(No Model.) 2 Sheets—Sheet 1.

P. BURMEISTER.

CALENDAR.

No. 466,395. Patented Jan. 5, 1892.

Fig. 1.

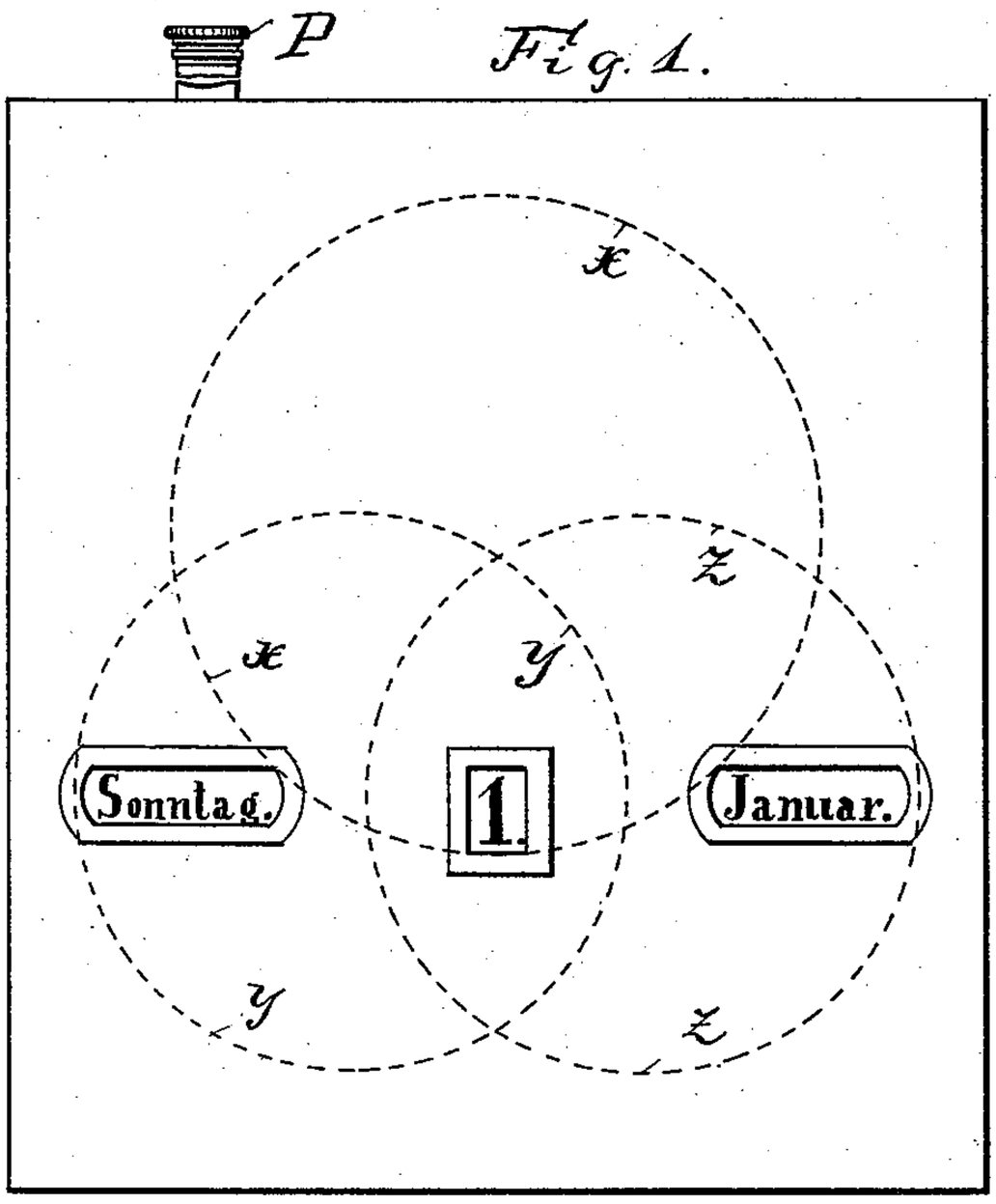


Fig. 3.

