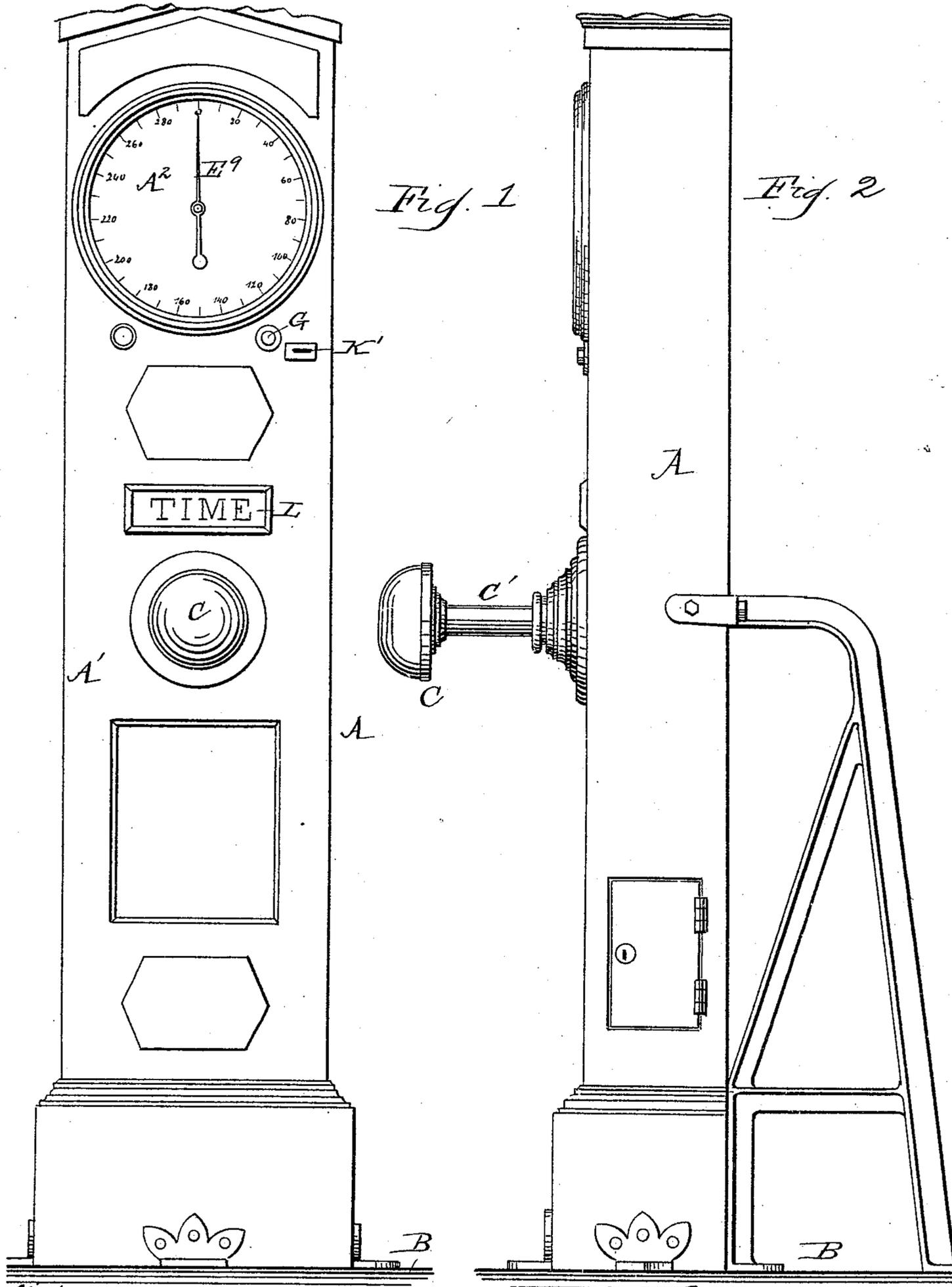


J. P. O'BRIEN & H. COOPER.
COIN CONTROLLED BLOW TESTER.

No. 437,382.

Patented Sept. 30, 1890.



Witness
 J. Albert Palmer,
 Fred. Bennett

James P. O'Brien
 Henry Cooper
 by Laurence R. King
 Atty.

