Jan. 2, 1923. 1,440,510.

R. W. TRUEBLOOD ET AL.

DEVICE FOR CODING AND DECODING TELEPHOTOGRAPHS.

FILED AUG. 3, 1921.

Fig. 1.

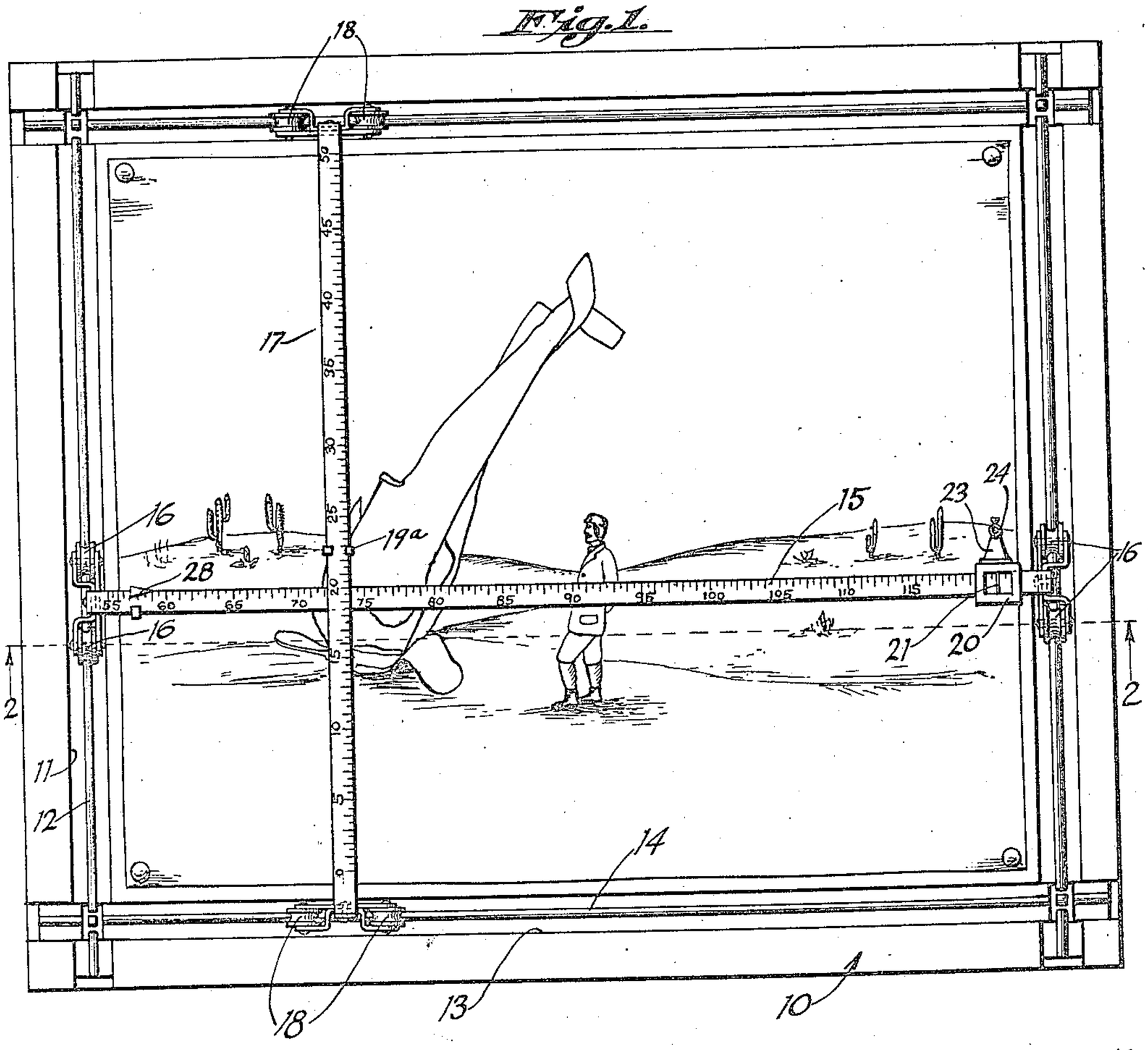
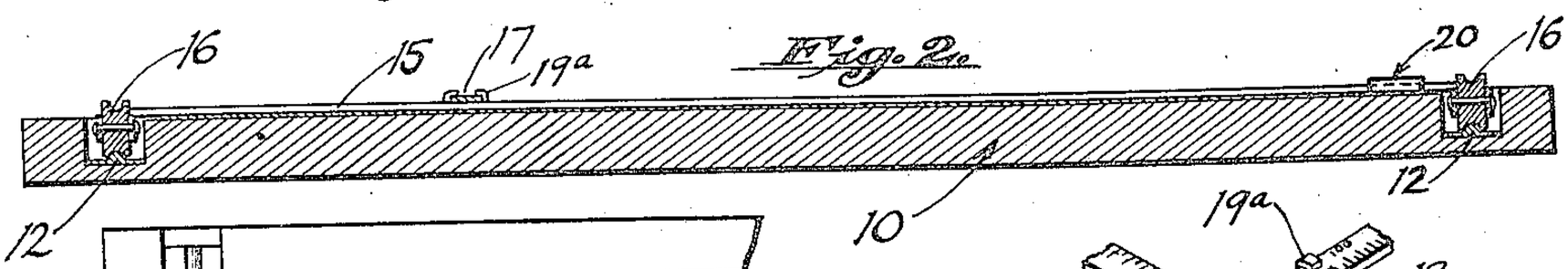


