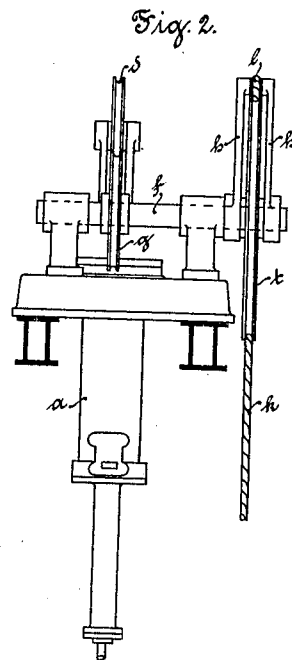
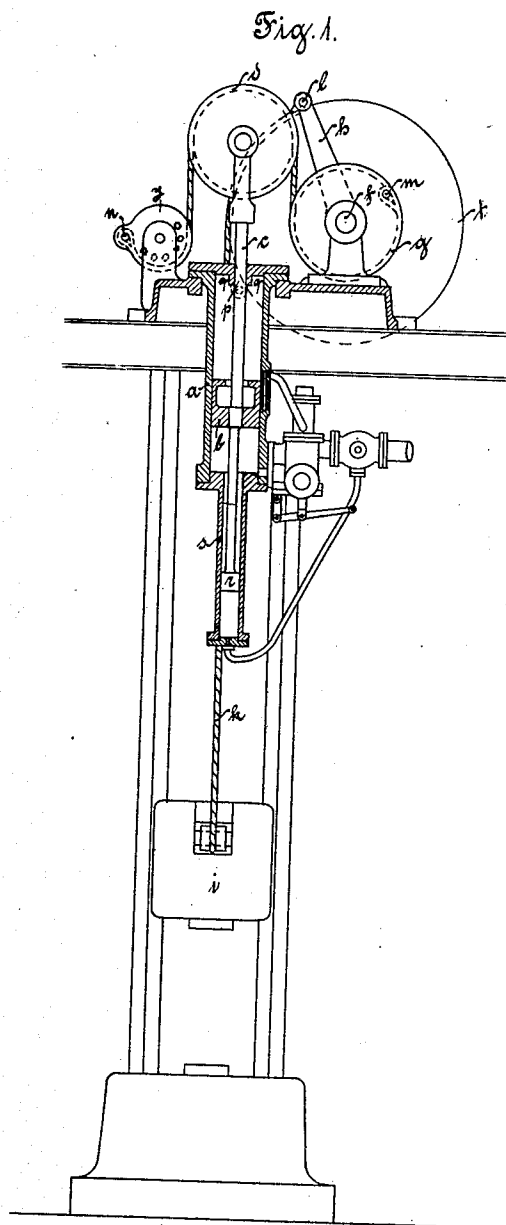


920,106.

J. BÊCHÉ.
DROP HAMMER.
APPLICATION FILED MAY 29, 1906.

Patented May 4, 1909.
2 SHEETS—SHEET 1.