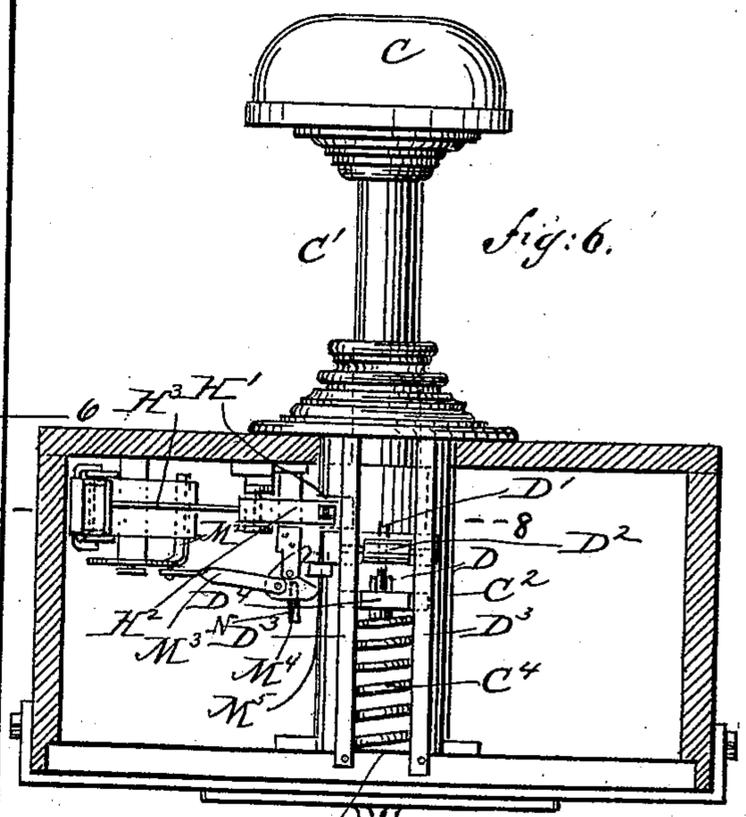
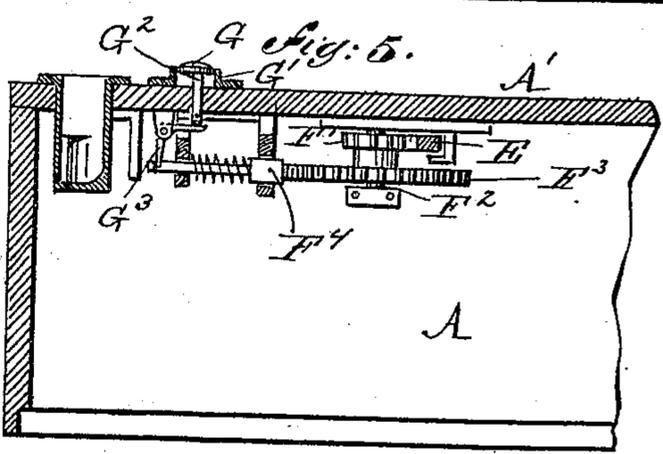