Fig. 2.



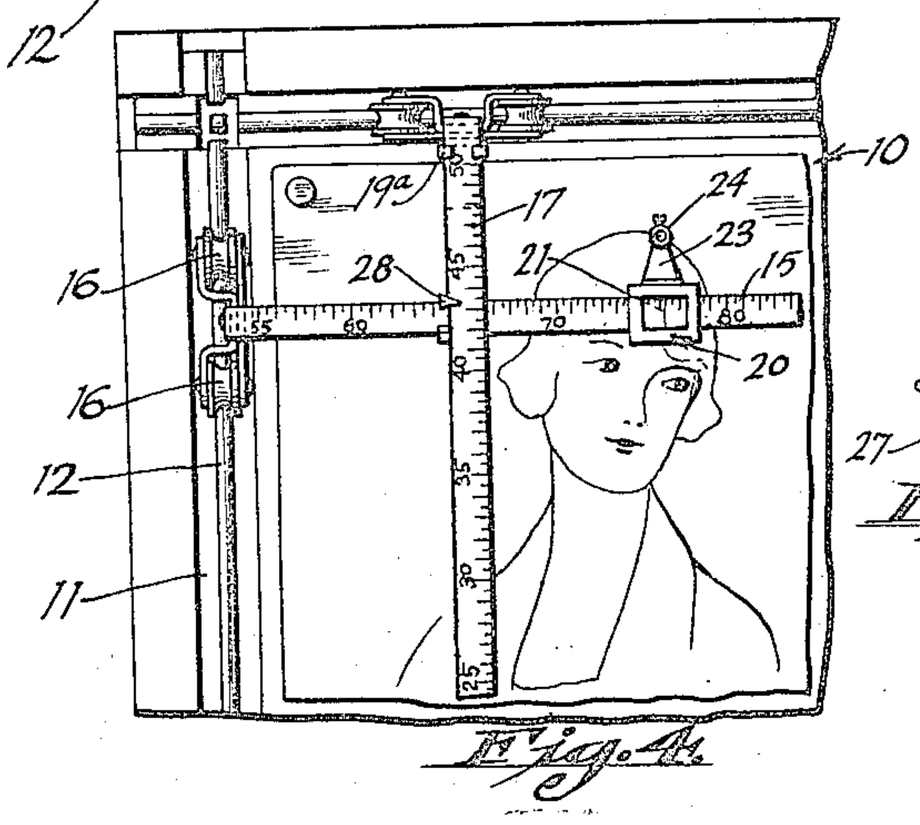


Fig. 4.

