

P. C. A. ROBAIL.

SAFETY GRIPPER FOR MANIPULATING GLASS PLATES AND OTHER ARTICLES.

APPLICATION FILED MAR. 28, 1912.

Patented Dec. 31, 1912.

1,049,150.

2 SHEETS—SHEET 1.

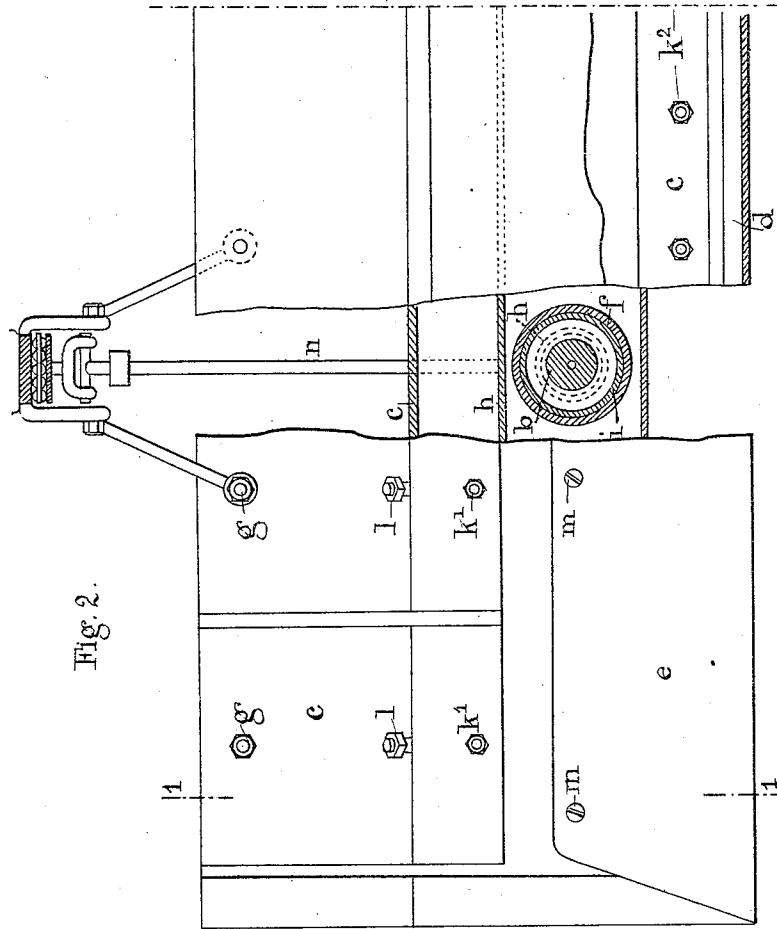


Fig. 2.

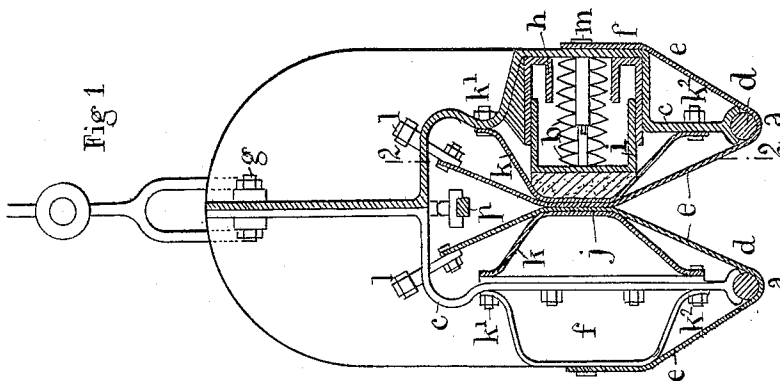
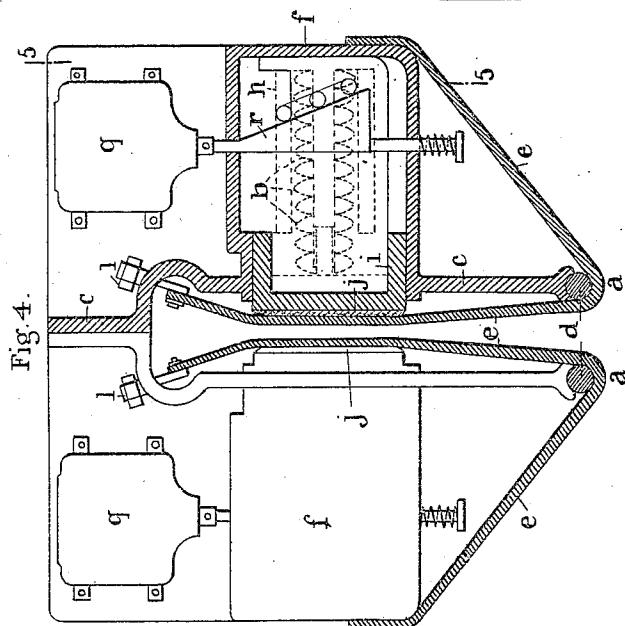
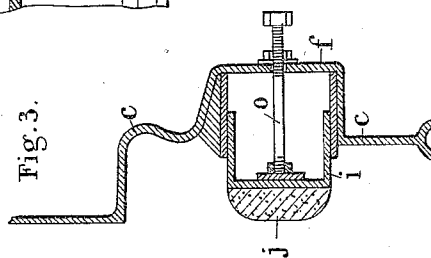
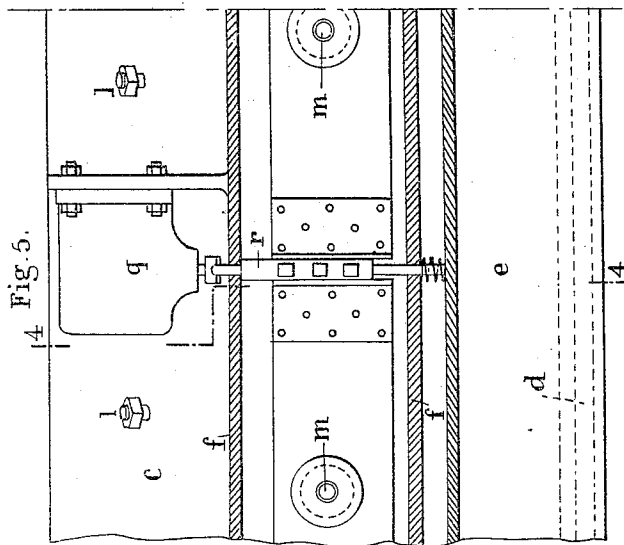


