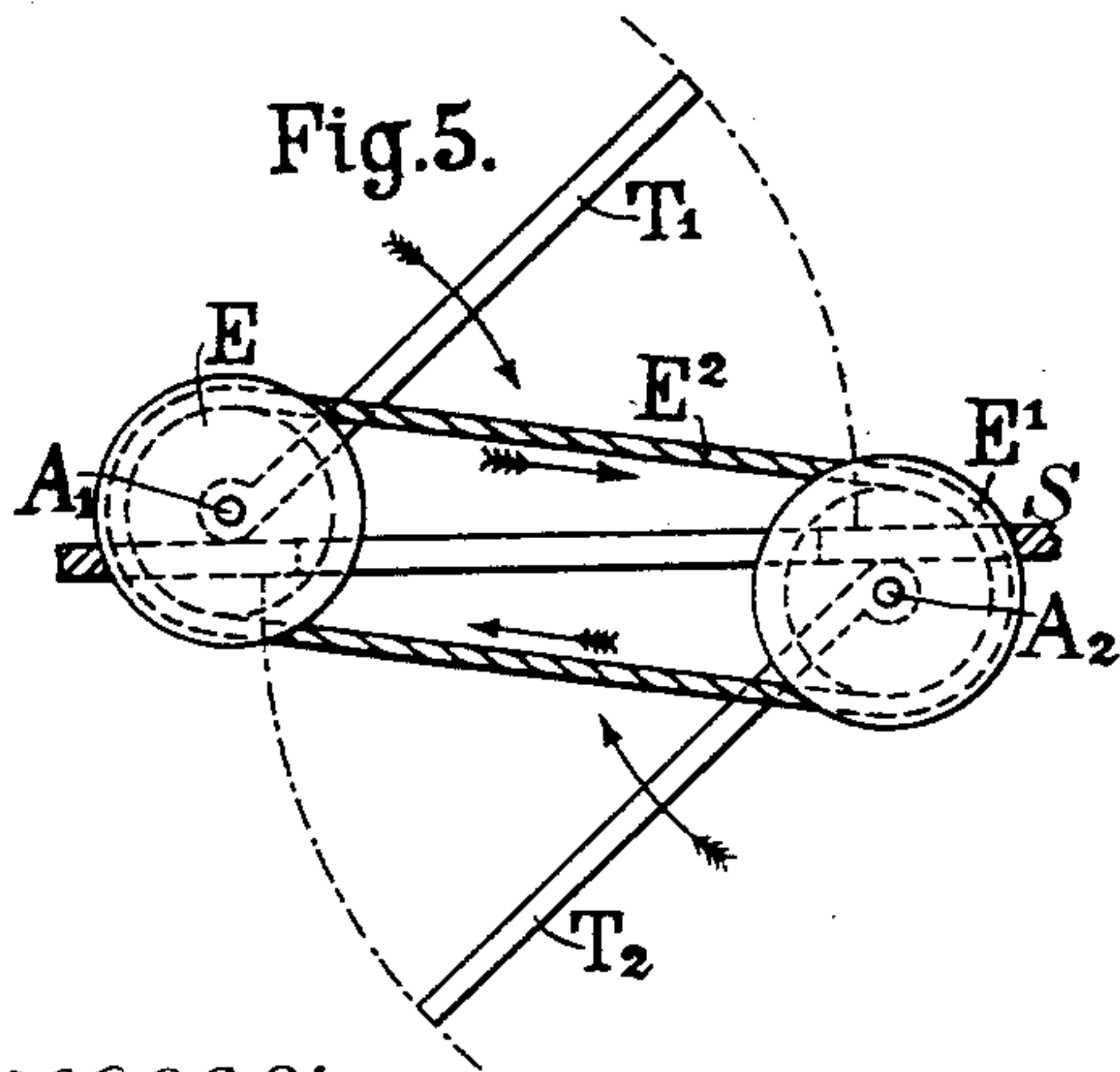
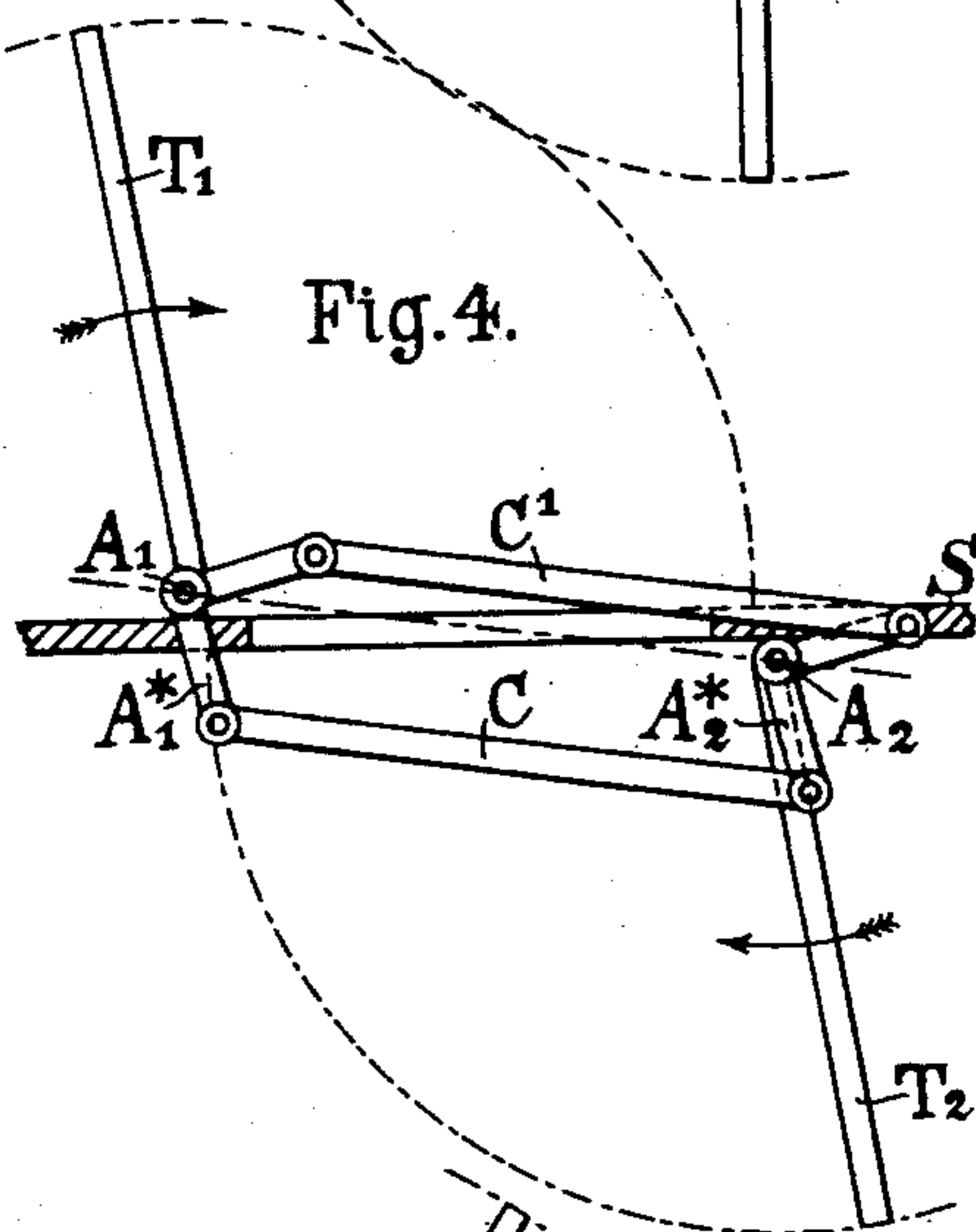
