

April 4, 1939.

C. L. GROVER

2,153,463

INDEX PLATE FOR BORING AND MILLING MACHINES

Filed Aug. 24, 1937

2 Sheets-Sheet 1

Fig. 1

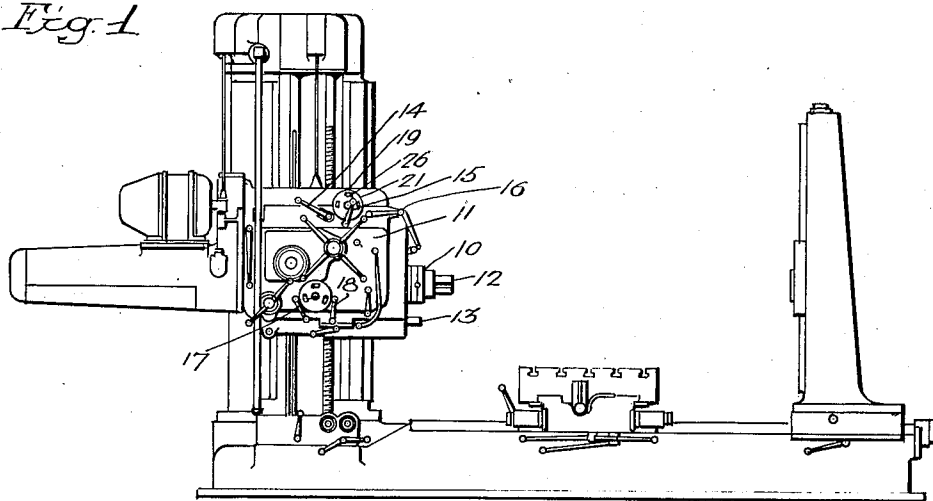


Fig. 2

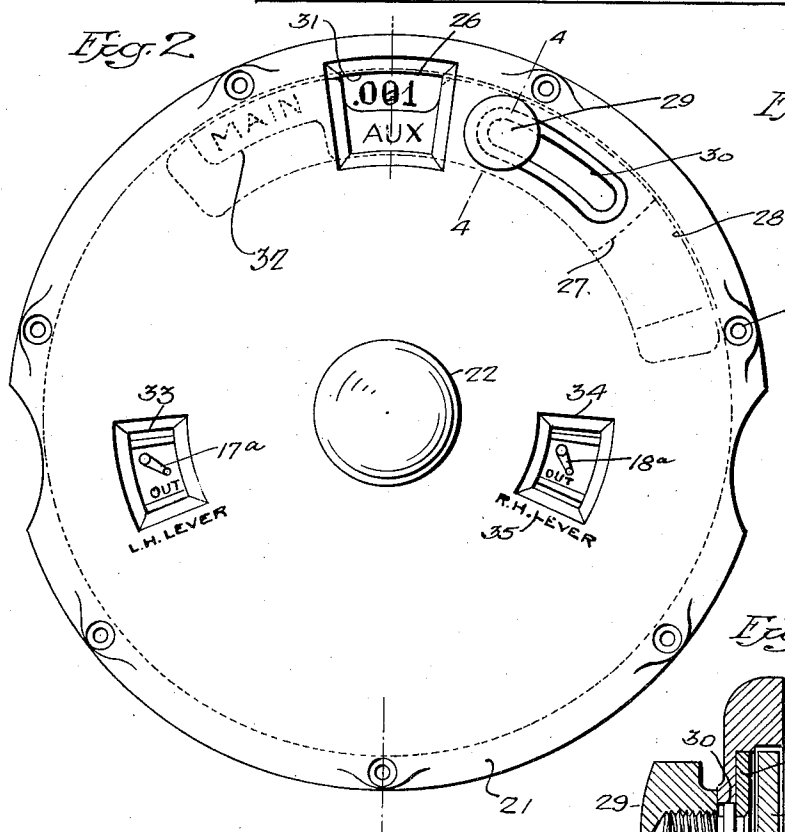


Fig. 3

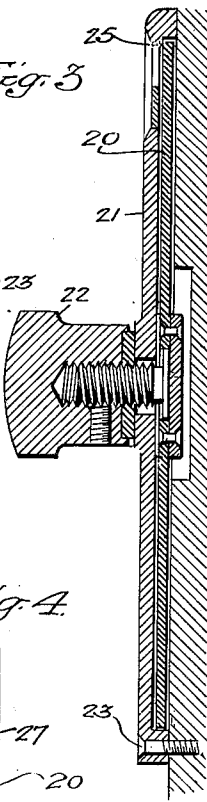
