Office de la Propriété Intellectuelle du Canada
Un organisme d'Industrie Canada

Canadian Intellectual Property Office
An agency of Industry Canada

CA 2314207 C 2005/12/06

(11)(21) 2 314 207

(12) BREVET CANADIEN
CANADIAN PATENT

(13) C

(22) Date de dépôt/Filing Date: 2000/07/21

(41) Mise à la disp. pub./Open to Public Insp.: 2001/01/23

(45) Date de délivrance/Issue Date: 2005/12/06

(30) Priorité/Priority: 1999/07/23 (A 1282/99) AT

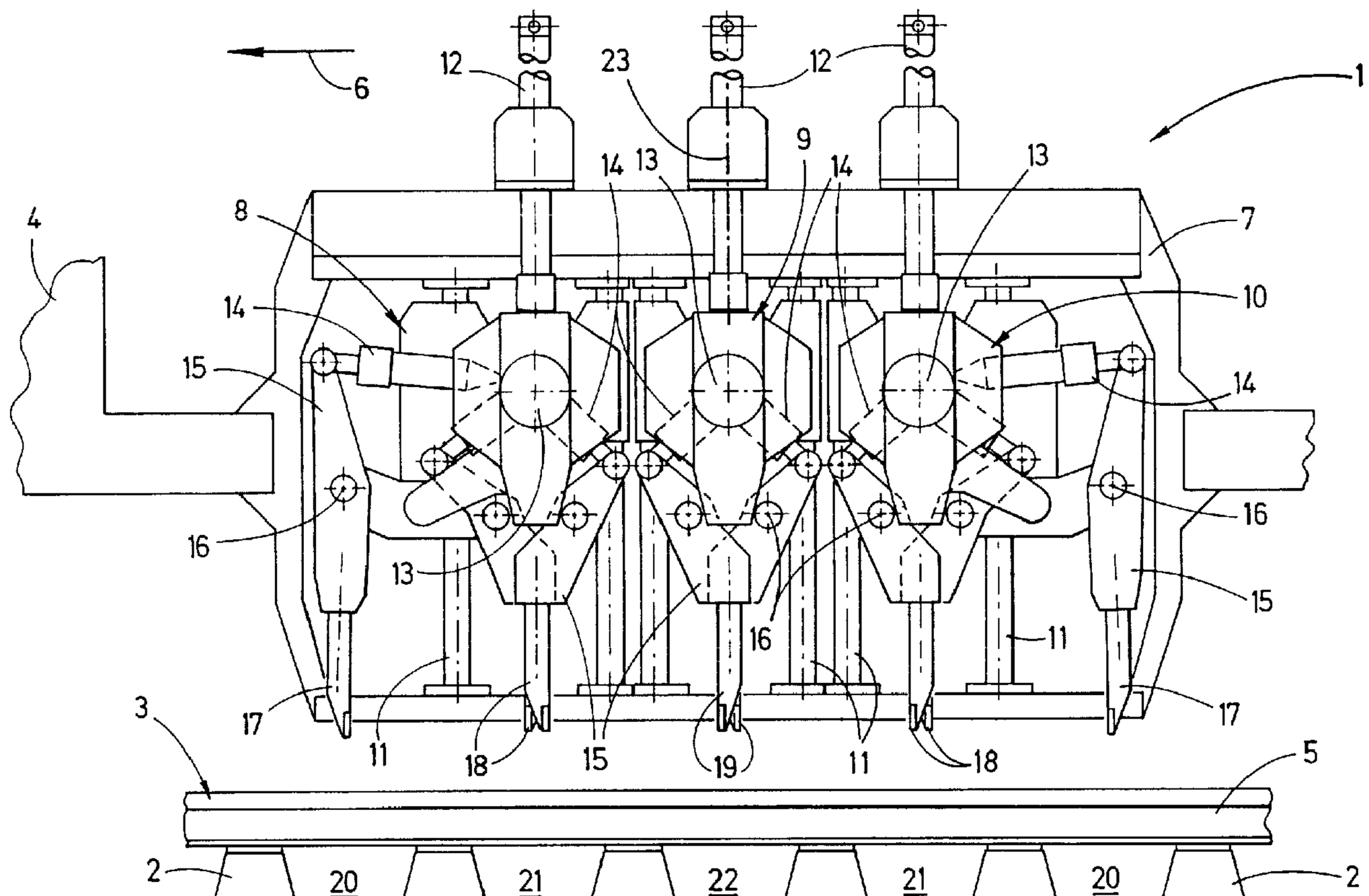
(51) Cl.Int.^{7}/Int.Cl.^{7} E01B 27/16

(72) Inventeurs/Inventors:
THEURER, JOSEF, AT;
PEITL, FRIEDRICH, AT

(73) Propriétaire/Owner:
FRANZ PLASSER BAHNBAUMASCHINEN-INDUSTRIEGESELLSCHAFT M.B.H., AT

