No. 731,056. PATENTED JUNE 16, 1903.

S. F. JONES.

ELECTROMAGNETIC VIBRATING REED.

APPLICATION FILED SEPT. 23, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

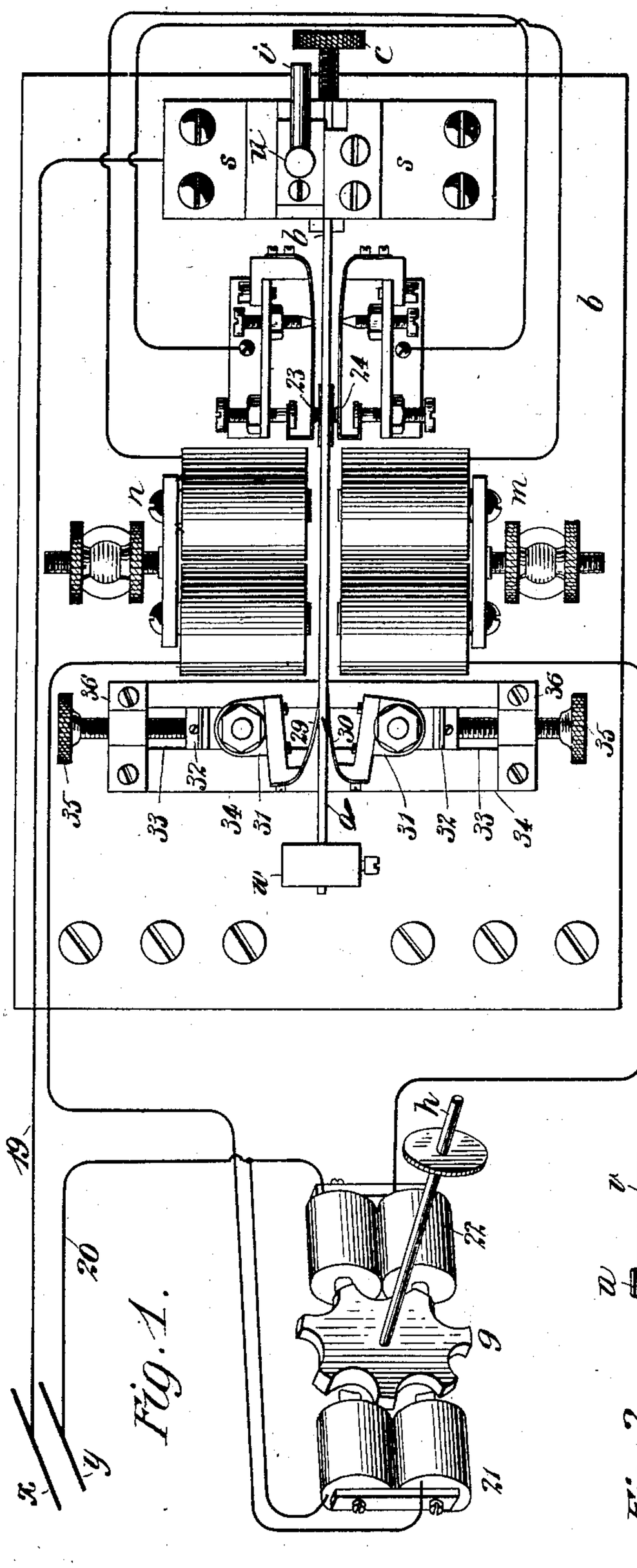

Fig. 1.

