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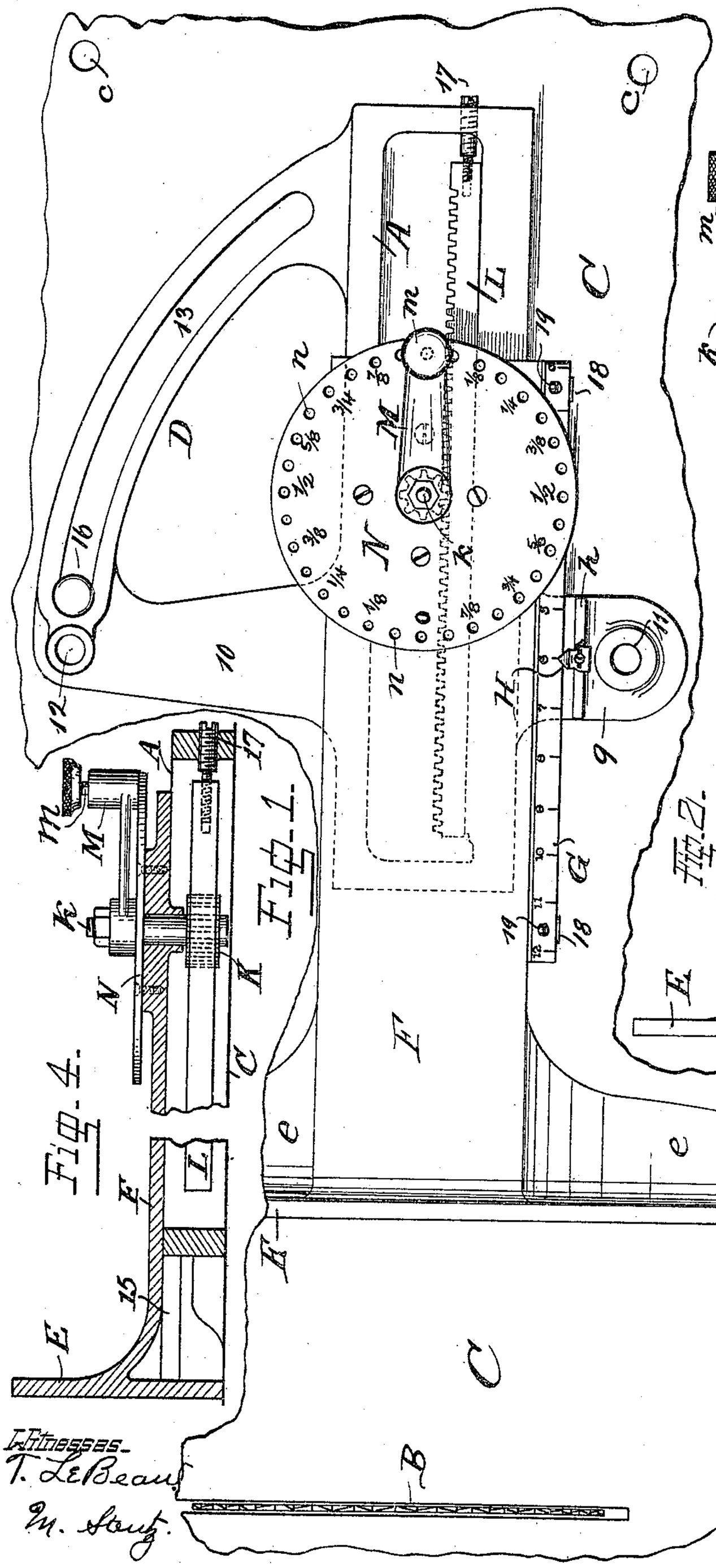
GAGE.

APPLICATION FILED JUNE 12, 1908.

946,032.

Patented Jan. 11, 1910.



UNITED STATES PATENT OFFICE.

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GAGE.

946,032. Specification of Letters Patent. Patented Jan. 11, 1910.

Application filed June 12, 1908. Serial No. 438,017.

