

No. 668,294.

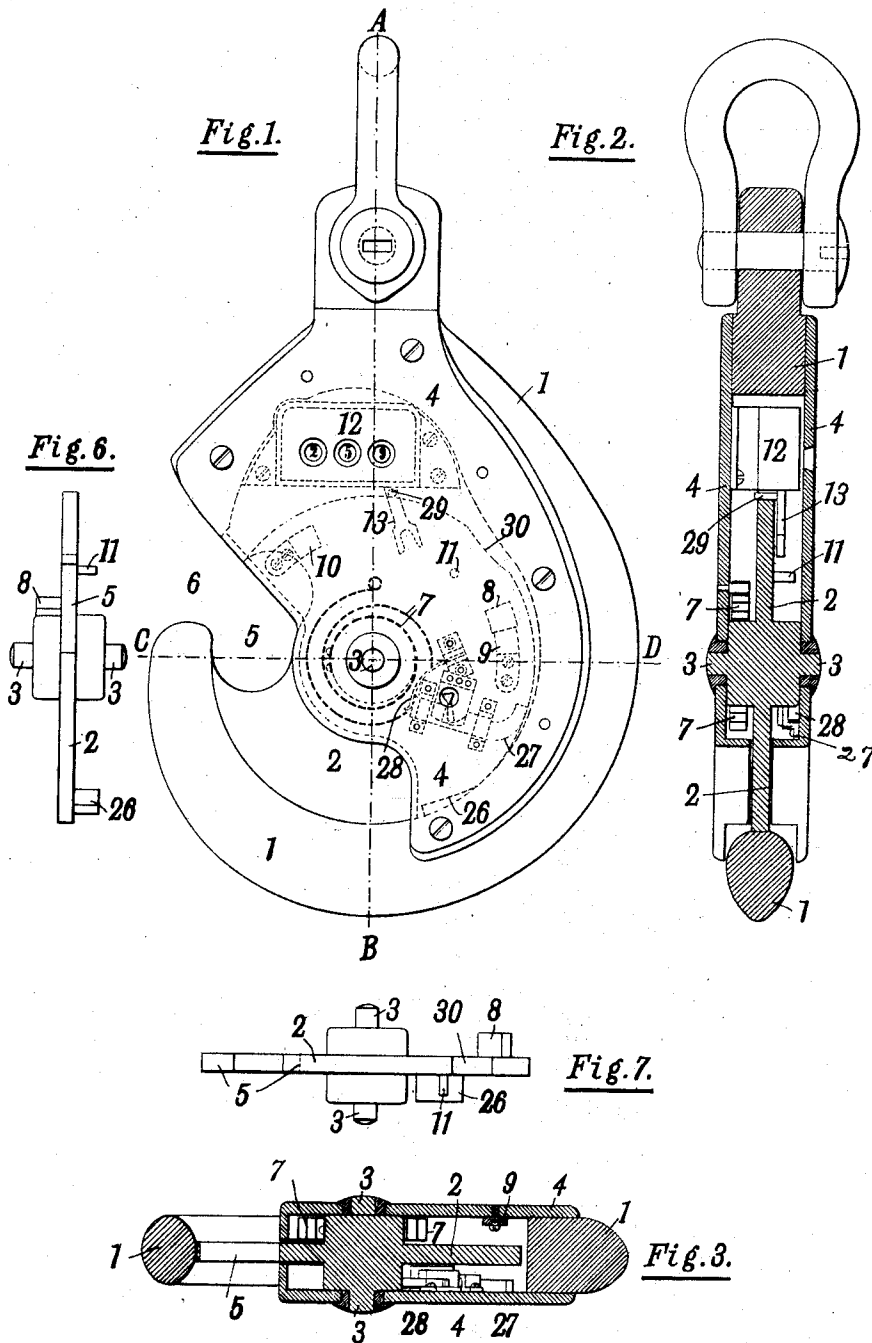
Patented Feb. 19, 1901.

C. H. P. MICHAEL.
SAFETY CRANE HOOK.

(Application filed Aug. 7, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:
John Hickman.
William Schulz.

