W. GROSS.

COUNTER FOR LOOMS.

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1,435,389. Patented Nov. 14, 1922.

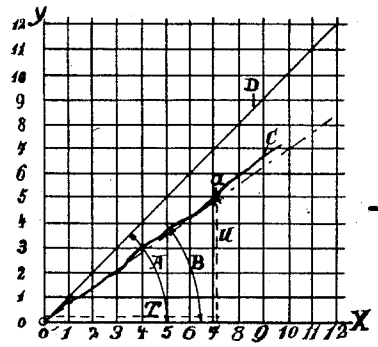


Fig. 1.

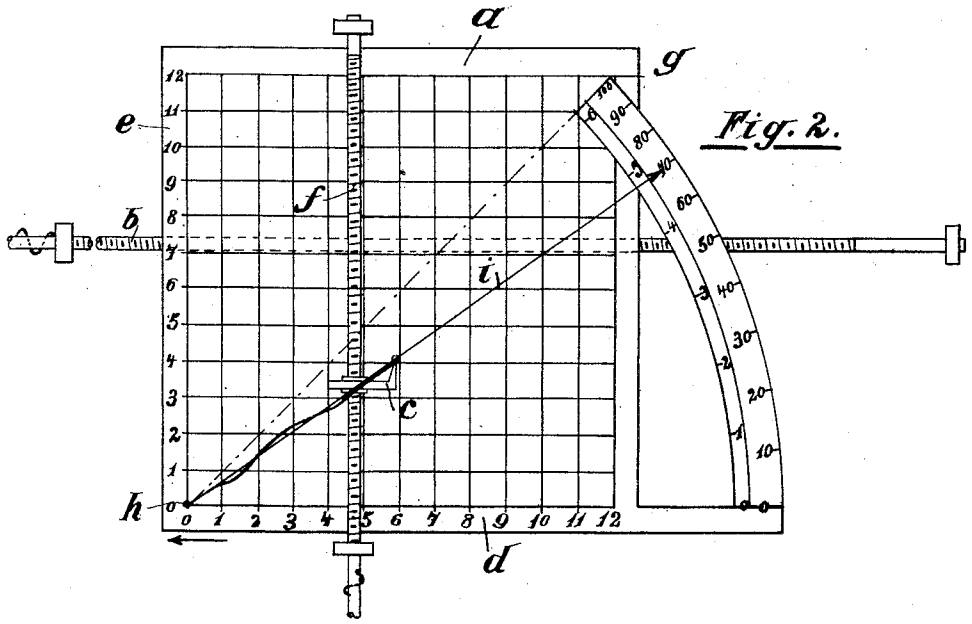


Fig. 2.

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UNITED STATES PATENT OFFICE.

WILHELM GROSS, OF ROTTWEIL, GERMANY.

COUNTER FOR LOOMS.

Application filed March 20, 1920. Serial No. 367,460.

To all whom it may concern:

Be it known that I, WILHELM GROSS, residing at Rottweil a. N., Wurttemberg, Germany, have invented certain new and useful Improvements in Counters for Looms, of which the following is a specification.

This invention relates to a measuring and controlling apparatus for machines, which shows and records the work done by the machine in such a manner that the fully utilized rotation of the machine is put in relation to the rotation of the gear, whereby the efficiency of the machine, in case it is due to the rotation, may be shown in anyway, for instance graphically. This new apparatus is particularly suitable as a counter for looms, because it shows accurately the efficiency of each machine and so enables the inspection staff to oversee the working of the looms, that is to say the inspectors are able to oversee continually the work done.

The invention acts also as a wages-controller and serves to spur the workmen, showing them clearly how much they lose if the machines is standing still and how much they would earn effectively in case their looms continue working.

The new apparatus and its working is shown by the accompanying drawing in which—

Fig. 1 shows graphically the construction in a rectangular co-ordinate system as well as the working of the new machanism, while Fig. 2 is a plan view of the recording mechanism.

Calling the number of revolutions of the gear T and the effectively used number of rotations by the loom U, if the efficiency N of the loom is dependent on U the effect is: U:T=N. Now, putting T in a certain scale to the X-axis of a rectangular-coordinate system and U to the Y-axis (Fig. 1), the curve C is obtained by combining both points, which curve may be called efficiency curve, because it shows the work done by the loom. For all points of the curve C the proportion in question U:T is valid. In connecting now a point of C, for instance *a* with the centre of the axis *o*, the line *o*—*a* form with the abscissa line *cx* (*i*) an angle B which stands in a fixed proportion (tang U:T.) to the efficiency N so the latter can be read in the size of the angle B in a certain scale.