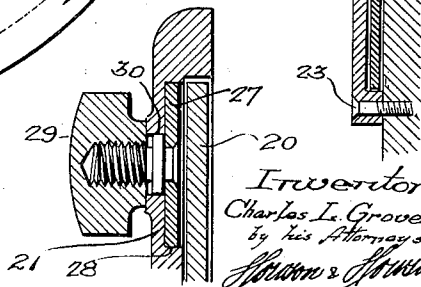


Fig. 4



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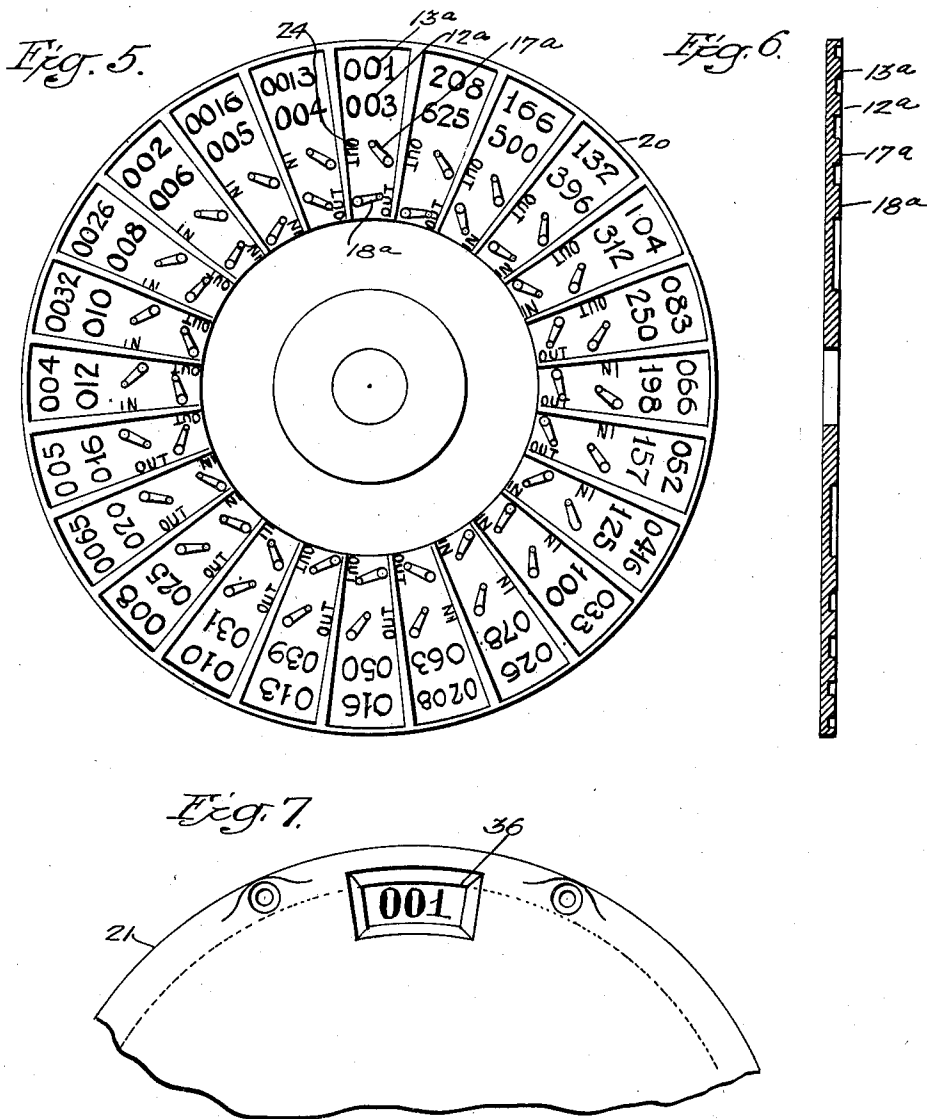
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INDEX PLATE FOR BORING AND MILLING MACHINES