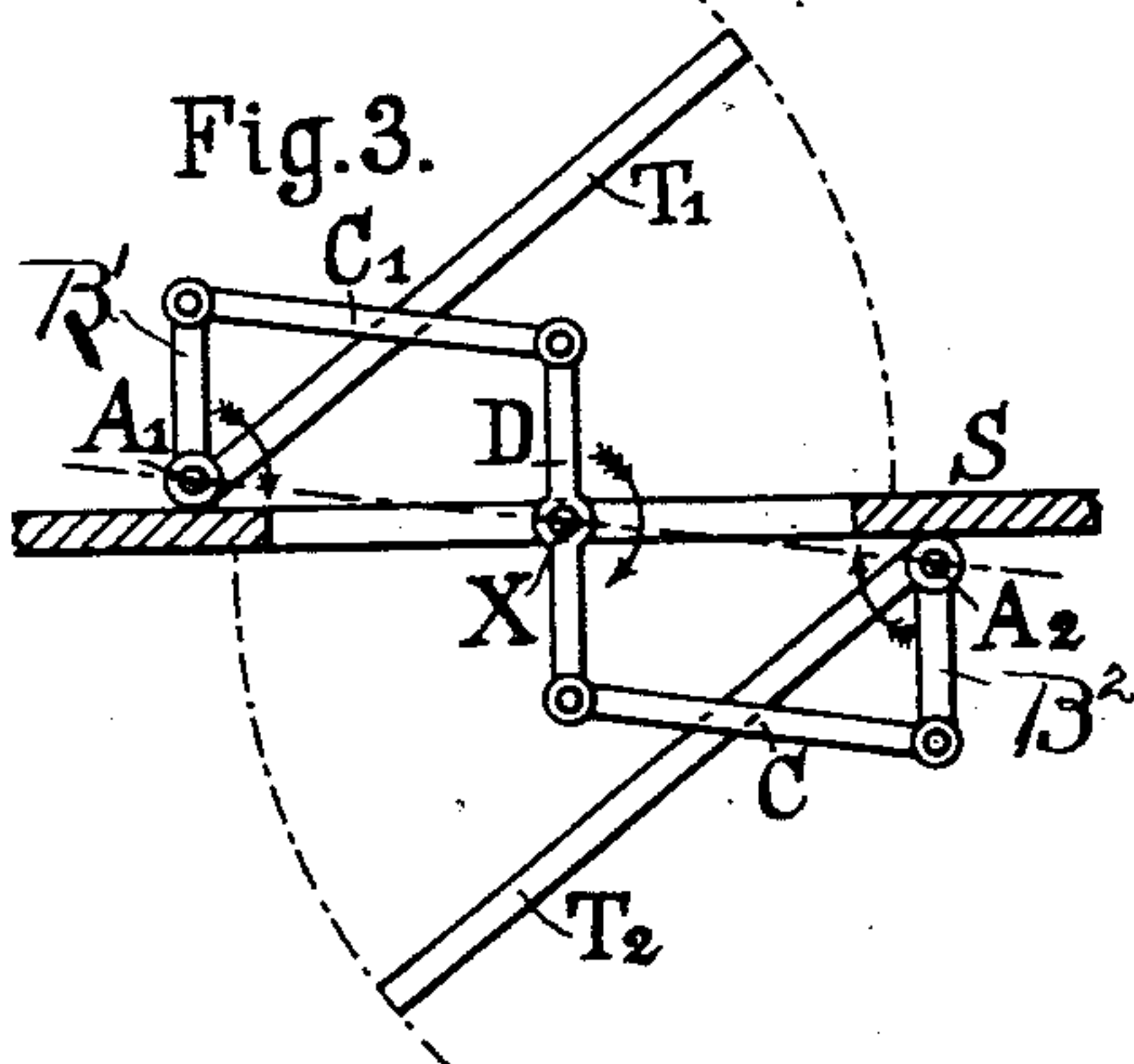
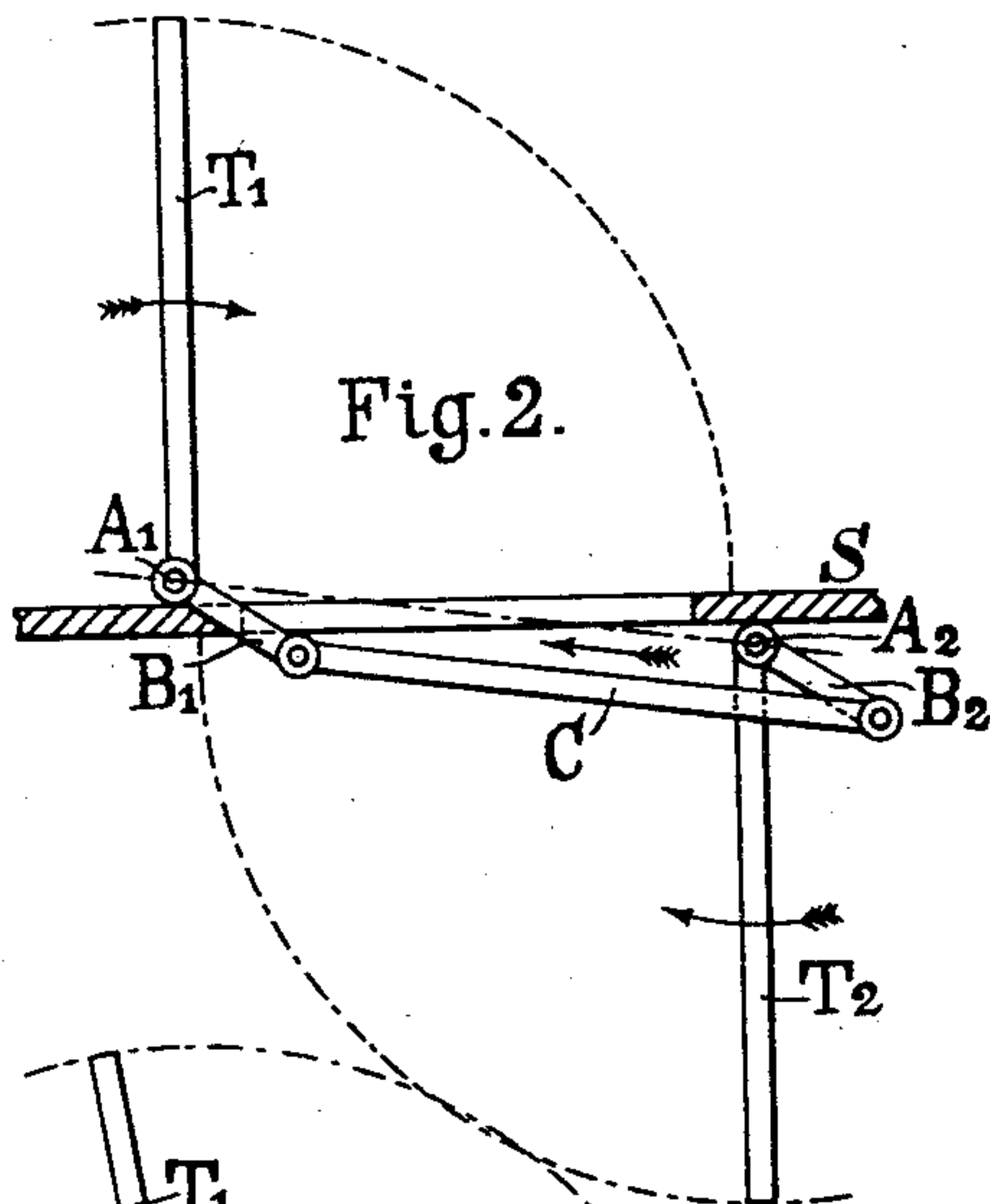