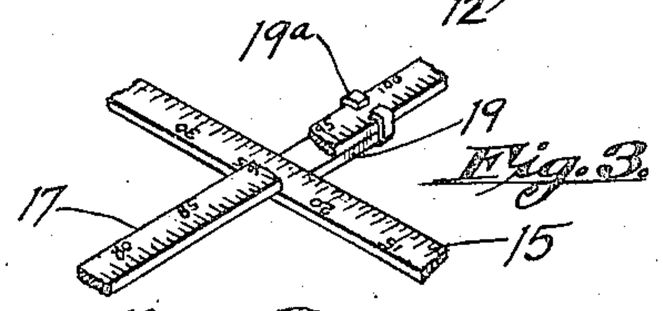


Fig. 3.

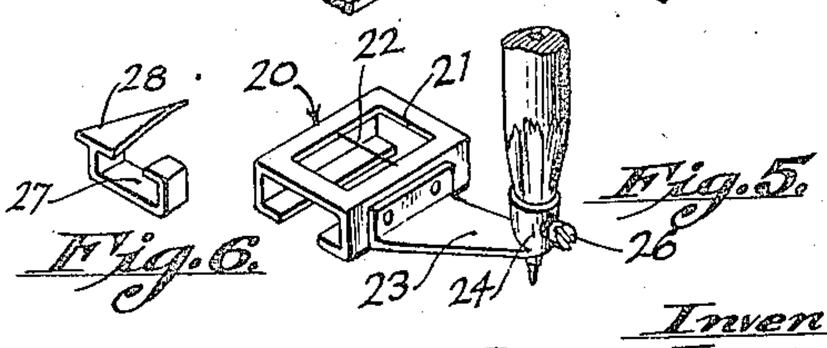


Fig. 6.

Fig. 5.

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UNITED STATES PATENT OFFICE.

RALPH W. TRUEBLOOD AND AVA M. ROCHLEN, OF LOS ANGELES, CALIFORNIA.

DEVICE FOR CODING AND DECODING TELEPHOTOGRAPHS.

Application filed August 3, 1921. Serial No. 489,652.

To all whom it may concern:

Be it known that we, RALPH W. TRUEBLOOD and AVA M. ROCHLEN, citizens of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Devices for Coding and Decoding Telephotographs, of which the following is a specification.

Our invention relates generally to the art of telegraphic transmission of pictures or telephotographs, and more particularly to a device for coding or decoding the transmitted pictures or telephotographs, the principal object of our invention being to provide a relatively simple and practical device that may be advantageously used for accurately and rapidly reducing a drawing, picture or photograph to a code, and which latter may be transmitted by telegraph or other electrical means to a distant point, and which code, after transmission, may by the use of a duplicate device, be quickly and accurately decoded, thereby enabling the picture or photograph to be accurately reproduced at the receiving point.

The device contemplated by our invention will be of particular value to newspapers, for by the use of such device, newspapers and like publications will be able to receive and publish pictures of important news events, occurring at a distance, within a very small fraction of the time now required for the bodily transmission of such pictures by mail or messenger.

The coding and decoding device depends for its operation upon the fact that the essential parts of all pictures are reducible to certain definite lines, and in turn these lines may be accurately represented by a series of dots so placed that when they are connected the lines of the picture or photograph are accurately reproduced. If, therefore, the relative positions of all of the dots thus representing the lines of the picture at the sending point are transmitted to a distant point, the line picture represented by these dots may be very accurately reproduced.

Briefly stated, our improved device includes two rulers or straight edges, each bearing a graduated scale and arranged at right angles to each other upon a flat surface, such as a drawing board. The rulers or straight edges are supported adjacent to their ends upon antifriction bearings so that they may be readily moved bodily across the surface of the drawing board or like support, and said rulers or straight edges being provided with markers or pointers that are constructed and arranged so as to facilitate the location of the points on the lines of a picture or the like, and also for the purpose of reading the graduations on the scales.

With the foregoing and other objects in view, our invention consists in certain novel features of construction and arrangement of parts that will be hereinafter more fully described and claimed and illustrated in the accompanying drawings, in which:

Figure 1 is a top plan view of a telephotograph coding and decoding device of our improved construction.

