

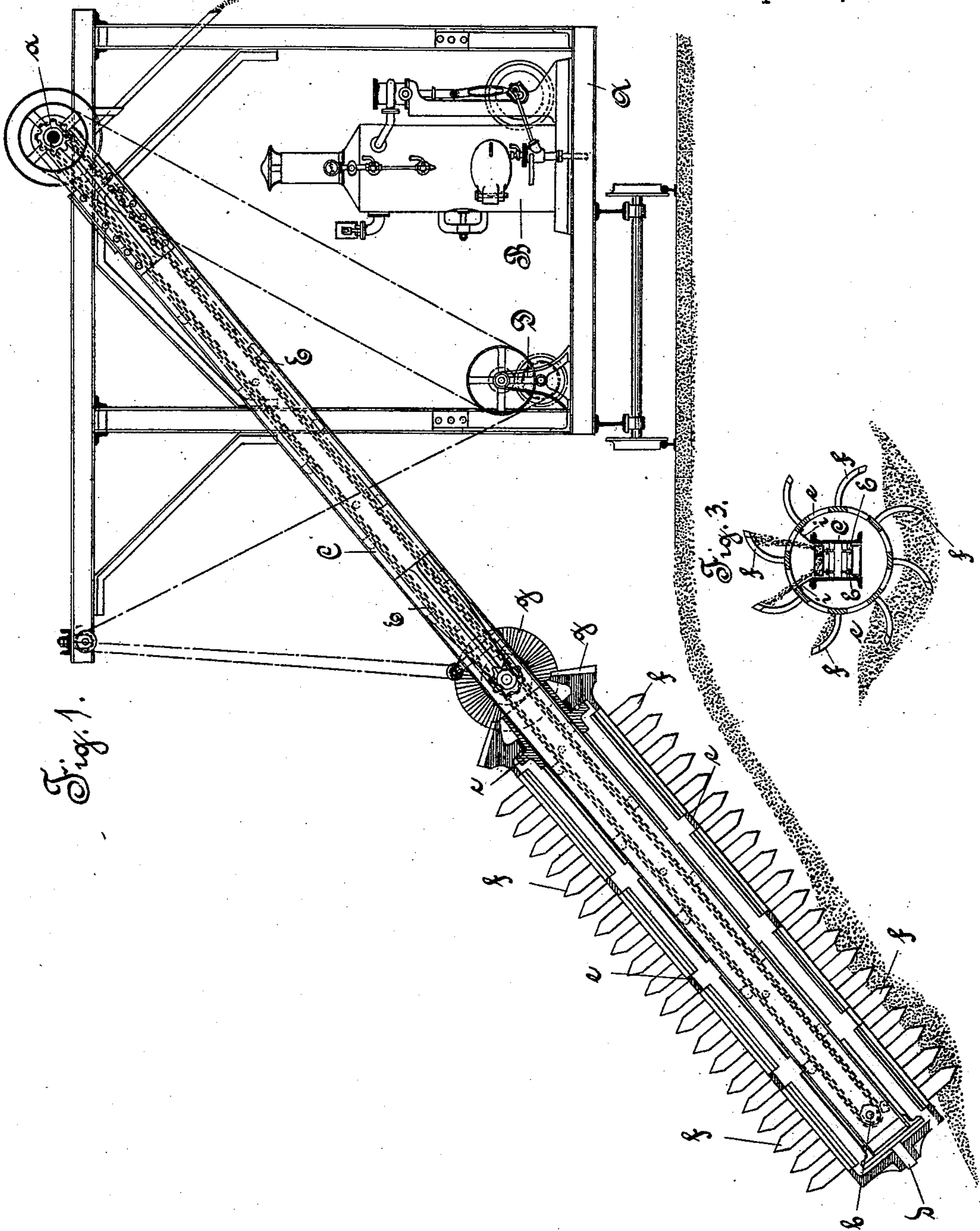
(No Model.)

2 Sheets—Sheet 1.

J. E. A. BRAUN.  
EXCAVATING AND DREDGING MACHINE.

No. 517,726.

Patented Apr. 3, 1894.



Witnesses:

*Oth. Hoff*  
*Hugh Ammerly*

Inventor:

