

No. 703,304.

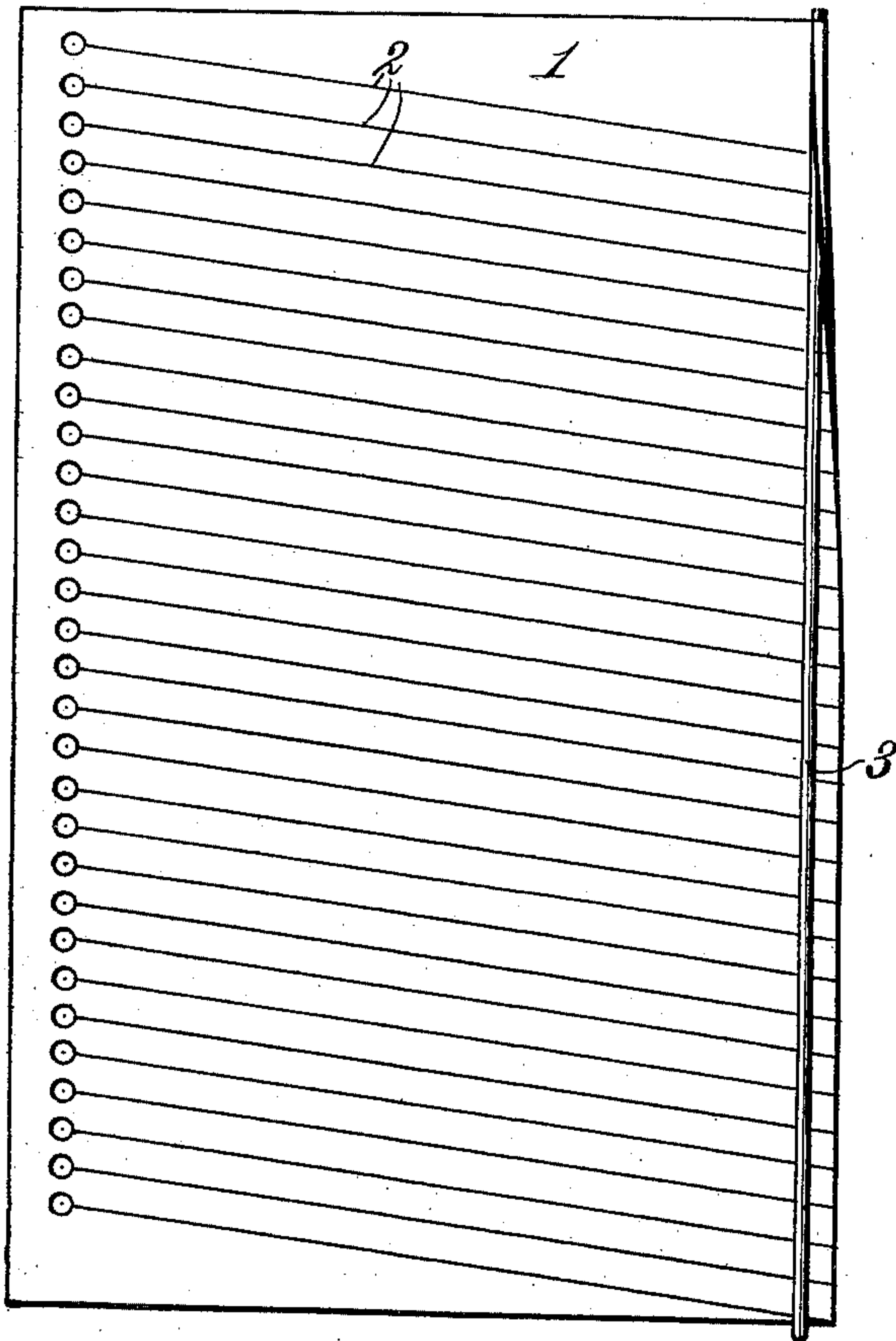
R. R. RAKESTRAW.  
PENCIL.

Patented June 24, 1902.

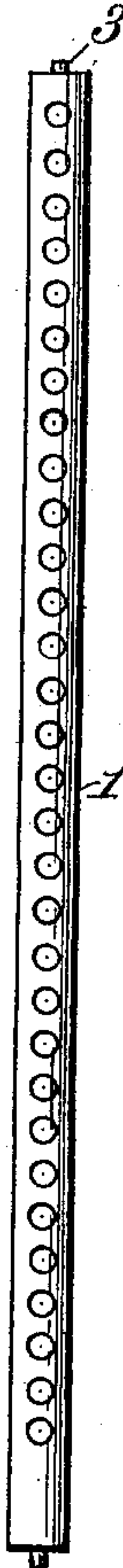
(Application filed Aug. 6, 1898.)