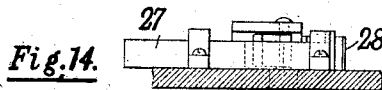
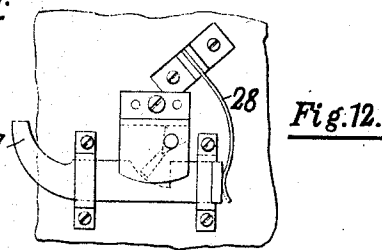
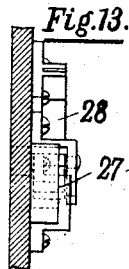
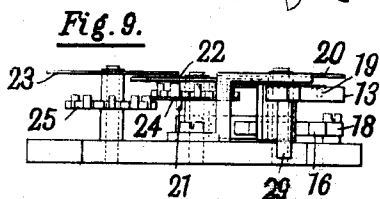
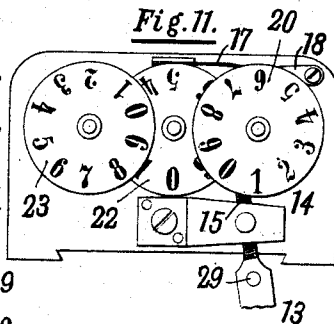
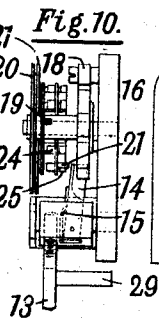
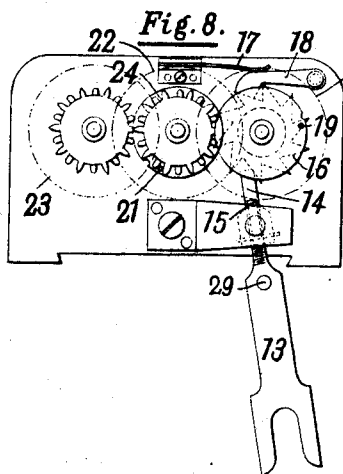
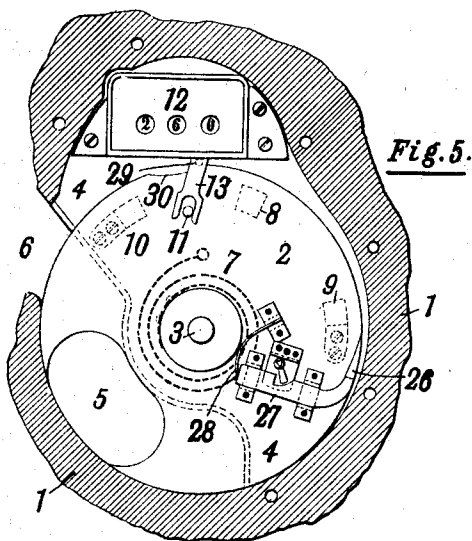
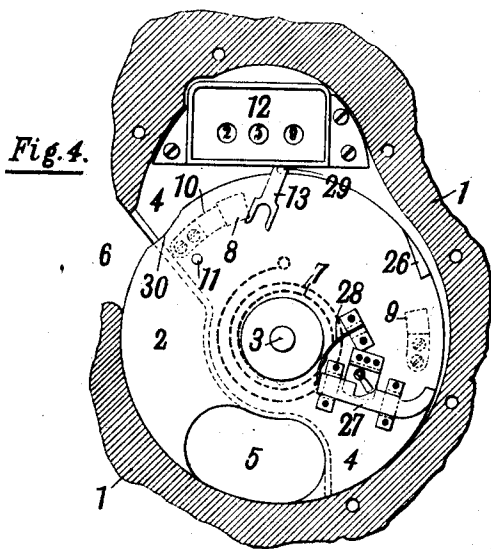
Inventor:
Christoph Heinrich Paul Michael
by his attorneys
Rohrer & Briesen

C. H. P. MICHAEL.
SAFETY CRANE HOOK.

(No Model.)

(Application filed Aug. 7, 1900.)

