

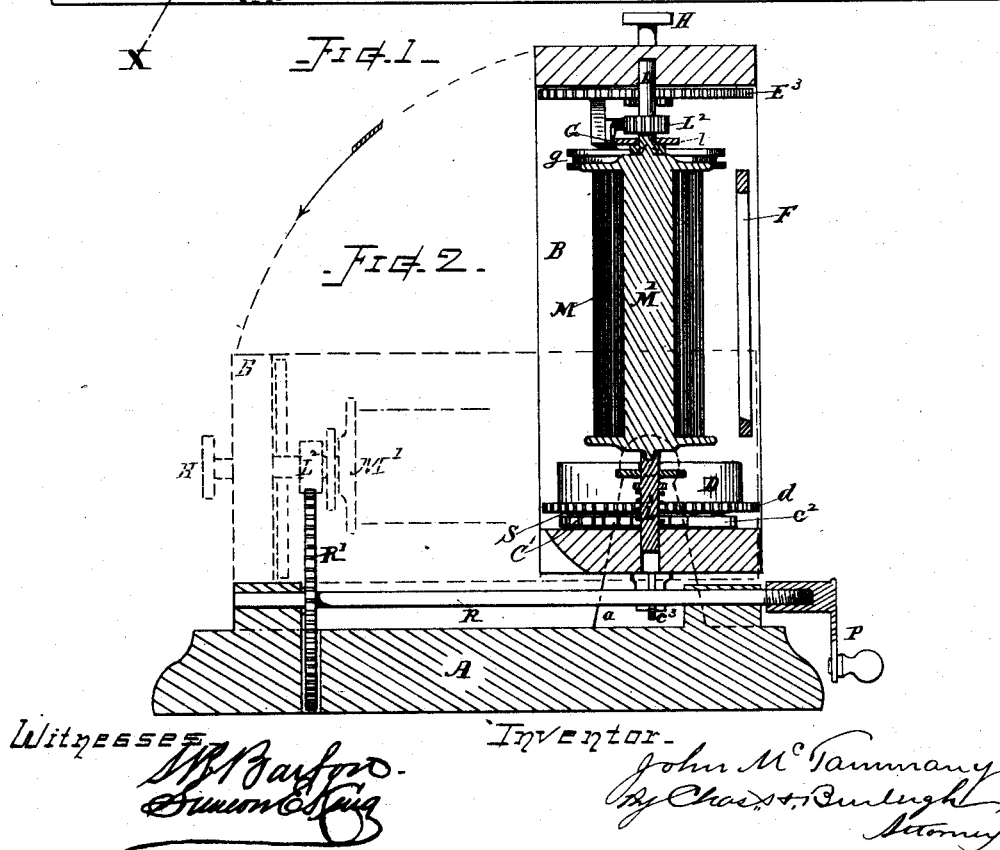
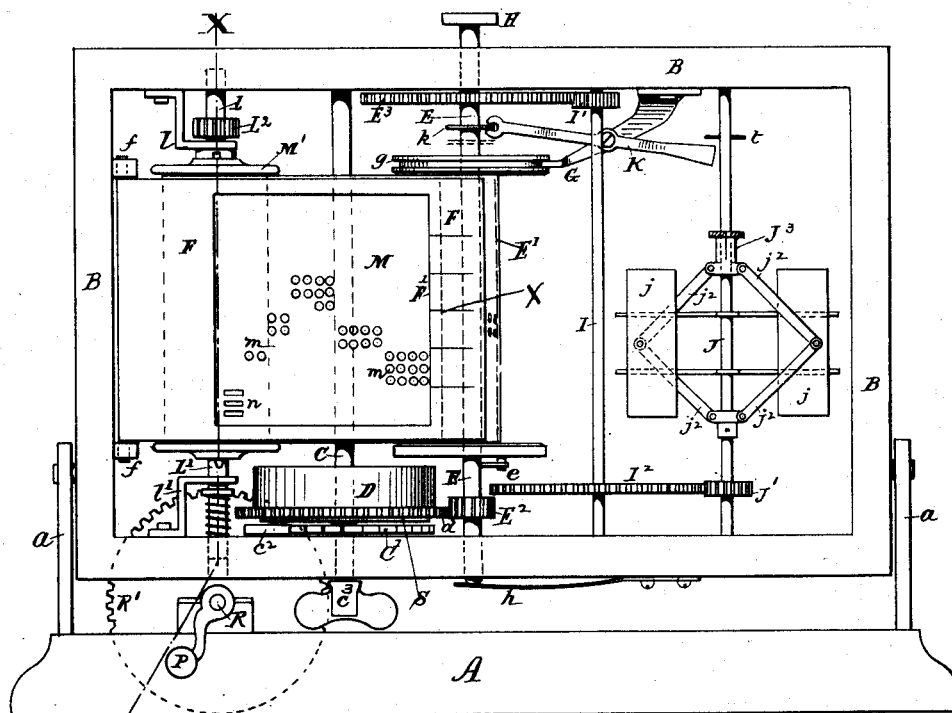
(No Model.)

