No. 776,713. PATENTED DEC. 6, 1904.

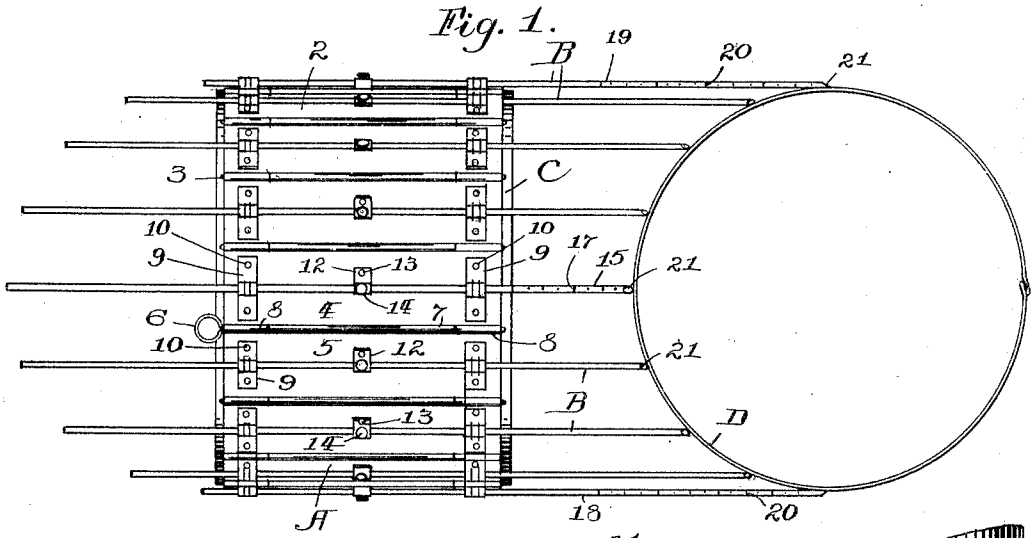
M. A. WURTS.

DRAFTING INSTRUMENT.

APPLICATION FILED MAR. 30, 1903.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.



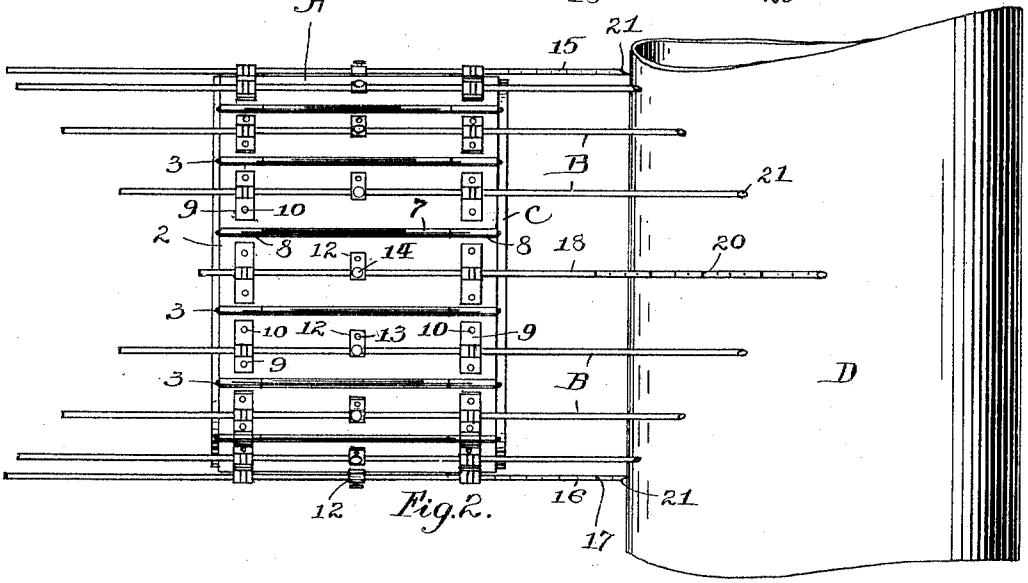


Fig. 2.