To all whom it may concern:

Be it known that I, WILLIAM A. GREAVES, a citizen of the United States, and residing at Cincinnati, Hamilton county, State of Ohio, have invented certain new and useful Improvements in Gages; and I do declare the following to be a clear, full, and exact description of the invention, attention being called to the accompanying two sheets of drawings, with the reference-characters marked thereon, which form also a part of this specification.

This invention relates to gages of the kind which serve to hold or guide work, or material, with reference to the operating part of a work-performing device or machine and which are adjustable, so that such operating part may be caused to act upon the work in a certain particular position or manner as may be desirable or necessary. Gages of this kind are used in connection with many types of sawing devices and for convenience I illustrate and explain my invention in connection with a saw used on wood.

The invention consists of a gage constructed in a certain manner to permit it to be so set, that work according to desired measured dimensions results and whereby the manipulation for determining any particular dimension also moves the gage to the desired position and locks it thereat, so that one manipulation only becomes necessary for all purposes.

In the following specification and particularly pointed out in the claims at the end thereof, will be found a full description of my invention, together with its manner of use, parts and construction, which latter is also illustrated in the accompanying two sheets of drawings, in which:—

Figure 1, is a top view of such a gage constructed as contemplated by my invention and secured in position on a saw-table. Fig. 2, is a side-elevation of the same, it being adjusted to a different position. Fig. 3, is an end-view of it, partly in section. Fig. 4, is a longitudinal section of it, taken in a position shown in Fig. 2, a position between the ends of the figure having been broken out.

The invention is illustrated in connection with a circular saw, B being the saw-blade and C the saw table.

E is the gage, also called fence when used in connection with a saw and serves to hold the work (wood) in proper position with reference to the saw while being fed past the same. This gage is secured to, or forms part of a slide F which projects rearwardly at right angles from the gage and away from a saw and is fitted to an elongated, rectangular frame A in a manner permitting it and the gage carried thereby to be moved to and from the saw-blade, said frame forming the base for the gage. Braces *e* strengthen the position of the gage on the slide.

Complementary, interengaging guides 14 and 15 are provided, the former on the parallel sides of base-frame A and the other on the underside of slide F, whereby this latter is held to the base while adjusted with reference to the saw-blade. This frame A which forms the base for the gage is provided on one side with a lug 9 and on the opposite side with an arm 10, both projecting laterally therefrom and provided with pinholes and pins, or set-screws fitted to these holes, one, 11 in lug 9, and the other one, 12 in arm 10, both of which are adapted to enter openings *c*—*c* in the top of the saw-table, to which openings they are fitted and when said openings register with the pinholes. Between the outer end of arm 10 and that side of the base from which it projects, there extends a frame-member D which is provided with a slot 13 formed on an arc concentric with pin 11 in lug 9. By removal of pin 12 in arm 10, the base with the gage may be adjusted about pin 11, which remains in lug 9, to assume an angular relation with reference to the saw, and the work is cut accordingly. A set-screw 16 engaging frame-member D, through its slot 13, is used to hold the base in its adjusted position when the gage is so used. This particular adjustment has however no bearing upon my invention and no novelty is claimed for it.

A scale G and a complementary pointer H are provided, one in a stationary position and the other so as to move with the gage, thereby showing the particular position

which the gage occupies with reference to the saw. By preference, scale G is attached to one of the longitudinal sides of slide F, which carries the gage and pointer H is attached to lug 9, a ridge *h* being provided to support it in proper position with reference to the scale and opposite the same. The length of this scale is arranged to suit requirements and as shown its measuring capacity is twelve scale-units, which for instance may be inches.

Base A, as before stated, is held in a fixed position with reference to the saw, which position is such that, when the zero mark on the scale is opposite the pointer, gage E is close to the saw blade and no work can be done. If the gage is moved away from the saw, the extent of this movement is shown by scale G. In the position shown in Fig. 1, the gage is adjusted to six inches, so that, if a piece of wood is placed against it and fed toward the saw, the latter will cut it six inches wide, that is on a line six inches from that edge of it which is in contact with the gage.