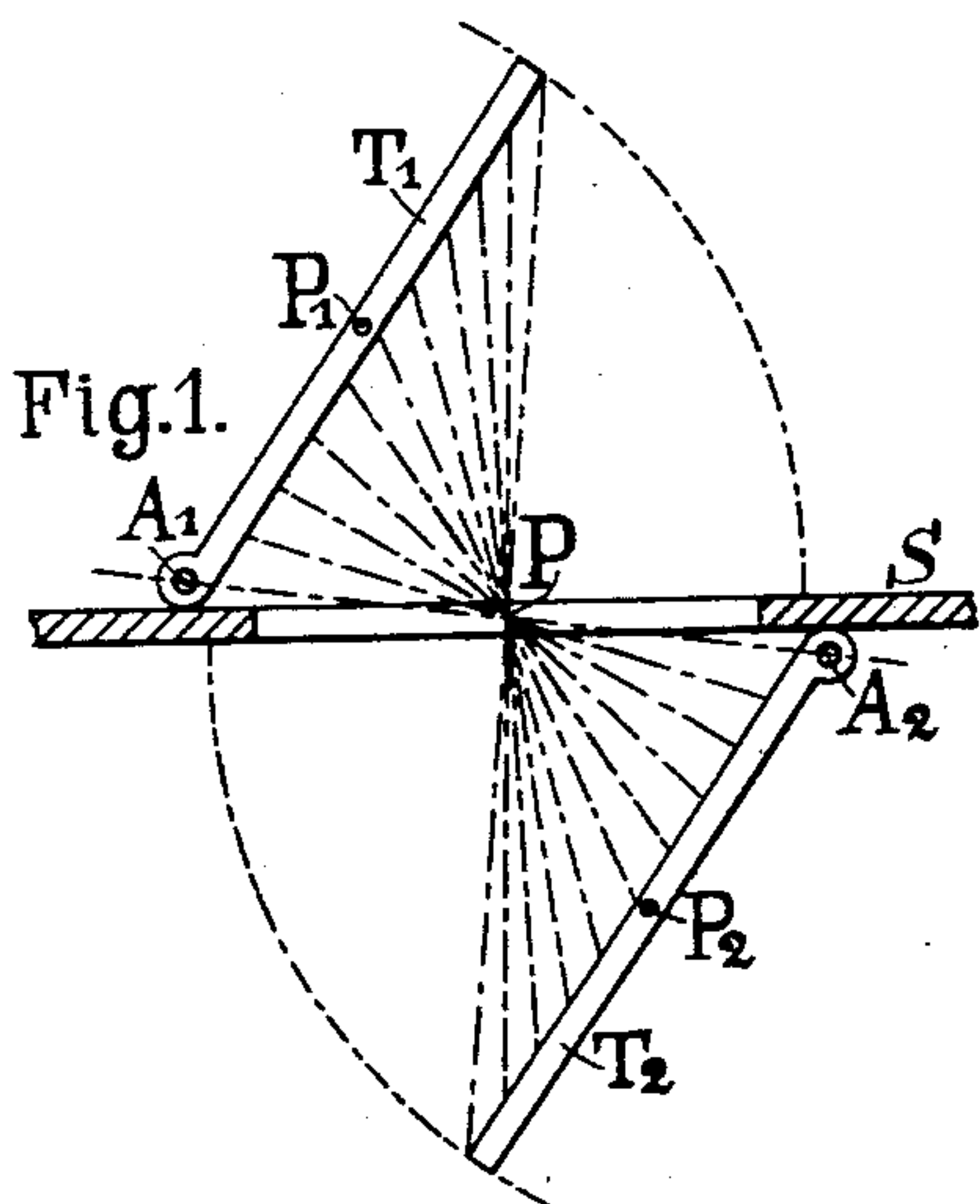
(No Model.)