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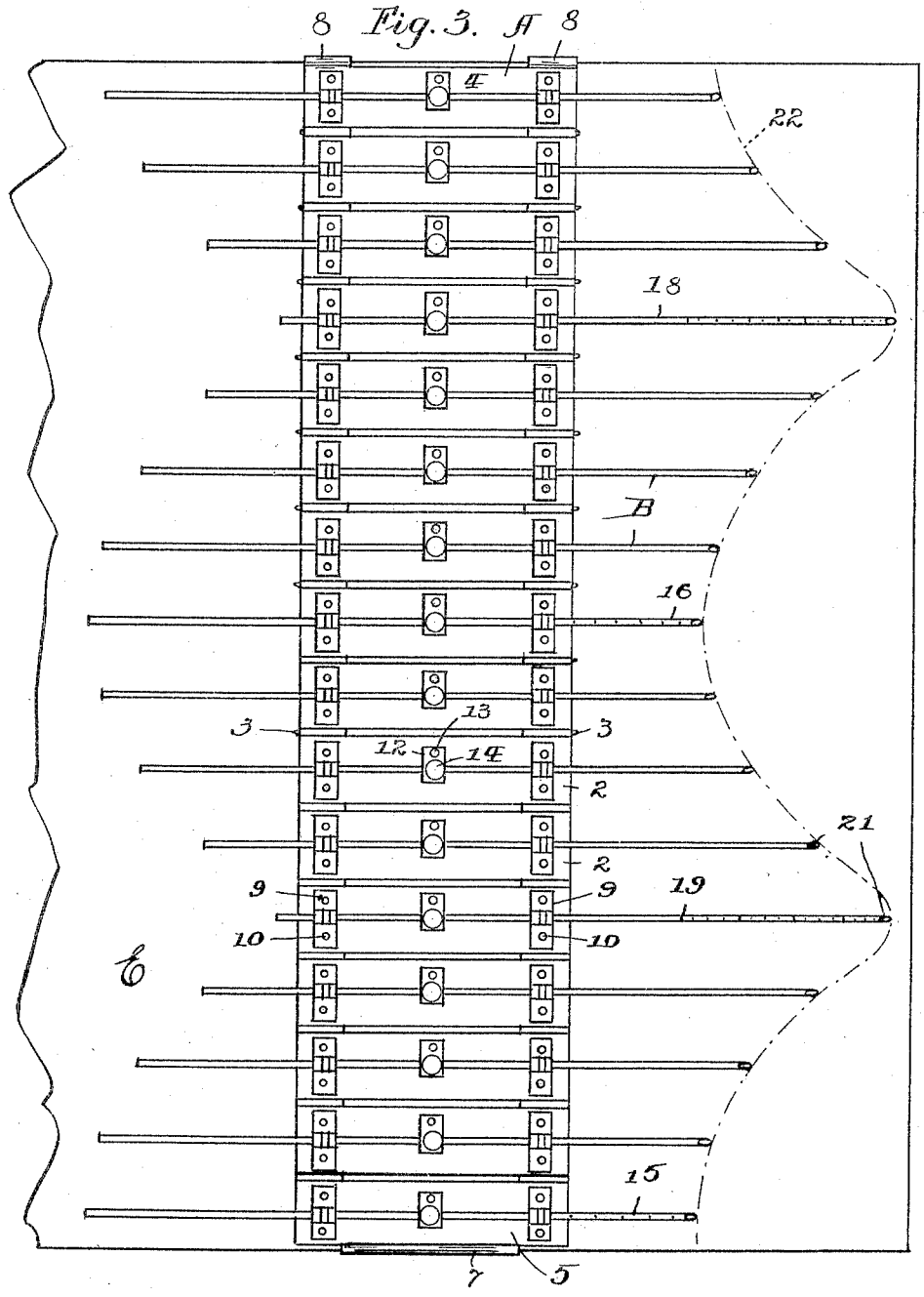
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NO MODEL. 3 SHEETS—SHEET 2.

Fig. 3.



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APPLICATION FILED MAR. 30, 1903.

NO MODEL. 3 SHEETS—SHEET 3.