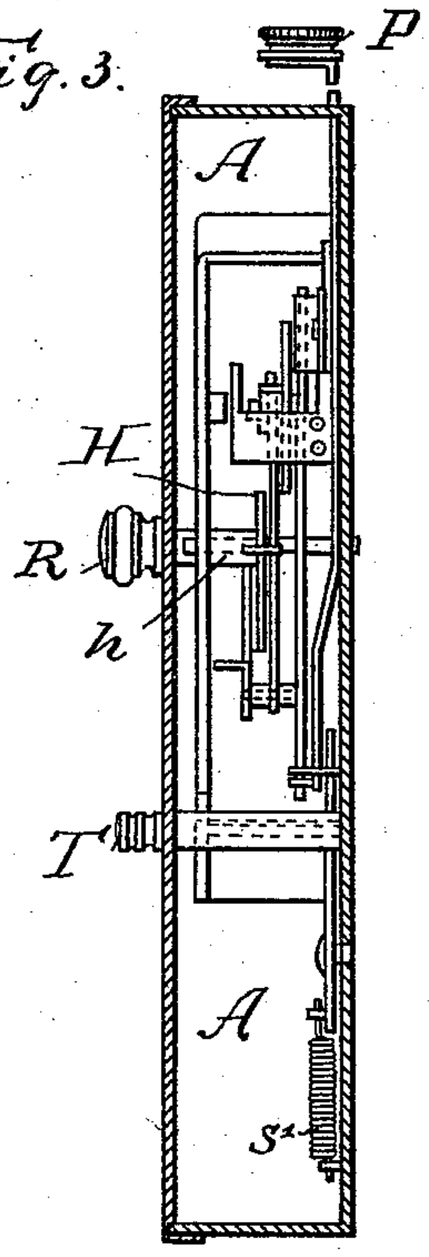
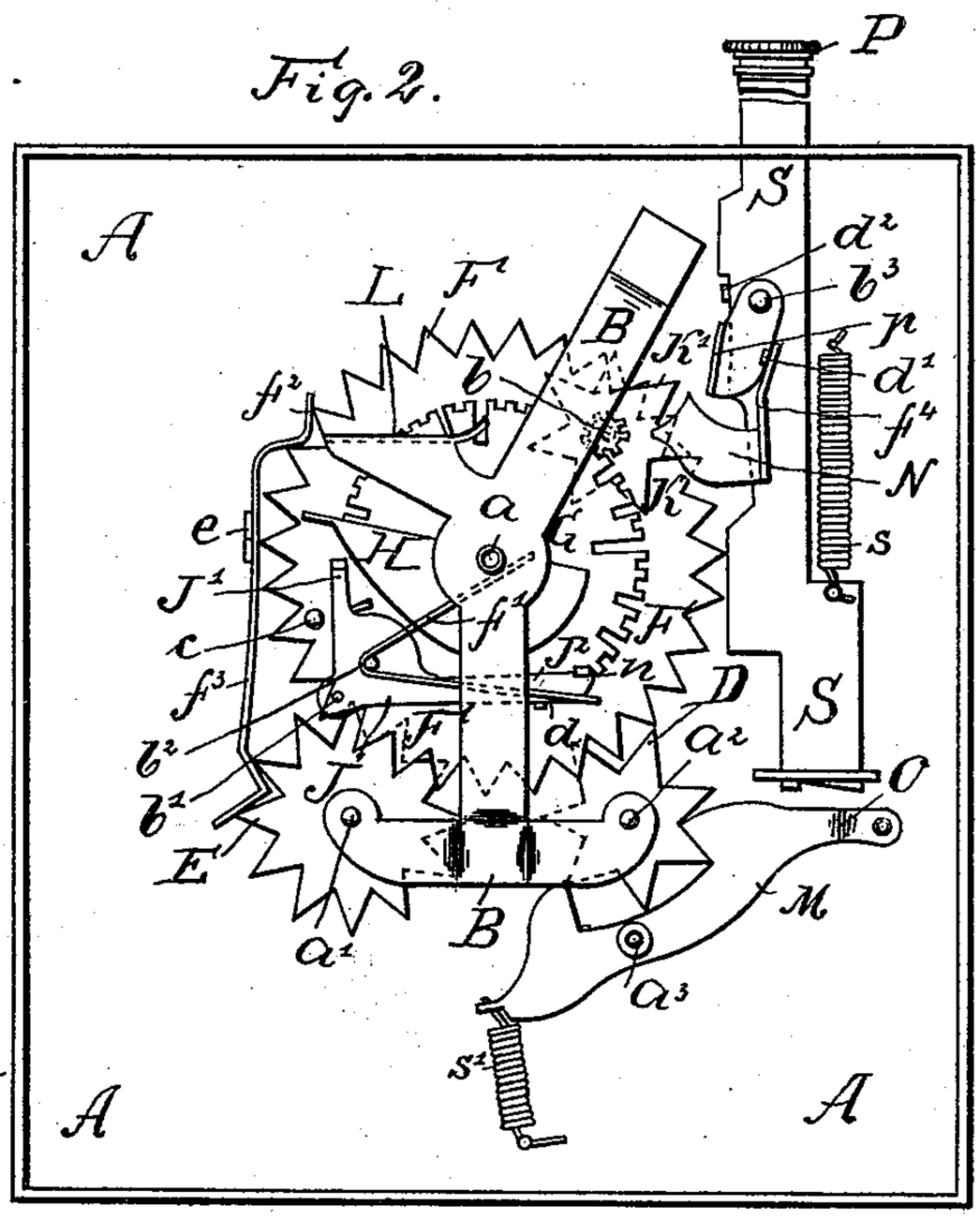


Fig. 2.



Witnesses:
J. Haemecke
W. Hutte.