(74) Agent: RICHES, MCKENZIE & HERBERT LLP

(54) Titre : DISPOSITIF DE BOURRAGE POUR LE BOURRAGE DE TRAVERSES DE CHEMIN DE FER
(54) Title: A TAMPING UNIT FOR TAMPING SLEEPERS OF A TRACK



(57) Abrégé/Abstract:
A tamping unit (1) for tamping sleepers (2) of a track (3) is equipped with tamping tines (17,18), arranged in pairs transversely of the track and mounted on two tamping tool carriers (8,10) arranged successively in a longitudinal direction and vertically adjustable independently of one another. Mounted on each tamping tool carrier (8,10) is an end pair of tamping tines (17), with respect to the

CA 2314207 C 2005/12/06

(11)(21) 2 314 207

(13) C

(57) Abrégé(suite)/Abstract(continued):
longitudinal direction, for immersion in an end sleeper crib (20) and two pairs of twin tamping tines (18) for immersion in a sleeper crib (21) adjacent to the end sleeper crib (20) and for tamping two adjacent sleepers (2). Arranged between the two tamping tool carriers (8,10) is a further, central tamping tool carrier (9), vertically adjustable independently, on which are positioned two pairs of twin tamping tines (19) provided for immersion in a central sleeper crib (22) and squeezable apart for tamping two adjacent sleepers (2) simultaneously.

ABSTRACT

A tamping unit (1) for tamping sleepers (2) of a track (3) is equipped with tamping tines (17,18), arranged in pairs transversely of the track and mounted on two tamping tool carriers (8,10) arranged successively in a longitudinal direction and vertically adjustable independently of one another. Mounted on each tamping tool carrier (8,10) is an end pair of tamping tines (17), with respect to the longitudinal direction, for immersion in an end sleeper crib (20) and two pairs of twin tamping tines (18) for immersion in a sleeper crib (21) adjacent to the end sleeper crib (20) and for tamping two adjacent sleepers (2). Arranged between the two tamping tool carriers (8,10) is a further, central tamping tool carrier (9), vertically adjustable independently, on which are positioned two pairs of twin tamping tines (19) provided for immersion in a central sleeper crib (22) and squeezable apart for tamping two adjacent sleepers (2) simultaneously.

A 99/01282

A Tamping Unit for Tamping Sleepers of a Track

The invention relates to a tamping unit for tamping sleepers of a track, comprising tamping tines tiltable about horizontal pivot axes extending parallel to one another and arranged in pairs with respect to the said pivot axes in the transverse direction of the track, which tamping tines are mounted on two tamping tool carriers, arranged successively with respect to a longitudinal direction extending perpendicularly to the pivot axes and vertically adjustable independently of one another by means of drives, and are respectively connected via squeeze drives to vibration drives, there being mounted on each tamping tool carrier an end pair of tamping tines, with respect to the said longitudinal direction, for immersion in an end sleeper crib and also two pairs of twin tamping tines, spaced apart from one another with their pivot axes with respect to the said longitudinal direction, provided for immersion in a sleeper crib adjacent to the end sleeper crib and for tamping two adjacent sleepers.

A tamping unit of this kind is already known from US 5,133,263. The two tamping tool carriers are fixed to a carrier frame connected to a mobile track machine and may be lowered individually or together into the ballast of the track. The simultaneous use of both tool carriers serves to treat an area of track comprising three mutually adjacent sleepers in one work sequence, an end tamping tine and a twin tamping tine arranged on the same tool carrier respectively tamping the first or the third sleeper of the group of three together. The two other twin tamping tines of the two tool carriers cooperate or are tilted towards one another in order to tamp the middle sleeper. It is also possible to operate just one of the two tool carriers as required (e.g. where the sleeper spacing is uneven or there are track obstacles) and thus to use the machine as a single sleeper tamping machine.

A tamping unit is also disclosed in DE-OS 24 26 841 comprising two tamping tool carriers each having three tamping tines which may either be lowered together to tamp three sleepers or may also be used singly.

JP 54-45011 describes an arrangement of three tamping tool carriers which are arranged successively in the longitudinal direction of the track and are adjustable in their mutual spacing. Each of the tamping tool carriers may be lowered individually and is equipped with tamping tines for tamping a single sleeper, enabling one, two or even three sleepers to be treated in each work sequence.

A tamping machine is known from US 4,094,250 which has two tamping tool carriers arranged successively in the longitudinal direction of the machine and vertically adjustable independently of one another. Mounted on each carrier are two pairs of twin tamping tines which are provided for immersion in two adjacent sleeper cribs and may be spread apart with the aid of squeeze drives. Lowering both tamping tool carriers together enables three mutually adjacent sleepers to be fully tamped and the two sleepers adjoining the group of three to be half-tamped in each case, i.e. from one side only, at the same time.