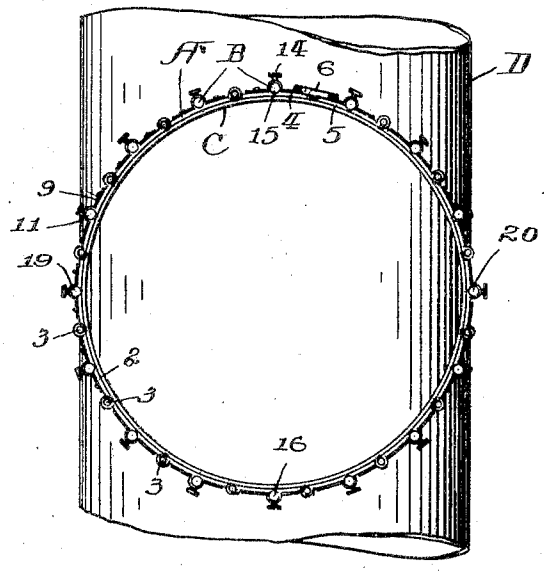


Fig. 4.

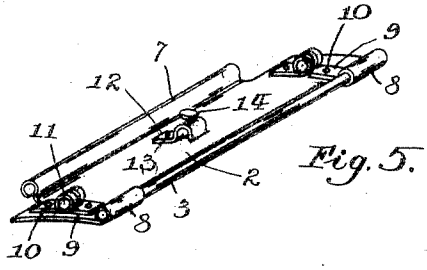


Fig. 5.

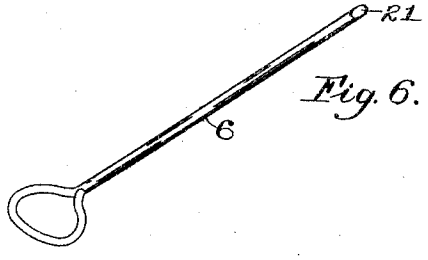


Fig. 6.

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No. 776,713. Patented December 6, 1904.

UNITED STATES PATENT OFFICE.

MAURICE A. WURTS, OF ST. PAUL, MINNESOTA.

DRAFTING INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 776,713, dated December 6, 1904.

Application filed March 30, 1903. Serial No. 150,163. (No model.)

To all whom it may concern:

Be it known that I, MAURICE A. WURTS, a citizen of the United States of America, and a resident of St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Drafting Instruments, of which the following is a specification.

My invention relates to improvements in drafting instruments, its object being to transscribe lines of intersection of cylindrical, conical, and other shaped bodies. This instrument is particularly adapted for use by sheet-metal workers, and is simple and inexpensive in construction, enables the skilled workman to work more quickly and the unskilled to work with greater accuracy and precision.

To the above ends my invention consists, generically, of a flexible band adapted to be opened and a series of adjustable ordinal-rods mounted thereon.

In the the accompanying drawings, forming part of this specification, Figure 1 is a plan view of my invention, showing the ordinal-rods adjusted for use when it is desired to join two pipes. Fig. 2 is a side elevation of Fig. 1. Fig. 3 is a view of my improved drafting instrument, showing the same opened upon a sheet of material for describing the line of a joint. Fig. 4 is an end view of Fig. 1. Fig. 5 is a perspective view of one of the links of the band, and Fig. 6 is a perspective view of the connecting-pin.

In the drawings, let A represent the flexible band; B, the ordinal-rods; C, the form for holding the band distended, and D the pipe to which, for convenience in describing my invention, I have shown the ordinal-rods adjusted for describing the line of intersection of another pipe.

