

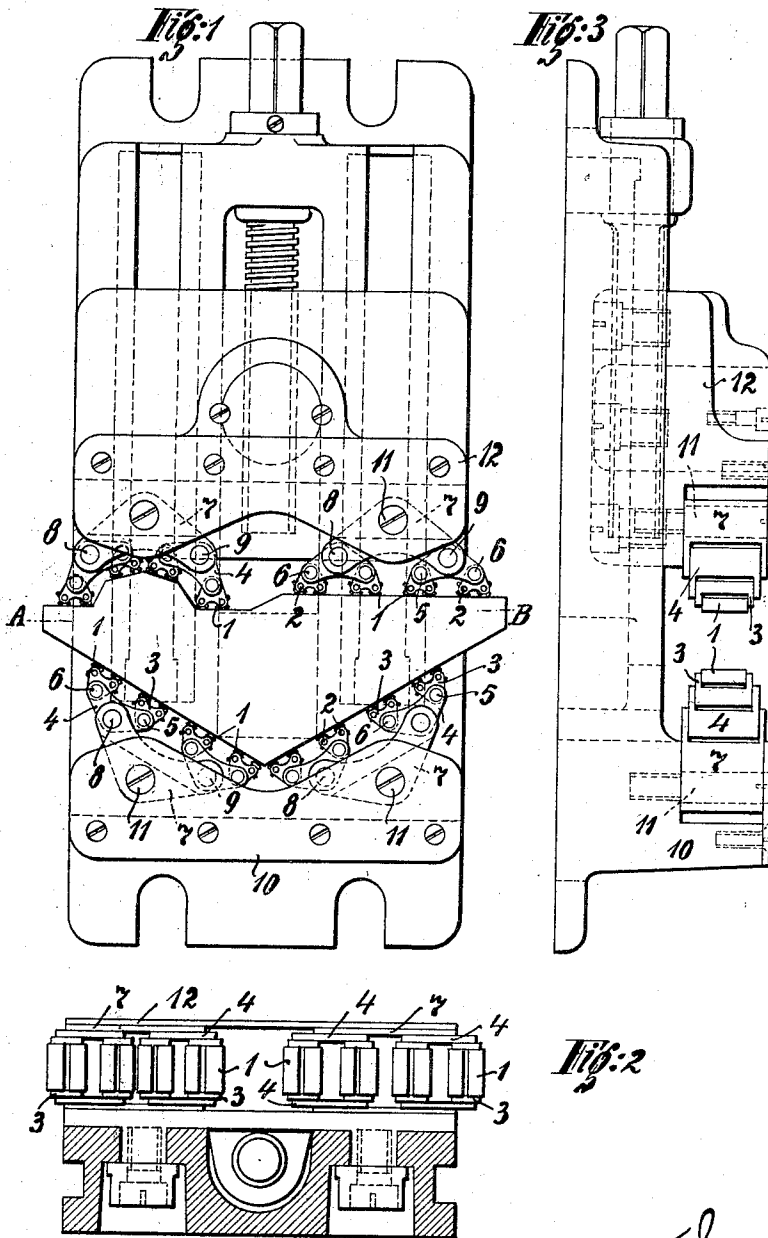
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GRIPPING JAWS FOR SNUGLY CLAMPING OR HOLDING IRREGULARLY SHAPED BODIES.

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1,203,152.

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Witnesses:
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UNITED STATES PATENT OFFICE.

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GRIPPING-JAWS FOR SNUGLY CLAMPING OR HOLDING IRREGULARLY-SHAPED BODIES.

1,203,152.

Specification of Letters Patent.

Patented Oct. 31, 1916.

Application filed June 9, 1914. Serial No. 844,079.