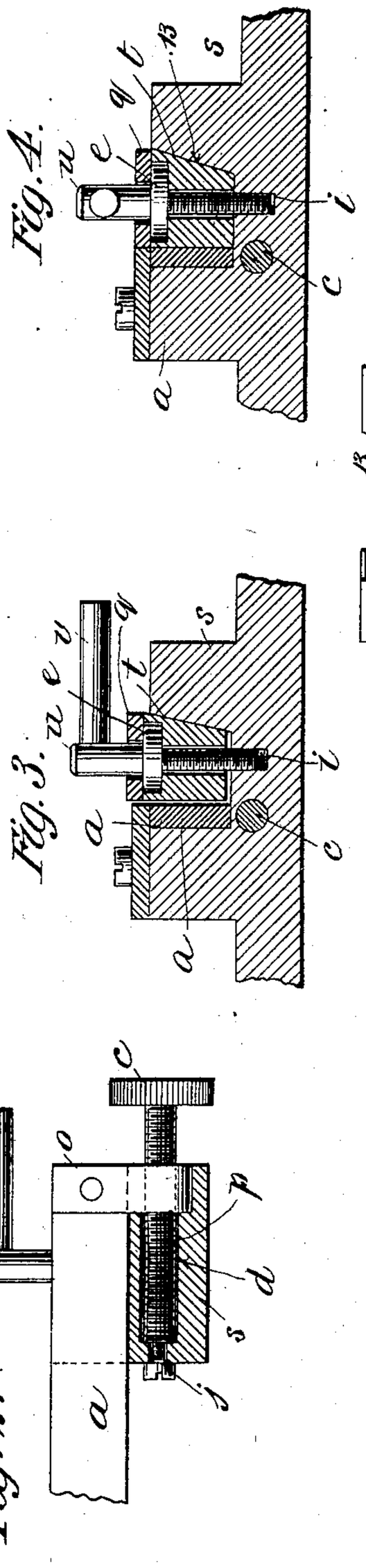

Fig. 4.

Fig. 3.

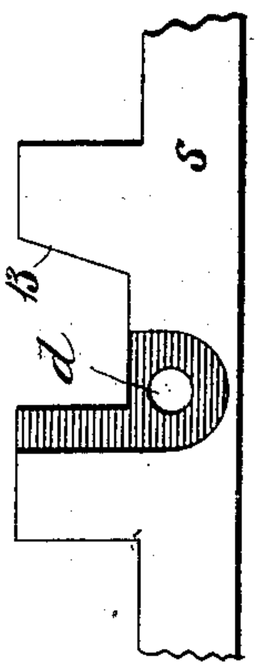

Fig. 5.

