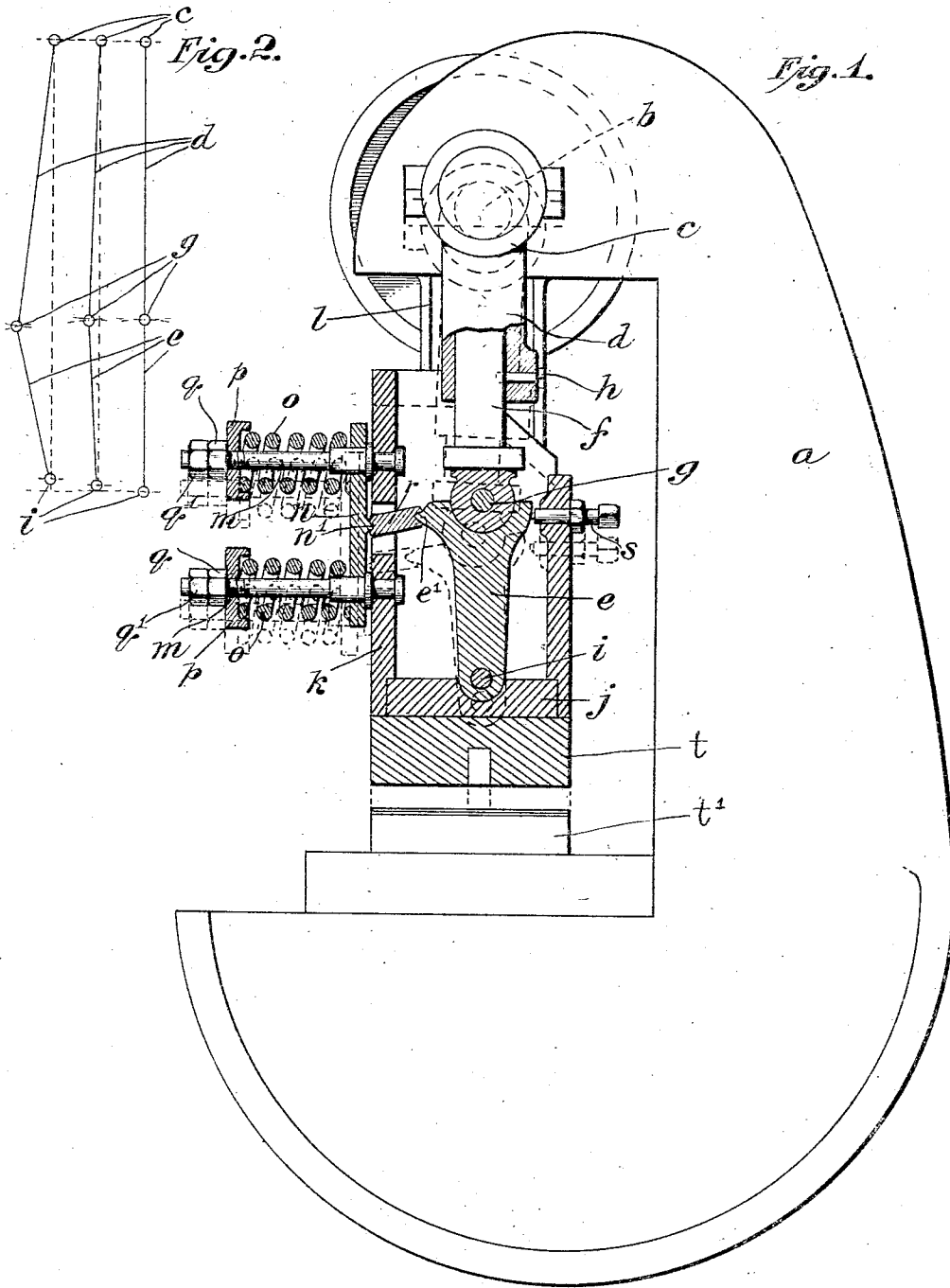


APPLICATION FILED MAR. 30, 1912.

1,121,886.

Patented Dec. 22, 1914.



Attest:
E. Mitchell
 Eugene W. Werning

August H. Wittberg Inventor:
by Frank P. Newton
his Atty.

UNITED STATES PATENT OFFICE.

AUGUST K. WITTLINGER, OF NEW YORK, N. Y., ASSIGNOR TO DOEHLER DIE CASTING COMPANY, A CORPORATION OF NEW YORK.

ATTACHMENT FOR POWER-PRESSES.

1,121,886.

Specification of Letters Patent. Patented Dec. 22, 1914.

Application filed March 30, 1912. Serial No. 687,323.

To all whom it may concern:

Be it known that I, AUGUST K. WITTLINGER, a subject of the Emperor of Germany, residing at the borough of Brooklyn, in the city of New York, county of Kings, and State of New York, have invented certain new and useful Improvements in Attachments for Power-Presses, of which the following is a specification, reference being had therein to the accompanying drawings, which form a part thereof.