AT 303 793, finally, shows the tamping of four adjacent sleepers of a track, but without explaining the tamping unit in detail in any way.

The object of the present invention is to create a tamping unit of the aforementioned type with increased performance and a wider range of applications.

This object is achieved with a tamping unit of the type previously defined in that there is arranged between the two tamping tool carriers a further, central tamping tool carrier, vertically adjustable independently of them by means of its own drive, on which are positioned two pairs of twin tamping tines provided for immersion in a central sleeper crib, with respect to the said longitudinal direction, and squeezable apart for tamping two adjacent sleepers simultaneously.

A considerable increase in the efficiency and the tamping output of the machine may be achieved with a tamping unit designed in this way, since when all

three tamping tool carriers are employed at the same time, four sleepers may now be tamped at once. This represents an increase in input over the conventional machine by about a third. Accompanying this, quadruple tamping of this kind also has an advantageous effect on the uniform or consistent quality of the working result which may be more reliably and satisfactorily guaranteed with a block of four sleepers being treated at the same time. In addition to this increased economic efficiency, however, the design according to the invention also produces a wider variety of possible applications with regard to the number of sleepers that can be tamped in one working pass. This may now vary between one, two or four sleepers and may be selected or adjusted as required depending on the prevailing circumstances, the sleeper spacing or the presence of track obstacles. Should it be desired, a tamping pattern involving only every second sleeper may also be employed or only the two end sleepers of a group of four may be treated.

Other advantages according to the invention are evident from the drawing.

In one aspect, the present invention resides in a tamping unit for tamping sleepers of a track, comprising tamping tines tiltable about horizontal pivot axes extending parallel to one another and arranged in pairs with respect to the said pivot axes in the transverse direction of the track, wherein the tamping tines are mounted on two tamping tool carriers, arranged successively with respect to a longitudinal direction extending perpendicularly to the pivot axes and vertically adjustable independently of one another by means of drives , and are respectively connected via squeeze drives to vibration drives, there being mounted on each tamping tool carrier an end pair of tamping tines, with respect to the said longitudinal direction, for immersion in an end sleeper crib and also two pairs of twin tamping tines, spaced apart from one another with their pivot axes with respect to the said longitudinal direction, provided for immersion in a sleeper crib adjacent to the end sleeper crib and for tamping two adjacent sleepers, wherein there is arranged between the two tamping tool carriers a further, central tamping tool carrier, vertically adjustable independently of them by means of its own drive, on which are positioned two pairs of twin tamping tines provided for immersion in a central sleeper crib, with respect to the said longitudinal direction, and squeezable apart for tamping the two adjacent sleepers simultaneously.

The invention is explained in more detail in the following with the aid of an embodiment represented in the drawing, in which

Fig. 1 shows a side view of a tamping unit designed according to the invention, and

Fig. 2 to 4 show respective, greatly simplified side views of the tamping unit in various positions of use.

A tamping unit 1 shown in Fig. 1 for tamping sleepers 2 of a track 3 is connected via a carrier frame 4 to a tamping machine - not represented - which is mobile on rails 5 of the track 3 in a longitudinal direction indicated by an arrow 6. Each rail 5 has its own tamping unit 1 allocated to it, of which only one is shown for the sake of simplicity.

The tamping unit 1 has an auxiliary frame 7 extending in the said longitudinal direction above the rail 5, on which a total of three tamping tool carriers 8, 9 and 10

are arranged successively with respect to the longitudinal direction. Each tamping tool carrier 8-10 is connected to the auxiliary frame 7 so as to be vertically adjustable in each case with the aid of two vertical guide columns 11, spaced apart in the longitudinal direction, and is equipped with its own drive 12 for vertical adjustment independently of one another. Furthermore, there is provided on each tamping tool carrier 8-10 a vibration drive 13 designed as an eccentric shaft, connected via respective squeeze drives 14 to the top ends of tamping tools 15. These are mounted on each tamping tool carrier 8-10 so as to be tiltable about horizontal pivot axes 16 extending parallel to one another or perpendicularly to the longitudinal direction, and are each equipped in their lower end region with tamping tines arranged in pairs with respect to the pivot axis 16, i.e. in the transverse direction of the track, and described in more detail below.

Mounted on each of the two tamping tool carriers 8 and 10 positioned at each end with respect to the longitudinal direction is an end pair of tamping tines 17 which is provided for immersion in an end sleeper crib 20, and also two pairs of twin tamping tines 18 which are provided for immersion in a sleeper crib 21 adjacent to the aforementioned end sleeper crib 20. The twin tamping tines 18 are arranged with the pivot axes 16 associated with them spaced apart from one another in the longitudinal direction and are designed so as to be squeezable apart to tamp two adjacent sleepers 2. Unlike the two aforementioned tool carriers 8 and 10, the third tool carrier 9 positioned centrally between them is only provided with two pairs of twin tamping tines 19 which are provided for immersion in a central sleeper crib 22 and are designed so as to be squeezable apart with the aid of their squeeze drives 14 in order to tamp two adjacent sleepers 2. The pivot axes 16 of these two pairs of twin tamping tines 19 are similarly spaced apart from one another with respect to the longitudinal direction.