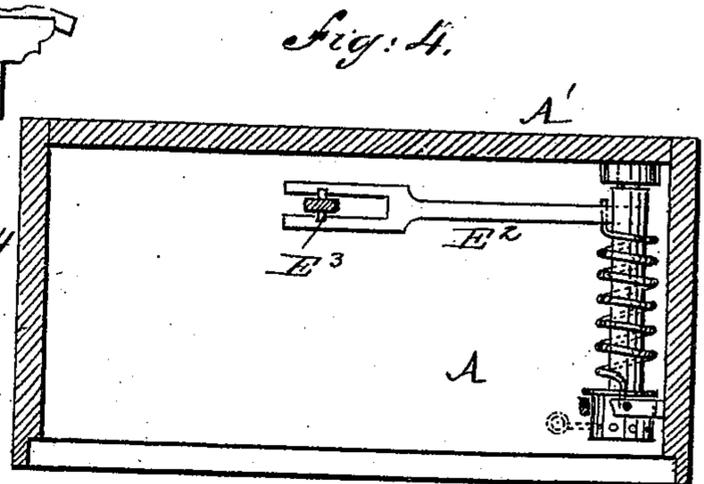
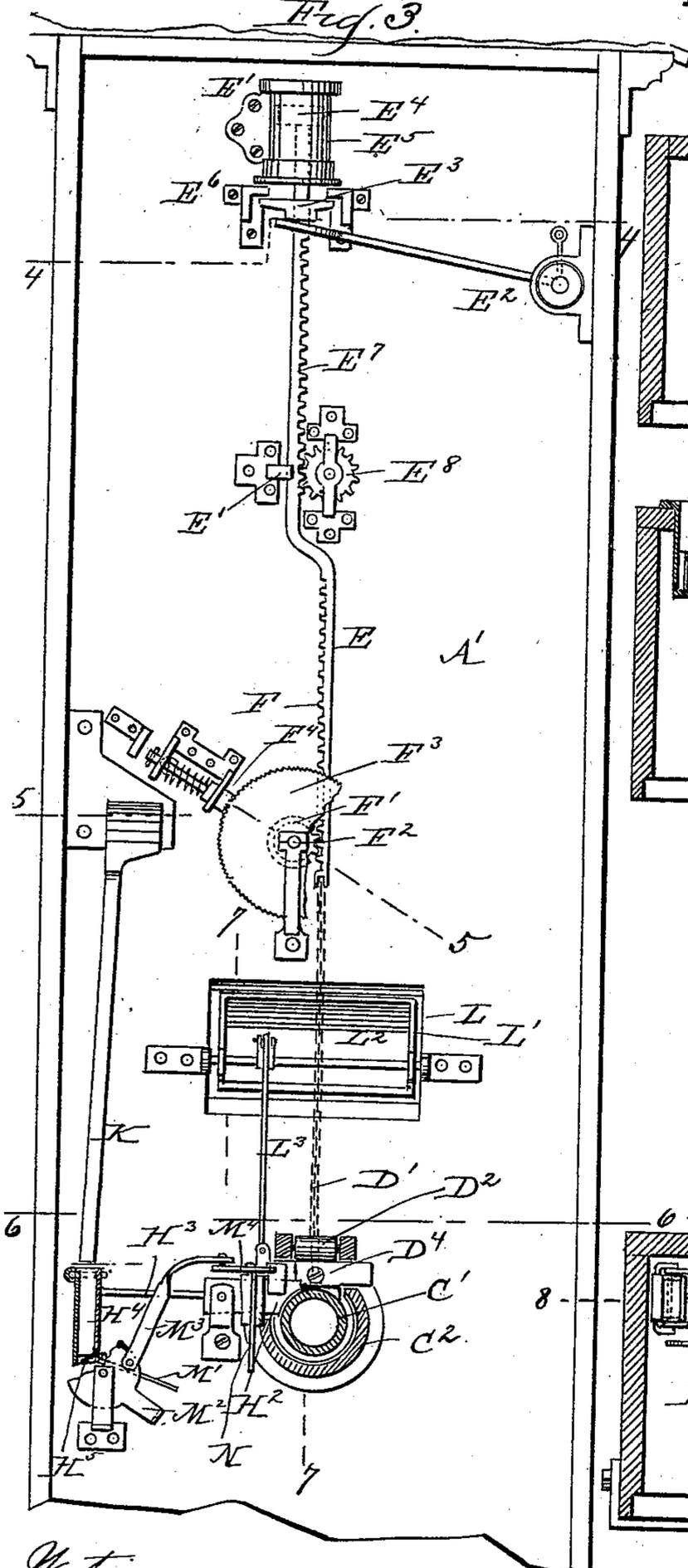
(No Model.)

