(No Model.)

G. WEICKUM.

MECHANISM FOR CONVERTING MOTION BY HELICAL SURFACES.

No. 346,335. Patented July 27, 1886.

Fig.1

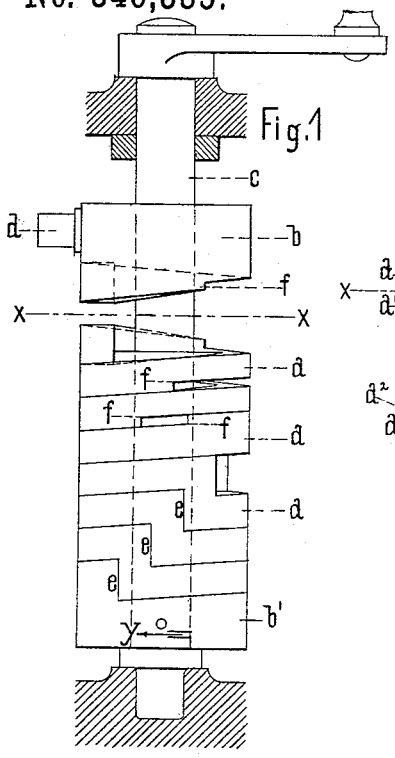


Fig.3

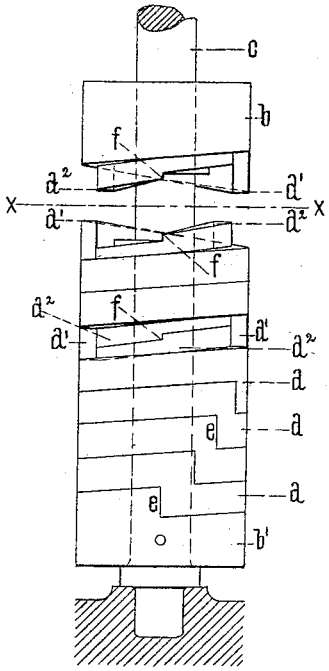


Fig.5

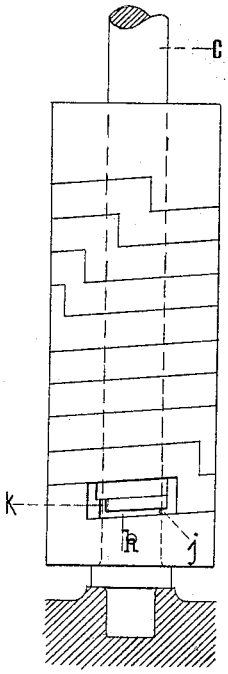


Fig.2

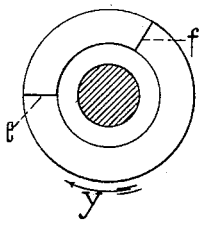


Fig.4

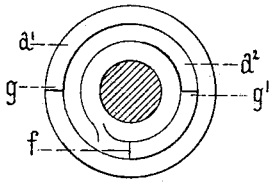


Fig.6

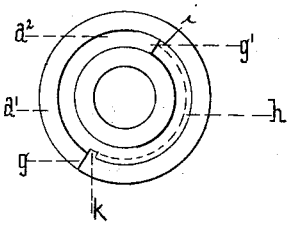
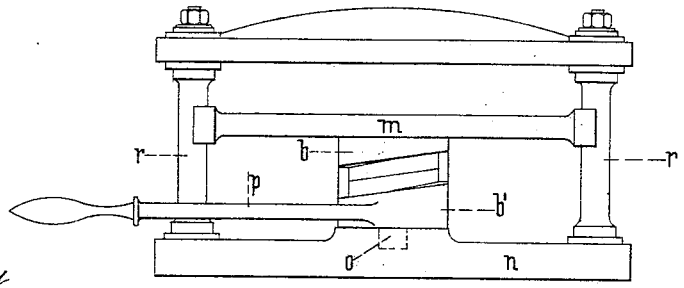


Fig.7



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UNITED STATES PATENT OFFICE.

GEORG WEICKUM, OF VIENNA, AUSTRIA-HUNGARY.

MECHANISM FOR CONVERTING MOTION BY HELICAL SURFACES.

SPECIFICATION forming part of Letters Patent No. 346,335, dated July 27, 1886.

Application filed March 23, 1886. Serial No. 196,277. (No model.)

To all whom it may concern:

Be it known that I, GEORG WEICKUM, engineer, a subject of the Emperor of Austria, and residing in Vienna, Empire of Austria-Hungary, have invented new and useful Improvements in Mechanism for Converting Motion by Helical Surfaces, of which the following is a specification.