The tamping unit 1 with all the tamping tines, drives etc., thus in all essential particulars, is designed so as to be mirror-symmetrical – with respect to a vertical plane of symmetry 23 running through the central tamping tool carrier 9 and extending perpendicularly to the longitudinal direction.

In the example of a working application of the tamping unit 1 represented in Fig. 2, only one end tamping tool carrier 8 is lowered with the aid of the drive 12, while the other two tamping tool carriers 9 and 10 are still in their inoperative position – for instance because of a track obstruction (not represented). In this situation only a single sleeper 9 (shown in hatching) is tamped, one pair of twin tamping tines 18 (on the right in the drawing) of the tamping tool carrier 8 not being acted upon to tilt but remaining in the perpendicular position until the tamping tool carrier 8 is raised out of ballast bed again. If the obstruction is only located in the vicinity of the central tamping tool carrier 9, it would be possible to lower the other end tamping tool carrier 10 as well and tamp a second sleeper 2 – see the position of the tamping tines shown in dot and dash lines.

Fig. 3 shows the configuration of the tamping tines when two mutually adjacent sleepers 2 are tamped with the aid of the tamping tool carriers 8 and 9 lowered simultaneously. In the case of the central tamping tool carrier 9, one pair of the twin tamping tines 19 remains inoperative or is not acted upon, while the third tamping tool carrier 10 remains entirely in its raised inoperative position.

In Fig. 4, finally, the full use of the tamping unit 1 is represented, in which all three tamping tool carriers 8, 9 and 10 are lowered and all the tamping tines 17, 18 and 19 are tilted or squeezed with the aid of their squeeze drives 14 about their pivot axes 16 in order to tamp four mutually adjacent sleepers 2 of the track 3 simultaneously.

We Claim:

1. A tamping unit (1) for tamping sleepers (2) of a track (3), comprising tamping tines (17, 18) tiltable about horizontal pivot axes (16) extending parallel to one another and arranged in pairs with respect to the said pivot axes in the transverse direction of the track, wherein the tamping tines are mounted on two tamping tool carriers (8, 10), arranged successively with respect to a longitudinal direction extending perpendicularly to the pivot axes (16) and vertically adjustable independently of one another by means of drives (12), and are respectively connected via squeeze drives (14) to vibration drives (13), there being mounted on each tamping tool carrier (8, 10) an end pair of tamping tines (17), with respect to the said longitudinal direction, for immersion in an end sleeper crib (20) and also two pairs of twin tamping tines (18), spaced apart from one another with their pivot axes (16) with respect to the said longitudinal direction, provided for immersion in a sleeper crib (21) adjacent to the end sleeper crib (20) and for tamping two adjacent sleepers (2), wherein there is arranged between the two tamping tool carriers (8, 10) a further, central tamping tool carrier (9), vertically adjustable independently of them by means of its own drive (12), on which are positioned two pairs of twin tamping tines (19) provided for immersion in a central sleeper crib (22), with respect to the said longitudinal direction, and squeezable apart for tamping the two adjacent sleepers (2) simultaneously.

2. A tamping unit according to claim 1, wherein the pivot axes (16) of the two pairs of twin tamping tines (19) arranged on the central tamping tool carrier (9) are spaced apart from one another with respect to the said longitudinal direction.

3. A tamping unit according to claim 1 or 2, wherein each tamping tool carrier (8, 9, 10) is mounted on its own two vertical guide columns (11) spaced apart from one another with respect to the said longitudinal direction.

4. A tamping unit according to any one of claims 1 to 3, having a mirror-symmetrical design with respect to a vertical plane of symmetry (23) running through the central tamping tool carrier (9) and extending perpendicularly to the said longitudinal direction.