My invention relates to attachments for power presses, and more particularly to a type thereof adapted for use in forging metal.

An attachment of the character herein described is particularly adapted for use in connection with the production of brass forgings of intricate parts to be utilized in lieu of the ordinary sand cast, machine finished parts. The production of such parts is accomplished by means of delicate dies acting upon brass heated approximately to the fusing point, the die acting upon an ingot of such metal to give it the desired form and density. Owing to the delicacy of the die which must be used, and the necessity for preserving this die in the interest of economy, it is necessary to provide an attachment for the press whereby the die will be caused to automatically accommodate itself to any slight variance in the bulk of the brass fed thereto in order to prevent the breaking of the die through the excessive resistance encountered thereby as a result of this excess material.

With these conditions in mind, the main object of the invention is to provide an attachment for presses wherein the maximum pressure which may be developed by the die will be automatically governed and the die relieved from any excess pressure.

A further object is to provide in an attachment of this character, means whereby the pressure regulating mechanism may be adjusted to set the press to any desired pressure.

A still further object is to provide an attachment embodying a ram which will comprise two sections united by a toggle joint, wherein means will be provided for normally setting said sections in a manner so that excess pressure will automatically break the joint against the tension of a spring resistance.

A still further object is to provide an attachment of this character wherein if desired the two sections of the ram may be set in perfect alinement so as to prevent the breaking of the joint and permit the use of the press in the ordinary manner. And a still further object is to provide an attachment of this character which may be applied to the ordinary power press by merely substituting the attachment for the ordinary ram.

My invention consists in an attachment for power presses embodying therein a ram or punch having a head adapted to carry a die and adapted to be reciprocated by means actuated from the shaft of a press, and a yielding member through which the power from said shaft is applied to the head of the ram whereby the maximum pressure exerted at the head of the ram will be limited by the resistance of said yielding member; and in such other novel features of construction and combination of parts as are hereinafter set forth and described, and more particularly pointed out in the claims hereto appended.

Referring to the drawings:—Figure 1 is a side elevation of the upper part of a press embodying my invention, the attachment being shown in vertical section; and Fig. 2 is a diagrammatic view showing the mode of operation of the attachment.

Like letters indicate like parts in both of said views.

In the embodiment of the invention shown in the drawings, *a* indicates a press frame having mounted therein a power shaft *b* indicated in dotted lines, carrying an eccentric *c* for imparting to the ram the required reciprocatory movement.

The detailed construction of the press is immaterial to this invention, any desired and well known design of press being capable of use for this purpose.

Actuated from the eccentric *c* is a bi-part ram composed of two sections *d* and *e*, the first of which *d*, has adjustably mounted therein an eye pin *f* the lower end of which is pivotally united to the section *e* by means of the pivot pin *g*. The adjustment of the pin *f* is secured by means of the bolt *h*, the section *d* being hollow to receive the pin *f* and permit it to be adjustably mounted therein.

The section *e* is pivotally mounted at

to the ram head *j*, the construction and arrangement of the sections *d e* being such as to permit them to break at the pivot *g* and have an oscillatory movement about the pivots formed by the eccentric *c* and the pivot *i*.

Carried by the head *j* is a casing *k* having a reciprocatory movement only, the press being provided with suitable side guides as *l* for limiting it to this movement.

Fixedly mounted upon the casing *k* is a plurality of guide rods *m* upon which is slidably mounted the plate *n*. Encircling each of the rods *m* is a coiled spring *o*, acting against the plate *n* and against a spring cup *p* carried by each of said rods *m*. The outer ends of the rods *m* are screw threaded and carried thereby and acting against the cups *p* are adjustment nuts *q* adapted to be set in any adjusted position by means of the lock nuts *q'*.

That side of the ram section *e* toward the springs *o* is provided with a projection *e'* and acted upon by said projection and by the projection *n'* upon the plate *n* is a link *r* which transmits the pressure of the springs *o* to the said section *e* and normally tends to restore the ram sections *d e* to their normal position. The spring rigging herein described constitutes the resistance through which power is applied to the head of the ram and which limits the power which may be applied to the ram head *j* through the ram *d e*.

Upon the casing *k* opposite to the projection *e'* of the section *e* is a stop screw *s* which defines the normal position of the ram sections and at the same time permits such adjustment thereof as to permit said sections to be brought into perfect alinement or to vary the angle of projection of one section relative to the other in order to insure the positive action of the ram while the press is in operation.

The two parts of the split die are indicated at *t* and *t'* respectively.