Fig. 2 is a cross section taken on the line 2—2 of Fig. 1.

Fig. 3 is a perspective view of portions of the rulers or straight edges of the device, and showing a sliding block that is carried by the upper one of said rulers or straight edges.

Fig. 4 is a plan view of a portion of the device, and showing a modified arrangement for obtaining greater accuracy of the points on the lines of a picture or telephotograph.

Fig. 5 is a perspective view of a sliding member that is mounted on one of the straight edges in the modified form of the device, and which serves as a support for the point or pencil that is utilized in coding and decoding a telephotograph or picture.

Fig. 6 is a perspective view of a pointer that is utilized on one of the rulers or straight edges in the modified form of the device.

Referring by numerals to the accompanying drawings which illustrate a practical embodiment of our invention, 10 designates the base of the device that may be in the form of a drawing board of wood or analogous material and having a flat smooth top surface. Formed on the top of this base adjacent to its side edges are parallel grooves 11, in the bottoms of which are arranged suitable rails 12, and formed in the base 10 adjacent its upper and lower edges are grooves 13 in the bottom of which are arranged suitable rails 14. The grooves 11 and rails 12 are arranged at right angles relative to the grooves 13 and rails 14, and the space on the face of the base 10 between said grooves is adapted to be occupied by

the drawing or picture that is to be coded or decoded.

Arranged to move freely over the surface of the drawing board between the grooves 13 is a relatively thin narrow straight edge 15 that is preferably formed of metal and its ends being supported upon small grooved wheels or rollers 16, and which latter are arranged for operation on the rails 12. Obviously, other forms of rolling supports for the ends of the straight edge 15 may be provided, for instance, said supports may take the form of ball or roller bearing operating on suitable tracks or raceways.

Overlying the straight edge 15 and arranged to move freely between the grooves 11 is a straight edge 17, the ends of which are supported by suitable anti-friction rollers or bearings 18, and which latter are mounted for operation upon the rails 14. Thus the straight edges 15 and 17 disposed at right angles to each other, are arranged to move freely over the surface of the base 10 between the grooves 11 and 13, and which space is adapted to be occupied by the picture or photograph that is being coded or decoded. Both rulers or straight edges are provided on their upper surfaces with graduated scales, preferably of the metric system, or U. S. Standard, and the graduations of said scales are preferably provided with proper designating numerals in order to facilitate the coding and decoding operations.

Inasmuch as the straight edge 17 overlies the straight edge 15, there will be a space equal to the thickness of the straight edge 15 between said straight edge 17 and the surface of the board or picture that is positioned thereupon, and in order to fill this space immediately above the point of intersection of said straight edges, a block 19, preferably or metal, and which is equal in thickness to the thickness of straight edge 15, is arranged for sliding movement on the under side of straight edge 17, and said block being retained on the latter straight edge in any suitable manner, preferably by means of small upwardly projecting ears or fingers 19ª, the upper ends of which overlie the side edges of said straight edge 17 (see Fig. 3).

In the modified form of the device illustrated in Figs. 4, 5 and 6, a substantially box-shape member 20 is arranged to slide freely upon the ruler or straight edge 15, the top of said sliding member being provided with an opening 21, and extending transversely of said opening is a centrally arranged hair line element 22 that is utilized in connection with the graduations of the scale on straight edge 15. Projecting outwardly from one side of the sliding member 20 is an arm 23 of resilient material, the outer end of which carries a vertically disposed tubular support 24 that is adapted to receive the pointed end of a pencil or the like, and a set screw 26 that passes through the wall of the tubular member 24 provides means for locking the pointed element to said tubular member.

Arranged for sliding movement upon the horizontally disposed straight edge 15 and on the opposite side of straight edge 17 from the sliding member 20 is a relatively narrow band 27, the top of which is provided with a horizontally disposed laterally projecting pointer 28 that is adapted to overlie the straight edge 17 and co-operate with the graduations of the scale thereon.