2 Sheets—Sheet 1.

M. STÜHLER.
DOUBLE DOOR FOR SHIPS' BULKHEADS.

No. 541,253.

Patented June 18, 1895.



Witnesses:-
Fred Hayes
George Barry,

Inventor-
Martin Stühler
by attorneys
Brown & Leeward

(No Model.)

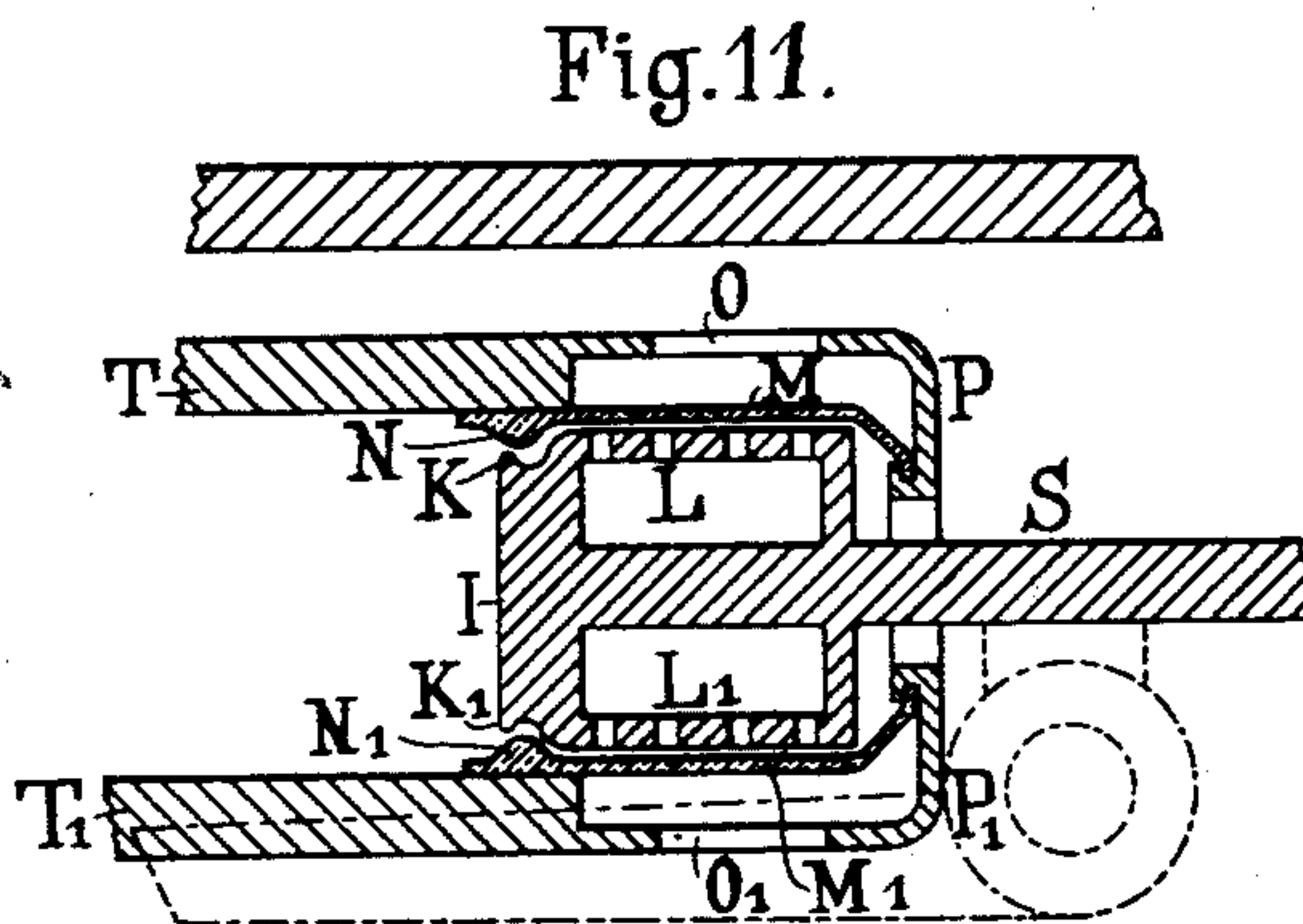
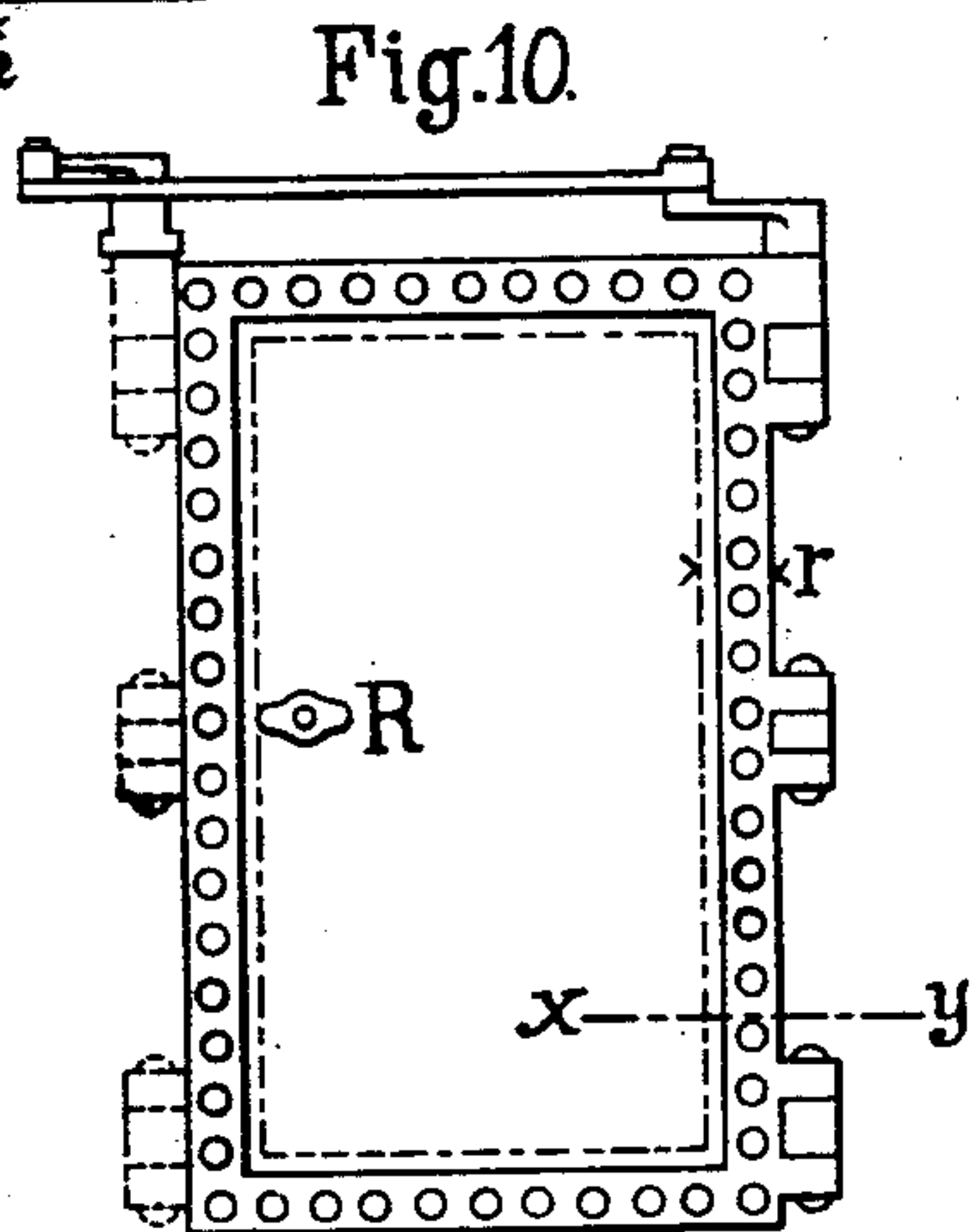
