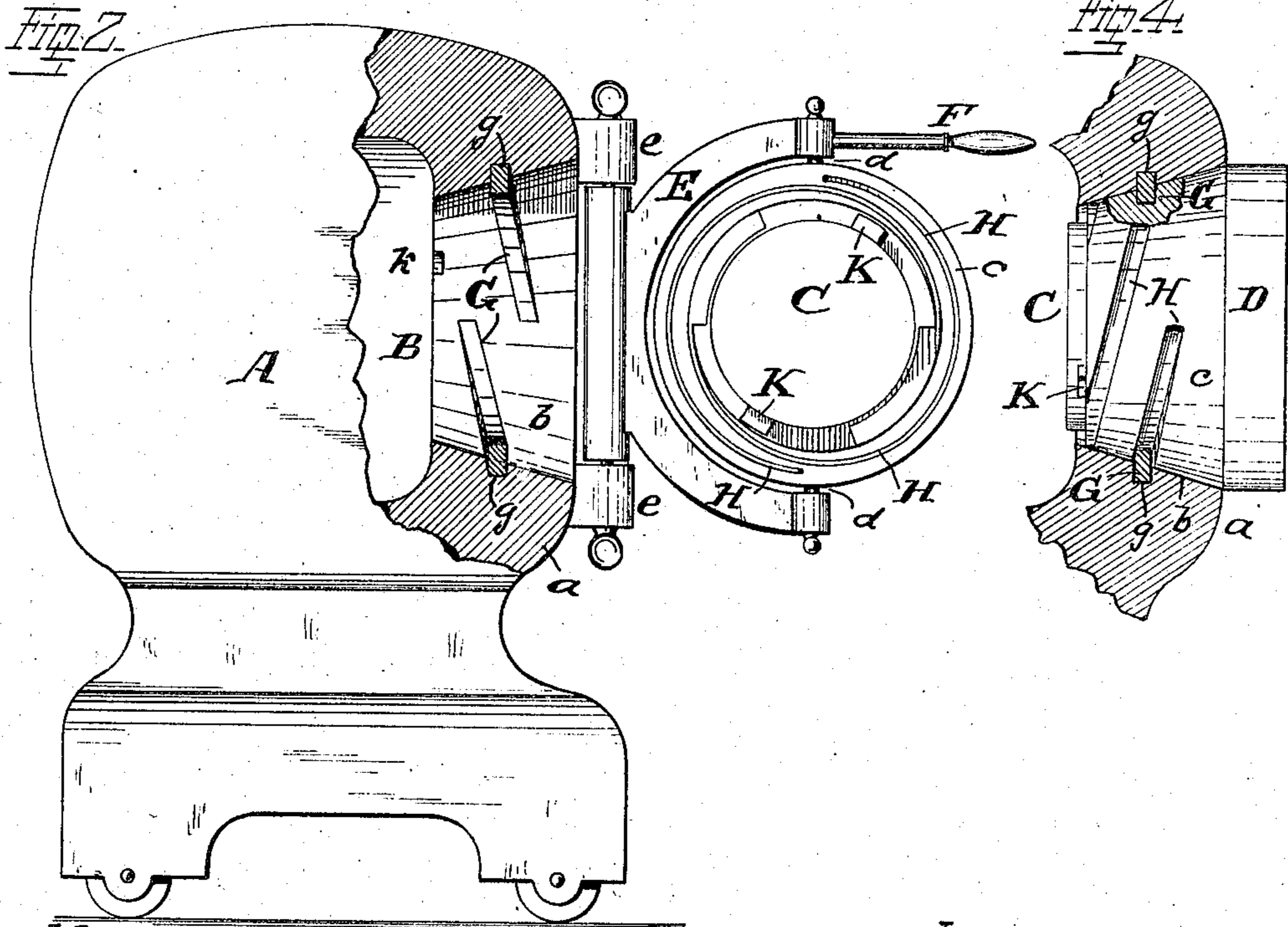