2 Sheets—Sheet 2



Witnesses:
John Hickman.
William Schulz.

Inventor:
Christopher Heinrich Paul Michael
by his attorneys
Rooder & Brienens

UNITED STATES PATENT OFFICE.

CHRISTOPH HEINRICH PAUL MICHAEL, OF HAMBURG, GERMANY.

SAFETY CRANE-HOOK.

SPECIFICATION forming part of Letters Patent No. 668,294, dated February 19, 1901.

Application filed August 7, 1900. Serial No. 26,150. (No model.)

To all whom it may concern:

Be it known that I, CHRISTOPH HEINRICH PAUL MICHAEL, a citizen of the German Empire, and a resident of Kurze Mühren 13, Hamburg, Germany, have invented certain new and useful Improvements in Safety Crane-Hooks, of which the following is a specification.

This invention relates to safety crane-hooks adapted for use in harbors for loading and discharging ships, and in stores, warehouses, &c., for taking in and sending out loads of all kinds. They enable the number of loads raised to be registered with absolute certainty, and therefore completely avoid the hitherto usual personal counting.

An example of a crane-hook according to this invention is represented in the accompanying drawings.

Figure 1 is a side elevation of the open hook. Figs. 2 and 3 are sections corresponding, respectively, to the lines A B and C D of Fig. 1. Figs. 4 and 5 show the hook closed. Figs. 6 and 7 represent the disk that effects the closing of the hook, Fig. 6 being a front elevation and Fig. 7 a plan of the disk, which is shown in side elevation in Fig. 1. In Figs. 8, 9, 10, and 11 the counting mechanism is shown in detail, and Figs. 12, 13, and 14 show the lock for stopping the disk.

The crane-hook proper, 1, which is attached to the chain of the crane or is suspended from an ordinary crane-hook attached thereto, is so formed that it incloses a disk 2, whose journals 3 are mounted in plates 4, fixed at both sides of the hook. A notch 5 is formed at a suitable part of the periphery of the disk 2 for receiving the means (rope, chain, or the like, hereinafter called a "sling") for carrying the load. When the sling is placed in the hook, the notch 5 is of course opposite to the hook-opening 6, Fig. 1. When the load is raised, it causes the disk 2 to rotate in the direction indicated by the arrow *z* in Fig. 1, so as to bring the notch into the position shown in Fig. 4 and to wind up a spiral spring 7, which is fixed at one end to the hub of the disk and at the other end to a side plate 4 and tends constantly to return the disk 2 to its original position. When the hook is open, a stop 8 on the disk 2 bears, as shown in Fig. 1, against an abutment 9 on one of the side

plates 4, and when the hook is closed the said stop bears against another abutment 10 on the same side plate, so as to limit the movement of the disk 2. One side of the disk 2 is also provided with a pin 11, which when the disk is rotated in one direction or the other engages with and moves the forked end of a lever 13 for actuating a counting apparatus 12, Fig. 5, which is so constructed that it is actuated only during the return movement of the disk 2. The actuating-lever 13 has two arms, the longer of which is fixed in a boss, Figs. 8 and 10, in which is pivoted the shorter arm 14, which is formed as a loose pawl and is pressed by a spring 15 into engagement with a ratchet-wheel 16. One edge of the pawl 14 is chamfered off, so that when the lever is moved by the sling and the disk in the direction indicated by the arrow *y* in Fig. 8 the pawl 14 can slide over a tooth of the ratchet-wheel 16, while when moved in the opposite direction it rotates the ratchet-wheel 16 by one tooth. A detent 18 under the influence of a spring 17 prevents the ratchet-wheel from rotating at the wrong time. The movement of the disks indicating tens and hundreds is effected in the usual manner by means of a pin 19 on the units-disk 20 and a pin 21 on the tens-disk 22, which pins engage at the proper times with the teeth of toothed wheels 24 and 25, secured to the disks 22 and 23, indicating the tens and hundreds, respectively, so as partially to rotate the said disks.