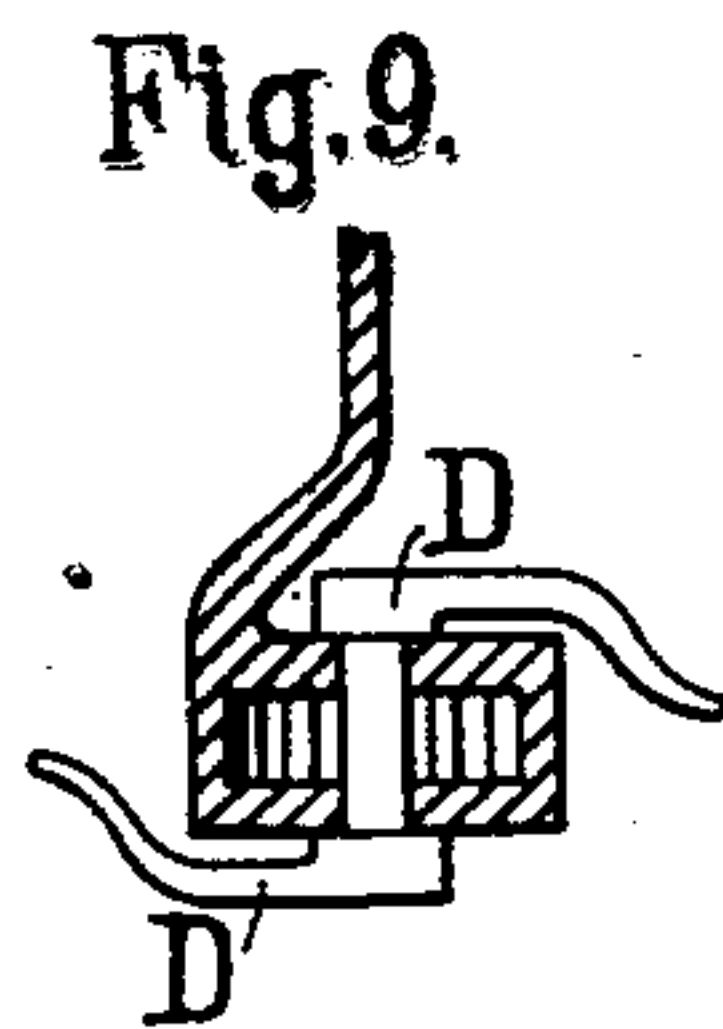
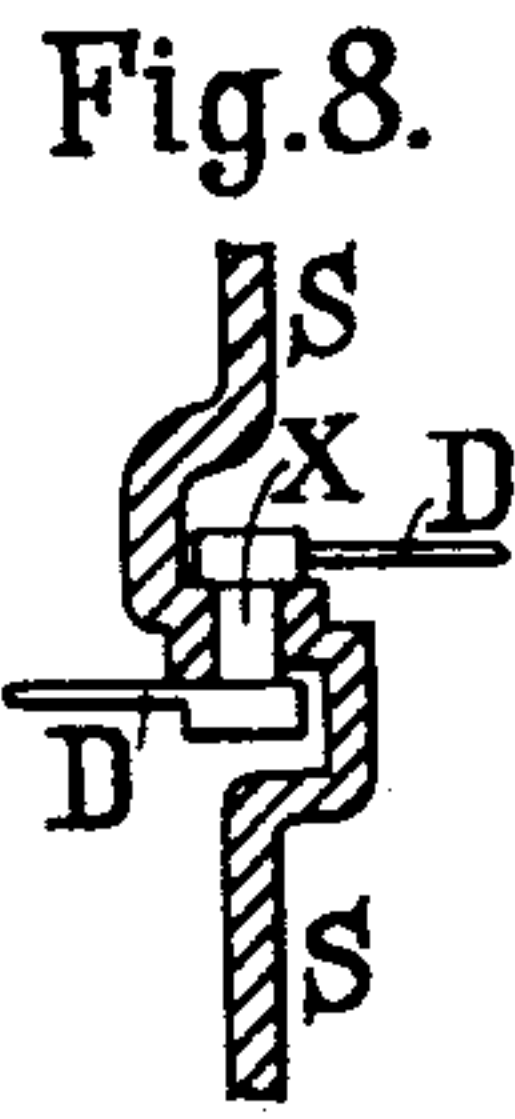
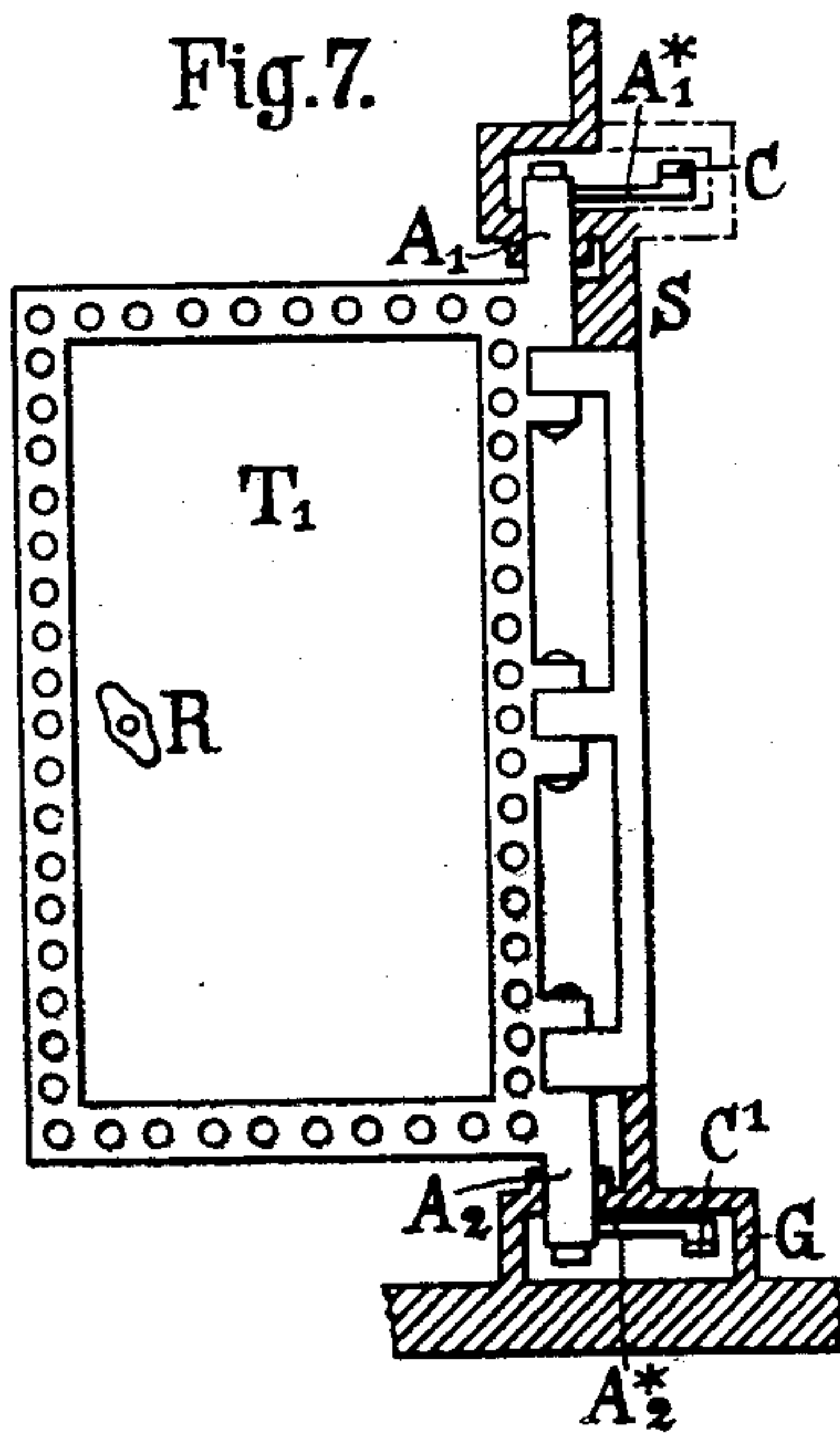
2 Sheets—Sheet 2.