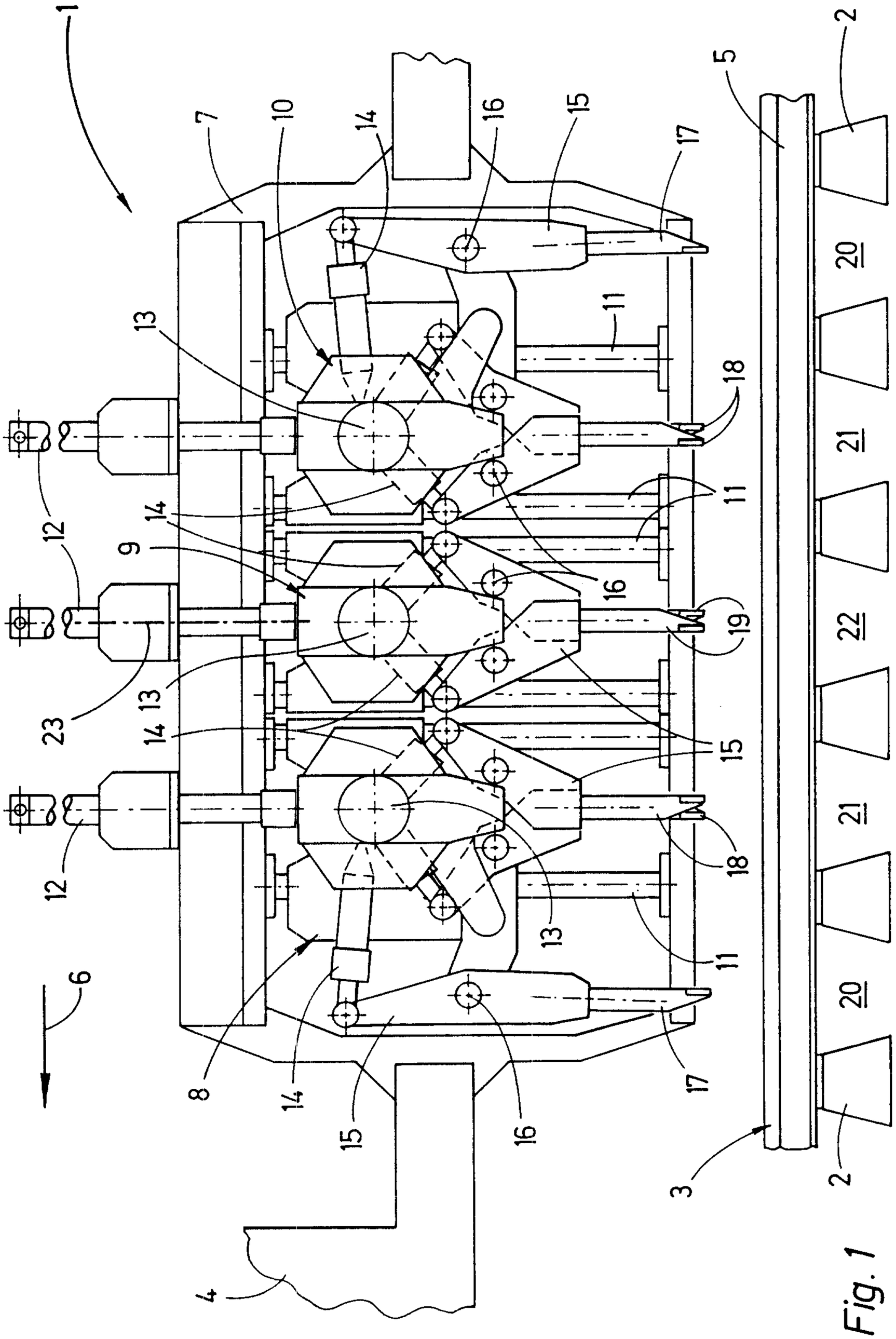


Fig. 1

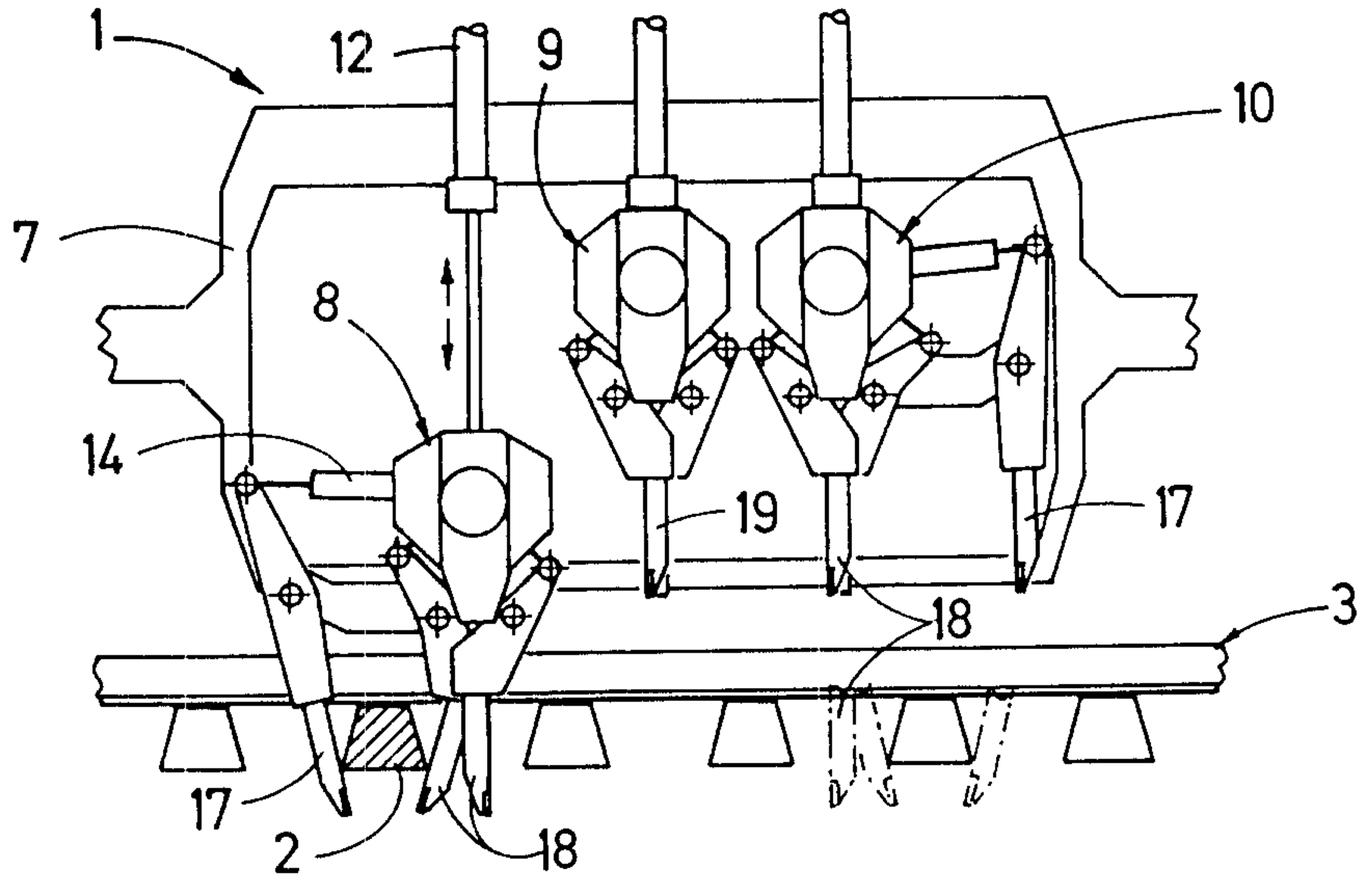