Inventor:
Paul Burmeister.
by Robert Deissler
& Son
Attorneys.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

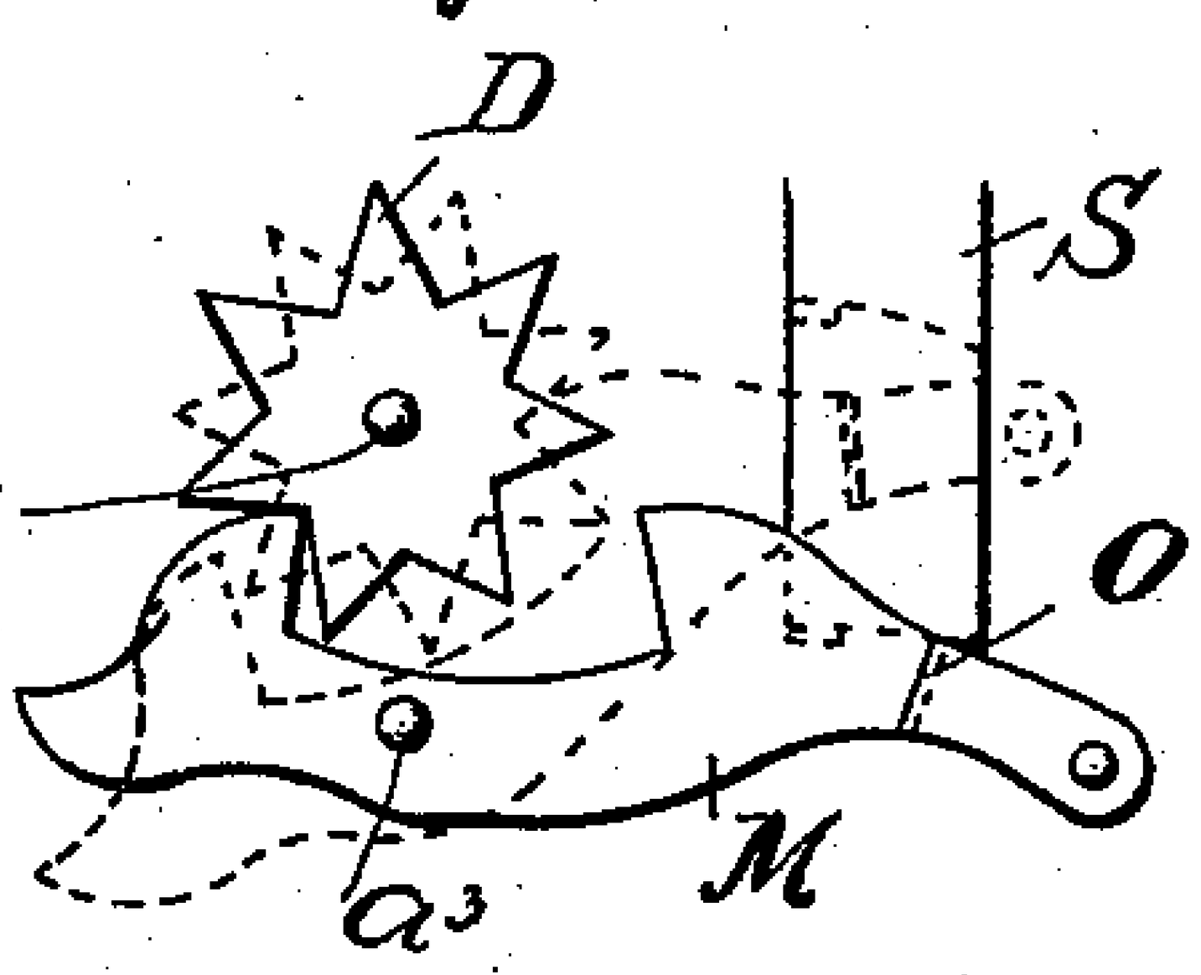


Fig. 5.