When the hook is closed, the disk is locked. Consequently the hook cannot be opened until the lock is opened. When the disk is moved by the sling in the direction indicated by the arrow *z* in Fig. 1, a projection 26 on the disk forces in and moves past a bolt 27, that is pressed upon by a spring 28 and forms part of a lock secured to one of the side plates 4. The bolt 27 and the projection 26 are so arranged that when the notch 5 in the disk 2 has completed about half of its movement the projection 26 has passed the bolt 27. When the load is removed, the disk 2 can therefore be moved backward by an amount determined by the position of the forward abutment 10 and the stop 8; but the hook cannot be opened because the projection 26 will come against the bolt 27, Fig. 5. Only by drawing back the bolt 27—i. e., moving it

against the pressure of its spring 28 by means of a key—can the projection 26 be released, so as to allow the disk to be moved by the spiral spring 7 until the stop 8 bears on the lower abutment 9. Consequently when the disk 2 is sufficiently rotated the load is locked and cannot be released without the aid of a suitable key, which is in the hands of the receiver of the goods. When the load reaches him, he draws back the bolt 27 with the aid of his key, so as to allow the disk 2 to be rotated backwardly by the spiral spring 7 until the notch 5 is again opposite to the opening 6 in the hook.

The counting apparatus is operated when the disk 2 is returned to its original position by the spiral spring 7. The counting-apparatus-actuating lever 13 is provided with a pin 29, which is constantly in contact with the periphery of the disk 2 and prevents an arbitrary movement of the actuating-lever 13. It is only when a recess 30, Figs. 1, 4, 5, and 7, which is made in the periphery of the disk, so as to be radially opposite to the pin 11, that engages with the said lever, has arrived at the pin 29 on the actuating-lever, Fig. 5, that the lever 13 can be operated by the pin 11 on the disk, which engages with its forked end. The several parts are so arranged that the operation of the counting apparatus is effected only after the projection 26 has been released by the withdrawal of the bolt 27 by means of a key or the like. Misuse of the hook is thereby prevented in a reliable manner, although the disk 2 can rotate to the extent allowed by the forward abutment 10 and the stop 8 without affecting the counting mechanism 12.

The hereinbefore-described safety crane-hook consequently acts in such a way that when each load is raised the disk 2 is rotated and locked and the counting apparatus 12 is prepared for registering the load raised. When the load reaches the receiver, he releases the disk by means of his key, thereby enabling it to be again turned back by the spiral spring 7 and to register the load. After the load has been removed from the hook the latter is returned open to the sender of the goods, so as to allow a second load to be raised. A reliable check is therefore always

kept on the operations, as the hook can be opened only by the possessor of the key, and when the hook is closed he can at once detect if it has been tampered with.

A hook according to this invention registers with absolute certainty the number of articles—for example, heavy goods, sacks, boxes, and barrels—dealt with when the same number is raised each time, and it is above all light in weight, so that such hooks can be used everywhere, while it is also cheap and insures constant and efficient working.

I claim—

1. A safety crane-hook provided with a rotatable disk adapted to be actuated by the load, and a counting apparatus operatively connected to the disk, substantially as specified.

2. A safety crane-hook provided with a notched rotatable disk, means for limiting the movements of the disk, and a counting apparatus operatively connected to the disk, substantially as specified.

3. A safety crane-hook provided with a notched rotatable disk, means for locking and releasing said disk, and a counting apparatus operatively connected to the disk, substantially as specified.

4. A safety crane-hook, provided with an inclosed rotatable member adapted to be actuated by the load, and a spring for returning said member to its open position, substantially as specified.

5. A safety crane-hook, provided with an inclosed rotatable member adapted to be actuated by the load, a bolt for locking said member in its closed position, and a spring for returning said member to its open position, substantially as specified.

6. A safety crane-hook, provided with an inclosed rotatable spring-influenced member adapted to be actuated by the load, and with a counting apparatus operatively connected to said member, substantially as specified.

Signed by me at Hamburg, Germany, this 28th day of July, 1900.

CHRISTOPH HEINRICH PAUL MICHAEL

Witnesses:

F. TOTH,

E. H. L. MUMMENHOFF.