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2 Sheets-Sheet 2



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INDEX PLATE FOR BORING AND MILLING
MACHINESCharles L. Grover, Philadelphia, Pa., assignor to
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2 Claims. (Cl. 116—124)

This invention relates to index plates for use with transmission controls, and more particularly to an index plate for designating the proper lever positions to attain a desired output speed in a complicated transmission having a plurality of control levers.

As is well known, many machine tools such as boring mills and milling machines embody extremely complicated transmissions, usually controlled by a plurality of shifting levers. Furthermore, these transmissions have often a plurality of outputs which are driven at different speeds for a given setting of the control levers. This necessitates the use of a convenient table from which the machine operator can obtain instruction as to the proper settings of the levers to obtain a given speed at a given output and the usual apparatus comprises simply a flat plate having speed indications and, usually, pictorial representations of the lever positions to effect the associated speed. Since it is possible for the workman to simultaneously view all of the speed indicia and all of the setting indications, it is readily possible to fall into error and select the wrong speed.

An important object of this invention is the provision of an indicating device for use with transmissions of this character wherein it is impossible for the workman to simultaneously view any other indications than those necessary to produce the selected speed, so that such errors may be avoided.

Another object of the invention is the production of a device of this character which may be cheaply and readily produced and which will be compact and may be readily installed upon a machine.

These and other objects I attain by the construction shown in the accompanying drawings, wherein.

Fig. 1 is a side elevation of a boring mill embodying speed selection index plates constructed in accordance with my invention;

Fig. 2 is a front elevation of the index plate;

Fig. 3 is a vertical sectional view therethrough;

Fig. 4 is an enlarged section on line 4—4 of Fig. 2;

Fig. 5 is a face view of the inner dial plate;

Fig. 6 is a vertical sectional view therethrough;

Fig. 7 is a fragmentary detail view showing a slight modification of the structure.

Referring now more particularly to the drawings, the numeral 10 generally designates the boring head of a horizontal boring machine, this

boring head consisting principally of a transmission casing 11 for providing selected output speeds controlling the operation of a boring spindle, or spindles, two such spindles being shown at 12 and 13 in the present instance. The transmission gearing (not herein shown) is controlled by a plurality of levers, these being divided into two groups one of which comprises levers 14, 15 and 16 controlling the speed of rotation of the spindles 12 and 13, and the other of which comprises levers 17 and 18 controlling the speed of feed of the spindles 12 and 13 and of the remaining movable elements of the machine. In each instance a given setting of the levers of either group will result in different speeds for the spindles 12 and 13, whether this speed be that of feed or rotation. Adjacent each group is disposed an indicator means, generally designated at 19, for indicating the proper setting to select a given speed. This indicating mechanism comprises inner and outer plates 20 and 21 mounted for relative rotation, which may be effected through a control knob 22, the inner plate being the rotary plate and the outer plate being stationarily secured to the transmission casing in close proximity to the group of control levers with which it is associated, by screws 23 or the like.