The operation of the device is substantially as follows: The photograph or other picture to be transmitted, or a line tracing thereof, is pinned onto the board or base 10 in such a way that the essential parts of the picture fall within the range covered by the straight edges in their movements over the board or base. In the event that the matter being transmitted is in the nature of a photographic print, it is desirable, though not absolutely necessary, to have the principal lines strengthened with pen or pencil and to arrange at suitable distances apart along said lines, a series of dots or points. After the picture thus prepared has been pinned onto the board or base 10, one of the lines of the picture is selected for coding and the straight edges are manipulated until the point of intersection between the upper edge of member 15 and the right hand edge of member 17 is in direct vertical alinement with the first predetermined point on the selected line. Thus it will be seen that the first predetermined point on the picture will be represented by two numbers or graduated points on the scales on members 15 and 17, and this first pair of numbers is set down as the first numbers of the code and expressed, for example, as 7.7 —54.5. Substantially the same operations are repeated until all of the dots or predetermined points on the selected first line have been expressed in code numbers, and in thus ascertaining the code numbers of the points, it is necessary of course, to obtain said numbers from the graduated scales in the same relation that the first pair of numbers were obtained, that is the first number of each pair must be read from the vertical scale and the second number from the horizontal scale. The next line of the picture is taken and the dot or point-ascertaining operations are repeated until all of the principal lines of the picture have been coded. The entire series of numbers thus obtained is then transmitted to the point where the picture is to be reproduced, by telegraph or other means of rapid communication.

At the destination or receiving point an apparatus exactly similar to the one used in coding the picture is utilized by reverse op-

erations for decoding the transmitted numbers. A sheet of plain paper is pinned onto the board or table of the decoding device beneath the straight edges, and the first point or the point that is indicated by the first pair of numbers may be accurately located by proper manipulation of the vertical and horizontal rulers or straight edges. When these straight edges have been manipulated to bring the first two code numbers of the scales adjacent to the point of intersection between the upper edge of straight edge 15 and the right hand edge of straight edge 17, a dot is made with a pencil or other marking device upon the paper at the point of intersection of the edges just mentioned. The straight edges are now manipulated to ascertain the second point on the line of the picture and which second point is represented by the second pair of code numbers and thus, as the operations are repeated, a series of dots may be made upon the paper, and which dots represent the first line of the transmitted picture or photograph. The completion of this first line may be indicated in the transmitted code by some convenient word, such as "Stop." The entire series of dots are then connected by a smooth line, and which latter is necessarily an exact duplicate of the coded first line of the transmitted picture. These operations are repeated until all of the lines sent by code have been described on the sheet of paper positioned on the receiving apparatus.

Where it is desired to reproduce lights and shadows or relatively dark and light portions of the original photograph, the instructions therefor may be sent with the code covering the outlines of the picture. For instance a part of the code may read "area from 6.6—52.4 to 10.3—53.1 to 11.5—56.1 to 6.7—58 solid black."

Another area similarly designated by its marginal points may be described as a pure white, light or dark gray, or shaded into white or black, thus giving very accurate directions for shading or coloring the picture reproduced at the receiving station. A general description of the photograph or picture in ordinary English and preceding the code numbers, will be of valuable assistance to the decoder, particularly if the latter is totally unfamiliar with the picture that is to be received.

For very fine or close work, we have devised the hair line carrying slide 20 and the pointer carrying slide 27, and these parts will be found advantageous where the dots or points to be coded or decoded occur with great frequency in a given line. When the parts 20 and 27 are used upon the straight edges, the vertical member 17 is moved to a position toward the left away from the immediate vicinity where a line is being pointed, by the use of a pointer member or pencil inserted through the tubular member 24 of resilient arm 23, and as member 20 is shifted lengthwise upon straight edge 15, the readings on the graduated scale on said member may be obtained by noting the position of hair line member 22, and the point on graduated scale on the straight edge 17 is read from the pointer 28. The point making implement or the pencil that is positioned on tubular member 24 may be moved downward by the application of sufficient pressure to overcome the resistance of spring arm 23, and after the point has been made and the pressure upon the pointer or pencil relieved, the resiliency of spring arm 23 will immediately elevate the pointer or pencil so that the same will not mark or mar the paper when the device is moved to the next position on the line that is being coded or decoded.