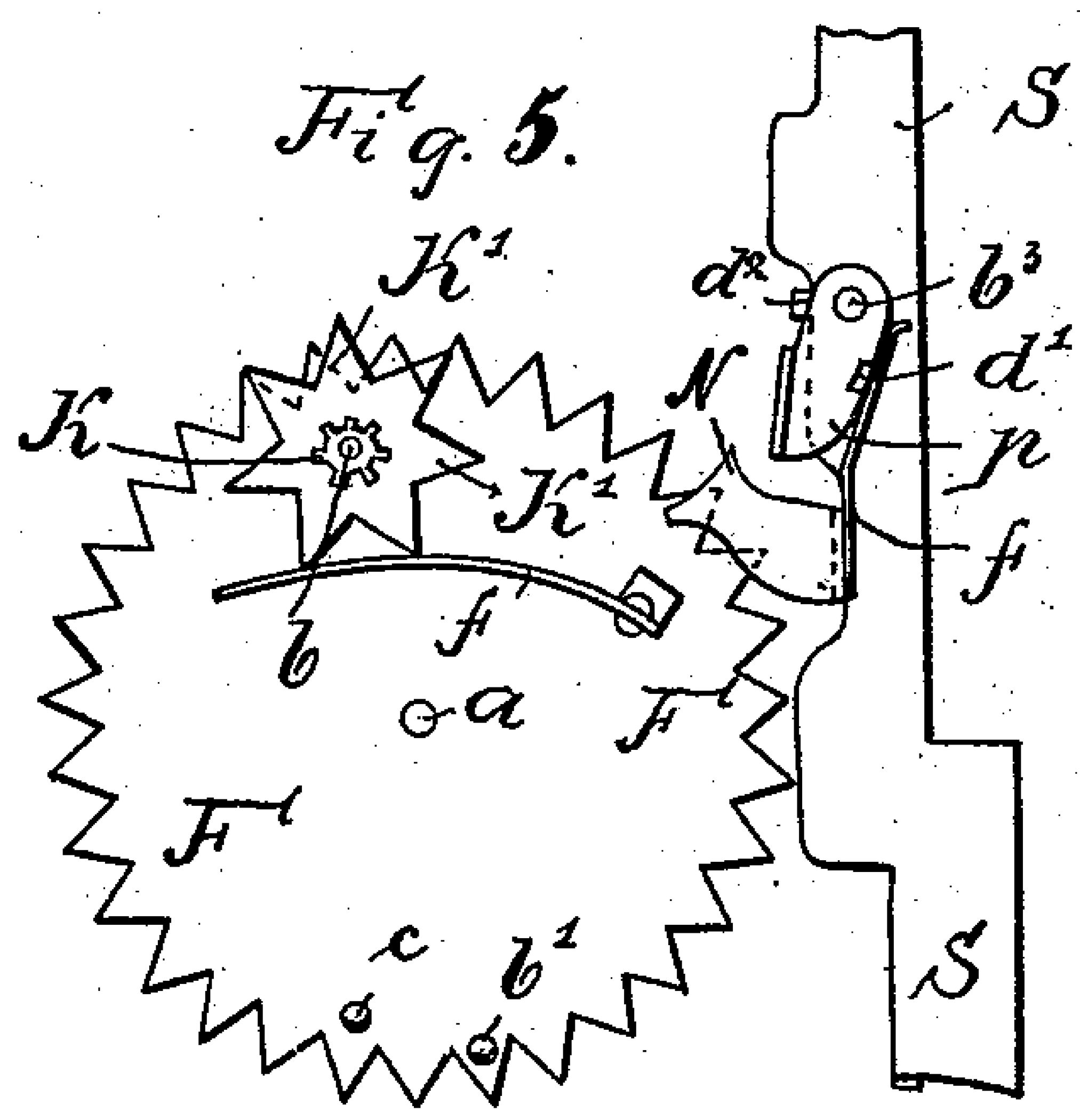


Fig. 6.