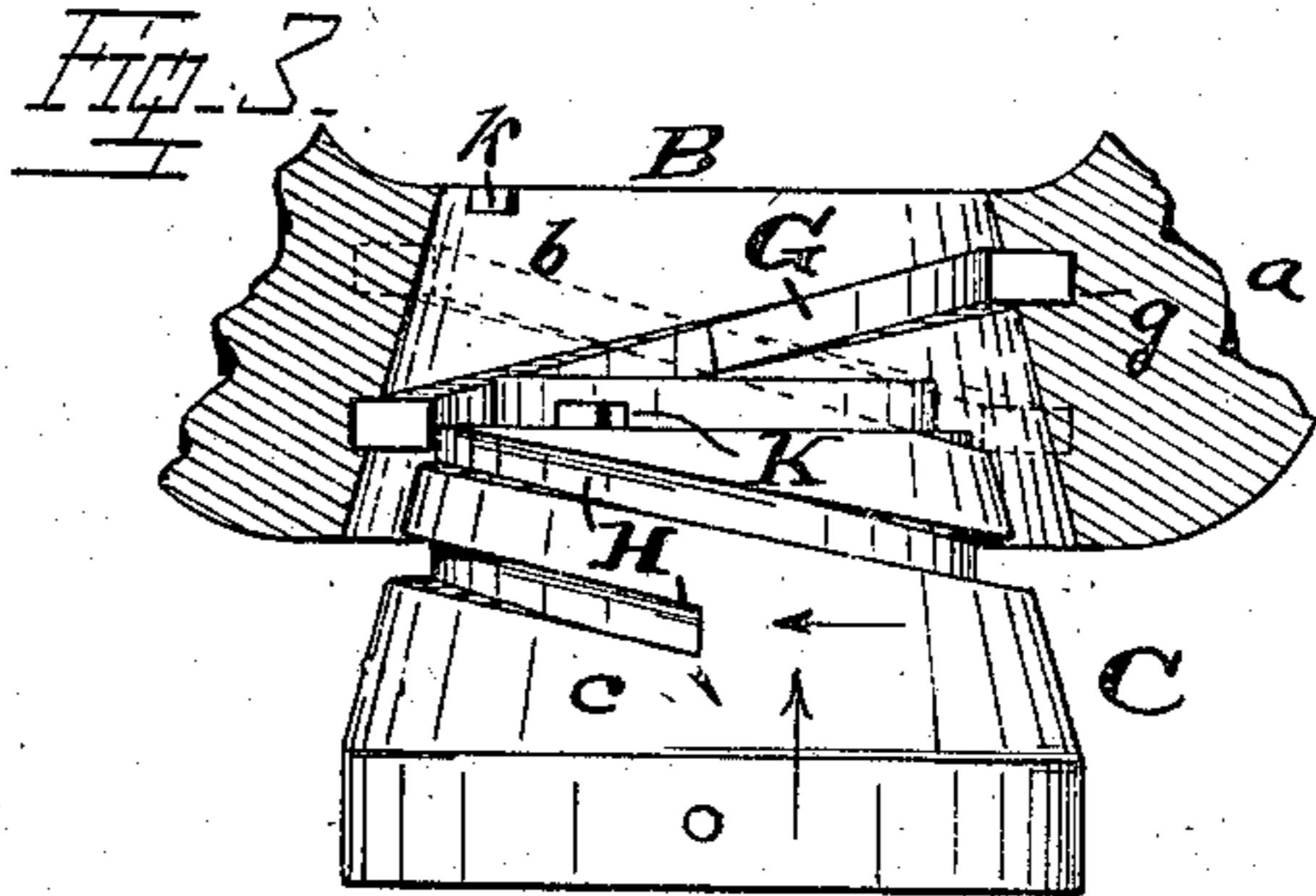