3 Sheets—Sheet 2.

J. P. O'BRIEN & H. COOPER.
COIN CONTROLLED BLOW TESTER.

No. 437,382.

Patented Sept. 30, 1890.



Witnesses
J. C. ...
Fred. ...

James P. O'Brien
Henry Cooper
 by *Clarence ...*

UNITED STATES PATENT OFFICE.

JAMES P. O'BRIEN, OF NEW YORK, AND HENRY COOPER, OF BROOKLYN,
ASSIGNORS, BY DIRECT AND MESNE ASSIGNMENTS, TO SAID O'BRIEN AND
BERNARD VAN LEER, OF NEW YORK, N. Y.

COIN-CONTROLLED BLOW-TESTER.

SPECIFICATION forming part of Letters Patent No. 437,382, dated September 30, 1890.

Application filed August 2, 1889. Serial No. 319,600. (No model.)

To all whom it may concern:

Be it known that we, JAMES PATRICK O'BRIEN, of the city, county, and State of New York, and HENRY COOPER, of Brooklyn, in the county of Kings and State of New York, both citizens of the United States, have invented a certain new and useful Improvement in Coin-Controlled Blow-Testing Machines, of which the following is a specification.

This invention relates to machines for receiving and automatically indicating the force of a blow, particularly those which are set for action by, and can be operated only on, insertion of a coin of a certain size or weight. These machines generally comprise a movable padded punching-head on which the blow is struck, a spring or other reacting device acting on the punching-head against the force of the blow, an index adapted to be operated by the punching-head and to indicate the extent of movement of the same and thus the force of the blow, means for temporarily retaining the index at the point to which it is moved so that it can be observed by the operator, and for afterward returning the index to zero and a contrivance whereby the machine is rendered operative on and only on insertion of the proper coin.

The objects of the present invention are to absolutely prevent the movement of the punching-head except when released by the payment of the proper coin; to inform the intending user when and whether the punching-head is locked or released; to secure the immediate return of the punching-head to its normal position and the automatic locking of the same after each blow is struck, while at the same time providing for the temporary locking of the index at the point to which it is moved, and preventing it from being thrown beyond that point by its momentum, and to provide for the release of the index and its return to zero a short time afterward, either automatically or by hand, all by simple and efficient means.

The invention consists of certain novel combinations of parts and features of construction, hereinafter particularly set forth in the claims; and in order that the invention

may be fully understood, we will previous to claiming the invention describe in detail the mode in which the same may be carried into effect.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a face view of a coin-controlled blow-testing machine embodying our invention. Fig. 2 is a side elevation of the said machine. Fig. 3 is a rear view of the same, the back of the machine-case being removed and the base being broken off. Fig. 4 is a sectional plan view of the same on the line 4 4, Fig. 3. Fig. 5 is a sectional plan view on the line 5 5, Fig. 3. Fig. 6 is a sectional plan view on the line 6 6, Fig. 3. Fig. 7 is an enlarged cross-sectional view of a part of the machine on the line 7 7, Fig. 3. Fig. 8 is a transverse sectional view of a part of the same on the line 8 8, Fig. 6. Fig. 9 is a detail plan view of part of the shank of the punching-head of the same. Fig. 10 is a detail view illustrating mechanism forming part of our invention for automatically releasing and permitting the return of the index after a temporary detention.

Like letters of reference designate corresponding parts in these several figures.

In the construction of the machine thus illustrated an upright hollow case A is rigidly secured and braced upon a floor or other suitable base, and the standard A, forming the front of the case, is provided on its face with a circular scale A², the graduations of which are numbered in order to denote pounds.

A padded head C, having a tubular shank C', is arranged to project from the front of the case A at a convenient height for the average man to punch, and the shank C' is mounted to slide lengthwise in a fixed tubular guide C², projecting from the back of the standard A' and having on its rear end a stop C³, between which and the punching-head C is interposed a stiff coiled spring C⁴, by which the punching-head C is normally held projected, but which will permit the head to move inward when struck a distance proportionate to the force of the blow.

The shank C' is provided with a projecting lug D, which rides in a longitudinal slot formed in the tubular guide C², so as to prevent the shank from turning and to limit its movement in the guide.

In the path of the lug D is arranged to slide in straight guides D³, fixed above and parallel to the tubular guide C², a loose cross-head D⁴, which is adapted to be carried inward by and with the shank C' when forced inward by a blow upon the punching-head C, but being separate from the shank will allow the same to be projected again by the reaction of the coiled spring C⁴ immediately after the blow is struck and itself remain stationary.

To the cross-head D⁴ is attached one end of a strong chain cable D', which runs forward around a stationary pulley D², then upward, and is attached to the lower end of a rack-bar E, which is mounted to slide vertically in fixed guides E' on the back of the standard A', so that when the punching-head C is forced inward by a blow the rack-bar E will be drawn downward a distance exactly proportionate to the force of the blow and remain in such position while the punching-head is again projected.

An adjustable spring-arm E² is attached to the back of the standard A', and its free end arranged to bear upward against a projection E³ on the rack-bar E, so as to normally sustain the said rack-bar and by its reaction to return the rack-bar when free to its normal position after being drawn downward, as stated.

The upper end of the rack-bar E is provided with a plunger E⁴, working loosely in a downwardly-opening cylinder E⁵, fixed to the standard A', so that the return of the rack-bar will be checked and thus accomplished without noise, and a fixed stop E⁶ is arranged to bar the projection E³ on the rack-bar, and thus limit the return of the rack-bar at the proper point.

The upper series of teeth E⁷ of the rack-bar E are geared with a pinion E⁸, fixed on an arbor which projects through the standard A' at the center of the scale B on the face thereof, and carries an index E⁹, which turns over and registers with the divisions of the said scale.

The adjustment and arrangement are such that when the punching-head C is fully projected and the rack-bar E at its uppermost position the index E⁹ will register with zero of the scale A², and when the rack-bar E is drawn downward by a blow on the punching-head the index E⁹ will turn to coincidence with a number of the scale representing the force of the blow struck in pounds.