Witnesses:
H. K. Boulter
J. E. Thompson

Inventor
Jean Bêché
By J. M. Boulter,
Attorney

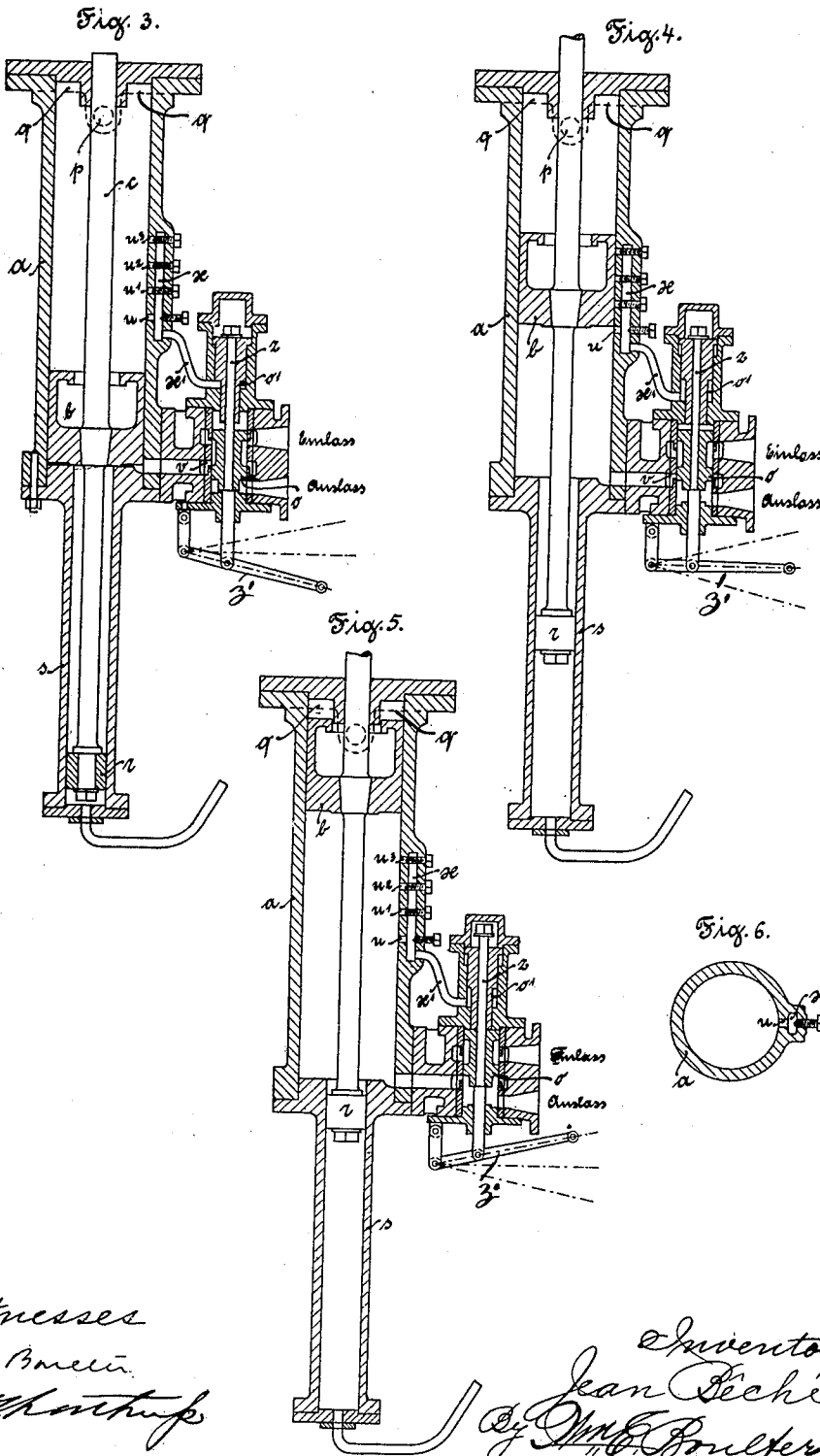
J. BÉCHÉ.
DROP HAMMER.

APPLICATION FILED MAY 29, 1906.

920,106.

Patented May 4, 1909.

2 SHEETS—SHEET 2.



Witnesses
W. H. Bouché
J. Bouché

Inventor:
Jean Béché
J. Bouché
Attorney

UNITED STATES PATENT OFFICE.

JEAN BÉCHÉ, OF HÜCKESWAGEN, GERMANY.

DROP-HAMMER.

No. 920,106.

Specification of Letters Patent.

Patented May 4, 1909.

Application filed May 29, 1906. Serial No. 319,305.

To all whom it may concern:

Be it known that I, JEAN BÉCHÉ, a subject of the German Emperor, residing at Hückeswagen, Rheinland, Germany, have invented certain new and useful Improvements in Drop-Hammers, of which the following is a specification.

This invention relates to a winding device for drop hammers driven by steam or compressed air, in which, in addition to the driving piston proper, a counter-pressure-piston is also provided the object of which is always to hold the winding means taut, in order to prevent breakage of the cable.

A winding device for drop hammers according to this invention is shown in Figure 1 in longitudinal section and in Fig. 2 in side elevation, Figs. 3-5 show different positions of pistons and Fig. 6 is a cross-section through the working cylinder.

The piston *b* is forced upward in the cylinder *a* by means of steam or compressed air, the piston rod *c* being provided with a loose pulley *d*. On one side of the cylinder *a* is arranged a spindle *f* on which is fixed a pulley *g*, while on the opposite side is a fixed but adjustable roller *y*. A cable secured to the said roller at *n* passes over the loose pulley *d*, then over the pulley *g* and is connected to the latter at *m*, consequently an upward movement of the piston rotates the spindle *f*. To this spindle are keyed two levers *h* to which is secured at *l* the cable *k* supporting the hammer head *i*. Between the said two levers *h* is arranged a loose pulley *t* over which the cable *k* passes when the levers *h* are moved.

On the working cylinder *a* is arranged a valve cylinder provided with a regulating slide valve *o* and with a second slide valve *o'* mounted loose on the spindle *z* and arranged above the first slide valve.