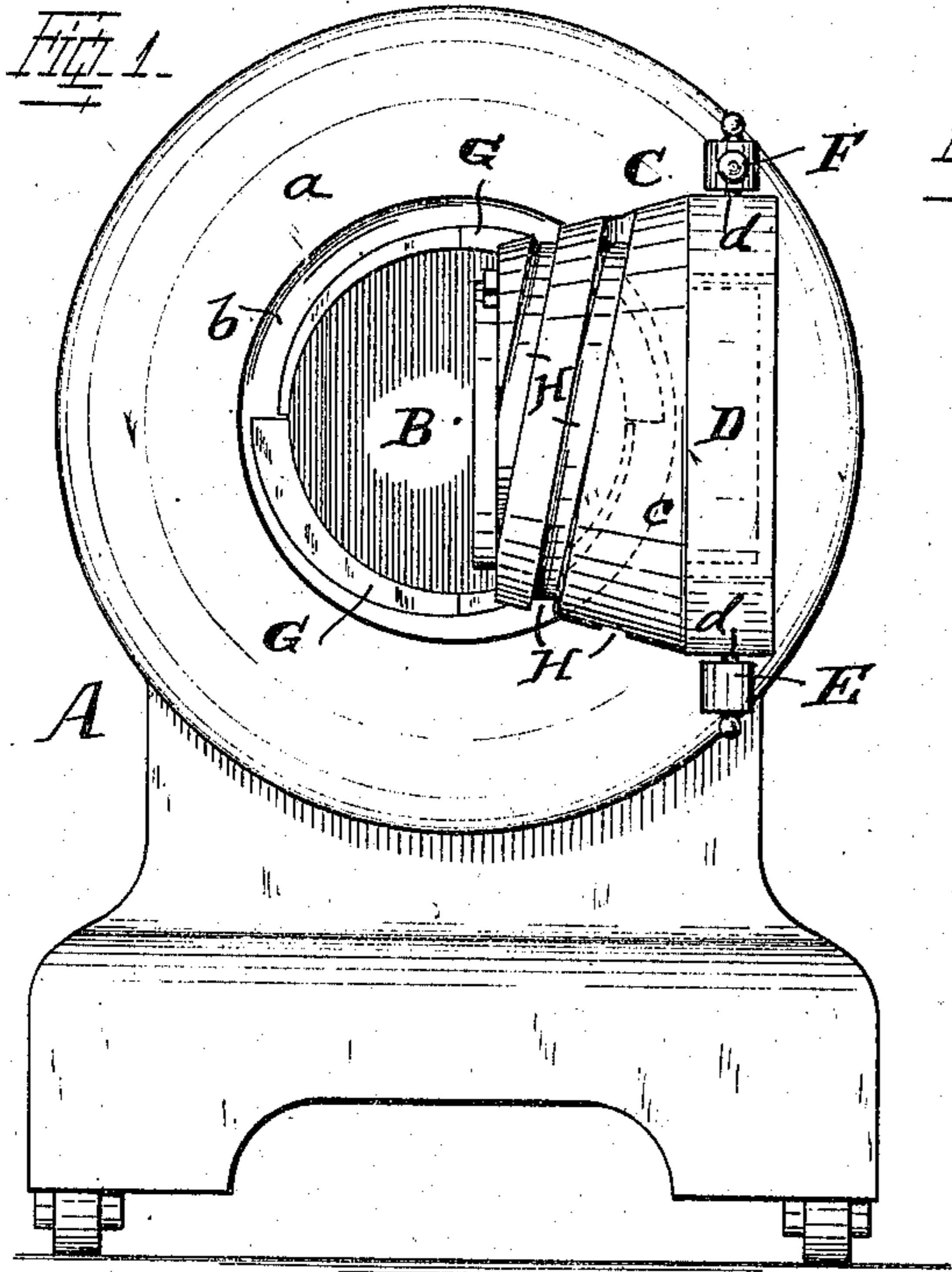