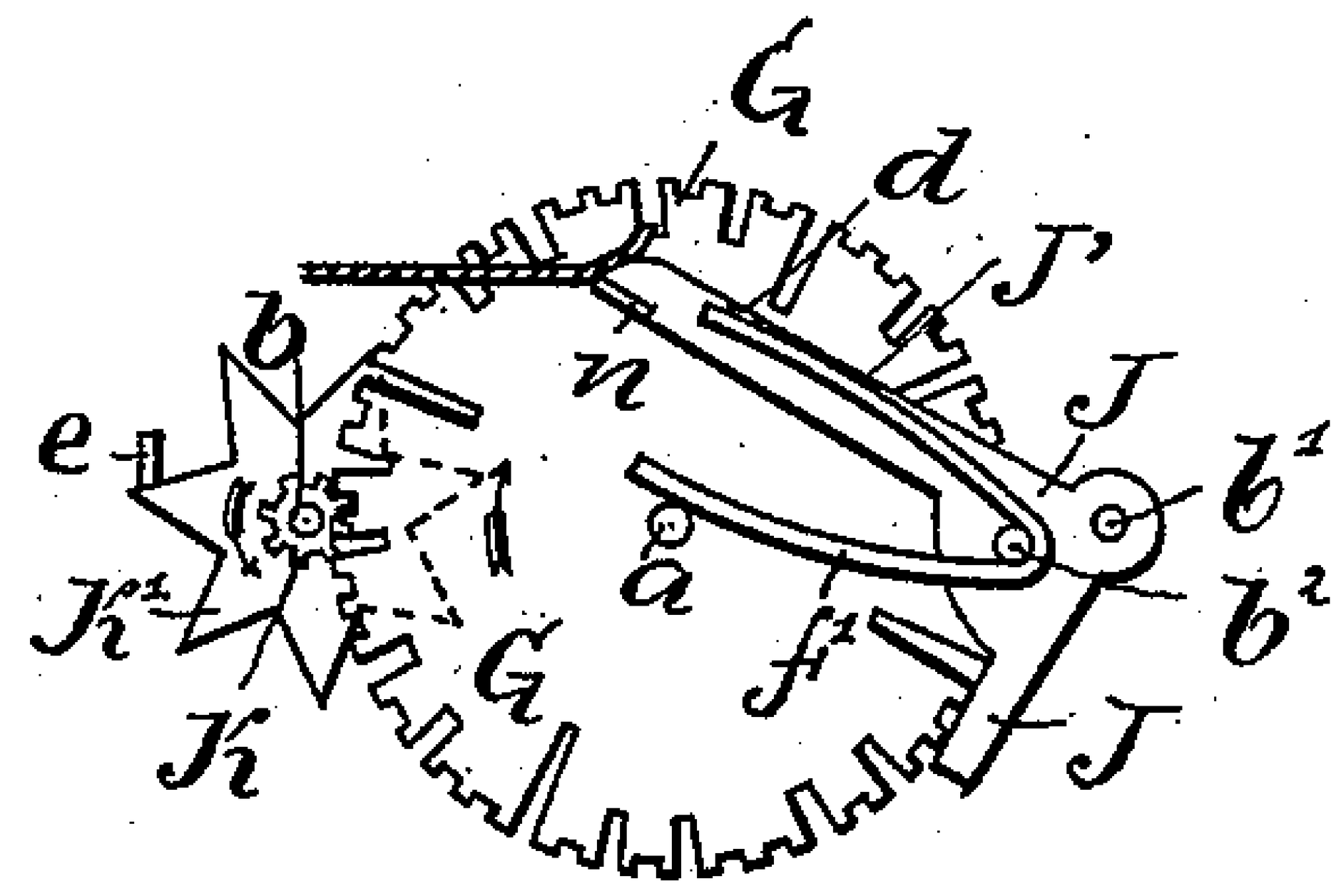


Fig. 7.

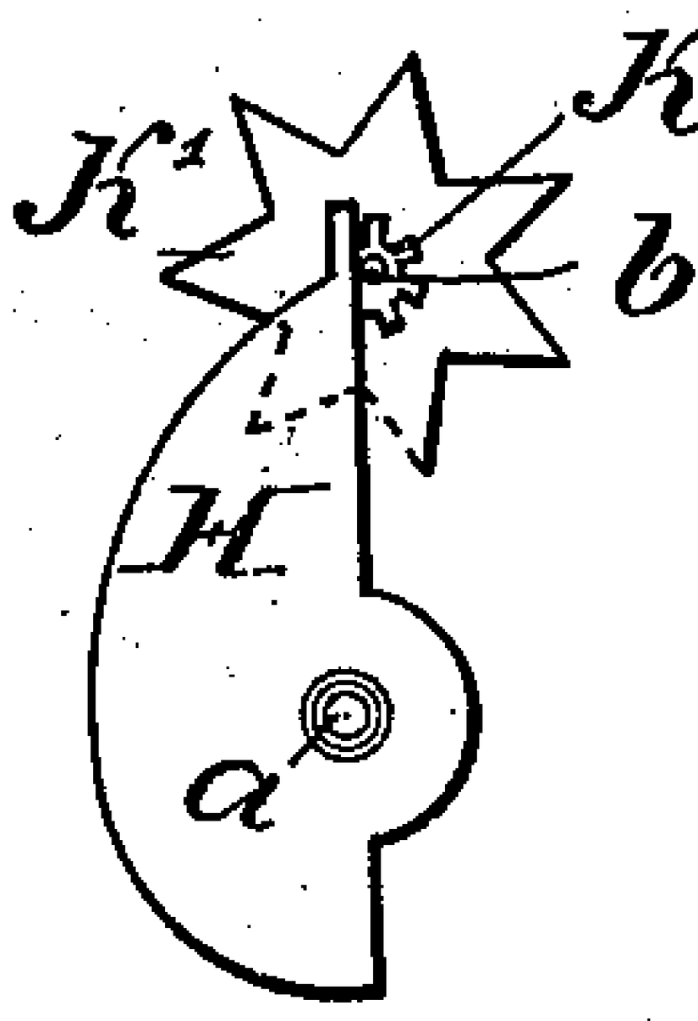
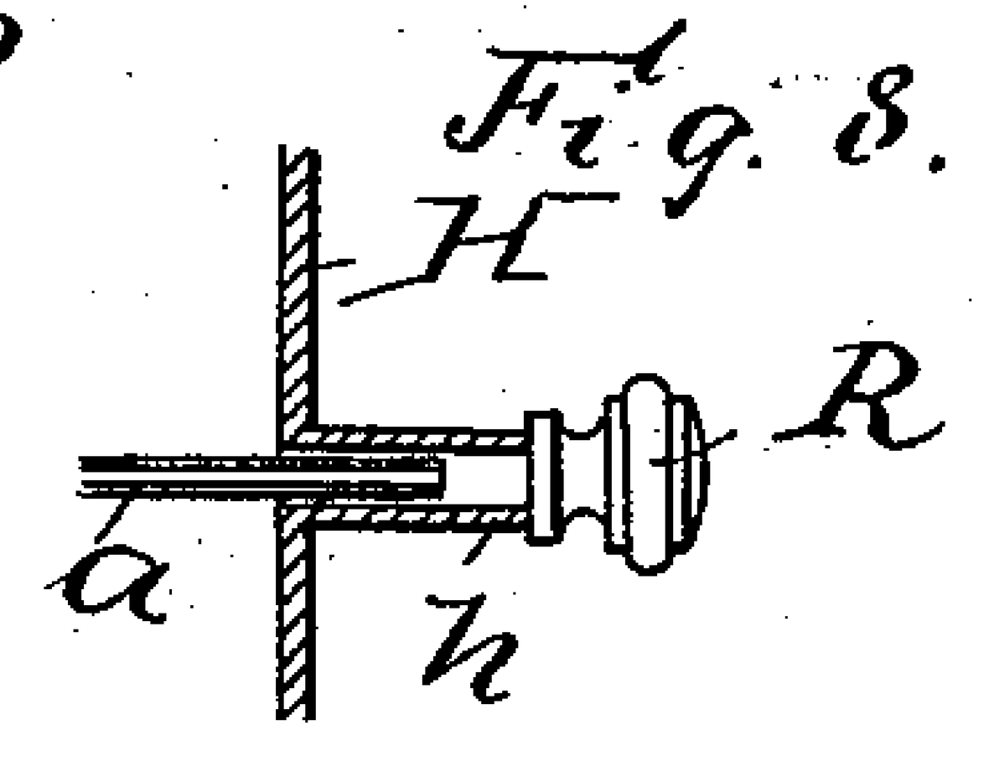