The operation of the herein described attachment when applied to a power press is substantially as follows:—The two parts of the die *t t'* being normally spaced apart, an ingot of brass or other similar metal heated to a point just below the fusing point is fed to the die and the press is tripped. With the tripping of the press, the shaft *b* and with it the eccentric *c* is rotated, forcing the ram *d e* downwardly carrying with it the casing *k* and the parts appurtenant thereto. The guides *l* limit the movement of this casing to a direct vertical movement. When the shaft rotates, the power developed thereby will have a tendency to buckle the ram sections *d e* at their point of pivotal connection *g*, this tendency being overcome by the tension of the springs *o* acting through the link *r*. The stop screw *s* not only defines the normal

position of the sections *d e* but also serves to facilitate the exact adjustment of the dies in setting them upon the press. The eye pin *f* may be adjusted to accommodate the attachment to dies of different sizes, the securing bolt *h* being used for setting said pin in any desired position. Under normal conditions, the sections *d e* will be set at a slight angle to each other as shown in Fig. 1, and in the middle diagram of Fig. 2, and this condition will be maintained so long as the bulk of metal contained in an ingot is not in excess of that required to forge with precision the part to be made, or of which the part may be forged with a single blow. If, however, a single blow is not sufficient to forge the part, or if the bulk of metal in the ingot is too great, the power of the eccentric *c* and the resistance encountered by the die will act and react upon the sections *d e* in a manner to render the springs *o* inoperative to further advance the die and cause the sections *d e* to buckle slightly and thus permit the continued rotation of said eccentric without applying any greater pressure through the die at any time than that developed by the springs *o* which will yield under the buckling action above referred to and thus avoid any injury to the die or to the ram itself. The slight rotative movement of the projection *e'* is compensated for by the manner of mounting the link *r*. Immediately after the completion of the down stroke of the ram, and upon the initiation of the up stroke thereof, the springs *o* will act upon the projection *e'* of the section *e* in a manner to right the two sections of the ram or restore them to their normal position. In case of the development of excessive pressures, the sections *d e* will assume the position shown diagrammatically in the diagram to the left of Fig. 2.

It will be observed that the sections *d* and *e* respectively when they buckle, rotate upon the eccentric *c* and about the pivot *i* by means of which the section *e* is attached to the ram head *j*. The link *r* is free to have movement in a slot in the casing *k*.

The tension of the springs *o* may be regulated by means of the set nuts *q*, thus permitting the regulation of the force of the blow delivered by the ram.

While the section *e* is pivoted to the ram head *j*, the frame *k* is movable with the ram solely because of the resistance developed by the springs *o*, the pressure or force of the blow delivered being imparted through said springs and limited thereby.

The more obtuse the angle between the sections *d e* the less will be the tendency of said sections to buckle, so that if it be desired to slightly vary the pressure developed, such a variance may be accomplished by means of the adjustment bolt *h*.

By means of the attachment herein de-

scribed, the force of the blow imparted by the ram may be regulated to a nicety, and the ram itself may thus be caused to deliver a blow of constant force with a varied length of stroke from an actuating member acting at a constant leverage.

If it be desired to render the spring rigging inoperative, it is merely necessary to withdraw the stop screw *s* sufficiently to permit the sections *d* and *e* to come into alinement as shown in the diagram to the left of Fig. 2, under which conditions power will be applied to the ram head through the ram sections directly, and not through the spring rigging.

It is not my intention to limit the invention to the precise details of construction shown in the accompanying drawings, it being apparent that such may be varied without departing from the spirit and scope of the invention.

Having described my invention, what I claim as new and desire to have protected by Letters Patent, is:—

1. An attachment for power presses embodying therein a ram comprising two pivotally united sections, a head adapted to carry a die, a pivotal connection between said head and one of said sections, said last named section being provided with a lateral projection adjacent to its point of connection with the other section, means actuated by the power shaft of a press acting upon the ram section which does not carry said head, a casing movable with said head, means limiting said casing to a reciproca-

tory movement, a spring rigging carried by said casing and movable with said head, a link operative against said projection and said spring rigging, and means whereby the angle at the point of pivotal connection between said sections may be adjusted to determine the operative effect of said spring rigging.

2. An attachment for power presses embodying therein a ram comprising two sections pivotally united, a head adapted to carry a die, a pivotal connection between said head and one of said sections, said last named section being provided with a projection adjacent to its point of connection with the other section, means actuated by the power shaft of a press acting upon the ram section which does not carry said head to reciprocate both said sections, a casing movable with said head, means limiting said casing to a reciprocatory movement, a resistance spring carried by said casing, a movable plate against which said spring acts, a link between said plate and said projection, and an adjustable stop oppositely disposed as to said link and acting to hold said sections in any desired position.

In witness whereof, I have hereunto affixed my signature, in the presence of two subscribing witnesses, this 18th day of March, 1912.

AUGUST K. WITTLINGER.

Witnesses:

O. A. SCHROEDER,
A. H. MOEHLER.