3 Sheets—Sheet 1.

J. McTAMMANY.
MECHANICAL INDICATOR FOR MUSICIANS.

No. 422,964.

Patented Mar. 11, 1890.



Witnesses

SEE
M. J. Sanford
Simon & Schuster

Inventor.

John M. Tammamy
By Chas. S. Burlingame
Attorney

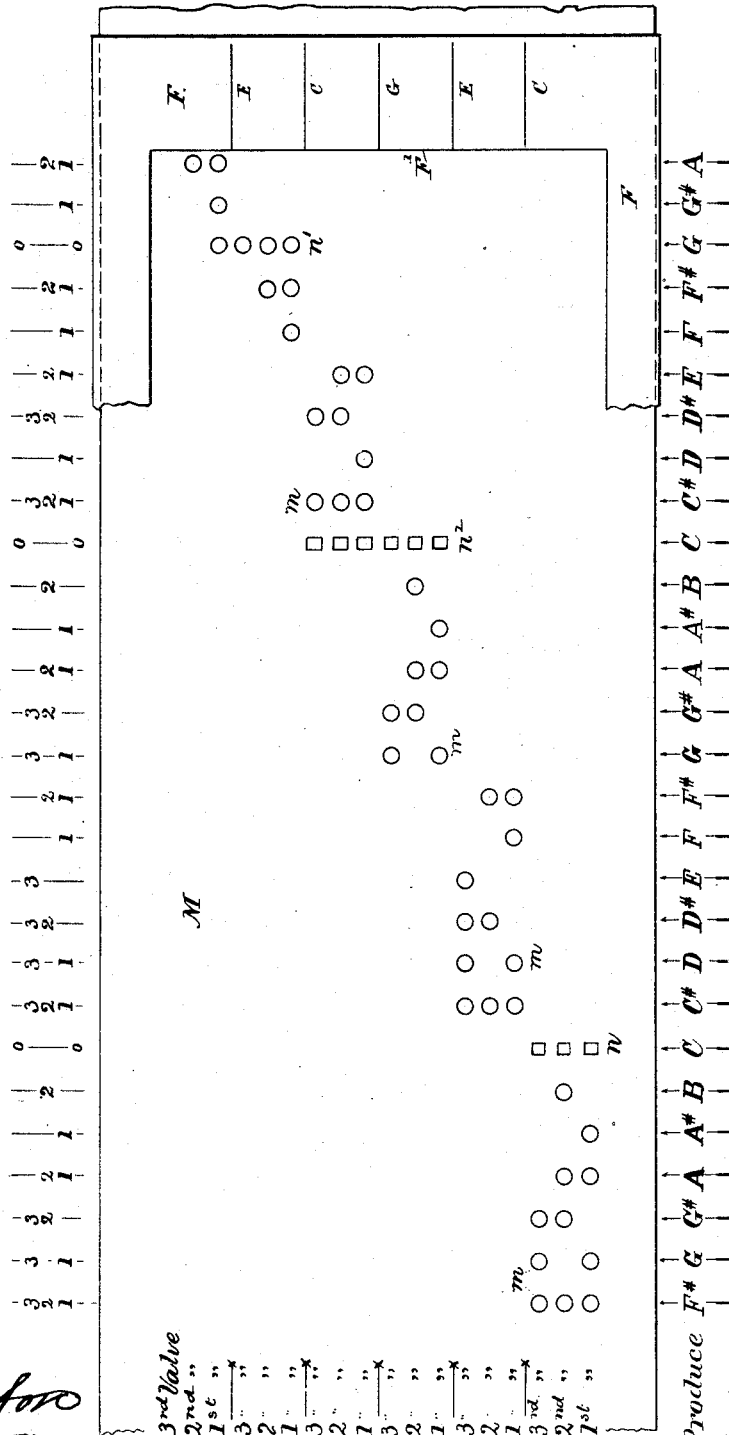
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Fig. 3—

Cornet.—Valves to be Depressed.