*Julius E. A. Braun,*  
by his attorney *Wm. S. Boulter*

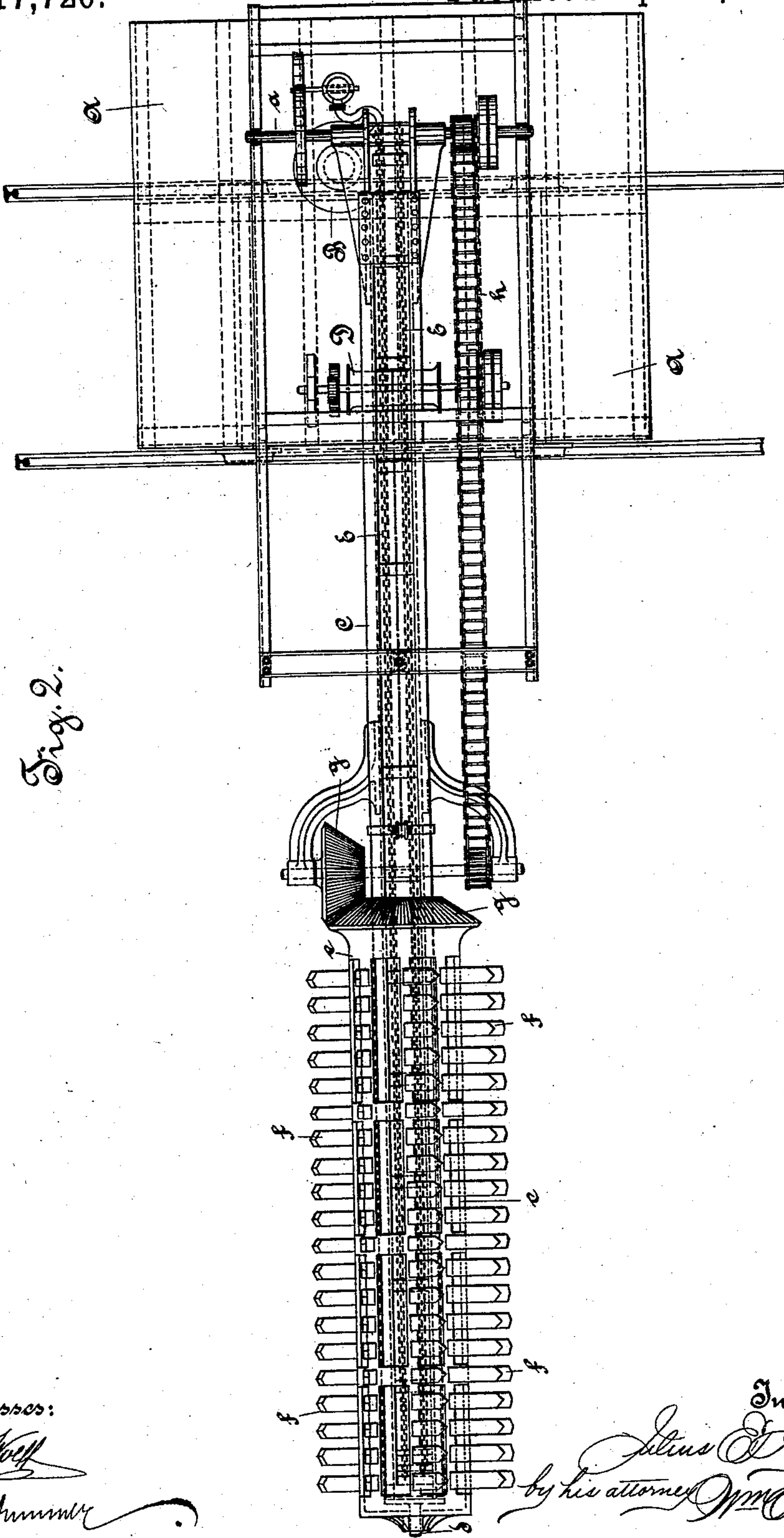
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*Oth. Wolf*

*August Brummer*

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# UNITED STATES PATENT OFFICE.

JULIUS EMIL ARTHUR BRAUN, OF DAUTZSCHEN, NEAR TORGAU, GERMANY.

## EXCAVATING OR DREDGING MACHINE.

SPECIFICATION forming part of Letters Patent No. 517,726, dated April 3, 1894.

Application filed June 11, 1892. Serial No. 436,356. (No model.) Patented in Germany March 27, 1892, No. 66,619; in England April 22, 1892, No. 7,652, and in Austria-Hungary September 29, 1892, No. 18,593 and No. 42,056.

*To all whom it may concern:*

Be it known that I, JULIUS EMIL ARTHUR BRAUN, a subject of the King of Prussia, residing at Dautzschen, near Torgau, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Excavating or Dredging Machines, (for which Letters Patent have been obtained in Great Britain, No. 7,652, dated April 22, 1892; in Germany, No. 66,619, dated March 27, 1892, and in Austria-Hungary, No. 18,593 and No. 42,056, dated September 29, 1892,) of which the following is a specification.

This improved excavator or dredger differs from machines of the same class hitherto known in the peculiar arrangement and method of operation of its operative mechanism proper which consists of a number of knife-edges acting much in the same manner as the cutters of ordinary wood-cutting or shaping machine tools. These knife-edges are arranged constantly to revolve about a longitudinal shaft having its bearings in the elevator apparatus, and in so doing they cut, or dig up the earth or mud, raise it, and convey it into suitable carrying apparatus, (a bucket-chain, conveyer-screw, &c.) This constitutes an essential difference from the old machines of this class, which operate intermittently with the exception of those in which bucket-chains are employed. These, however, as hitherto constructed, have not been found applicable to a somewhat hard ground for which the present machine is suitable, while the advantages arising from a continuous operation, as compared with the usual intermittent action, are obvious and need not further be dwelt upon.

In the accompanying drawings Figure 1 is a sectional side elevation of the machine. Fig. 2 is a plan, and Fig. 3 a cross-section of the same.