Fig. 2

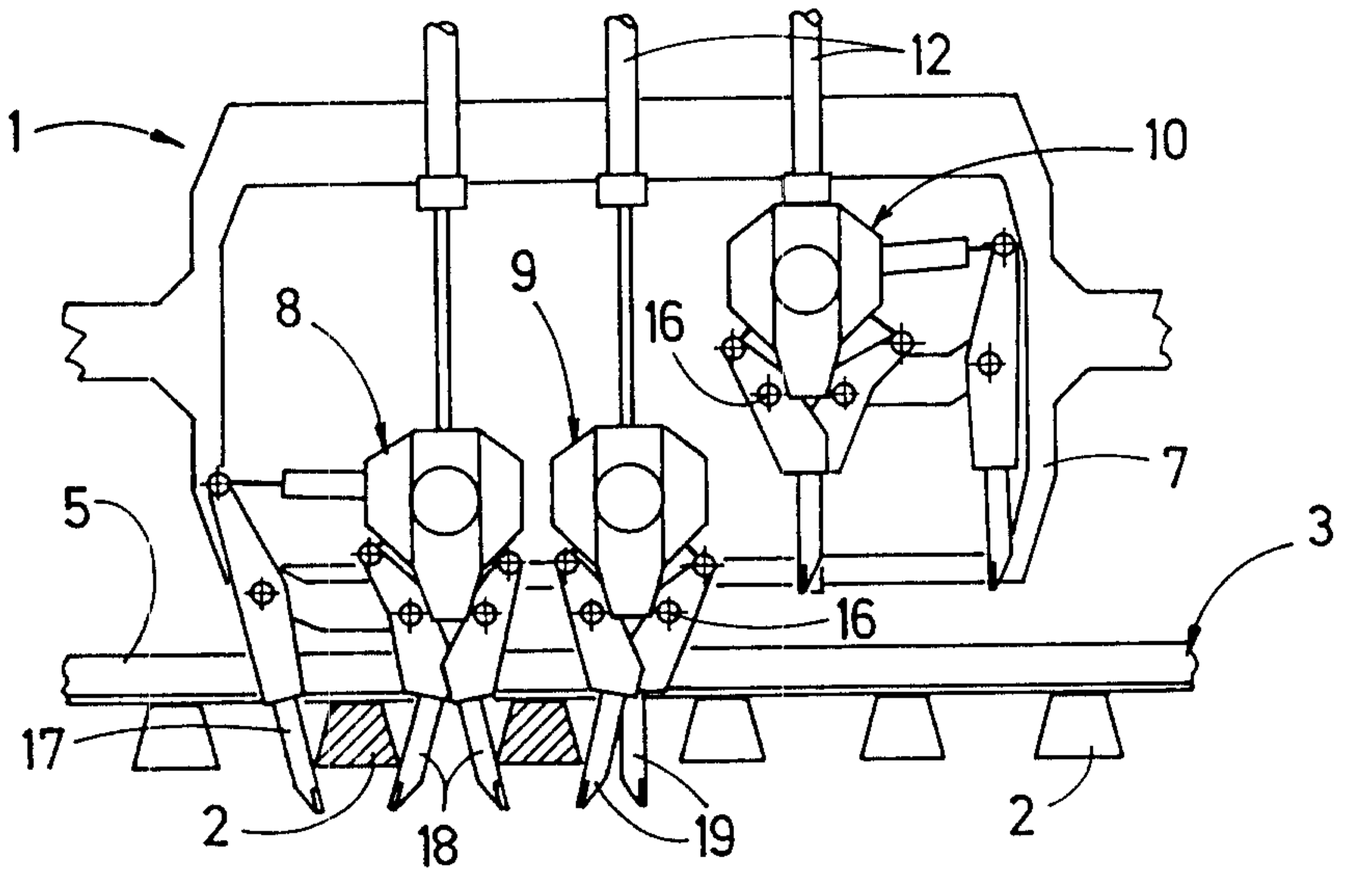


Fig. 3

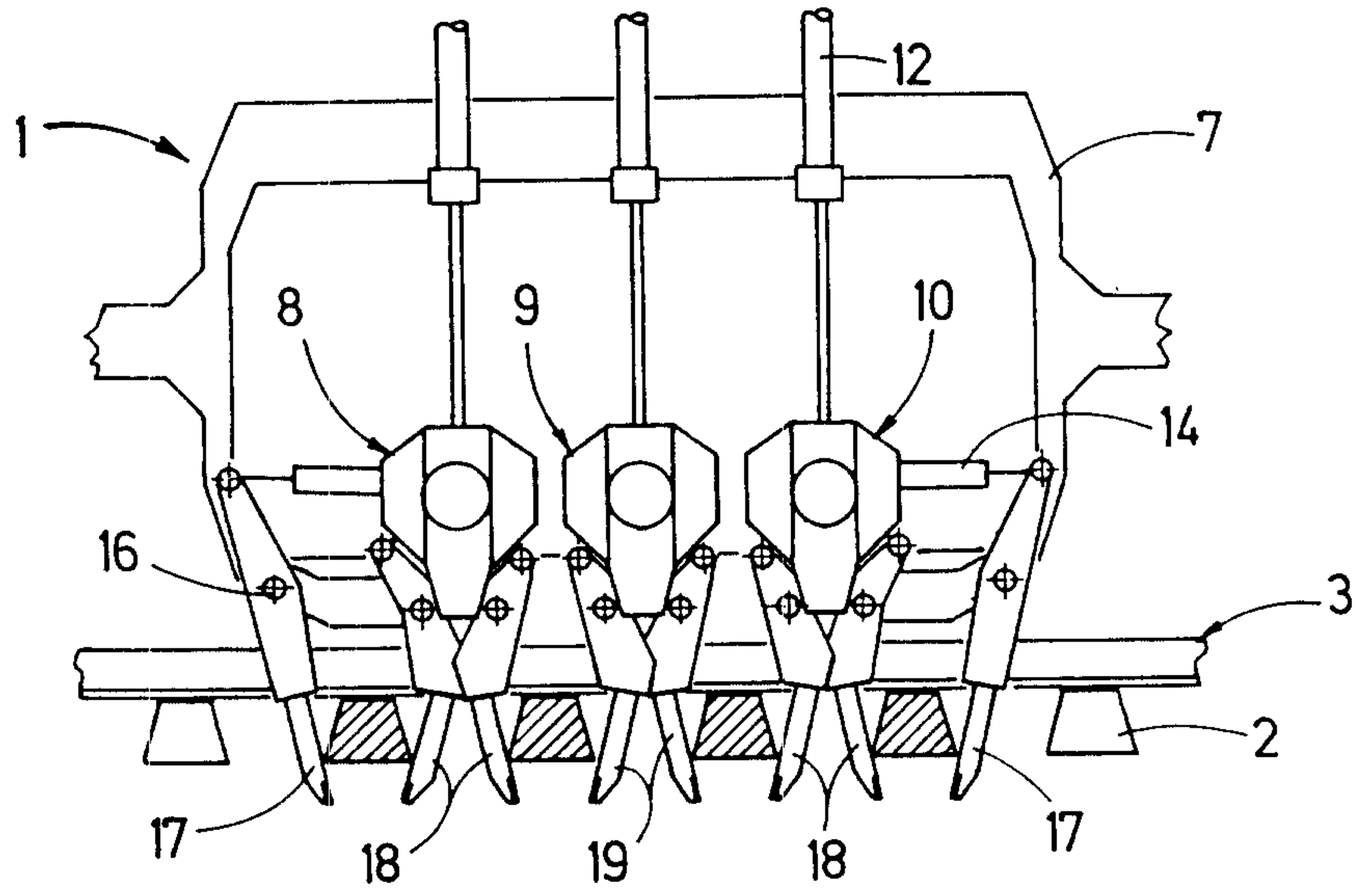