Fig. 1

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UNITED STATES PATENT OFFICE.

PAUL CHARLES AUGUSTE ROBAIL, OF FRANIÈRES, BELGIUM, ASSIGNOR TO SOCIÉTÉ ANONYME DES MANUFACTURES DES GLACES ET PRODUITS CHIMIQUES DE SAINT GOBAIN, CHAUNY ET CIRCY, OF PARIS, FRANCE.

SAFETY-GRIPPER FOR MANIPULATING GLASS PLATES AND OTHER ARTICLES.

1,049,150.

Specification of Letters Patent.

Patented Dec. 31, 1912.

Application filed March 28, 1912. Serial No. 686,799.

To all whom it may concern:

Be it known that I, PAUL CHARLES AUGUSTE ROBAIL, a citizen of the Republic of France, and a resident of Franières, Belgium, have invented a certain new and useful Improvement in Safety-Grippers for Manipulating Glass Plates and other Articles, of which the following is a specification.

This invention relates to a safety gripper device serving for the manipulation of glass plates or sheets and other articles; this gripper is normally closed and cannot allow the article which is undergoing transport, to escape until a certain releasing operation is performed; in this way any premature release of the article which is being transported is absolutely prevented.

The annexed drawing shows by way of example two methods of carrying out the object of the invention.

Figures 1, 2 and 3 relate to a first form of constructing the gripper, which is pneumatically controlled.

Fig. 1 shows on the left hand an end view and on the right hand a sectional view on line 1—1 of Fig. 2. Fig. 2 is an elevation, part section, on line 2—2 of Fig. 1. Fig. 3 is a detail in sectional elevation. Fig. 4 shows on the left hand side an end view and on the right hand side, a section on line 4—4 of Fig. 5. Fig. 5 is a section on line 5—5 of Fig. 4.

The apparatus consists essentially of two jaws *a* forcibly pressed one against the other by springs or elastic washers of any suitable kind *b* previously compressed, the compressing strength of which is regulated in such a way that it will prevent any slipping of the articles held between the jaws. The two jaws which are identical are composed each of a fixed metal framework *c* furnished at its lower part with a gutter into which enters a rubber cylinder *d* which extends the whole length of the gripper. The rubber cylinders *d* have for object to cushion shocks against the ground and to insure the tensioning of the felt pieces *e* hereafter described. The metallic frames of the two jaws are incurved like a shell *f* and are connected to their upper portions by assembling bolts *g*. Upon the bottom of the shell *f* is fixed a circular socket *h* which serves as a fixed guide for the washers *b*.