Witnesses

W. R. Burt
Simon & King

3rd Valve
2nd "
1st "

Inventor John McTammany

By Chas. H. Burlingame, Attorney

To Produce

(No Model.)

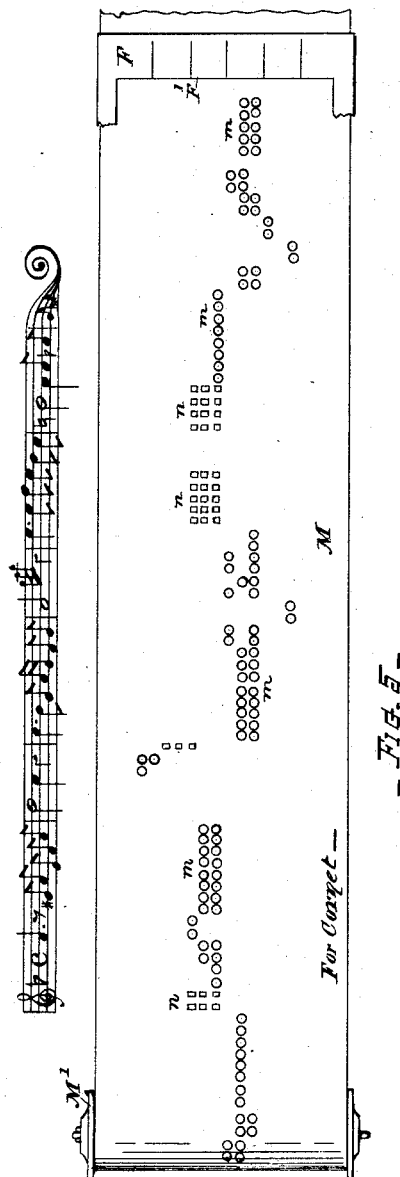
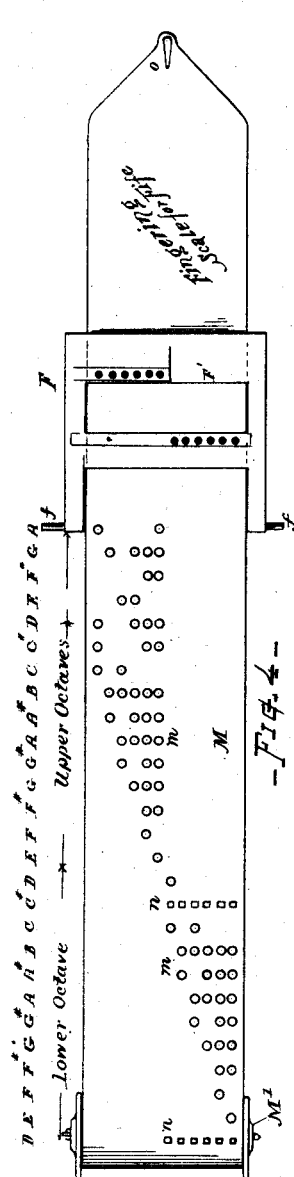
3 Sheets—Sheet 3.

J. McTAMMANY.

MECHANICAL INDICATOR FOR MUSICIANS.

No. 422,964.

Patented Mar. 11, 1890.



Witnesses

W. R. Barton
Simon E. King

Inventor

John McManamy
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UNITED STATES PATENT OFFICE.

JOHN MCTAMMANY, OF WORCESTER, MASSACHUSETTS.

MECHANICAL INDICATOR FOR MUSICIANS.

SPECIFICATION forming part of Letters Patent No. 422,964, dated March 11, 1890.

Application filed June 14, 1889. Serial No. 314,268. (No model.)