Fig. 8.



Witnesses:

Inventor:
Paul Burmeister.

Attorney

UNITED STATES PATENT OFFICE.

PAUL BURMEISTER, OF BERLIN, GERMANY, ASSIGNOR TO ARNOLD ROCHOLL, OF SAME PLACE.

CALENDAR.

SPECIFICATION forming part of Letters Patent No. 466,395, dated January 5, 1892.

Application filed August 28, 1891. Serial No. 403,988. (No model.) Patented in England August 12, 1891, No. 13,595.

To all whom it may concern:

Be it known that I, PAUL BURMEISTER, a subject of the King of Prussia, German Emperor, and a resident of 68 Skalitzer Strasse, Berlin, S. O., in the German Empire, have invented a new and useful Almanac, (for which I have filed an application for patent in Germany, July 21, 1891, and in England, No. 13,595, filed August 12, 1891,) of which the following is a clear and exact specification.

My invention relates to those almanacs which indicate the date, week-days, and months and may be regulated by mechanism, and the object is to provide an ever-correct working mechanism, which requires no other regulation and no other operating but the pressing down of a slide once a day. After the last day of a month having thirty-one days, as well as after the last day of a month having thirty days, or even such having twenty-eight or twenty-nine, the almanac will correctly change into the first of the following month by operating the same in the usual manner. I attain the said object by the mechanism illustrated on the drawings, in which similar letters denote similar parts throughout the different views, and in which—

Figure 1 is a front view of the almanac. Fig. 2 is a back view showing the mechanism. Fig. 3 is a sectional side view of the same, and Figs. 4 to 8 are details.

A box A, which may be covered by a lid, contains the complete mechanism. The frame B serves, combined with the bottom of the box, for the bearings of the shafts a a' a^2. On the shaft a the wheel F, having thirty-one teeth, is attached at a short distance from the bottom. The shaft a' carries the wheel E, having twelve teeth, and the shaft a^2 the wheel D, with seven teeth. The thirty-one teeth of the wheel F correspond with the days of a month, the twelve teeth of the wheel E correspond with the months in a year, and the seven teeth of the wheel D with the days in the week. On the first-named shaft a there is a second wheel G, having forty-eight teeth, and sitting loosely on the said shaft, which teeth represent the months during four years. A pinion K, seated on the wheel F, by means of the stud b, engages the wheel G, and is rigidly connected to a small spur-wheel K′, of which one tooth always projects out of the periphery of the main spur-wheel F. The unintentional turning of these wheels is prevented by the spring f, which is firmly attached to F and has its bearing end resting against the points of two teeth of the wheel K′, Fig. 5. Opposite to the pinion K a double-armed lever J is pivoted to the wheel F by the pin b'. The same is a short distance more apart from F than the wheel G, so as to be able to oscillate free from the same. The end of the shorter arm J′ is bent down at right angles and adapted to catch in between the teeth of the wheel G. The end of the other arm J^2 is provided with a lug n, which with each revolution of the wheel F will come in contact with the under surface of a bar L, being integral with the framing. While sliding against this surface the lug n will be forced nearer to the center, and thus liberate the end of the arm J′ out of the space between the teeth of the wheel G. As soon as the wheel G thus is disengaged the spur-wheel K′ knocks with its outer tooth against a pin e, being firmly attached to the casing. The pin e will hold the tooth colliding therewith back, and thus cause K′ to turn about its axis enough to rotate the wheel G as much as the pitch of the teeth will make out. At the same time the stud n, having passed the bar L, is set at liberty and the point of the arm may enter the space between the next following teeth. Since the wheel F completes its revolution once a month, the aforedescribed event will happen as often, and, there being forty-eight teeth, the point of the arm J′ will not enter the same space until four years have elapsed. A double-armed spring f' is fulcrumed on J by the pin b^2 and rests with one bearing-arm against the shaft a and with the other against the pin d, which is attached to the end of the arm J^2, thus tending to remove this end of the arm J^2 from the shaft a and to force the point of the counter-arm J′ in between the teeth of the wheel G. The spaces between these teeth are of variable depth, corresponding with the length of the different months. A month with thirty-one days is represented by a space between two teeth not exceeding about the breadth of one tooth. The spaces representing months with thirty days