The movable portion of the jaws is composed of two shells *i* boxed with tight joints into the shells *f* and upon the internal face of which bear the washers *b*. The external face of the shells *i* is provided with a drum or pad *j* of rubber or other elastic material; this pad is itself covered with rubbered cloth *k* which is fixed to the frame by the bolts *k'* and *k''*. A sheet of felt *e* commencing from the tensioning bolts *l* covers the rubber-proofed sheet *k*, the rubber cylinder *d* and is fixed at its other extremity by means of bolts *m* placed in the axial line of compression of the washers *b*. The interior of the shells is connected by means of piping *n* to a vacuum pump placed upon the lifting apparatus or in any other suitable position. The gripper is normally closed, that is to say, the movable portions *i* of the jaws are normally applied one against the other by pressure of the washers *b*. If communication be established between the vacuum pipe *n* and the interior of the shells, the air is rarefied in the latter, and the atmospheric pressure acting from the exterior causes the shells *i* to recede into the shells *f*. The movable parts separate remaining parallel to one another, and the gripper is thus opened. Upon again allowing air to enter within the shells the closing of the gripper is effected.

It will be seen that in case of accident, stoppage of the vacuum pump, breakage of the piping, etc., the gripper automatically closes retaining the article instead of releasing it. Moreover, if any derangement occurs while the gripper is at rest, warning of this will be given when it is wished to separate the jaws.

Fig. 3 shows the arrangement of the screw *o* which enables the compression of the washers *b* to be regulated, by bringing together the movable shell *i* and the fixed shell *f*.

A rail *p* (Fig. 1) faced with felt and bolted to the bottom of the gripper is intended to cushion shocks at the moment of engaging the plate or other object. The gripper is suspended from the lifting device, as shown in Fig. 2, by means of connecting rods and bearings and the piping is furnished with joints which allow the gripper to turn about a vertical axis and a horizontal axis.

In the second form of construction (Figs. 4 and 5) the separating movement of the jaws is obtained by means of two electromagnets *g* which can act upon the movable shells by the intermediary of inclined ramps *r*, or by means of any other mechanical device.

Having thus described my invention, what I claim as such and desire to secure by Letters Patent, is:—

1. An automatic safety gripper comprising a fixed gripping body composed of two shells, jaws formed of movable shells, sliding in the said fixed shells and springs interposed between the said fixed shells and the said movable shells and operative connections to the interior of the shells for separating said jaws.

2. An automatic safety gripper of the type described, comprising a fixed gripping body, composed of two shells, jaws formed of movable shells sliding in the said fixed shells, springs interposed between the said fixed shells and the said movable shells and means independent of the article gripped for separating the said jaws against the action of said springs.

3. An automatic safety gripper of the type described, comprising a fixed gripping body composed of two shells, jaws formed of movable shells sliding in the said fixed shells, springs interposed between the said fixed shells and the said movable shells and means for creating a vacuum between the fixed and movable shells.

4. An automatic safety gripper of the type described, comprising a fixed gripping body composed of two shells, sliding jaws carried by said shells, springs interposed between said fixed and movable shells and means operative from the interior of the shells for separating said jaws in parallel planes against the action of said springs.

5. A safety gripper for glass plates and other objects, comprising a gripping body, gripping jaws comprising a pair of oppositely-faced shells slidably mounted on said body, means for maintaining said movable jaws normally closed, elastic pads provided on the contacting faces of said jaws, and positive means for separating said jaws in

parallel planes against the action of said normally closing means.

6. A safety gripper for glass plates and other objects, comprising a gripping body, means for suspending said body, shells fixed upon said body, said fixed shells being arranged in axially opposed pairs, movable jaws sliding in said fixed shells, springs interposed between said fixed shells and said movable jaws, said springs serving to close together the pairs of said movable jaws, elastic pads provided on the contacting faces of said movable jaws, means for cushioning the descent of said gripper body upon the object and upon the ground and means for separating said jaws against the action of the springs.

7. A gripper of the type described, comprising a fixed gripping body composed of oppositely faced fixed shells, movable shells mounted in the juxtaposed faces of said fixed shells and presenting their gripping faces constantly in parallel planes, means tending to hold said movable shells constantly in gripping relation, and means for separating said movable shells to free the article gripped between the same.

8. In a gripper of the type described, a gripper jaw comprising oppositely faced fixed shells, and movable shells carried on the juxtaposed faces of said fixed shells, for gripping an interposed body, said fixed shells having extensions forming lips *c*, together with cushioning material at the edges of said lips, for the purpose specified.

9. In a gripper of the type described, a gripper jaw comprising oppositely faced fixed shells, and movable shells carried on the juxtaposed faces of said fixed shells, for gripping an interposed body, said fixed shells having extensions forming lips *c*, together with cushioning material *e*, carried by the fixed shells and passing over said lips and the meeting faces of the movable shells, substantially as described.

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

PAUL CHARLES AUGUSTE ROBAIL.

Witnesses:

JACQUES LEJEUNE,
LÉON PELLLET.