To all whom it may concern:

Be it known that I, JOHN MCTAMMANY, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Mechanical Instructors for Band and Orchestra Instruments, &c., of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

This invention relates to mechanically-indicated musical instruction and means whereby it is especially adapted for band and orchestra wind musical instruments—such as the cornet, clarionet, flute, fife, piccolo, flageolet, &c., and instruments of similar class—the objects of my invention being, first, to provide a musical instructor adapted to assist the performer in learning the fingering or valve action on the classes of instruments above named, or such as have a limited number of valves or finger-holes, and in which pitch of tone is carried above or below the normal pitch by increase or diminution of blowing-pressure, or by different degrees of intensity due to the lip-blast or tonguing action; second, to provide an indicator-sheet for the purpose specified, having indents, spots, or perforations arranged in rows or groups and severally denoting the valves to be pressed or finger-holes to be opened, and in which the groups are offset or displayed at different positions in lateral relation to the sheet for indicating the blowing pressure or lip-blast action; third, to provide an indicator-sheet for the purpose specified, having series or groups of indents, spots, or perforations denoting the valves or finger-holes to be pressed or opened, and in addition thereto having a differently formed or delineated series of indents, spots, or perforations indicating portions where all of the valves are to be pressed or all of the finger-holes stopped.

Another object of my invention is to provide, in combination with an indicator-sheet having groups of indents, spots, or perforations denoting the valves or finger-holes pertaining to instruments of the classes above named, and offsetting in lateral relation for indicating the blowing-pressure, an automatic

motor for propelling the sheet, and an index or frame for showing the time movement of the sheet and for indicating the position in relative lateral alignment of any indent or group of indents when passing the visual aperture of the instructor apparatus.

These objects I attain by mechanism the nature and construction of which is explained in the following detailed description, the subject-matter claimed being hereinafter definitely specified.

In the drawings, Figure 1 is a front view of my mechanical instructor set up for use. Fig. 2 is a sectional view of the same at line X X. Fig. 3 is a diagram showing the mechanical instructor-sheet with the arrangement of the scale as adapted for a cornet or similar three-valved instrument. Fig. 4 is a diagram showing the scale as adapted for a fife or similar six-finger-holed instrument, and Fig. 5 shows the instructor-sheet as perforated to exhibit the valve action for a cornet corresponding to the strain of music illustrated at the top of the figure.

Referring to parts, A denotes a platform or bed provided with uprights or side standards *a a*, and B denotes a swinging frame hinged or pivoted to said standards and capable of adjustment to upright or horizontal position, and which serves for supporting the operating mechanism which is disposed thereon, as shown.

C denotes the motor-shaft combined with a common clock or flat volute coil-spring S, which is inclosed in the drum D, having a drive-gear *d* thereon. One end of the spring is attached to the drum and the other to the shaft, which latter is provided with a suitable ratchet C', while a pawl *c*², pivoted on the frame, engages therewith for holding the tension or preventing backward movement. A winding-key *c*³ is fitted on the end of the shaft or spring-arbor, which extends through the exterior of the frame, whereby the spring S can be wound up.

E denotes the operator-shaft, carrying thereon a winding-roll or take-up spool E', which can turn loosely on said shaft, and is retained in proper lateral relation to the index-plate F by a guide G, that engages with the grooved head *g* of the roll. The shaft E is longitudinally adjustable in its bearings, and

is provided with a spring *h*, for maintaining it in normal position, and with a presser-knob *H*, by which it can be moved endwise in opposition to said spring. The shaft normally engages the roll *E'* by the clutch pins or lugs at *e*, so that the shaft operates the roll; but the clutch *e* will be thrown out of engagement when the knob *H* is pressed down. A pinion *E*² is fixed on shaft *E*, by which it is rotated from the gear *d*, and a gear *E*³ is fixed to its opposite end, by which motion is imparted to the pinion *I*¹ and speed-shaft *I*, and thence by the gear *I*² and pinion *J*¹ to the governor-shaft *J*. The governor-fly is preferably made with its plates or blades *j*, connected to its shaft by arms *j*², which are adjustable for increasing or decreasing the radial distance of the blades *j* from the axis, this adjustment being effected by sliding the hub *J*³ on the shaft *J*, thereby increasing or diminishing the speed at which the mechanism rotates.

K denotes a lever actuated in combination with the shaft *E* by the flange *k*, for engaging a stop *t* on the fly-shaft *J*, and preventing rotation of the gear-train when the shaft *E* is shifted and the winding-roll clutch *e* is disengaged.

The index plate or bar *F* is formed with an opening or visual space, through which the sheet *M* is revealed, and said plate is hinged to the frame *B*, as at *f f*, so that it can lie flat to the roll *E*, or be raised up to facilitate the introduction and removal of the sheet *M* and its containing-spool *M'* when changing tunes. Said plate has a gage-line *F'* and a surface that is divided by lines or marks *z*, that aid in denoting the different groups of indents on the moving sheet *M*.