For moving slide F and the gage, two complementary, inter-engaging machine-elements are used, one of which is supported on and carried by the slide, while the other one is held in base A. One of these elements is a rotary gear K rigidly mounted upon a shaft *k* and the other is a complementary linear gear or rack L, both in mesh with each other. The rotary gear K is positively and directly operated by hand for which purpose a handle M is provided, which is mounted upon shaft *k*. This gear and its handle M are carried on the slide in which position the handle may be most conveniently manipulated by the operator who becomes quickly used to this location because, with reference to gage E, it remains a permanent and fixed one. The complementary element L, or rack is held in base A, as shown in Figs. 1 and 3. It will now be understood that if handle M, is manipulated, the pinion rolls on the rack and thereby shifts slide F, on base A, so as to adjust with reference to the saw, the position of the gage carried by the slide. Carried in handle M, there is a vertically movable locking pin *m* which operates in conjunction with a locking plate N rigidly secured to the slide and provided with a number of openings *n* arranged in a circle and adapted to receive the lower end of this locking pin. Such engagement locks the handle, prevents movement of the pinion on the rack and holds the gage in its adjusted position. This locking pin may seat simply by gravity, or it may be spring-actuated, see details in Fig. 3, also observe Fig. 4, which shows its manipulation.

In the further perfection of this device, its construction is so designed that manipulation of the handle, which rotates the pinion, moves the slide at a certain ratio with reference to the pointer and to its complementary scale, and openings *n*, are so arranged and located that, when after manipulation of handle M, slide F is locked by action of pin *m*, the gage is in a certain position with reference to the scale-units, which position is definable by the graduation marks thereon, that is one of these marks is opposite the pointer. This ratio may be arranged arbitrarily and in the present case it is so arranged that one half rotation of handle M, moves the slide, or what is the same, gage E, carried thereby, one scale-unit. Thus for instance by moving handle M from an opening in plate N, to another one located diametrically opposite thereto, both openings being also correspondingly located with reference to two graduation marks on the scale, the slide will be moved a scale-unit, and when locked in its new position, one of these marks on the scale is again opposite pointer H. By subdividing the distance between two such diametrically spaced openings by similar openings *n*, all equally spaced as shown, the gage may be locked in corresponding intermediate positions, which positions are equivalent to fractions of scale-units and may be indicated accordingly by related sub-graduations on the scale. In this case there are sufficient openings *n*, to provide for 16 sub-divisions between two such diametrically opposite openings, providing for 16 intermediate positions of the gage and accordingly when in the present case handle M, is moved from one of these openings to the next one, the gage is shifted a distance equal to one sixteenth part of a unit on scale G. Still smaller sub-divisions may be had by providing additional openings *n*, which may be provided in a second circular row, if location in one row would bring them too close together. The openings in such an additional row would be intermediate the openings in the other row. The same locking-pin may serve, or another one is added. Numerals may be provided upon plate N and opposite the openings therein which refer to the sub-divisions of the scale-units. As will now be seen, manipulation by action upon handle M, not merely shifts the gage, but it also adjusts the same according to measured scale-units, further it locks it in such adjusted position and finally this position is shown with reference to the scale and may be read by observing the numbers thereon and those opposite openings *n* in plate N, the former indicating even scale-units (inches) while the latter show fractions thereof.

Saw-blades differ frequently more or less in thickness, or they may vary as to cutting action according to the set to which their teeth have been swaged some taking a

wider cut. This would obviously interfere with the proper indicating action of the scale to show sizes correctly and requires accordingly regulation to rectify any deficiency. For such purpose I use rack L, which is connected to base A in a manner to permit for it a limited, lengthwise adjustment thereon. If now in such a case, that is after a change of saw-blades for instance, a test measure is taken and the wood cut off, does not actually measure as wide as the scale indicates, then the position of the gage with reference to the saw-blade requires correction and is accordingly regulated by this adjustment. Thus for instance in the case illustrated in Fig. 1, the wood, after cut by the saw, must measure exactly 6 inches if the normal (zero) position of the gage with reference to the saw-blade is correct. The movement required for this purpose is obviously never very extensive and is readily accomplished by a differential screw 17, seated in frame A and also tapped into one end of the rack. That portion of this screw, which is seated in the rack is however of a different pitch so that although the screw when rotated moves in both, it nevertheless moves the rack at a rate different from the rate of its movement in the base. Pointer H, may also be adjusted, if necessary, to fit the regulated position of the scale, the opening through which its holding-screw passes being elongated for the purpose.

