

No. 658,795.

Patented Oct. 2, 1900.

J. B. MEDICI.

SYSTEM FOR FORMATION OF PERMANENT CHANNELS IN NAVIGABLE RIVERS.

(Application filed July 6, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1-

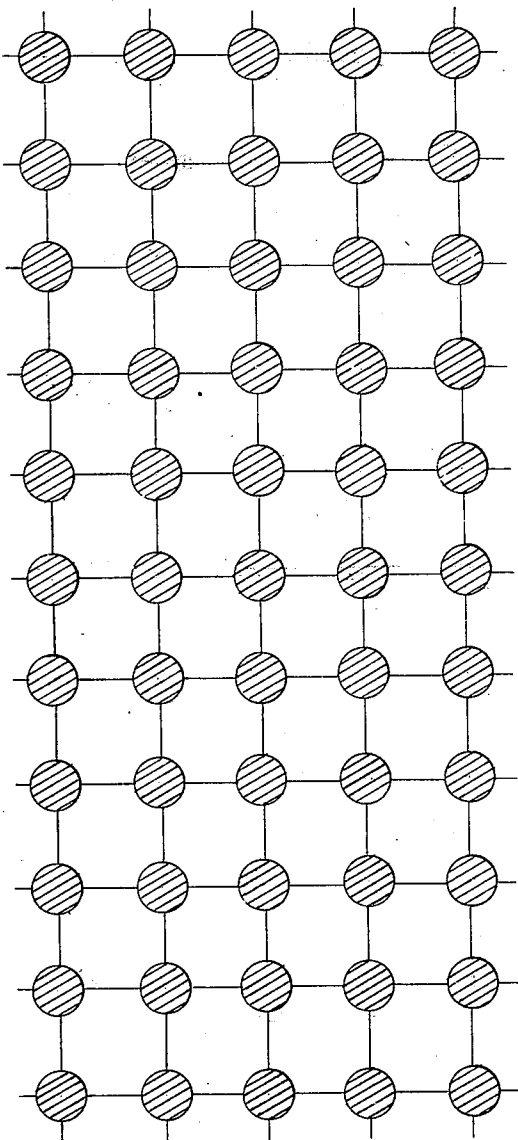
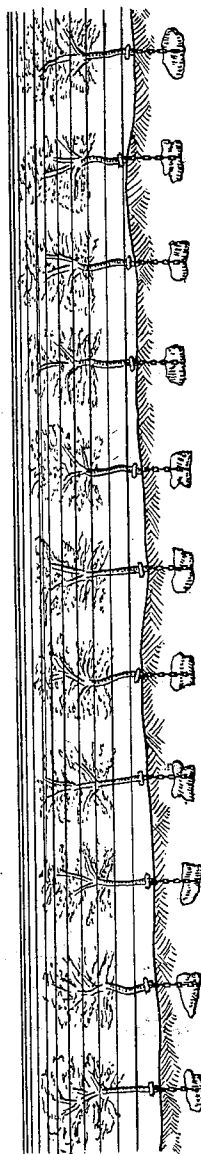