L and *L'* denote spool-supporting axles mounted in bearings *l l'* and having their ends fitted for receiving and engaging with spool-tips, such as are used on spools of automatic music. One of said axles is fitted with a spring to give back when the spool is entered, and the other is furnished with a gear-pinion *L*².

The rewinding-shaft *R* is mounted in bearings on the bed *A*, and is provided with a crank *P* on its projecting end, also with a gear *R'*, with which the pinion *L*² engages when the frame *B* is swung down into horizontal position. (See dotted lines, Fig. 2.)

The instructor-sheet *M* consists of a strip of paper or suitable material—such as used in the music-sheets for automatic musical instruments—and said sheet is provided with similarly-formed perforations ranging in longitudinal rows throughout the length of the piece at intervals proportionally corresponding to the "time" durations of the musical notes, but with this difference, which is the important feature of my invention as distinguished from the ordinary music-sheet, that the spots, indents, or perforations are arranged in a manner that will represent the fingering or valves of a cornet or similarly-played in-

strument, as in Fig. 3, or the finger-holes of a fife or similarly-played instrument, the rows of indents *m* being disposed laterally of the sheet in groups corresponding to the number of valves or finger-holes on the instrument.

With instruments of the class above named tones of different parts of the scale are produced by the same fingering by varying the vibratory intensity of the blast or pressure. The first octave or lower series of tones being produced by a low pressure of wind forced through the mouth-piece of the cornet, then by contracting the lips and increasing the pressure the higher tones or the upper octave are produced. As it might otherwise be a matter of doubt with the performer which tone was intended to be produced when similar fingering is indicated, I arrange the spots or perforations *m* in differently-disposed groups or series on the sheet *M*, the groups being offset laterally from longitudinal alignment, or placed more or less toward one side or the other of the sheet, so that the grouping will show above or below the marks on the face of the index-plate *F*. The highness or lowness of the pressure is thus represented by the position of the perforations relatively to the width of the sheet. The relation of the perforations to lines on the indicator-plate assists the performer in determining the pitch and amount of pressure necessary to produce any desired tone, while the number of the perforations indicates the valves or fingering for different notes of the scale, as will be understood from an inspection of Fig. 3. Some of the sounds on the class of instruments named are produced without fingering, or with the valves all in normal position, but at higher or lower tones simply by varied pressure; therefore to indicate when the valves are all up or no fingering necessary I use differently-shaped spots or perforations—as, for instance, a group of square indents *n*, such group being disposed at proper lateral position to indicate the pitch, as above explained. Instead of a differently-shaped perforation, an increased number of perforations may be used for this neutral group—say four or more round perforations, as at *n'*, or an extended or double group, as at *n''*, Fig. 3.

The sheets *M*, properly perforated for the different tunes, when prepared can be wound upon spools or rolls *M'* in the usual manner employed for mechanical music, said spools having ends adapted to be placed in connection with the axles *L L'*, so as to be interchanged as desired. From the spool *M'* the sheet is drawn past the indicator-opening and index-line to the winding-spool *E'* by the action of the motor mechanism, and at a regular speed controlled by the governor-fly.

The operation is as follows: The plate or bar *F* is raised and a spool containing a sheet *M* of the nature described is placed in position, the end of the sheet hooked onto the winding-spool *E'* and the indicator-plate *F*

turned down upon the sheet. The spring S having been wound and the frame B elevated, the apparatus is placed on a table, desk, or other support at convenient position for sight, and is ready for action when the stop-button H is released and the shaft E slipped to its normal position, so as to free the stop *t* and engage the clutch *e*. Now, suppose a person knowing nothing about musical notation desires to learn to play the cornet. This he can do by the aid of the apparatus. There are three keys or valves on the cornet, and all tones of the scale are produced by the three valves and the varied pressure of air through the lips. The valve action is indicated by the groups of indents on the sheet, and the blast or lip pressure by the position of these groups of perforations. The performer takes position before the mechanical instructor, starts the mechanism, and observes the perforations of the sheet and plays accordingly. The sheet M being set in motion, the spots or perforations pass in their order and at regular speed across the opening of the index-plate. When the perforation reaches the gage or line F', the performer depresses the corresponding valve on his cornet and holds it down while such spot or perforation is in sight, and releases it the instant the perforation disappears, at the same time modulating the lip-pressure to correspond to the required intensity of blast, as indicated by the position of the perforation in relation to the lines on the face of the index-plate. For rewinding the sheet from the roll E' to the spool M' the knob H is pressed down, thereby sliding the shaft E, so that the clutch at *e* is thrown off and the lever K swung into engagement with the stop *t* to hold the train of gearing to prevent the spring from running down. The frame B is then swung downward until the pinion L² meshes with the gear R'. (See dotted lines, Fig. 2.) Then the spool M' can be rotated by means of the hand-crank P and shaft R, and the rewinding of the sheet thereby effected.