In case the size of the wood to be cut exceeds the measuring capacity of the scale, the entire outfit is shifted to a position farther away from the saw, for which purpose additional openings *c c*, are provided in the saw-table farther away from the saw which are adapted to receive the pins or set-screws 11 and 12 to hold the base in the new position.

These openings are so located that in the new position of the base, scale G may again be used for reading the position of the gage in the same manner as in the original position. For such purpose the distance between the first position and the second position is one which may be readily added without requiring consideration of fractions. It equals the measuring capacity of the scale, twelve inches, so that, when the gage is in its new position, it may be used exactly as before, with the exception that it does not gage below twelve inches wide. To render scale G properly readable for use in the new position, it is made removable and reversible, its other side being also graduated with unit-marks which form a continuation of the marks on the first side starting from 12 inches and showing up to 24 inches. For such purpose the scale rests on small brackets 18, which project from the slide and to which it is held by pins 19, they being received by openings one near each end of the scale. When the scale is to be changed, it is merely lifted off from these brackets, reversed and replaced.

Having described my invention, I claim as new:

1. In a gaging-device, the combination of a stationary base, a gage, a slide which carries the gage and is adjustably mounted upon the base, a graduated scale on one and a complementary pointer on the other, a rack provided on the base, a pinion fitted to mesh with it, a shaft vertically supported in the slide on which this pinion is mounted, a manipulating handle on the upper end of this shaft to set the gage, a locking plate rigidly attached to the slide and provided with circularly arranged, equally spaced openings, and a locking pin carried on the handle and adapted to engage with these openings, the arrangement being such that a complete rotation of the handle moves the gage a distance equal to a fixed number of scale-units, while an additional limited rotation of it from one opening in the locking-plate to another moves the gage a distance equal to a fractional part of a scale-unit.

2. In a gaging-device, the combination of a horizontally supported, rectangular base-frame, a slide adjustably fitted to it, a gage carried by the slide, a rack provided in the base-frame, a pinion in mesh with this rack, a vertically arranged shaft carried by the slide on which this pinion is mounted, a gage-setting manipulating-handle on this shaft, locking means for it, a scale carried by the slide, a differential screw seated in the base-frame and engaging the rack to regulate the normal position of the gage with reference to the work, a stationary pointer complementary to this scale and means whereby it is adjustably held to permit its adjustment with reference to the scale to meet the adjusted position of the slide.

3. In a gaging-device for saws, the combination of a gage, a slide on which it is carried, a scale carried on the slide having numbered graduations on both sides, the graduations on one side being a continuation of those on the other side, a base-frame to which the slide is adjustably fitted and which is provided with lateral projections having pin-holes, a pointer on the base-frame complementary to the scale, means to manipulate the slide on the base-frame to set the gage, a saw, a saw-table provided with a set of holes complementary to the pin-holes mentioned and adapted to register with them, pins fitted to occupy these registering openings, to hold the base-frame in place with reference to the saw, there being also a second set of holes in the saw-table more remote from the saw, also adapted to register with the pin-holes in the base-frame to permit connection of the base-frame when

moved to a position farther away from the saw after the measuring capacity of the scale in the first position has become exhausted, the distance between the two sets of openings in the saw-table being equal to the measuring length of the scale and means whereby this latter is reversibly supported so that when reversed in the second position of the device, dimensions in excess to those readable in the first position may be read.

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

WILLIAM A. GREAVES.

Witnesses:

C. SPENGEL,

T. LE BEAU.