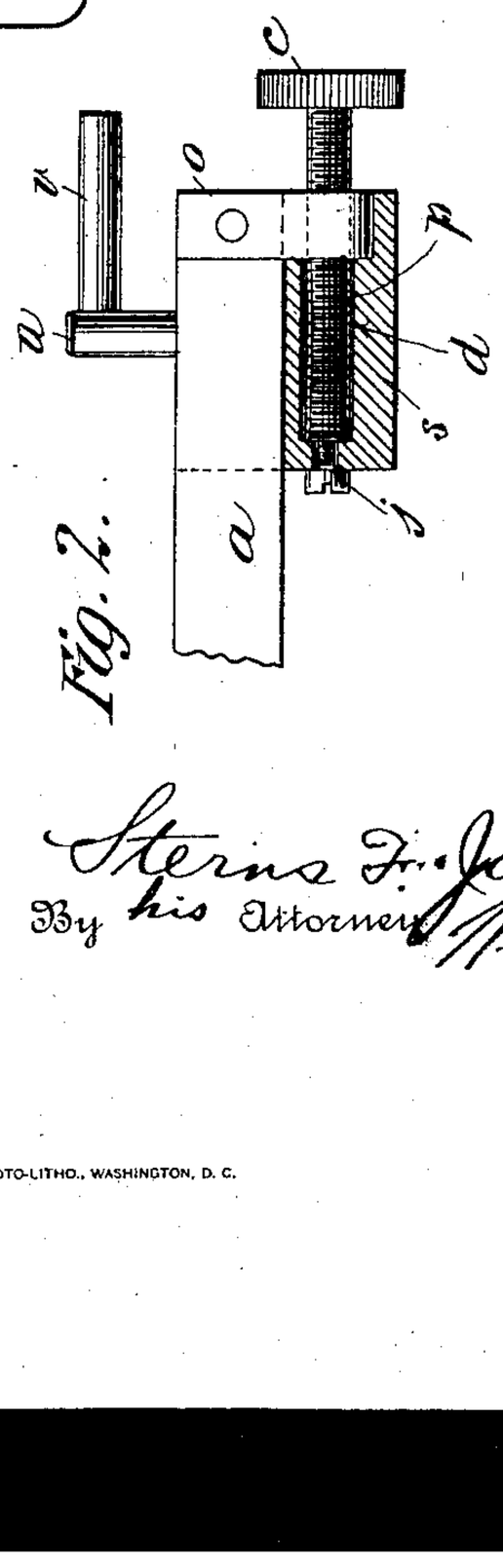

Fig. 2.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 7.

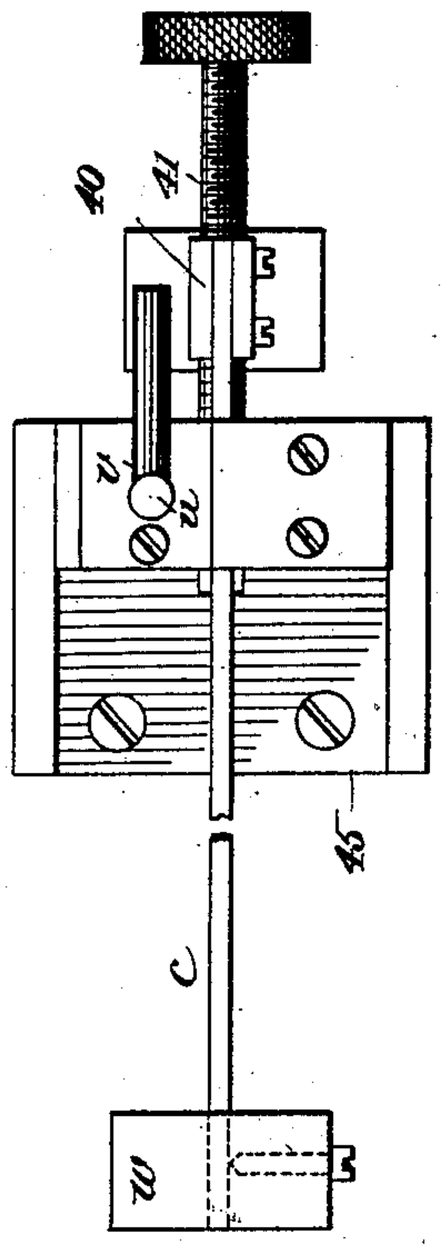


Fig. 8.