Fig. 2-



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Fig. 4-

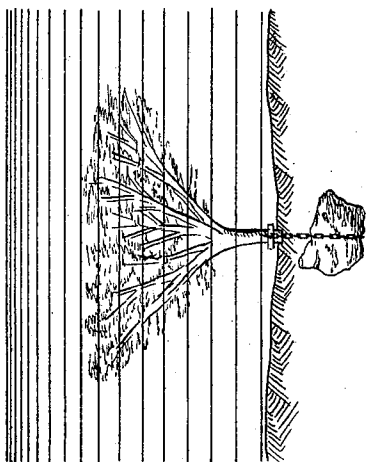


Fig. 3-

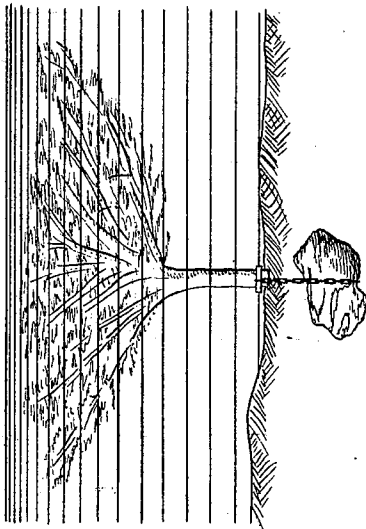
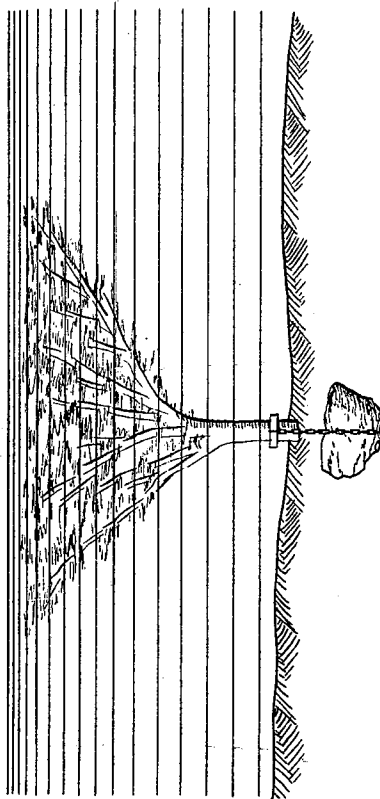


Fig. 5-



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JUAN BAUTISTA MEDICI, OF BUENOS AYRES, ARGENTINA.

SYSTEM FOR FORMATION OF PERMANENT CHANNELS IN NAVIGABLE RIVERS.

SPECIFICATION forming part of Letters Patent No. 658,795, dated October 2, 1900.

Application filed July 6, 1900. Serial No. 22,728. (No model.)

To all whom it may concern:

Be it known that I, JUAN BAUTISTA MEDICI, a subject of the King of Italy, residing at No. 1369 Calle Rivadavia, in the city of Buenos Ayres, Argentina, have invented certain new and useful Improvements in Systems for the Formation, Deepening, and the Maintenance of Permanent Channels in Navigable Rivers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to a new system for the formation of permanent channels in navigable rivers, the maintenance of the depth of the same, and the control of their direction, all of which by means of my invention is accomplished without the necessity of dredging by directing and applying the force of the current itself, thus causing the demolition of the sand-banks and other alluvial deposits, as will be hereinafter described with reference to the accompanying drawings.

In the said drawings, Figure 1 represents a plan of the works embodying my system. Fig. 2 is a vertical section of the stream or rather a submarine view of a row of anchored trees employed in said system. Figs. 3, 4, and 5 are details showing the manner of anchoring and placing the trees of the several categories, as hereinafter explained.

The nature of the system devised by me for obtaining the proposed result makes it appropriate that before entering into the details of my system I should briefly outline the technical considerations on which it is based.

A serious difficulty which in many parts of the world constitutes a veritable bar to navigation and to commerce consists in the tendency observed in many rivers to form bars of sand and other alluvial material, not only at their mouths but also at the point of confluence with other rivers, the cause in both cases being the contrary action and partial equilibrium of two opposing currents—as, for example, that of the river against that of the tide in the one case and those of the two confluent streams in the other. Up to the present time the most efficacious means which have been employed for the purpose of counteracting to some degree the formation of

such bars consists in the use of powerful dredges, a system entailing a vast amount of labor and expense and involving the almost constant use of such machines, together with their necessary complement of tow-boats, flat-boats, &c. Yet in spite of all this the results obtained are far from satisfactory.

A long and detailed study of river-currents involving several years of practical experience has led me to believe that the dredging system is not the most efficacious for opening channels in rivers nor for demolishing banks. I have therefore sought to devise a system which by availing itself of the force of the current itself should provide a permanent remedy for the evil, a system involving the least possible amount of original outlay, together with a minimum of subsequent work and attention to keep the same in effective operation.