The working cylinder *a* is provided with passages or ports *u u¹ u² u³* which can be closed by screws and which all open into a common passage *x*. A pipe *x'* connects the latter with the valve chest below the slide valve *o'*.

If pressure be applied to the piston *b*, the slide valve *o* being in the position shown in Fig. 3, the said piston rises, and the roller *g* is revolved and with it the spindle *f* and the arms *h*, and thus raises the hammer-head *i*, the cable *k* turning with the loose pulley *t*. The pressure medium is admitted into the

cylinder *a* until the piston *b* has passed the free passage *u*, Fig. 4, when the pressure medium passes through the latter and the passage *x'* to underneath the valve *o'*, raising the latter and the regulating valve *o* and stopping further admission of the pressure medium. The latter then begins to expand. According to the weight of the hammer-head or the pressure of the pressure medium, one of the passages *u¹ u² u³* can be used instead of the passage *u*, this prolonging the period of full pressure. After the piston *b* has reached its highest position corresponding to the travel of the hammer-head *i*, the regulating valve is brought into its highest position as shown in Fig. 5, whereby the working space of the cylinder is brought into communication with the atmosphere, and the hammer-head *i* falls by its own weight. A lever *z'* is provided to give the required movements to the spindle *z*. This lever, as shown, is operated by hand, but if desired an operative connection may be provided between the said lever and the working spindle, to enable the lever to be operated automatically. Such means are well known in the art and need not therefore be particularly described. During the up-and-down movement of the piston *b* the air can freely enter the cylinder *a* and escape therefrom through the opening *p*. The chamber *q* formed above the said opening, constitutes in case of the cable breaking, a cushion space, and prevents the rapid rise of the piston *b* from injuriously striking against the cylinder head.

In order to keep the cables taut under all circumstances, a smaller piston *r* is arranged on a downward extension of the piston rod *c*. The said second piston *r* moves in its cylinder *s* simultaneously with the movements of the piston *b*. The piston *r* is in constant communication with the pressure medium through its outer end and offers a certain resistance to the descending piston *b*, so that the cables always remain taut. A loose hanging of the cable would cause it to break when the pressure medium was admitted.

What I claim as my invention and desire to secure by Letters Patent is—

1. In a drop hammer the combination of a cable, a hammer head secured to said cable at one end, a pressure cylinder open to the atmosphere at one end, means to control the inlet and outlet of pressure fluid at the other end of the cylinder, a working piston in the

cylinder, a piston rod passing through the cylinder and extending beyond it at each end, an operative connection between said cable and said piston rod at one end thereof, 5 and means connected to the other end of said piston rod for keeping said cable taut, substantially as and for the purpose set forth.

2. In a drop hammer the combination of a cable, a hammer head secured to said cable 10 at one end, a pressure cylinder open to the atmosphere at one end, means to control the inlet and outlet of pressure fluid at the other end of the cylinder, a working piston in the cylinder, a piston rod passing through the 15 cylinder and extending beyond it at each end, an operative connection between said cable and said piston rod, a second cylinder of smaller diameter than the first arranged on and opening into the pressure end thereof, a working piston in the second cylinder 20 carried on the said piston rod and a connection with a source of pressure fluid at one end of said second cylinder, substantially as and for the purpose set forth.

3. In a drop hammer the combination of a cable, a hammer head secured to said cable at one end, a pressure cylinder open to the atmosphere at one end, a cylinder slide valve 25 to admit pressure fluid to the cylinder, a second valve to close the first valve, a connection between the second valve and the working cylinder, and means to vary the position of the said connection in the working cylinder, a working piston in the cylinder, a piston 30 rod passing through the cylinder and extend-

ing beyond it at each end, an operative connection between said cable and said piston rod at one end thereof and means connected to the other end of said piston rod for keeping said cable taut, substantially as and 40 for the purpose set forth.

4. In a drop hammer the combination of a cable, a hammer head secured to said cable at one end, a pressure cylinder open to the atmosphere at one end, a cylinder slide valve 45 to admit pressure fluid to the cylinder, a second plunger valve to close the first valve, a connection between the second valve and the working cylinder and means to vary the position of the active port-hole with which 50 the connection communicates, means for moving the cylinder slide valve into the exhaust position, a working piston in the cylinder, a piston rod passing through the cylinder and extending beyond it at each end, 55 a pulley connected to the upper end of said piston rod to support the said cable, cable pulleys as *y d g* and *t* and means connected to the other end of said piston rod for keeping said cable taut, substantially as and for the 60 purpose described.

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

JEAN BÉCHÉ.

Witnesses:

OTTO KÖNIG,
J. A. RITTERSHAUS.