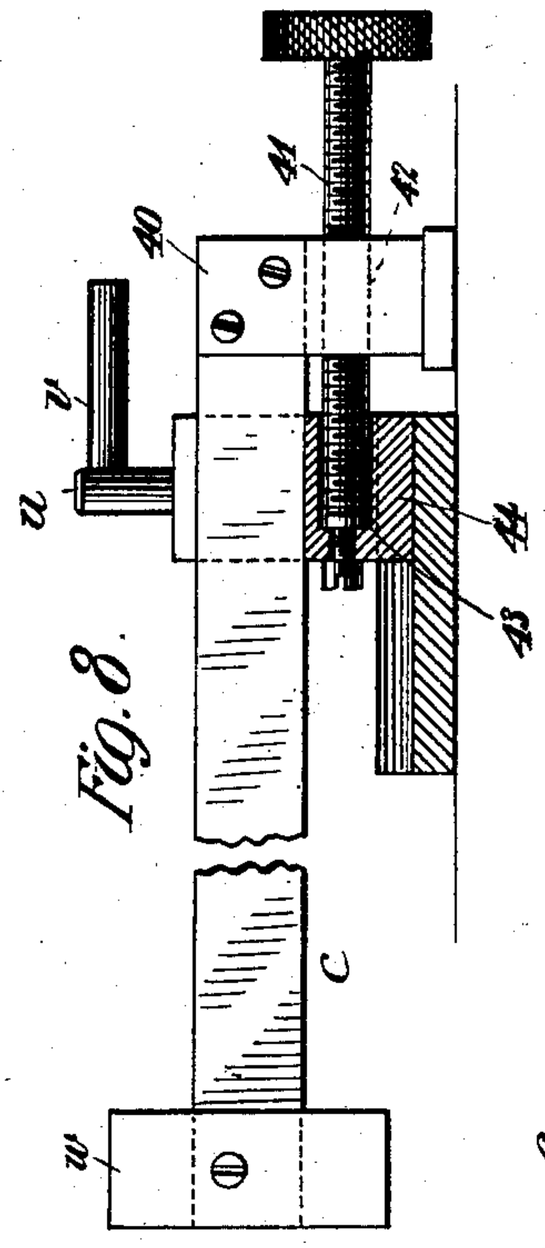


Fig. 9.

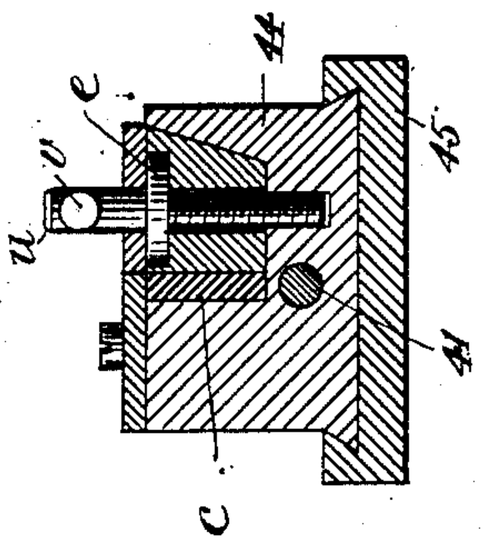
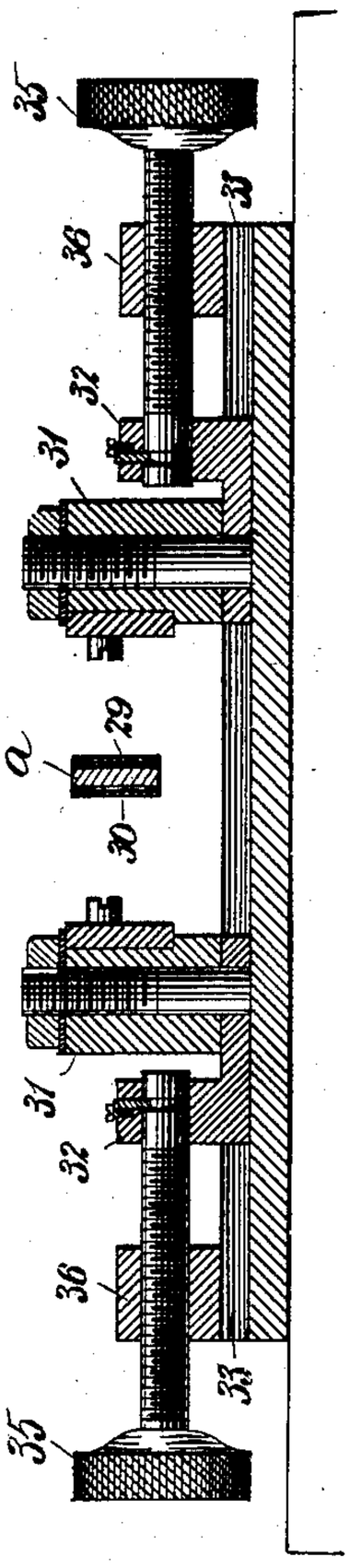


Fig. 6.