The system of jetties or artificial islets formed of brush and earth employed, for example, in the delta of the Mississippi has fallen short of the desired results, owing to the rigid nature of the resistance thus offered to the tremendous force of wave and current, before which force such rigid bodies must eventually give way. I have therefore sought to overcome the defects of such systems in the manner which I will now proceed to describe.

For the purpose of guiding or turning currents in order to form artificial banks, deepen the channels already existing, form new channels, or to cut away the banks which have been formed by alluvial deposits I make use of the following means: By means of trees, preferably willows or similar species, anchored in appropriate points, the currents are turned and directed toward other points or in other directions. These trees are placed at a certain distance one from another, being made fast by a chain at the base of the trunk to a stone of three hundred to four hundred kilos weight, which serves as an anchor to prevent the tree from being carried away by the force of the waves or current, so that the tree remains flexibly in an upright position, like a spar-buoy. The trees are of two categories, the first comprising trees of from five to seven meters in length, with a spread of branches of from eight to nine meters. The trees of this category will be placed at the height of the ordinary water-level of the river—that is, the

the tops of the trees will not protrude above ordinary water-level. The second category will comprise trees of from two to three meters in length, with a diameter of branch spread 5 of from four to five meters, being placed at from two to two and one-half meters below the mean water-level. The trees are placed at a distance of twenty meters apart from center to center of the trunks, so that the 10 branches will approach much nearer to each other, according to their respective diameters. The accompanying plans show the manner of placing the trees in rows like an orchard, as well as the details of the man- 15 ner of mooring them. When it is desired to produce a current to deepen a channel, the trees will be placed parallel to said channel. The anchorage of trees may embrace a width of from fifty to one thousand meters 20 and a length of from one thousand to forty thousand meters, according to the exigencies of the case in hand. When it is desired to change the direction of the current or of the channel of a river with the object of forming 25 new channels, or if it is desired to cause the river to return to a former channel, the trees will be placed in the site of the channels which are to be abandoned in order to produce a current toward a given point. The 30 trees being placed so as to form a sort of submarine forest of the width and length required, the waters flowing among them will diminish the velocity of their current, flowing sluggishly on account of the flexible ob- 35 stacles thus encountered, so that they will have a tendency to deposit the matter which they carry in suspension, thus forming islets or banks, which is the object sought after, while the waters which flow in those parts 40 where these obstacles are not encountered will for the same reason find their velocity augmented, so that they will carry away the banks which have been formed at such points, thus forming the new channel or reopening 45 the primitive channel, as the case might be.

As will be seen from the above description, the system of my invention is exceedingly

simple and inexpensive, as in nearly all cases the necessary material may be found growing in profusion on the banks of the very river 50 in which it is desired to operate. The flexibility of the anchored trees, which permits them to yield in part to the influence of the current or waves, constitutes a great advantage, overcoming the defects of the system of 55 jetties employed in the Mississippi, as no rigid bodies are opposed to the action of the currents or of the waves. The channel thus formed will have a permanent depth, because this important advantage will be obtained by 60 the action of the current itself, which is formed by means of the trees placed on each side of the same, as has already been explained. This result cannot be obtained by 65 any known system of dredging, all of which require a constant outlay of labor, and consequently of immense sums of money. The reason is obvious. There is no force apart from that of the dredges themselves to aid in maintaining the channels open, as is the case 70 in the system which I have devised. This affirmation, which may be called the "technical reason" on which my invention is based, is demonstrated by the comparative study of the hydrographic charts which from time to 75 time are made of channels where such dredging is made use of.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is— 80

The herein-described means for the formation and alteration of channels in navigable streams consisting of trees placed in upright position therein, said trees being placed in 85 two series, the tops of one series extending to the water-level and the other series terminating a distance below the water-level.

In witness whereof I have hereunto affixed my signature in presence of two witnesses.

JUAN BAUTISTA MEDICI.

Witnesses:

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