To all whom it may concern:

Be it known that I, MARTIN STEUDNER, director, a citizen of the German Empire, and a resident of Lusan, near Gera, Germany, have invented certain new and useful Improvements in Gripping-Jaws for Snugly Clamping or Holding Irregularly-Shaped Bodies; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Gripping jaws for snugly clamping or holding irregularly shaped bodies are known and they consist of a number of parallel cylinder segments resting with their peripheries within corresponding hollows of larger cylinder segments which again are received within a cavity of cylinder segments, and so on. By this arrangement a perfect equilization of pressure and an intimate and even hold of the work piece is intended. However, these devices have their drawbacks which are so serious as to render them useless for many practical purposes. First of all the cost of manufacture is very high. Then the drawback is encountered that chips and filings are apt to settle between the semi-cylindrical sliding surfaces; also water can easily enter between the said surfaces whereby the movability of the parts is seriously impeded and the rust which is consequently set up often renders the device useless within a very short time. Apart from the aforesaid, the disadvantage prevails that the conditions of friction are very unfavorable owing to the increasing size of the consecutive cylinder segments which are in sliding contact with one another. One has tried to remedy the inconvenience of chips and water entering between the contacting surfaces by magnetizing the parts and to thereby maintain the close assemblance of same. By this means, however, iron chips and filings were all the more attracted, the circumferential friction considerably increased and the workpieces under treatment sometimes became magnetized. The disadvantages became very acute when the devices were used in connection with metal work, as vises, for example, where the iron filings were directly attracted by the vise owing to the magnetic nature of the latter.

The aforesaid disadvantages are completely removed by the arrangement according to this invention, the essential feature of which consists in that the gripping bodies which have the purpose of closely adapting themselves to the shape of the workpiece, are arranged on pivots, which are held in the ends of two-armed swing levers, the other ends of which are also provided with similar pivots, the individual bodies being all closed up for the purpose of preventing the settlement of dust, grit and the like. The pivot of the two armed levers are also held by the ends of two armed swing levers and so on, the number of pivoted bodies depending on the degree of flexibility which it is desired to obtain.

The gripping bodies may have various shapes; they may be smooth, roughened, round, triangular, for example, or they may represent small swing levers. The most suitable form, however, would be that of a square with the corners removed so that the sides of the square protrude. Bodies of this shape will be suitable to grip the workpiece with any of their sides, irrespective of the position they assume.

It will be seen that the peripheral friction of the old arrangement is, according to this invention, replaced by axle friction. Axle constructions have long been approved of and a jamming of the pivots by means of filings or chips or by rust may safely be regarded as out of the question. At any rate, a small resistance caused by rust could easily be overcome as it can only take place around the small surface of a pin.

The new device can be used to grip parts of all description as the spindles of vises, lathe and drilling machine chucks, clips and clamps for surgical instruments or the like, it may be used in collar plates, for self-adjustable gages or templet and so on.

In the accompanying drawings, the invention is illustrated by way of example as applied to a parallel vise.

Figure 1 is a plan view of the vise, the movable jaw being purposely shown irregular in order to illustrate its flexibility. Figure 2 is an elevational view of the gripping bodies the vise being sectioned on line A—B of Fig. 1. Figure 3 is a side elevation of Figure 1 as seen from the left hand side.

In this drawing 1 denotes the gripping bodies proper which are of approximately square cross section with the corners re-

moved, thus projecting edges are formed which closely adapt themselves to the shape of the workpiece. The said bodies are adapted to turn on pivots 2. Each two of
5 the said pivots are received by the ends of a small two-arm lever 3 which is adapted to swing on a pin 6 or 5 respectively. The pins 6 and 5 of each two of these small swing levers are held by the ends of swing levers 4
10 having axle pins 9 and 8 respectively which in their turn are carried by the ends of swing levers 7 whose turning pins 11 are journaled in the jaws 10 and 12 of the vise.

In the example shown the jaws of the vise
15 are provided with two groups of gripping members with their main elements 7. It is evident that such gripping or clamping devices may be carried out in a number of ways and they could be made much more
20 extensive than it is shown in the drawing, according to the degree of flexibility it is desired to obtain. The individual groups

may consist of a smaller or a larger number of elements according to requirements.

What I claim and desire to secure by Letters Patent is:—

In a gripping device of the character described, the combination of square-shaped gripping bodies having the corners of the squares removed, closely adapting themselves to the shape of the work-piece with two-armed levers, pivots at the ends of said levers for said bodies, a fixed support and double-arms at the ends of which said two armed levers are pivotally secured decreasing in number and increasing in size toward
35 said fixed support.

In testimony whereof I affix my signature in presence of two witnesses.

MARTIN STEUDNER.

Witnesses:

CARL BARTLES,
ALFRED EISEL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."