The band A consists of a series of links 2, which are pivoted together by means of the rods 3. The ends 4 and 5 of this band are fastened by means of a pin 6, which passes through the loops 7 and 8 on the connecting ends 4 and 5 of said band. The form C or sleeve corresponds in shape and size to the pipe or body which it is desired to join with the pipe D, and when used is held at the same angle to the pipe D as the pipe to be connected is to assume. The band is then fastened around the form, as shown in Fig. 1, by inserting the pin 6 through the loops 7 and 8. The ordinal-rods B are parallel, and, as shown, are circular in cross-section, though it is obvious that they may be of any suitable shape and made of any suitable material. Clips 9 are riveted at 10 to each segment. These clips are perforated at 11 for holding the ordinal-rods on the periphery of the band. A spring-clip 12 is fastened to each segment by means of the rivet 13. The spring-clips are provided with set-screws 14, which are adapted to impinge against the ordinal-rods and hold them in adjusted position. The ordinal-rods may be marked with scales which indicate degrees and inches for adjusting the device at the relative pitch between the two bodies it is desired to connect. Each ordinal-rod is pointed at 21, as shown in Fig. 6, so as to obtain more accurate adjustment of the parts. As shown, the rods 15 and 16 are marked at 17 with degrees and the rods 18 and and 19 at 20 with inches.

I have shown my improved drafting instrument in position for joining two pipes of equal size and at an angle of ninety degrees. The ordinal-rods 15 and 16 are adjusted with their points 21 at ninety degrees to the sides of the pipe D, and the rods 18 and 19 are projected equal distances to meet the surface of said pipe. (See Fig. 1.) The intermediate ordinal-rods are adjusted so that their points touch the surface of the pipe. If the branch pipe is inclined down or up from the main pipe D, the ordinals-rods 15 and 16 are adjusted so that one rod remains at zero on its scale, while the other is fixed at the degree-mark corresponding with the angle of the branch pipe. For example, if the branch pipe inclines down from the main pipe at an angle of forty-five degrees then the rod 15 is projected and set at "45°" on its scale, while the rod 16 is set at "0." The intermediate rods between the degree-rods are then set so that all of their points touch the surface of the pipe D. After the rods have been adjusted, as shown in Figs. 1 and 2, the pin 6 is withdrawn from the segments and the band opened, as shown in Fig. 3, on the sheet of metal E, which it is desired to

form as a branch of pipe D. The material is cut on the broken line (indicated at 22) which intersects the pointed end of each ordinal-rod. It is then cut on said line and formed into a pipe, as in ordinary construction, and joined with the pipe D. A close-fitting joint between the pipes is the result.

When the drafting instrument is adjusted to the pipe D, the points where the ordinal-rods touch its surface are marked and the pipe is cut with a corresponding opening. Said opening conforms with the opening in the pipe which it is desired to connect with the pipe D.

Different-sized bands are used for different-sized pipes and openings. One or more segments may be removed by withdrawing the connecting-pins 3 to decrease the size or additional segments added to increase the size of the band.

It is obvious that the flexible band of hinged links and their connections, as described, may be varied in construction or adapted for use on different-shaped intersecting bodies and that the means by which the rods are fastened to said band may be changed without departing from the principles which I have applied, and I do not wish to confine myself to the specific construction specified.

This device may be used for connecting cylinders, cones, and other forms of solid or hollow bodies at any desired angle.

Having described my invention, what I claim as new, and desire to protect by Letters Patent, is—

1. In combination, with a form, an endless band, a plurality of ordinal-rods, a scale by which the position of the ordinal-rods is indicated, a separable connection with said band, and means for holding said rods in parallel position on said band, consisting of a pair of clips perforated for holding each rod on the periphery of said band, a spring attachment between each pair of clips, and a set-screw in said attachment adapted to impinge against the ordinal-rod passing through said pair of clips, so as to hold it in adjusted position.

2. A device of the class set forth, consisting of a flexible band, a form for holding said band distended, a plurality of ordinal-rods, and a separable joint in said band; said band consisting of a plurality of links, each link having a pair of clips and a spring attachment for permitting the ordinal-rod to slide on said link and holding it in adjusted position.

3. A device of the class set forth, consisting of a band A, formed by a series of links 2, a pivot-rod 3, between each pair of links, a removable pin for permitting said band to be opened, a sleeve C for holding said band distended, clips 9 on the surface of each link, perforations in said clips, an ordinal-rod passing through each set of perforations, a spring 12 between each pair of clips, and a set-screw passing through said spring and impinging against the ordinal-rod for holding the same in adjusted position.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MAURICE A. WURTS.

Witnesses:
E. M. BOESEL,
F. G. BRADBURY.