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SAFE CLOSING MEANS.
APPLICATION FILED MAY 8, 1908.

905,180.

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SAFE-CLOSING MEANS.

No. 905,180.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE A. HATTERSLEY, a citizen of the United States, and residing at Norwood, Hamilton county, State of Ohio, have invented certain new and useful Improvements in Safe-Closing Means; and I do declare the following to be a clear, full, and exact description of the invention, attention being called to the accompanying drawing, with the reference characters marked thereon, which form also a part of this specification.

This invention relates to improvements in the construction of means for holding the door of a safe seated in closed position within the opening provided for it in the front-wall of the safe-body.

It provides a construction for such conditions where a round door with a tapering edge is used and fitted to seat in a circular door-opening which has a correspondingly tapering door-jamb, and where a screw-connection is provided to hold the door in its seated position, the complementary parts of the screw-connection being provided on the tapering surfaces of door and jamb respectively.

Rotation of the door is resorted to for the purpose of so seating it, after which, when fully in position within the door-opening, bolts, carried usually by the door, operate to enter complementary sockets provided for them whereby rotation of the door in reverse direction, necessary to open it, is prevented and the same becomes securely locked in position, so that it cannot be opened thereafter, unless the bolts are first withdrawn. The manipulation of the bolts for such purpose may be controlled by combination or by time-locks, but this feature has no bearing on my invention. Conditions as outlined are usually found in so-called screw-door-safes, and my invention may therefore be considered as concerning improvements in this type of safes. It is obvious under the conditions named, that a sharply defined relation must exist as to the position of the bolt-sockets and as to the complementary parts of the screw-connection so that, when the door is fully received into its seat, it is also in position which brings the ends of the bolts carried by it exactly opposite their sockets, that is to say the screw-connection

must operate so as to move the door to this position, otherwise the bolts cannot enter these sockets for locking. This presumes a perfect fit of the parts concerned which can only be attained by accurate and minute adjustment between them. The construction and arrangement of the screw-connection must therefore be such that such adjustment may be had and is possible at the time when the safe is manufactured and by preference also at any time thereafter, so that the relation between the adjusted parts may be maintained when continued use and wear cause the door to come to a seat in a position which varies more or less from the position to which it was originally adjusted. Otherwise, as is obvious, a slight change in the extent of its rotation, which would cause it to come to a stop sooner or later, is sufficient to prevent proper registration of the bolt-ends with their sockets and renders their engagement impossible. My invention provides a construction whereby this adjustment may be readily obtained when the safe is constructed, and which may also be maintained thereafter. My invention provides furthermore possibility of carrying it out in a practical manner, when both safe-body and its door are made of non-machinable metal, like manganese steel for instance, a metal which cannot be worked otherwise except by grinding. This means that the screw-threads to be provided on the tapering surfaces of body and door must also be produced by grinding and the tools available for this purpose are of a character which limits the manner under which these threads may be formed in the tapering surfaces on which they are provided to a particular procedure.

In the following specification and particularly pointed out in the claims at the end thereof, will be found a full description of my invention, together with its parts and manner of construction, which latter is also illustrated in the accompanying drawing, in which:—

Figure 1, shows in front-view a customary safe with its circular door open. Fig. 2, is a side-view of the safe shown in the preceding figure with parts partly broken away. Fig. 3, is a horizontal section of the front-wall of the safe-body and taken through the center of the door-opening therein, the door

being shown in the act of entering the opening, it having about sufficiently passed in and is now in position for rotation to engage the screw-connection. Fig. 4, is a similar section of the same parts except that it is taken in a vertical plane and shows the door fully seated.

In the drawing, A represents the safe-body, and *a*, is the front-wall thereof.

B is the circular door-opening within this front-wall. The surface of this latter which surrounds the opening, and forms the seat for a door is shaped to form a tapering jamb *b*.

C, is the circular door fitted to this opening, its edge *c*, being tapering and fitted to seat against the tapering jamb *b*, within the opening. This door is carried in a ring or circular frame D, in which it is supported for rotation in a manner customary in screw-door safes. The ring hangs between vertically aligned trunnion-bearings *d*, formed on the usual crane-frame E, which is supported by hinges *e*, on the front-side of the safe-body.