A is the frame, B is the motor-engine and C the elevator turning about the shaft *a* and capable of being raised or lowered as required by means of a winch D.

In the form of apparatus here shown the elevator is constructed of two U-shaped iron cheeks with high edges (Fig. 3). Between these cheeks a bucket-chain E is arranged to run upon the driving-shaft *a* and another

shaft *b*. Upon the elevator is placed the bearing *c* Fig. 1, while at its lower end there is a plate with journals or pins *d*. These two latter parts serve for supporting the cylindrical body *e* carrying the digging or cutting blades. *e* is an openwork, hollow cylinder consisting as shown of a number of bars forming a cylindrical grate or cage, each bar being provided with excavating blades *f f* arranged in a row. The perforations of the cylinder wall, or the spaces between the bars in the present arrangement, serve for allowing the earth or mud raised by the knife-edges or blades to drop through the cylinder into the intermediate space between the angle-irons, or in other words upon the bucket-chain. The body *e* is revolved by means of the bevel gearing *g g* and the pitch-chain *h* from the main shaft *a* and the transmission of motion is so regulated that the bucket-chain moves at a comparatively rapid rate, in relation to the speed of motion of the excavating blades. The object of this is to accelerate the removal of the lumps of earth or the like cut or dug up by the said knives, to avoid the accumulation of a too heavy load upon the elevator, so that a comparatively small and light bucket-chain may be sufficient to perform the work, and a proper proportion is at all times maintained between the quantity of material raised by the blades and that which is carried away.

In Fig. 3 are shown inclined sheets of metal *i i* situated upon the upper edge of the angle-irons in such a position as to form a hopper which facilitates the conveyance of the material to the buckets.

The arrangement here described may vary in the details of construction, arrangement, size and shape to suit requirements without departure from the principle of the invention. Thus, as before suggested, a conveyer-screw or any other similar device may be employed instead of the bucket-chain. Again no limit is placed on the number, shape or size of the excavating tools.

I claim—

1. In an excavating apparatus, the combination with a suitable supporting frame, of a driving shaft rotatably mounted therein, an inclined elevator frame loosely mounted at one end upon the driving shaft and adapted



to be raised and lowered thereupon, as described, the upper side of said elevator frame being open to permit the excavated material to be discharged therethrough, a rotatable shaft  
 5 carried by the elevator frame at its opposite end, an endless bucket chain arranged within the said elevator frame and mounted upon the said rotatable shaft and the driving shaft and adapted to receive the excavated material, a  
 10 cylinder mounted over and rotatably supported by the elevator frame, said cylinder being provided with a series of openings, and a series of cutting blades carried by the cylinder, as and for the purpose specified.

15 2. In an excavating apparatus, the combination with a suitable supporting frame, of a driving shaft rotatably mounted therein, an inclined elevator frame loosely mounted at one end upon the driving shaft and adapted  
 20 to be raised and lowered thereupon as described, the upper side of said elevator frame being open to permit the excavated material to be discharged therethrough, a rotatable shaft carried by the elevator frame at its op-  
 25 posite end, an endless bucket chain arranged within the said elevator frame and mounted upon the said rotatable shaft and the driving shaft and adapted to receive the excavated material, a cylinder mounted over and rotat-  
 30 ably supported by the elevator frame, said cylinder being provided with a series of circumferentially arranged cutting blades and with a series of openings, said blades being curved and adapted when rotated to raise the  
 35 excavated material and discharge the same through the openings of the cylinder onto the bucket chain, as and for the purpose specified.

3. In an excavating apparatus, the combination with a suitable supporting frame, of a  
 40 driving shaft rotatably mounted therein, an inclined elevator frame loosely mounted at

one end upon the driving shaft and adapted to be raised and lowered thereupon as described, the upper side of said elevator frame being open to permit the excavated material  
 45 to be discharged therethrough, a rotatable shaft carried by the elevator frame at its opposite end, an endless bucket chain arranged within the said elevator frame and mounted upon the said rotatable shaft and the driving  
 50 shaft and adapted to receive the excavated material, a cylinder mounted over and rotatably supported by the elevator frame, said cylinder being provided with a series of open-  
 55 ings, a series of cutting blades carried by said cylinder, and gearing between the driving shaft and the cylinder for rotating the latter at a slower speed in relation to that at which the bucket chain is moved, for the purpose  
 60 specified.

4. In an excavating apparatus, the combination with a suitable supporting frame, of a traveling bucket chain adapted to raise the excavated material, a revolving drum or cage  
 65 surrounding said bucket chain and provided with a number of openings, a series of cutting blades carried by said drum and adapted to excavate and raise the material and discharge it through the openings, and inclined plates  
 70 arranged beneath the said openings and adapted to form hoppers for facilitating the discharge of the material onto the traveling chain, as described.

In testimony whereof I have hereto set my hand in the presence of the two subscribing  
 75 witnesses.

JULIUS EMIL ARTHUR BRAUN.

Witnesses:

OTTO WOLFF,

HUGO DUMMER,

*Both of Dresden.*