For instance, if the number of rotations T is fully used, that is U=T, the result would be D including with the X-axis the angle A. Now U:T=1. If, however the loom is not actually producing, and thus U=O, then the result D would fall on the X axis and then $N=\frac{U}{T}=O$, viz the result =O, in which case the angle A=O also. It can easily be understood by these explanations that the work done by the loom can be expressed by the angle A formed by the result (D) and the X-axis, and then the maximum of N=*l* (tang A), while the minimum of N=O (tang O°); that is to say: in all cases N can be expressed in terms of the angle (CX). The work done will increase, the nearer curve C comes to D. Referring more particularly to Figure 2, the daily rotations of the gear as well as of the loom are shown in a certain scale, for instance in thousands on a table *a* provided with a plurality of angular intersecting lines, a rod *b* is rotated by a continually rotating part of the machine and by this rotation the table *a* is pushed forward in the direction of the arrrow and a finger *c* shows at the same time on the scale *d* the rotation done by the gear. To mark the rotations, done by the loom, on the scale *e* the finger *c* is moved by a second rod *f* whose axis is perpendicular to *b*. This rod *f* is turned in the same proportion of transmission by any rotating part of the machine, preferably by the wheel of the loom regulator. Regarding now the movement of the finger *c* on the table *a*, the former is moved in a direction at right angles to the movement of the table, the finger *c* being provided with a writing instrument, shows as in Fig. 1 a curve, beginning at the point where *d* and *e* intersect. In Fig. 2 the scales *d* and *e* and the rods *b* and *f* correspond to the X and Y-axes of Fig. 1. Arranging now on an arc about the *o*-point a scale, the efficiency can be read by means of a pointer *i* pivoted at the *o*-point *h* and lead by the point of the finger *c* (O *g*=D of Fig. 1). The exact working of the pointer is clearly to be seen in Fig. 2 and, as suggested thereon the scale is provided with graduated markings ranging from 0 to 100 indicative

of the percentage of efficiency. Furthermore on the scale the fixed pay of the workman may be indicated, as suggested by the numerals from 1 to 6 on Fig. 2, by which means the man working that loom can at any minute see what he earns in case his machine goes on working in the moment the man looked at the scale.

Instead of being shown on a table *a* the scales may be arranged also on the surface of a cylinder in which case the movement of the table must be altered into a rotation of the cylinder, the movement of the finger *c* remaining the same. By means of the curve produced by the present invention, not only the workman is controlled, but eventually also information can be had regarding the quality of the material used, for from the equal or un-equal move, of the curve is to be seen whether the fault lies with the workman or the material.

By aid of the new apparatus the following can be read:

1. The actual state of the number of rotations of the gear (scale *d*).

2. The used rotation by the loom (scale *e*) (out of the rotation of the gear).

3. The actual work done in % of the maximum effect (circular scale).

4. The pay earned by the workman or the quantity of goods produced by the loom.

I claim as my invention and desire to secure by Letters Patent:

1. A mechanically operated device of the character described comprising a table mounted for movement in one direction, means adapted to be driven from a moving part of a machine and acting upon the table to move the latter, an efficiency indicating member carried by and movable with the table, a scale associated with said indicating member, and means adapted to be driven by another moving part of a machine and coacting with the indicating member to vary the position of the latter angularly with respect to the direction of movement of the table whereby said indicating member is caused to move across the scale.

2. In a device of the character described, a table movable in one direction, means adapted to be driven from a moving part of a machine for moving the table in said direction, an indicating element movable with the table and capable of swinging movement with respect to the latter, a scale associated with the indicating element, and means adapted to be driven by another part of the machine and connected with the indicating element for moving the latter across the scale.

3. In a device of the character described, a table movable in one direction, means adapted to be driven from a moving part of a machine for moving the table in said direction, an indicating element movable with the table and capable of swinging movement with respect to the latter, a scale associated with the indicating element, means adapted to be driven by another part of the machine and connected with the indicating element for moving the latter across the scale, and recording means carried by the last mentioned means movable across the table.

4. In a device of the character described, a table mounted for movement in one plane, means adapted for actuation by a moving part of a machine for moving said table in said plane, an indicating element carried by said table and capable of swinging movement independently thereof, a scale carried by the table and provided with graduated markings and arranged to be traversed by the indicating element, and means adapted for actuation by another moving part of the machine and movable in a plane at right angles to a plane of movement of the table for moving the indicating element over the scale.

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

WILHELM GROSS.

Witnesses:
EUGEN HÖRING,
EUGEN BOSCH.