are considerably deeper. That representing February in the leap-year is still somewhat deeper, and the rest, intended for February with twenty-eight days, are the deepest. It will be evident that the lug *n* will be the farther away from the center the deeper the space is into which the end of J′ is caught. The mechanism so far described is operated by a vertical slide-bar S, having a knob P on top by which it is pressed down once a day. A spiral spring *s*, being attached to this bar, tends to force it upward and redraws the same into its normal position each time it has been pushed down. A pawl *p* is pivoted to the bar S, and is held against the stud d^2 elastically by the spring f^4. The same is adapted to catch hold of one tooth of the wheel F as the sliding bar moves down and rotates this wheel as much as the pitch of the teeth. When the bar returns, the pawl is moved aside, the spring f^4 giving way to the pressure. An arm N, bent at right angles, is rigidly connected to the sliding bar S. Its front edge is somewhat curved, and is adapted to catch hold of the stud *n* of the double lever J when the same comes within its path. The length of the same is such that it will not be able to operate on the lever J when the point of J′ is within one of those spaces between the teeth of wheel G which represents a month with thirty-one days. However, in case the point J′ has entered a deeper slot-like space, which may represent a month having thirty days, the stud *n* will project out far enough to be caught by the arm N. When now the bar S is pushed down, the arm N will collide with the said stud *n* before the pawl *p* may catch a tooth of the wheel F, and the rotating caused thereby will be twice as much as is otherwise the case caused by the pawl *p*. This will happen after the 30th of a short month. The almanac will overleap the 31st and will at once be regulated to the 1st of the following month. In February the lever J′ is engaged by a still deeper slot of the wheel G. The stud therefore projects out still farther, and on account of the curved edge of the arm N the same will catch hold of it, even one or two days sooner, as the case may be, according to the depth of the slot, either after the 28th of February, or in a leap-year on the 29th. In each case the almanac will be turned to the 1st of March by one single pressure. On these days four different effects are attained by this pressure, viz: The week-day, the month, and the date are regulated, whereby the regulation of the date at the same time involves the overleaping of one, two, or three days. The way this is done will be at once comprehended by a glance at Fig. 1. At the center there is an opening permitting the appearance of the date. On a paper or card-board disk X the dates from 1 to 31 are printed in a circle. One of them is always presented to the opening. Two longer rectangular openings, one on each side, show off the name of the day and month, which are in a similar manner printed on paper disks Y and Z. The date-disk is firmly attached to the shaft A. The week-day disk Y is attached to the shaft a^2, and the month-disk Z to the shaft a'. The month-disk Z is set partly in rotation once a month by pin *c* being firmly secured to the wheel F. The same collides with a tooth of the wheel E, which, as has been said before, is furnished with twelve teeth. Each time the pin *c* comes round it turns the wheel E one-twelfth of its revolution, whereby each time the next following month appears in the opening in front of the almanac. Both wheels, E as well as F, are prevented from unintentional turning by springs f^3 f^2, resting against the points of two teeth. The actuating of the week-day disk Y, which is fastened to the shaft a^2, is accomplished in the following manner: An oscillating anchor-lever M catches the teeth of the wheel D, which, as has been mentioned before, is provided with seven teeth. At one end O this lever is bent up at right angles, so as to enable the sliding bar S to catch hold of the same when it is pressed down. A spiral spring *s*′, attached to the after end of lever M, tends to hold the same in such a manner that the first-named end O is always in its highest position, into which it is returned automatically by said spring after being pressed down by the sliding bar S. Each time this anchor-lever thus oscillates down and up it turns the spur-wheel D one-seventh of its revolution, whereby in the opening in the front of the almanac the name of the next following day appears.

In regulating the almanac, only a pressing down of the knob P once every morning is necessary. Thereby the lower point of the sliding bar operates on the anchor-lever M in the aforesaid manner and regulates the name of the day. At the same time the pawl *p* collides with a tooth of the wheel F and turns the same one tooth farther, whereby the date will be replaced by that of the next following day. This is the ordinary daily effect of pressing down the knob P until the end of the month, and when the same is thirty-one days long the pin *c* will be standing shortly behind a tooth of the wheel E. The next morning when regulating the almanac in the usual manner the pin *c* drives the tooth of the wheel E on, and thereby also the correct month appears in the opening. In course of the month one day it happens that one tooth of the wheel K′, projecting out, knocks against the pin *c* just after the stud *n* has begun to slide on the bar L, raising the point of the lever J′ out of the slot or space between the teeth of the wheel G. Now, while regulating the almanac the next day the pin *e* will hold back the said tooth of the wheel K′, and thus set by means of the pinion K the wheel G to revolve slightly more than half of the pitch of its teeth. At the end of this rotation the stud *n* leaves the bar L and the angular point of J′ drops down on the next following tooth, remaining thereon until the next day. When the