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No. 731,056. Patented June 16, 1903.

UNITED STATES PATENT OFFICE.

STERNS FRANCIS JONES, OF BROOKLYN, NEW YORK.

ELECTROMAGNETIC VIBRATING REED.

SPECIFICATION forming part of Letters Patent No. 731,056, dated June 16, 1903.

Application filed September 23, 1902. Serial No. 124,507. (No model.)

To all whom it may concern:

Be it known that I, STERNS FRANCIS JONES, a citizen of the United States, residing in the borough of Brooklyn, county of Kings, city and State of New York, have made certain new and useful Improvements in Electromagnetic Vibrating Reeds, of which the following is a specification.

My invention is an improvement in vibrating reeds which are usually operated by electromagnets located in a circuit containing contact-points opened and closed by the reed in its vibration. Such a reed is used to make and break the circuit for a telegraphic transmitter or other apparatus, and it often becomes necessary to adjust the time interval of these circuit interruptions while the reed is in operation.

The object of my invention is to provide for adjusting the rate of reed vibration or the frequency of contact intervals while the reed is in operation and without interrupting its regularity or stopping the transmission on the telegraphic circuit.

I employ a supporting-board, on which is located the vibrating reed, usually a strip of steel having a movable weight carried on its free end or terminal. There are electromagnets located on the base. On each side of the reed the magnets are in the local circuit with the contact-points operated by the reed in its vibrations. In the same circuit or in a separate circuit may be an impulse-motor, such as a magneto-electric motor employed in either the transmitting or receiving system of an automatic telegraph, or this electromagnetic device may be any well-known form of apparatus. The reed is supported at its base or non-vibrating end in a divided metal block. In one form there is a screw passing through a nut fixed to the base of the reed. The end of this screw is journaled in the metal block. The divided block has a movable section. A cam or eccentric operates to jam this movable section onto the reed-terminal and hold it firmly against movement. The cam is on a screw, and the movable section is beveled or tapered and fits into a beveled or tapered seat. When the screw carrying the cam is turned, the block-section is raised and freed, while the cam separates from the reed.

Buffer-springs are provided, one on each side and near the free terminal of the reed, to receive the impact of the reed and give to it an initial return movement. I locate each of these springs on a carriage moving in a dovetailed groove in a fixed metal block, and I provide screw adjustments for moving the carriages separately to and fro with respect to the reed. The screw used is one form of an inclined plane and may be substituted by a cam, if preferred.

The accompanying drawings illustrate my invention.

Figure 1 is a plan view of the complete apparatus, including the improved adjustment for the reed and buffer-springs. Figs. 2, 3, 4, and 5 are detail sectional views of the adjustable base-block of the reed. Fig. 6 shows the means for adjusting the buffer-springs. Fig. 7 shows a modification in structure of the base-block. Fig. 8 is an elevation of the same, and Fig. 9 is a cross-section of the movable part thereof with its grooved way or track.

In Fig. 1 *a* is the reed, consisting of a strip of steel supported firmly at *s*, carrying an adjustable weight *w* at its free or vibrating end. *m* and *n* are electromagnets in the circuit 19 20, connected to the street electric mains *x* and *y*. In this same circuit is the impulse-motor *g*, including field-magnets 21 22 and circuit-breaking points 23 24, operated by the reed. The break-point 23 is in one branch of the circuit with magnets *m* and 22. The break-point 24 is in a second branch of said circuit with magnets *n* and 21. The armature of the impulse-motor *g* is connected to a shaft *h*, carrying a gear-wheel forming part of a telegraphic transmitter, such as the Wheatstone transmitter. When the reed *a* is plucked, the circuit-breakers 23 and 24 are alternately closed and opened and current impulses pass through the pairs of magnets *m* and 22 and *n* and 21 alternately. The rate of vibration of the reed may be determined before starting it into operation by moving the weight *w* up or down, as desired; but this must be done before starting the reed or the reed will be put out of action during the adjustment.