The lower series of teeth F' on the rack-bar E are geared with a pinion F', fixed to and turning on a common pivot F², with a fine-toothed ratchet-wheel F³, which is normally engaged by a sliding spring-actuated multiple-toothed dog F⁴, so that when the index-operating rack-bar E is drawn downward, as de-

scribed, it will be automatically locked at the termination of its downward movement, and the index thus held in the position into which it may be thrown, whereby the user will be given ample time to note the force of his blow. The dog F⁴ acts also as a check to prevent the momentum of the moving parts from carrying the index beyond the true point.

A push-button G is arranged to work in a guide G' on the front of the standard A' near the scales, and its shank G² to bear against one arm of a pivotal elbow-lever G³, the other arm of which is arranged to bear against a projection on the rear end of the dog F⁴, so that by pressing the button G inward the user after noting the force of his blow, or the next intending user, can disengage the dog F⁴ from the ratchet-wheel F³, and thus permit the index E⁹ to be returned to zero by the reaction of the spring-arm E², before described.

The piston G¹³ is shown in Fig. 10 provided with a hemispherical rubber or leather cup or valve, placed with its convex face uppermost. This arrangement permits it to be readily moved upward; but when forced downward it tends to expand and closely hugs the wall of the cylinder, thereby confining the air beneath it and retarding its descent.

In some cases, to insure the return of the index to zero after each blow is struck, we use in addition an automatic time-index-releasing device, as shown in Fig. 10, which also forms part of our invention.

This device comprises another gravity or spring-actuated multiple-toothed dog G⁴ to engage the ratchet-wheel F³ in gear with the index; a pivotal finger-lever G⁵, arranged when swung on its pivot to engage a shoulder on the dog G⁴ and retract the same from the ratchet-wheel F³; a plunger G⁶, carrying a pin G⁷, working in a slot in the finger-lever G⁵ and arranged, when raised, to swing the finger-lever and let the dog G⁴ engage the ratchet-wheel F³, and, when lowered, to disengage the dog therefrom; guides G⁸, in which the plunger works; a pivotal plunger-operating lever G⁹, connected at one end to the plunger and having in its other end a beveled retractible spring-projected bolt G¹⁰; a beveled tappet G¹¹ on the rack-bar E, adapted, when the rack-bar is drawn downward by a blow, to strike the bolt G¹⁰, raise the plunger G⁶, and permit the dog G⁴ to lock the rack-bar and index at the termination of their movement, as before described, and a fixed upwardly-opening cylinder G¹², in which a valved piston G¹³ on the end of the plunger G⁶ works, whereby after the plunger is raised, as stated, the valve of the piston G¹³, which opened so as to unimpede such movement, will close and check the fall of the plunger by inclosing the air in the cylinder, and the retraction of the dog and release of the index thus be delayed until the plunger reaches the end of its slow downward movement. The temporary retention of the index can be made as long as desired by

adjusting the valve of the piston G^{13} in a common manner.

To prevent any movement of the punching-head C save on payment of the proper coin, the tubular shank C' and its fixed guide C^2 are formed with lateral cross-slots $H H'$, respectively, which are arranged to coincide when the punching-head is in its outermost position, as shown in Fig. 8. A stout bolt H^2 , formed on one arm of a pivotal weighing-lever H^3 , is arranged to normally overbalance the other arm of said weighing-lever and fall between the shoulders formed by the slots $H H'$ when coincident, and thus securely lock the shank C' to its guide C^2 , whereby movement of the punching-head is prevented.

The other arm of the weighing-lever H^3 carries a coin-bucket H^4 , which is normally held at the discharge end of a coin-chute K , extending upward and outward through the front of the case A of the machine. The mouth K' of the coin-chute K is of such a size and shape as to admit only coins below a certain size. The weighing-lever H^3 is so adjusted that its bolt-arm will ascend and release the punching-head only when overbalanced by the fall into the bucket H^4 of a coin of a certain weight. Further, the bottom H^5 of the coin-bucket, which bottom is movable for a purpose hereinafter described, is provided with a hole H^6 of such a size that the bucket will retain a coin of a certain size and let smaller ones fall out immediately into the case. Thus by a proper adjustment of the parts referred to the machine can be suited to a certain coin only, while other coins are either excluded or received without affecting the machine.