almanac again is regulated, the wheel K′ completes its partial rotation by the retraction of the pin *e* and also finishes the partial rotation of the wheel G. The moment this is done the point of J′ snaps into the space between the next following teeth. If it is a month with thirty days, this space has such a depth that the stud *n* will come within the path of the arm N, which will occur after the 30th of such month. On regulating the almanac the next morning, the arm N catches the said stud *n* and turns the mechanism twice as much as is usually done by the pawl *p*. Therefore the date is changed from the 30th at once into the 1st, while at the same time the month changes, as does the name of the day, in the usual manner. Similar occurrence takes place after the 28th of February. By aid of the so-much-deeper slot between the teeth of the wheel G the stud *n* projects out farther still and will collide with N so much sooner, and no matter how soon the stud is caught it will always be brought down to the same position by the arm N, and therefore always regulate the almanac to the 1st of the next month. Means also are provided to set the almanac right from any position independent of the sliding bar S. Causes may arise which bring the mechanism out of order—as, for instance, when the almanac is not made use of for some time, or by mistake the knob has been pressed down too often, or the mechanism has been played with otherwise. Therefore to enable separate regulation I provide a cam H, having a sleeve *h* attached thereto, which is loosely mounted on the shaft *a*. A knob R, projecting through the casing, is keyed onto the sleeve *h*, and thereby a rotating of the cam H is enabled by hand. This cam is arranged directly over and parallel to the wheel G. By its front straight edge the same will when turned right-handed catch the mechanism by the pin *b*, and by the back curved edge the same will lift the point of the arm J′ out of the slots of wheel G, and thereafter by its straight point also cause the backward turning of the mechanism. Also, the name of the days may be regulated *ad libitum* by providing the anchor-lever M with a knob R, which also projects out of the casing by a curved slot in the lid. By moving this knob R down and up the wheel D will be turned in the same manner as is done by the slide S.

Having thus fully described the nature of my said invention and in what manner the same may be carried into effect, I declare that what I claim, and desire to secure by Letters Patent of the United States, is—

1. In an almanac-regulating mechanism, a date-wheel F, having thirty-one teeth and means for intermittingly turning the same, in combination with a month-regulating wheel G, having slots of varying depths and arranged loosely on the shaft of the date-wheel F, a double lever J, pivotally attached to the wheel F and engaging with the wheel G by one end alternatively catching in slots of the same and having a stud *n* on the other end, and means for driving the same, thereby causing the accelerated or multiplied turning of the date-wheel at the change of the month, according to the depth of the slots in the wheel G, as described.

2. In an almanac-regulating mechanism, a date-wheel F and a slide-bar S for intermittingly turning the same, in combination with a month-regulating wheel G, having slots of varying depths and arranged loosely on the shaft of the date-wheel, a pinion K, gearing with the wheel G and rotatively attached to the date-wheel F, a spur-wheel K′, rigidly combined with the pinion K and intermittingly set to rotate by one tooth knocking against a pin *e*, a double lever J, pivotally mounted on the wheel F and adapted to lock the wheel G with F by one end alternatively catching in slots of the same, and a catching-arm N, integral with the sliding bar S, serving to operate upon the double lever J, and thus causing the accelerated or multiplied turning of the date-wheel F at the change of the month, according to the depth of the slots in wheel G, as described.

3. In an almanac-regulating mechanism, the combination of a date-wheel F with a sliding bar S, having a pawl *p* for driving the date-wheel one tooth each day, a spiral spring *s* for giving reciprocating motion to the sliding bar, a blade-spring f^2, resting with its bearing end against the teeth of the date-wheel F, a double-armed lever G, one end of which J′ is adapted to catch in between the teeth of a month-regulating wheel G and the other end J^2 carrying a stud *n*, a spring *f*, tending to hold the point of J′ locked with the wheel G, and a catching-arm N, mounted on said sliding bar S, serving by catching the said stud *n* to turn the date-wheel F more than one tooth at a time, as and for the purpose set forth.

4. In an almanac-regulating mechanism, the combination of a sliding bar S with an anchor-lever M, adapted to oscillate about the pin a^3 and elastically held in its highest position by a coiled spring *s*′, and a spur-wheel D, having seven teeth for regulating the names of the days, set to rotate by the oscillation of said anchor-lever, as set forth.

5. In an almanac-regulating mechanism, the cam H, adapted to be turned by hand and to set the complete mechanism to rotate right-handed by striking against a pin *b*, and when turned to the left by pressing against the end J′ of the double-armed lever J to release the same out of slots of the wheel G and set the mechanism to rotate backward, as and for the purpose set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

PAUL BURMEISTER.

Witnesses:
FR. SPULING,
R. HERPICH.