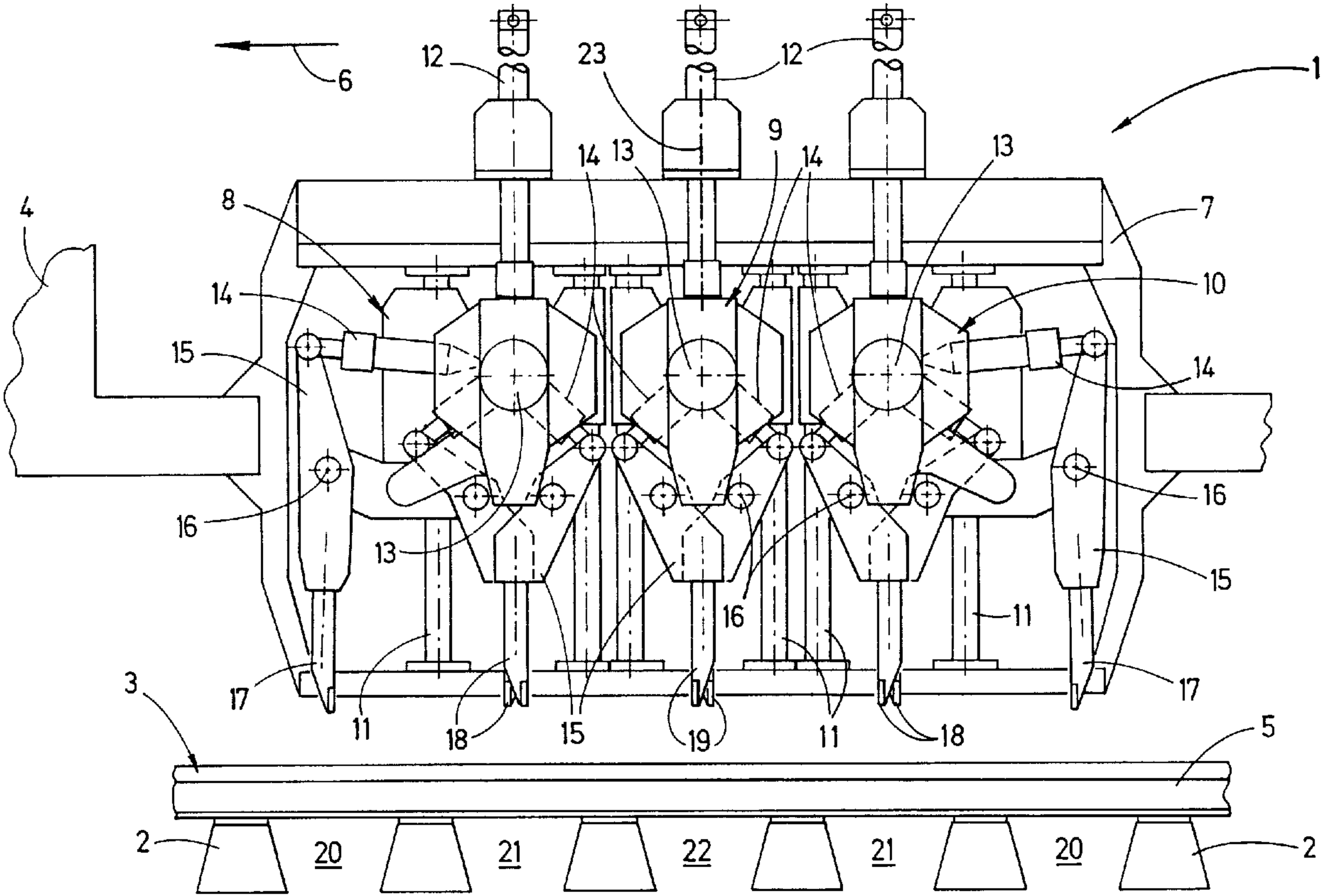


Fig. 4


6
12
23
12
1
9
14
13
14
13
8
7
4
14
10
15
14
16
16
13
15
16
11
17
3
17
11
18
15
19
11
18
5
2
20
21
22
21
20
2