In Figs. 1 to 4 *s* is a block of metal fixed to the base-board *b*. Block *s* is channeled near the center. The reed *a* lies alongside one

wall. The other wall is beveled, as at 13, Fig. 4. A nut *o*, Fig. 2, is fixed to the reed *a* and projects downwardly. A screw *c* passes through the nut *o*. The opposite end of screw *c* is journaled at *j* at the end of a passage *p* in block *s*. When screw *c* is turned, the reed *a* is advanced or withdrawn with respect to its seat in block *s*. It is necessary, however, to provide for clamping the reed against an extended surface after the screw movement is complete. For this purpose I provide the section *t*, tapered on one side to conform to the surface 13. A screw *u*, having a handle *v*, passes through the section *t* and engages a screw-threaded opening *i* in block *s*. Near the upper end of screw *u* is a cam *e*, fixed on the screw and rotating in an aperture in section *t*. Its edge engages the surface of reed *a*. The cam *e* is held in position by a cap-piece *q*. When the screw *u* is turned, the cam releases the reed and the screw rises by the same movement, lifting section *t*, completely freeing the reed. A turning of screw *u* in the opposite direction jams cam *e* and section *t* against the reed *a*.

The buffer-springs 29 and 30, Figs. 1 and 6, are located upon opposite sides and near the free end of the reed *a*. These springs cushion the impact of the vibrating reed and impart an initial return movement, as is now well and generally understood. Each of these springs is fixed to a block, like 31, which in turn is fixed to a carriage 32. The carriage 32 travels in a dovetailed groove 33 in the block 34. The screws 35 are screw-threaded through the fixed piece 36. The free end of each screw 35 has a turning connection with the carriage 32. It results from this that when the screw 35 is rotated the carriage 32 is caused to approach or recede, carrying its buffer-spring into more or less close engagement with the vibrating reed, and this adjustment of the buffer-springs I am able to make without interrupting the operation of the reed.

In Figs. 7, 8, and 9 I have shown a modification of the divided block for adjusting the reed. I prefer this form, because it enables me to adjust the vibrations of the reed without changing the contact-points with respect to the reed and without changing the mechanical contact-point of the buffer-springs with respect to the reed. In this modification the supporting-block is divided, a section 40 being firmly fixed to the base-board and a section 44 being arranged to slide in a grooved way in a fixed metal block 45. The reed *c* is firmly held by screws in the fixed block 40. The section 44 slides upon the reed. A screw 41 passes through the screw-threaded opening 42 in the block 40 and is journaled at 43 in the movable block 44. When the screw 41 is rotated, the reed does not change its position; but its free end or part is shortened or lengthened, and its rate of vibration thus varies by moving the block 44 to and fro with respect to the fixed block 40.

What I claim, and desire to secure by Letters Patent, is—

1. The combination of a vibrating reed, an electromagnetic device for maintaining the reed in vibration, springs located upon the base or support upon opposite sides of said reed to cushion the impact and impart an initial return movement, each spring being supported upon a sliding block or carriage, a groove or track for each carriage and means for gradually moving each carriage on its track to vary the position of said springs with respect to each other and to said reed.

2. The combination of an electromagnet located on a suitable base-board; a vibratory reed or strip operated thereby; a screw-threaded nut fixed to said reed; a channeled block having a beveled wall supported on said base-board; means for varying the rate of vibration of said reed including a screw engaging said nut; a sliding section tapered on one side to conform to the surface or wall of said block; a screw passing through said section and engaging a screw-threaded opening in said block; a cam fixed on said screw within a recess in said sliding section; circuit-closing points controlled by said reed, and an electric circuit including said magnet, points, and the coils of an electric motor.

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