The inner plate 20 has an annular series of feed indicia for each output of the transmission, two being shown in the present instance at 12a and 13a and corresponding to the feeds of the spindles 12 and 13 respectively. Inwardly of and concentric with the rows of speed indicia are an annular series of lever-position indicia 17a and 18a corresponding respectively to the levers 17 and 18. The individual indicia of the series 17a, 18a, comprise variously positioned miniature representations of the levers preferably accompanied by a written statement 24 of the position represented.

The outer plate, the inner surface of which is preferably recessed as at 25 to receive the inner plate, has an opening 26 of such size that it will simultaneously expose a single indicia of each of the speed indicia series 12a and 13a. Associated with this opening is a slide 27 disposed in an arcuate groove 28 in the inner face of the plate 21 and controlled from the exterior of the plate by a button 29 connected to the slide 27 through a slot 30 in the plate. The slide has a notch 31 to expose the outer indicia series 13a indicating speeds of the auxiliary spindle, and is provided in alignment with this notch with the designation AUX, showing that the indicia appearing at the opening refers to a feed of such spindle, and is further provided with a notch 32 to similarly ex-

pose the inner feed indicia series and adjacent this notch with the designation MAIN. By shifting slide 27, either notch 31 or 32 may be brought into alignment with the opening 26. The plate 21 is further provided with openings 33 and 34 aligning with the inner and outer series 17a, 18a of lever position indicia.

The plate at present illustrated indicates the settings for the feed of the spindles, and the settings for any desired available speed may be readily determined as follows:

Assuming that the operator desires to produce a feed of .001 inch of the auxiliary spindle for each rotation of the spindle; the slide 27 is shifted until the designation AUX appears in opening 26, and the knob 22 is then rotated until the designation .001 inch appears in the opening. At this time the proper lever settings appear in openings 33 and 34 and a corresponding positioning of the levers 17 and 18 will produce the indicated speed. The openings 33 and 34 are so associated with their respective levers that there is no possibility of error. This may be accomplished either by placing the levers in juxtaposition to the associated openings or by providing indicia 35 to indicate the lever intended, or both.

It will be obvious that while the plate particularly described has only two such openings, the number of openings is optional, depending entirely upon the number of levers in the associated group. It is, likewise, obvious that where but a single output is provided for the transmission the slide 27 and its associated parts may be omitted, as indicated at 36 in Fig. 7.

Since the construction is obviously capable of considerable modification without departing from the spirit of my invention, I do not wish to be understood as limiting myself thereto except as hereinafter claimed.

I claim:

1. Indicating means for indicating the positions of a plurality of multi-position speed change levers controlling the output speed of a transmission having a plurality of outputs, said indicating

means comprising relatively rotatable plates, one plate having a plurality of annular series of output speed indicia for and denoting the several delivered speeds of each output of the transmission and further having annular series of lever position indicia corresponding in number to the speed change levers and each series comprising indicia representing various positions of the associated lever, the other of said plates having an opening aligning with said speed indicia series and of a size to simultaneously singly expose an indicia of each of the output speed series, a shutter associated with said opening and constructed and arranged to selectively conceal the indicia of all but one of said series and a further opening in said plate for and aligning with each of said lever position series and of a size to singly expose the indicia thereof, and means to relatively rotate said plates.

2. Indicating means for indicating the positions of a plurality of multi-position speed change levers controlling the output speed of a transmission having a plurality of outputs, said indicating means comprising relatively rotatable plates, one plate having a plurality of annular series of output speed indicia for and denoting the several delivered speeds of each output of the transmission and further having annular series of lever position indicia corresponding in number to the speed change levers and each series comprising indicia representing various positions of the associated lever, the other of said plates having an opening aligning with said speed indicia series and of a size to simultaneously singly expose an indicia of each of the output speed series, a shutter associated with said opening and having means to selectively conceal the indicia of all but one of the indicia series and means to simultaneously indicate the output controlled by the exposed series, means to operate said shutter, said second plate having a further opening for and aligning with each of said lever position series and of a size to singly expose the indicia thereof, and means to relatively rotate said plates.

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