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DOUBLE DOOR FOR SHIPS' BULKHEADS.

No. 541,253.

Patented June 18, 1895.



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UNITED STATES PATENT OFFICE.

MARTIN STÜHLER, OF COLOGNE, GERMANY, ASSIGNOR TO CARL THEODOR DÖRR, OF SAME PLACE.

DOUBLE DOOR FOR SHIPS' BULKHEADS.

SPECIFICATION forming part of Letters Patent No. 541,253, dated June 18, 1895.

Application filed April 5, 1895. Serial No. 544,560. (No model.)

To all whom it may concern:

Be it known that I, MARTIN STÜHLER, of Cologne, in the Kingdom of Prussia, in the German Empire, have invented certain new and useful Improvements in Double Doors for Ships' Bulkheads, of which the following is a specification.

The present invention relates to a double door consisting of two single doors, for closing passage openings of ships' bulk-heads in a water-tight manner. The two single doors, of which there is one on either side of the wall of the bulk-head, and of which each door is designed to close the entire area of the opening, are connected together in such manner that when one or the other door is closed, either automatically or by hand, the other door will also be closed simultaneously. For this purpose the pivots of the doors are arranged parallel to each other at opposite edges of the door opening, so that the doors are always parallel to each other in their movement, and, therefore, open and close simultaneously. In order to effect a tight joint, the edges of the doors may be provided with holes and with jointing strips or valves situated behind the same, which, when the door is closed, and also if water should penetrate into the aforesaid holes, are pressed against a grating provided on the wall of the bulk-head, so that the passage of water from one bulk-head space into the next bulk-head space is completely and securely prevented.

Figures 1 to 6 are diagrammatic views representing horizontal sections of a bulk-head and plans of six sets of double doors, illustrating as many modifications of my invention. Fig. 7 represents a vertical section of a bulk-head and a face view of the door in an open condition. Figs. 8 and 9 are vertical sectional views of certain details which will be hereinafter explained. Fig. 10 is a face view of a door in its closed position. Fig. 11 represents a horizontal section, on a larger scale, in the line xy of Fig. 10.