(No Model.)

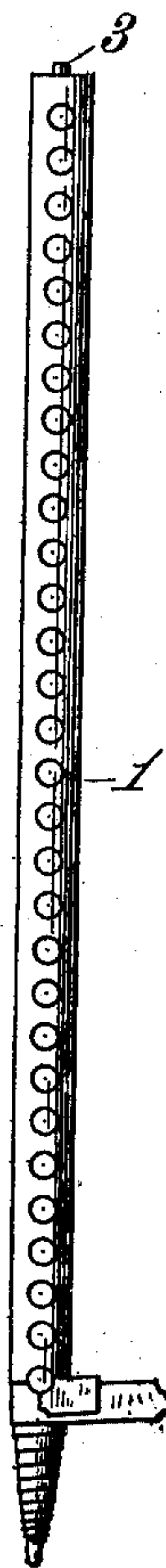
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



*Witnesses:*  
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*Robert R. Rakestraw.*  
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# UNITED STATES PATENT OFFICE.

ROBERT R. RAKESTRAW, OF VIENNA, AUSTRIA-HUNGARY.

## PENCIL.

SPECIFICATION forming part of Letters Patent No. 703,304, dated June 24, 1902.

Application filed August 6, 1898. Serial No. 687,986. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT R. RAKESTRAW, (whose post-office address is 14 Kyverdale road, Stoke Newington, London, England,) 5 manager of works, a citizen of the United States of America, residing at Vienna, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Pencils, of which the following is a specification.

10 My invention relates to pencils of the kind or class in which a sheet or strip of flexible material—such, for instance, as paper or thin wood—is rolled or wound around a lead or crayon.

15 In paper pencils as hitherto generally made the lead or crayon is rolled up in a sheet of paper which has been scored, indented, or otherwise weakened along a number of parallel lines to permit of its being easily severed or torn apart into narrow strips, the paper being rolled upon the lead or crayon in such a manner that in the finished pencil the said weakened lines each extend around the same in the form of a spiral cone or conical 25 helix, and consequently the removal of a strip of the paper will uncover a portion of the lead or crayon of suitable length for use. The paper is usually rolled upon the lead or crayon and upon itself without the application of any adhesive material except that which is applied 30 to the outer edge of the sheet to firmly secure the same to the convolution beneath it when the paper is completely rolled. The consequence of this mode of manufacture is that the pencil lacks the requisite stiffness or rigidity, and the paper is liable to be easily separated or torn apart at the weakened lines by bending of the pencil, there being but little if any resistance to relative longitudinal 40 movement or sliding of the layers or convolutions even when tightly wound one upon another.

It has sometimes been the practice to provide but slightly weakened lines in the paper to avoid in some measure the described liability of the breaking of the pencil; but the adoption of such slightly-weakened lines is seriously objectionable in that the strips separate from each other with much difficulty in the act of unwinding to point the pencil, and very frequently the strips will not separate. 50

The object of my invention is to obviate this defect and to increase the stiffness and

strength of such pencils as compared with those heretofore made, and thus diminish 55 their liability to be bent or broken.

My said invention partly consists in a pencil consisting of a lead or crayon, a sheet of flexible material, such as paper, weakened or partially severed along a series of parallel 60 lines and rolled or wound upon said lead or crayon, so that said weakened lines are diagonal to the axis of the roll, and a feeble adherent uniting the several convolutions of such material, so as to resist relative longitudinal movement of said convolutions when 65 tightly wound one upon another, while permitting easy detachment of narrow strips of said material by unwinding.

My said invention also partly consists in a 70 pencil composed of a lead or crayon, a sheet of flexible material, such as paper, with a series of weakened lines, wound upon said lead or crayon, so that said weakened lines are diagonal to the axis of the roll, and a feeble adherent or slightly-adhesive composition which unites the convolutions of said material and which consists of rosin or resin or a gum-resin dissolved in a suitable solvent, such as benzoin or turpentine, and applied as hereinafter 80 described or of which rosin or resin or gum-resin is one of the constituents, such substances as shellac or dextrine being in some instances mixed with the rosin or resin in order to cause the same to adhere to said flexible material, or the feeble adherent which I use may be a solution of india-rubber applied as hereinafter described. 85

In the accompanying drawings, Figure 1 is a plan view showing a crayon or pencil about 90 to be enveloped in its covering. Fig. 2 is a view of the pencil complete, and Fig. 3 is a similar view during the operation of exposing a greater portion of the crayon or lead.