Whichever method or apparatus is employed at the beginning of the sending operation must of course be continued throughout the transmission of the picture without change to the other method or apparatus. From the general description of the picture preceding the transmission of the code, the decoder may decide which method is preferable in any given case, or the person transmitting the code may indicate the method and apparatus utilized before starting the transmission of the code numbers. Obviously, the same method and apparatus must be used in decoding that was used in coding the transmitted picture.

A device of our improved construction is relatively simple, may be easily and cheaply produced and provides efficient means that may be advantageously used for the comparatively rapid coding and decoding of electrically transmitted pictures or telephotographs.

It will be understood that minor changes in size, form and construction of the various parts of our improved device for coding and decoding telephotographs may be made and substituted for those herein shown and described without departing from the spirit of our invention, the scope of which is set forth in the appended claims.

We claim as our invention:

1. In a device for coding and decoding telephotographs, a member having a supporting surface, a pair of members arranged substantially at right angles to each other and arranged to move freely over said supporting surface, each of said members bearing a graduated scale and means cooperating with said scale bearing members for rapidly and accurately reading the graduations thereupon.

2. In a device for coding and decoding telephotographs, the combination with a member having a supporting surface, of a pair of graduated scale bearing members

angularly arranged for independent movement over said supporting surface and means cooperating with said scale bearing members for effecting a rapid and accurate reading of the graduations thereupon.

3. In a device for coding and decoding telephotographs, the combination with a member having a supporting surface, of a pair of graduated scale bearing members angularly arranged for independent movement over said supporting surface, and pointers adjustably arranged on said members for accurately reading the graduations of the scale thereupon.

4. In a device for coding and decoding telephotographs, the combination with a member having a supporting surface, of a pair of graduated scale-bearing members angularly arranged for independent movement over said supporting surface, pointers adjustably arranged on said members for accurately reading the graduations of the scale thereupon, and a resilient support for a pointed member carried by one of said pointers.

5. In a device for coding and decoding telephotographs, a member having a supporting surface, guiding means thereupon, angularly disposed straight edge members supported by said guiding means and arranged to move freely over said supporting surface, each of which straight edge members bears a graduated scale and means cooperating with said straight edge members for effecting a rapid and accurate reading of the graduations thereupon.

6. In a device for coding and decoding telephotographs, a member having a supporting surface, a pair of graduated scale bearing members arranged for independent movement over said supporting surface, said members being angularly disposed with respect to each other and means carried by one of said graduated scale bearing members for effecting a rapid and accurate reading of the graduations of the scale thereupon.

7. In a device for coding and decoding telephotographs, a member having a supporting surface, a pair of graduated scale bearing members arranged for independent movement over said supporting surface, said members being angularly disposed with respect to each other and means mounted for movement upon one of said scale bearing members and adapted to cooperate with the other scale bearing member for effecting a rapid and accurate reading of the graduations of said scales.

8. In a device for coding and decoding telephotographs, a member having a supporting surface, a pair of graduated scale bearing members arranged for independent movement over said supporting surfaces, said members being angularly disposed with respect to each other and a member arranged for movement upon one of said scale bearing members, which member includes a support for a pointer and means for effecting an accurate reading of the graduations of the scale upon which said member is mounted.

9. In a device for coding and decoding telephotographs, the combination with a member having a supporting surface, of a pair of graduated scale bearing members arranged for independently moving over said supporting surface, said members being angularly disposed with respect to each other a member arranged for sliding movement upon one of said scale bearing members, which member includes a support for a pointer, and a designating element for reading the graduations of the scale on the member upon which said sliding member is mounted, and a pointer mounted for sliding movement upon one of said scale bearing members and cooperating with the other scale bearing member for effecting an accurate reading of the graduations of the scales on both of said scale bearing members.

In testimony whereof we have signed our names to this specification.

RALPH W. TRUEBLOOD.
AVA M. ROCHLEN.