The door, for opening or closing, is manipulated by a handle F, on the crane-frame whereby it is swung to or from its opening. For holding the door to its seat in this opening, I provide a screw-connection, the complementary parts of which are provided on the tapering surfaces of the door and its jamb respectively. By preference I use a plurality of threads which are equally divided around the circumference and have shown two, which start and terminate at points diametrically opposite each other. The circumferential extent of these threads may be so that each of them passes partly or entirely around the surfaces on which they are provided. When one thread only is used it should at least pass once around the entire circumference so that the door has a screw-connected bearing all around. In the form shown, the two threads are so arranged that they together provide such a continuous bearing.

Since the tapering surfaces of the door and its jamb are closely fitted to each other by a ground joint, the door being ground into its opening, it becomes necessary to provide the projecting or male part of the thread in form of a separate member which is placed in position after the door has been ground to a seat. In the case illustrated I provide for two threads and consequently use two of these members, designated hereafter as tongues G. These tongues are immovably secured in grooves provided for them in the tapering surface of one of the engaging parts of the safe and they are of a height which causes them to project above this surface, the projecting part constituting the male-thread of the screw-connection. The projecting parts of these tongues are re-

ceived by complementary grooves in the tapering surface of the other part of the safe, which latter grooves constitute the female threads. The male thread being in the present case provided in the door-jamb, the grooves in which the tongues, forming these threads, are secured are accordingly located in the door-jamb *b* and designated at *g g*. The grooves in which these threads operate are provided in the tapering edge *c*, of the door and designated at H H. In the non-machinable metal here contemplated, all these grooves are cut out by grinding-tools and a preferable and suitable way is to form them without regard to the tapering surfaces in which they are located. That is to say, I cut these grooves as if they were to be formed in cylindrical surfaces and the tools are arranged accordingly. This results in grooves, the bottom of which follows a cylindrical surface, that is one parallel to the axis of the door and the door-opening and the sides of these grooves are perpendicular to this axis.

The tongues which need not necessarily be non-machinable metal, since after the safe is closed, they are not accessible from the outside, are substantially ring-segments shaped and curved to a screw-pitch which corresponds to the pitch of the grooves, after which they are placed in grooves *g* in the door-jamb. They are closely fitted to these grooves, and since they have to be sprung into position, they remain rigidly seated. As before stated, they project above these grooves in which they are seated, the projecting part forming the thread proper. The fact that this cylindrical thread is formed on tapering surfaces causes the depth of the grooves to vary between their ends, that is they are deepest at one of their ends and become shallower towards the other end. Observe Fig. 3. The projection of the male-threads above the jamb surface is correspondingly higher at the outer ends of these threads and decreases towards their inner ends as best shown in Fig. 1. The resulting advantage is that the deepest parts of the grooves are remote from surfaces accessible from the outside with sufficient metal left between them and the outside of the safe, to prevent impairment of the strength of the structure. When the door is screwed home, grooves H H, in it advance over the projecting part of the tongues in the door-opening, after which, when their engagement is complete, the door is firmly held in its opening against movement in an axial direction, each one of the grooves H H, being occupied by one of the tongues G G, as shown in Fig. 4.

In the manufacture of the safe the door is so fitted to its jamb that, when fully seated therein, the outer terminal of each of the threads (grooves) H H, in the door is in contact with the outer end of each of the

