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A. LEIFER ET AL
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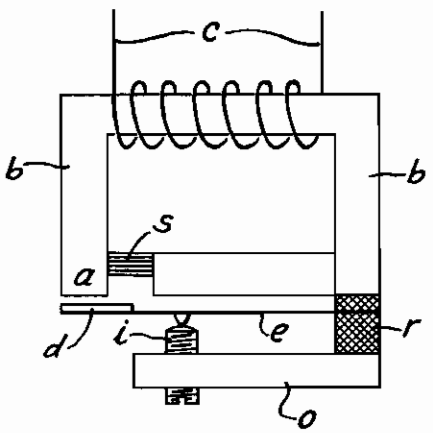

INVENTORS
ALFRED LEIFER
HELMUT WEIHS
BY H.S. Brower
ATTORNEY

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ALIEN PROPERTY CUSTODIAN

CHOPPER

Alfred Leifer and Helmut Weihs, Berlin, Germany; vested in the Alien Property Custodian

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The mechanical part of a chopper or vibrator of the type now mostly used represents an oscillable structure vibrating relatively free from damping. For this reason the forces required for sustaining the oscillation are small in contrast to the force required for the initial deflection of the spring blade. Hence, distinction must be made between the first or initial switching-in moment I and state II corresponding to full oscillation.

The oscillation or excursion amplitude (II) is fixed, and so is the initial deflection (I). Whence the requisite increase in force $P_I:P_{II}$ is determinable, that is to say, the factor by which the attraction force P_I must exceed the exciting force P_{II} which is active after vibrations have been built up.

For the production of the mechanical forces serves mostly a transformer with an air-gap. The latter is more or less short circuited by the vibrating keeper. Part of the aggregate flux incidentally passes by way of the keeper. The ratio of the keeper flux FA to the total flux F shall be denoted by

$$\frac{FA}{F}=FR$$

The mechanical force P by which the keeper is attracted is essentially proportional to $FA=FR\cdot F$; the requisite increase of force $P_I:P_{II}$ therefore is proportional to

$$\frac{FA_I}{FA_{II}}=\frac{FR_I.F_I}{FR_{II}.F_{II}}$$

the excess or increase of the flux $F_I:F_{II}$ being determined by the electrical conditions inherent in the circuit arrangement as well as the magnetic conditions or properties of the transformer (time-constant of the primary circuit, working utilization of the iron).

Occasionally, the above increase of flux is less than the increase of force above mentioned $P_I:P_{II}$. This applies particularly to choppers in which the primary winding of the transformer acts at the same time as the exciter winding. Because of the low voltage which is used (2.4v) and the comparatively high series resistances the growth of current upon switching in, and thus also the flux increase, remains small.

This drawback is obviated in the invention by shorting or shunting the air-gap of the transformer core by means of an iron bridge. The latter is of such dimensions that at the instant of switching-in (I) and the rise of current then prevailing, it will be more markedly saturated than the other iron parts, so that its reluctance rises more strongly. If desired, this effect could be further enhanced substantially by using iron of higher permeability for the said bridge piece. Incidentally, other dimensions must be so altered that the exciting force P_{II} stays unvaried.

An exemplified embodiment of the invention is illustrated by way of example in the appended drawing.

Opposite the pole-shoe *a* of the transformer core *b* on which the winding c is wrapped, oscillates the keeper *d*. The latter is attached on the spring or blade *e* which supports the contact *h*, the latter co-acting with the co-operating contact *i*. The latter is supported on a support o which is held on a piece of insulation material *r* which is attached to the transformer core *b*. On the same insulation piece could be supported also the blade or reed *e*.

Between the pole-shoe *a* and the pole of the iron-core *b* mounted opposite it is provided an iron bridge *s* the dimensions of which must be determined empirically. It closes or short circuits the air-gap in the core *b*, and it renders conditions so that the initial excursion of the spring or reed *e* is easier than heretofore.

ALFRED LEIFER.
HELMUT WEIHS.