In making paper pencils according to my 95 invention I make a sheet or strip 1 of paper with a series of weakened parallel lines 2, and I find it advantageous to use as a feeble adherent for uniting the convolutions of the paper rosin or resin dissolved in a suitable 100 solvent, such as benzoin or turpentine, which is spread upon the paper and the solvent then evaporated, so as to leave a coating on the paper, which when heated and then cooled will be sufficiently adhesive for the purpose 105 of my invention, or the paper can be run



through a solution of rosin or resin, which would soak into the paper and when the solvent is evaporated would leave a coating on both sides of the paper for uniting the convolutions thereof when wound upon the lead or crayon, or I use as a feeble adherent a solution of india-rubber in a solvent such as ether or benzin, spread upon the paper, so that when the solvent is evaporated a sufficiently-adherent film or coating will be left thereon, or I use a mixture of rosin or of rosin and shellac with a slightly-adhesive substance, such as dextrine or a weak solution of glue, to make the rosin or the rosin and shellac adhere to the paper. I have set forth adherents which are satisfactory in practice; but I wish it understood that I do not confine myself thereto, as other adherents may be employed within the scope of my invention.

After coating the paper I allow the adherent to dry and then roll or wind said sheet on a lead or crayon 3, so that said weakened lines are diagonal to the axis of the roll, and at the same time apply heat to melt said substance or composition, so that when cooled it will unite the convolutions of said material.

After the composition is spread on the paper and dried the paper is rolled into a pencil on the pencil-rolling machine disclosed in the Blaisdell patent, No. 550,212, of 1895. In this machine the pencil is rolled up between two metal rolls and the pencil is held in place while rolling a trifle back of the center of such rolls by a slender revolving rod. These rolls are heated by means of gas or steam, and the sheet of paper or flexible material coated with the composition and from which the pencil is made receives the heat necessary to melt said composition while being wound into its pencil form between said heated metal rolls. While the above method of melting said composition is preferred by me, several other ways would do, such as applying a flame to the coated surface of the sheet as it passes in between the metal rollers, or the bed of the machine upon which the sheet lies as it passes in between the metal rolls could be heated, thereby heating and melting the composition on the upper side of the sheet as it is drawn in between the rolls in the act of rolling up.

The feeble adherents above mentioned act very efficiently in resisting longitudinal movement of the convolutions united thereby, and thus greatly increase the strength of the pencil and its capability of withstanding bending stresses, and I am therefore enabled to make the weakened lines in the paper much weaker than has hitherto been practicable, thereby facilitating the separation of the strips one from another along the weakened lines in the operation of unwinding a strip and obviating the difficulties that have heretofore been experienced through insufficient weakening of the paper along the lines where it has to be separated.

Although I prefer in the manufacture of

my improved pencils to use a composition of which rosin or resin is one of the constituents, I do not confine myself to that particular substance or composition, as other substances or compositions might, as above stated, be used which would answer the purpose. I can also use as a feeble adherent for the purpose of my invention a weak solution of dextrine or glue—say of less than 5° Baumé—applied in a moist state to the paper just before the latter is rolled upon the lead or crayon. This solution when dried will cause the desired adherence of the convolutions of the paper and still be weak enough to permit the ready unwinding of the strips, or the pencil might be dipped into a suitable feebly-adhesive solution, so that the paper would absorb a sufficient quantity of the said solution to effect the requisite adherence of its convolutions.

In some cases the outer edge of the sheet of paper may be united to the convolution beneath it by means of the aforesaid feeble adherent strongly enough to prevent accidental detachment thereof. I prefer, however, to apply some more strongly adhesive material, such as strong glue, to the outer edge of the sheet, so that the same will be effectually secured to the convolution beneath it. This glue can, if desired, be applied over the coating of the aforesaid composition. When this reinforcing-glue is employed, the feeble adherent readily separates therefrom when the strips are being unwound in the operation of pointing the pencil.

My improvements are applicable not only to paper pencils, but also to other pencils in which a sheet or strip of flexible material is rolled or wound upon the lead or crayon.

My invention relates to the pencil, and while I have described the preferable adherent referred to in the specification and the preferable process of manufacturing the pencil and have indicated a suitable machine for manufacturing the same it will be understood that my invention of the pencil is not restricted to the particular adherent referred to, nor to the process of manufacture described, nor to the machine indicated for the manufacture of the pencil.

What I claim is—

A pencil consisting of a lead or crayon, a sheet of flexible material having weakened lines rolled or wound thereon, and a feeble adherent uniting the several convolutions of said material and of a character to resist relative longitudinal movement of said convolutions while permitting easy detachment of said material by unwinding, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ROBERT R. RAKESTRAW.

Witnesses:

HENRY C. CARPENTER,  
F. E. BLAISDELL.