A bulk-head S with a double door composed of two single doors T' T^2 is represented diagrammatically in Fig. 1 which shows a section taken through the pivots or hinges A' A^2 . The advantage of two single doors connected together by a suitable parallel arrangement so

as to constitute a double door lies in the fact that the imaginary center of gravity P (replacing the two centers of gravity P' P^2) of the double door will not be shifted in any position, direction, or movement of the latter, so that all rolling, pitching and oscillation of the ship has no influence on the movements of the double door. Consequently, if the double door has imparted to it a tendency, however small, to close itself, the said door will always remain closed but will allow of a convenient passage at the moment of imminent danger, and if water should enter from both sides, it acts as it were as a double valve, and indicates, by the resistance which it opposes to its being opened, the presence of water in the adjacent bulk-head space. The devices for keeping these single doors P' P^2 always parallel to each other during their motion, may be arranged at two opposite terminal points of the prolonged pivots of the doors, and may be either single or double, that is to say, they may be arranged on one side or on two opposite sides of the opening of the bulk-head door. Thus, for example, Fig. 2 shows an arrangement in which the door pivots are connected together by means of a simple parallelogram. The short sides of the latter are formed by cranks or links B' B^2 which are mounted on the door pivots A' A^2 and are connected together by means of a connecting rod C . The fourth (imaginary) side of the parallelogram passes through the centers of rotation of the door pivots A' A^2 . On rotating one of the door pivots A' or A^2 in the direction of the arrow, the connecting rod C will move in the direction of the arrow shown, and consequently both doors will be moved together into the closing position.

In the arrangement shown in Fig. 3, a perfectly equal or uniform distribution of the weight of the doors is effected by providing two connecting rods C C' which are connected respectively at one of their ends with cranks B' B^2 mounted on the door pivots A' A^2 while their other ends are connected to an intermediate lever D , the pivot X of which is situated in a line connecting the two pivots A' A^2 .

In the arrangement shown in Fig. 4, the cranks are replaced by bent levers A^* A^{*2} having arms at right angles to each other,

the free ends of which are connected together by means of the two connecting rods C C'. By employing a right angle in the levers A* A² a dead point is obviated.

5 In the arrangement shown in Fig. 5, the door pivots are provided with pulleys E E' around which passes an endless rope or chain E², while in Fig. 6, the pulleys are replaced by toothed wheels F F', and the endless rope
10 or chain is replaced by a toothed rack F² engaging with the said wheels.

The attachment of the door with the above described closing devices to the bulk-head wall is shown in Fig. 7, in which the door is
15 shown in the open position. In this case the two door pivots A' A² are carried in a watertight manner through the suitably bent bulk-head wall S, and the links A* A² and connecting rods C C' are contained in a box G
20 into which the prolongation of the door pivot A' or A² extends. In the arrangement of door shown in Fig. 3, the pivot X of the intermediate lever D may be carried through the bulk-head wall S as shown in Fig. 8, and the
25 connecting rods C' C² are attached to the ends of the intermediate lever on both sides of the bulk-head wall. The said pivot X of the intermediate lever D may also be carried through a spring box (Fig. 9), the spring in
30 which is connected to the pivot and has a constant tendency to close the double door. The said spring may obviously be replaced by any other desired motive power which acts in the direction of the arrows in Figs. 2
35 to 6, upon any suitable point in the door or in the connecting rods, &c.

In the case of double doors arranged in the deck of the ship and situated in a horizontal position when closed, the upper single door
40 is made heavier, so that when the door is closing the arc-shaped path of the center of gravity of the door will facilitate a rapid closing of the same.

Each single door covers the bulk-head wall
45 S on all four sides of the door opening for the width of a strip r , Fig. 10, upon which jointing devices are arranged in a suitable manner. These jointing devices, which are arranged around the whole of the door, or
50 around the door opening, may be variously constructed. Thus, for example, as shown in Fig. 11, which is a horizontal section on the line xy of Fig. 10, they may consist of a box

or casing I provided on the bulk-head wall, and the sides of which situated opposite or
55 facing the doors are formed by a fillet K or K' and a grating L or L' while strips M M' with bulges N N' are fixed to the end and to the commencement of the door. These strips are situated behind the protective boxes P
60 P' (provided with holes O O') of the doors T T', and bear, when the latter are closed, upon the gratings L L'. Now, as soon as water penetrates into that compartment of the ship, it flows through the holes O O' and presses
65 the strips M M' against the gratings L L'. Should the pressure of the water rising in the compartment and acting against the door become much greater, the bulges N N' on the strips M M' of the door (which may possibly
70 be somewhat on the skew) bear behind the ribs or fillets K K' (provided on the edge of the bulk-head wall) whereby a tight joint is effected independently of the joint formed by the strips M M'.
75

The doors may be provided with movable handles R which when the doors are closed, serve to effect a locking or bolting of the latter in an automatic manner.

What I claim as my invention is—

1. A double door for ships' bulk-heads consisting in the combination of two single doors respectively situated on the two sides of the bulk-head wall and pivoted at opposite edges of the door opening, and means substantially
85 as herein described for connecting the said doors together in parallel relation with each other whereby both open and close simultaneously, substantially as described.

2. The combination with the double door
90 and the connections whereby the two single doors are made to open and close simultaneously, of jointing strips at the edges of the single doors, said strips being adapted, when water penetrates into the several compart-
95 ments of the ship, to become pressed against grating-like openings provided along the edge of the opening in the bulk-head wall, substantially as set forth.

In testimony that I claim the foregoing as
100 my invention I have signed my name in presence of two subscribing witnesses.

MARTIN STÜHLER.

Witnesses:

FRITZ SCHRÖDER,
MARIA NAGEL.