In the front of the standard A' is provided a window L , back of which is pivoted to swing vertically a carrier L' , supporting a double sign L^2 , on one part of which is printed or produced a warning not to strike—as, for instance, the words "Wait for signal"—and on the other part a signal to strike, such as the word "Time." The carrier L' is connected by a rod L^3 with the bolt-carrying lever H^3 , the arrangement being such that when the bolt H^2 is in its lower locking position the above-mentioned warning will appear at the window and inform the intending user not to strike; but when the bolt H^2 is raised by the fall of the proper coin from the chute into the bucket H^4 , and the punching-head thus left free to operate, the sign L^2 will swing so as to conceal the warning and display the signal to strike, and thus indicate that the machine can be used. The blow being struck, the index will be swung to the appropriate number of the scale and remain there until reset automatically or by hand, as before described.

The movable bottom H^5 of the coin-bucket H^4 is carried by pendent arms M , pivoted at their upper ends to the opposite ends of the bucket, and is formed with an arm M' , projecting laterally over a pivotal tripper M^2 ,

which is connected by a link M^3 with one arm of a pivotal lever M^4 , the other arm of which is forked so as to embrace, when the punching-head is projected, a lug M^5 , attached to the shank of the same. The arrangement is such that when the punching-head is normally projected the tripper M^2 will be lowered to allow the bottom H^5 of the bucket to swing by gravity in place and retain the proper coin deposited therein and said bucket to fall with the weight of the coin and release the punching-head; but when the punching-head is forced inward by the blow the lug M^5 on its shank will swing the forked lever M^4 and thus the tripper M^2 , which latter will displace the bottom H^5 of the bucket H and dump the coin. Then as the shank C' is immediately projected again by its reacting spring C^4 , as soon as its slot H comes into register with the slot H' in the guide C^2 , the bolt H^2 , being no longer overbalanced, will fall by gravity into said slots $H H'$, and thus automatically lock the punching-head against movement. A choke-spring N is arranged to bear on the forked lever M^4 , so as to prevent the same from swinging save when the prongs of its fork are struck by the lug M^5 on the shank C' .

We claim as new and desire to secure by Letters Patent—

1. In a blow-testing machine, the combination, with the case, the punching-head having a shank, its reacting device and guide, of a sliding cross-head adapted to be moved by the said shank when forced inward only, the cross-head guide, an index, and index-operating devices connected with the sliding cross-head, substantially as described.

2. In a coin-controlled blow-testing machine, the combination, with a punching-head having a shank and a lug thereon, its reacting device, and its guide, of a shank-locking device, a weighing-lever to operate said locking device carrying a dumping-coin bucket, a tripper to dump said bucket, a pivotal lever having a fork normally embracing the lug on the punching-head shank, and a connection between the forked lever and the said tripper, substantially as described.

3. In a blow-testing machine, the combination, with the case, the punching-head, and its reacting device, of an index, its returning-spring, index-operating gear adapted to be operated by the punching-head when forced inward only, a self-acting dog to engage and restrain the index-gear, means for disengaging said dog, and an air-cushioning check device to retard the return of the index-gear, substantially as described.

4. In a blow-testing machine, the combination, with the case, the punching-head and its reacting device, of an index, its returning-spring, index-operating gear adapted to be operated by the punching-head when forced inward only, a check device to retard the return of the index-gear by its spring, and adjusting devices for regulating the tension of

said index-returning spring, substantially as described.

5 In a blow-testing machine, the combination, with the case, the punching-head and its reacting device, the reacting index, a movable rack-bar, index-operating gear connected with the rack-bar, and rack-bar-operating connections adapted to be operated by the punching-head when forced inward only, of
10 a ratchet-wheel geared to the rack-bar, a sliding self-acting dog engaging the ratchet-wheel, and means for disengaging said dog, substantially as described.

15 6. In a blow-testing machine, the combination, with the case, the reacting punching-head, the reacting index, index-operating gear comprising a ratchet adapted to be operated by the punching-head when forced in-

ward only, a self-acting dog to engage said ratchet and restrain the index-gear, a self-acting dog-retractor, and mechanism whereby the said retractor is released by the motion of the index-gear, and the dog thus permitted to engage the index-gear, of an air-cushioning check device to retard the reaction of the dog-retractor, and thus delay the release of the index-gear, substantially as described. 25

JAS. P. O'BRIEN.
HENRY COOPER.

Witnesses to said James P. O'Brien:

CLARENCE A. BURGER,
FRED. T. BENNETT.

Witnesses to Henry Cooper's signature:

B. VAN LEER,
CLARENCE A. BURGER.