My invention relates to a mechanical device for converting circular into rectilinear motion by helical surfaces, described in the specification of the German Patent No. 19,738; and the invention consists in certain improvements in this device, to be set forth hereinafter, and whereby particular advantages are attained.

On the annexed sheet of drawings, Figure 1 shows the old device in elevation. Fig. 2 is a sectional plan thereof on line *x x*, Fig. 1. Figs. 3 and 4 represent in like views the improved device. Figs. 5 and 6 show a modification thereof in elevation and in plan. Fig. 7 is a view of a press to which the invention is applied.

The device as shown by Figs. 1 and 2 consists in a number of rings, *a*, having substantially the form of a square screw-thread, the ends whereof overlap each other, and are united together so as to present the shoulders *e*. These rings, and two rings, *b b'*, whose end surfaces are ordinarily square to their axis, and which form the top and the bottom of the series, are strung on a spindle, *c*, placed in bearings, and the ring *b'* is fixed to the said spindle, while the ring *b* is provided with means which prevent it from turning, but which allow it to move longitudinally on the spindle *c*, such as a pin, *d*, sliding between guides parallel to *c*. When, with this arrangement, the spindle *c* is rotated in the direction of the arrows *y*, one of the rings *a* and *b'*, between which and the next upper ring there happens to be the least friction, will slide relatively to the latter, thereby pushing all the rings that are above the same forward on the spindle, and causing the ring *b* to exercise a pressure against any resistance acting on its top.

In order to limit the relative motion of the rings upon each other, they are provided on their screw-faces with offsets *f*. The motion of one ring being thereby stopped, another one will begin to turn, and so on until the ring *b* has been raised by the amount desired, or until all the stops *f* have come in contact with each other. This device presents the disadvantage that the rotation of a ring relatively to the contiguous one is limited to about one and one-half right angle, as otherwise the ring would become unsupported on one side of the spindle, so that it might jam on the same. Besides, dust may enter into the slits between the shoulders *f*. In order to obviate these defects, I at present construct the rings *a* with two annular portions, presenting screw-surfaces, an outer one, *a'*, and an inner one, a^2, (see Figs. 3 and 4,) the said portions being so arranged in respect to each other that the one commences at a point, *g*, Fig. 4, diametrically opposite to the commencement *g'* of the other, and the shoulders *f* are formed upon the inner portion, a^2, while the outer one, *a'*, has an uninterrupted helical surface. With the device of this construction the rings, when turned, will always be supported equally on both sides of the spindle. Each ring may therefore be rotated relatively to the contiguous one by any amount compatible with the size of the supporting-surfaces, which become smaller as the angle of rotation increases. Practically this angle may be equal to three right angles. Moreover, on account of the shoulders *f* being formed upon the inner ring portions, a^2, the set of rings *a b b'*, when turned back until the shoulders *e* are all in contact with each other, do not present any apertures into which dust can enter.

Figs. 5 and 6 show a modification relatively to the means for stopping the rotation of each ring at a certain point, these means consisting in a groove, *h*, cut into the outer periphery of the ring portion a^2, and terminating at *i*, and an inside projection, *j*, on the portion *a'* of the following ring, the said projection engaging with the groove *h*. For allowing the rings to be put together, the groove *h* communicates at its end opposite to *i* with a vertical groove, *k*.

If the amount of rectilinear motion required to be produced by the described device is not considerable, the two rings *b* and *b'* only may be arranged to work upon each other, as shown by Fig. 7, and if in such case the ring *b* is fixed to a part, *m*, movable on guides *r*, and the ring *b'*, having an arm, *p*, to turn the same, is

supported by a part, n, the said ring b' may be maintained in central position by a pivot, o, projecting from the ring into the part n, or vice versa, and the amount of rotation of the ring b' may be limited by the arm p striking against one of the guides r.

I claim as my invention—

The combination of two or more rings, such as a, b, and b', bearing upon each other, and having an outer annular portion, a', and an inner annular portion, a^2, the said portions a' and a^2 presenting screw-surfaces of like pitch so arranged that the end of one of the said surfaces is diametrically opposite to the end of the other one, together with means for rotating the ring b', for limiting the rotation of the rings relatively to each other, for keeping the rings concentric with their axis of rotation, and for presenting resistance to the circular motion of the ring b, substantially as and for the purpose described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

GEORG WEICKUM.

Witnesses:

EDMUN JUSSEN,

HENRY DAVIDS.