I am aware that in previous patents there have been shown and described musical charts and moving sheets for indicating the tones and their position on a piano or other musical instrument, and motor mechanism for propelling such sheets across a visual space in a given measure of time. Therefore it will be understood that I do not claim, broadly, the invention of a traveling indicating-sheet and means for the advancement thereof irrespective of my particular features of improvement.

What I claim as my invention, to be herein secured by Letters Patent, is—

1. A music-indicating sheet having a series of indents, marks, or perforations representing the valves or fingerings of a cornet, fife, or instrument of similar class, and disposed in groups in corresponding order for denoting at the different intervals the valves or

finger-holes to be pressed or opened, substantially as set forth.

2. A music-indicating sheet or scale for musical instruments operated by three valves, wherein the highness or lowness of blast-pressure is represented by a series of groups of indents or perforations arranged in offsetting order, while the several indents of each group represent the particular valves to be operated, substantially as set forth.

3. A music-indicating sheet having a series of perforations *m*, arranged in groups, representing the fingering-holes or valves on a fife, cornet, or instruments of similar class, said groups being offset in lateral position for denoting pressure of blast, and having a different series of markings *n*, to denote where all fingering or all valves are to be at normal position, substantially as set forth.

4. The music-indicating sheet or scale having a series of groups of indents or perforations arranged as described, the individual perforations representing the particular valve or finger-hole to be operated, and the highness or lowness of pressure for the pitch of the tone represented by offsetting the group of indents laterally on the sheet, in combination with an index plate or bar having graduating lines thereon, and means, substantially as described, for propelling said sheet across the index-plate, as and for the purpose set forth.

5. In mechanism for the purpose specified, the combination of the bed A, having the uprights *a*, the swinging frame B, pivotally attached thereto, the spring S, motor-drum D, and ratchet on shaft C, the operator-shaft E, the roll E', mounted on said operator-shaft, the clutch *e*, the spool-supporting axles L and L', the pinion L² on one of said axles, the removable spool M', the indicating-sheet M, the hinged index-plate F, and the fly J, and gear-train for operating said fly, all substantially as and for the purpose set forth.

6. In mechanism for the purpose specified, the combination, with the bed A and the upwardly and downwardly swinging frame B, whereon the indicator-sheet and operating mechanism are mounted, hinged to said bed, of the spool-supporting axles L L', one being provided with the pinion L², the rewinding-shaft R, mounted on said bed and provided with a crank P, and a gear R', into which the pinion L² meshes when the frame B is in downward position, substantially as set forth.

7. In mechanism for the purpose specified, the fly J, having its fans *j* attached by adjustable arms *j*³, in combination with the operator-shaft E, having the receiving-roll mounted thereon, the train of gears from said operator-shaft to said fly, the spring-motor, spool-supporting axles, and index-plate, as set forth.

8. In mechanism for the purpose specified, the combination of the rotating fly having the stop *t*, the longitudinally-movable shaft E, having the flange *k*, the lever K, actuated by

said flange, the gear-train operating said fly from said shaft, the roll E, its guide and clutch *e*, and the spring *h*, for the purpose set forth.

9. In a mechanical instructor for the purpose specified, the combination of the indicating-plate, the spool-supporting axles, the operator-shaft, the receiving-roll supported thereon, the clutch *e*, the knob H, the spring *h*, the perforated sheet M, the governor-fly J, the governor-fly stop-lever K, the spring-mo-

tor, and train of operating gears and shafts, all arranged for operation substantially as set forth.

Witness my hand this 5th day of June, A. D. 1889.

JOHN MCTAMMANY.

Witnesses:

CHAS. H. BURLEIGH,
ELLA P. BLENUS.