tongues occupying them at the time, so that further rotation of the door is positively stopped and wedging of it in its opening is prevented. In this position the ends of the locking bolts K carried by the door, two being shown, have also arrived opposite their sockets L, provided in the front-wall of the safe and are now ready to enter them. It is obvious that all these elements, viz; the two complementary parts of the screw-connection, the door and the jamb on which it seats, bolts and their sockets must properly co-act, otherwise the ends of the bolts cannot register with their sockets and locking becomes impossible. Under present conditions when the construction involves an integral male-thread, adjustment for such co-action is obtained only with many difficulties and requires much time-consuming labor by filing and by grinding to fit the parts to their exact positions. The provision of the male-thread in form of a separate insertible member which may be independently adjusted to meet the position of the door, after the same has been ground and fitted to its seat, goes far towards solving this perplexing problem. The tongues which, to facilitate insertion, are preferably each in sectional segments, two sections being used for each tongue, may be manipulated in the grooves in which they are seated, or metal may be removed at their ends, until they meet the ends of their complementary female-threads in proper position with reference to the door-seat and to the location of the bolts and their sockets. Such adjustment may be had at any time, also when, after use and wear, the original fit has been lost. The formation of the male-thread by means of such independently constructed, insertible members renders it possible to provide the complementary parts of the screw-connection on the tapering surfaces of the parts involved in the door-closure. This could not be done if an integral screw-thread as shown for instance in Patent No. 543,334, were to be formed in non-machinable metal as here contemplated, because the presence of the thread, by reason of its projection, would prevent the grinding of the door to its seat. It also dispenses with another proposed form of construction and in which the screw-connection is provided by means of added rings or segments of rings as shown for instance in Patents No. 793,072 and No. 793,132 and the reliable attachment of which rings is however quite difficult. Nor is it possible to provide these added parts in the tapering surfaces proper and it becomes necessary to extend the parts involved inwardly to increase their thickness, so that these rings may be received. I am also aware that it has been proposed to use two diametrically spaced studs which project from the jamb-surface,

to engage and to hold the door as shown for instance in Patent No. 788,325. This engagement involves however only a small part of the door-circumference and is altogether too limited to provide adequate security to hold the door in its seat. Nor is it equivalent to the engagement provided by the tongues of my construction which engage and hold the door all around and at every point of its circumference.

Having described my invention, I claim as new:

1. In a safe having a circular door-opening with a tapering door-jamb and a circular door with a tapering edge fitted to the tapering jamb with a ground joint, the tapering surfaces of jamb and of door being each provided with complementary screw-pitched grooves which, when the door is seated, are opposite each other, and tongues immovably seated in the grooves in one of the tapering surfaces and projecting above the same so as to be capable of entering and of occupying also the other grooves in the opposite tapering surface when the two surfaces are juxtaposed.

2. In a safe having a circular door-opening with a tapering door-jamb and a circular door with a tapering edge fitted to the tapering jamb with a ground joint, the tapering surfaces of jamb and of door being each provided with complementary screw-pitched grooves which in each of the surfaces are arranged supplementary to each other so as to extend circumferentially all around each tapering surface and which, when the door is seated, are opposite each other, and tongues arranged to correspondingly supplement each other so as to extend collectively completely around one of the surfaces and adapted to fill circumferentially the grooves in both of them all around their peripheries, they being immovably secured in the grooves in one of the surfaces.

3. In a safe having a circular door-opening with a tapering door-jamb and a circular door with a tapering edge fitted to the tapering jamb with a ground joint, the tapering surfaces of jamb and of door being provided each with complementary screw-pitched grooves which, when the door is seated, are opposite each other, the bottoms of the grooves following a cylindrical plane, and ring-segments which form tongues immovably secured in the grooves in one of the tapering surfaces and adapted to occupy also the grooves in the other tapering surface when both surfaces are in juxtaposition.

4. In a safe having a circular door-opening with a tapering door-jamb and a circular door with a tapering edge fitted to the tapering jamb with a ground joint, the tapering surfaces of jamb and of door being each provided with complementary screw-pitched

grooves which, when the door is seated, are
opposite each other, the bottoms of the
grooves being parallel to the axis of the door
and of its opening and have their sides par-
5 allel to each other and perpendicular to said
axis and ring-segments which form tongues
secured in the grooves in one of the tapering
surfaces and fitted to occupy also the grooves

in the other tapering surface when said sur-
faces are juxtaposed.

In testimony whereof, I hereunto affix my
signature in the presence of two witnesses.

GEORGE A. HATTERSLEY.

Witnesses:

C. SPENGEL,
T. LE BEAU.