

Jan. 30, 1968

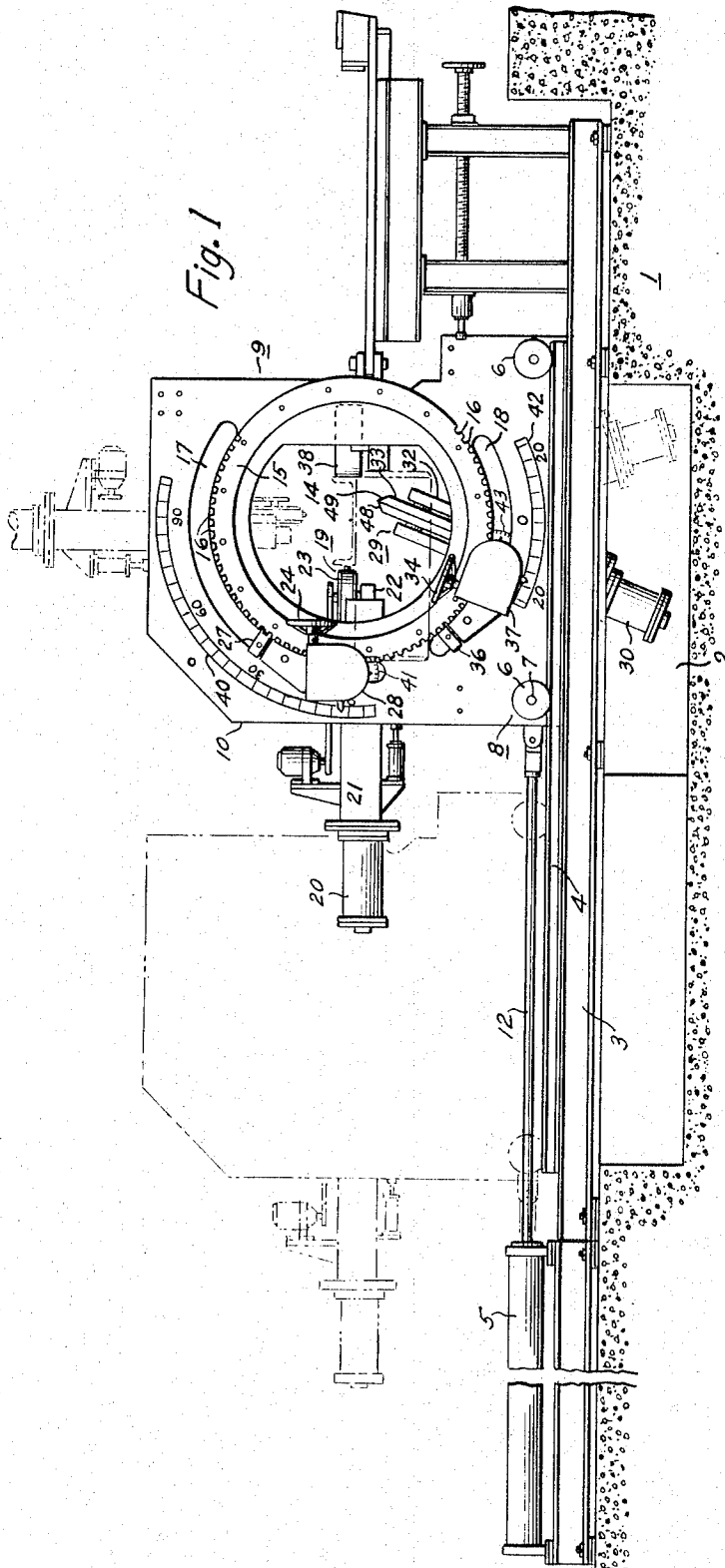
A. KRYNYTZKY

3,366,041

ADJUSTABLE MARKING MACHINE

Filed Dec. 29, 1966

3 Sheets-Sheet 1



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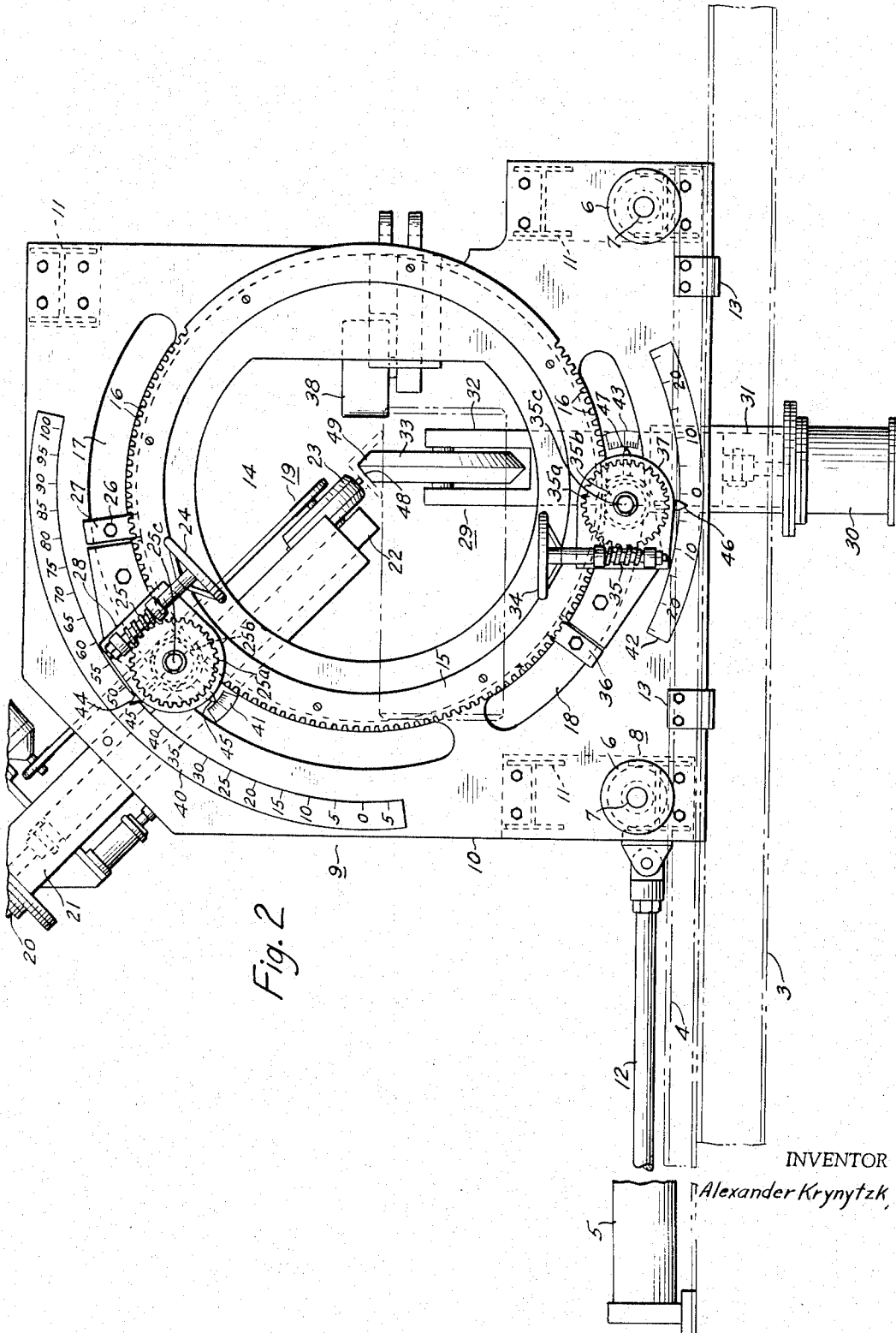
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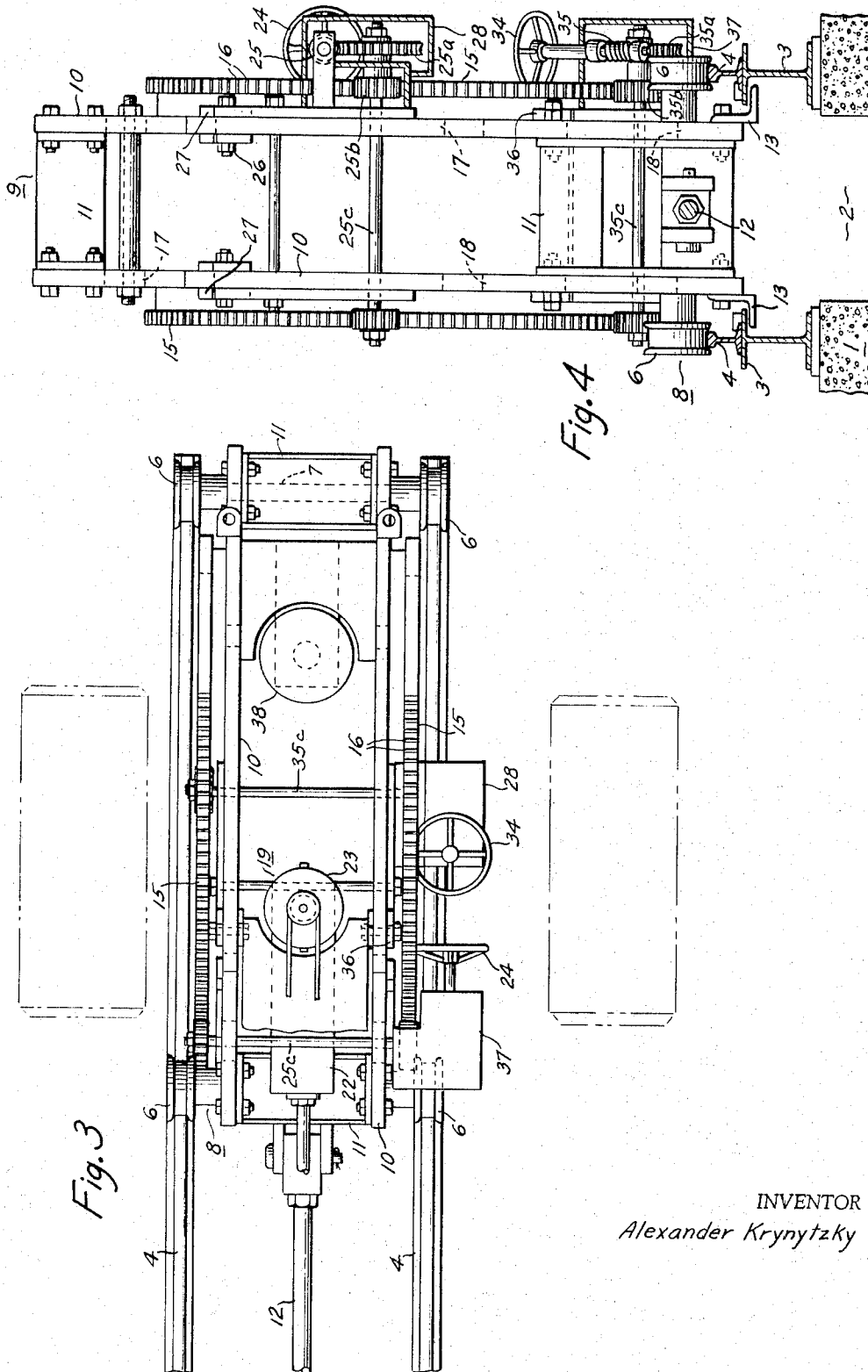
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3,366,041

ADJUSTABLE MARKING MACHINE

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Filed Dec. 29, 1966, Ser. No. 605,645
3 Claims. (Cl. 101-6)

ABSTRACT OF THE DISCLOSURE

A marking machine for impressing identification markings on a longitudinally moving structural steel shape by mechanism including a rotary marking wheel and a back-up wheel which engage the shape on opposite sides. The angular positions of the wheels relative to the shape are made radially adjustable over a wide range by ring gear and pinion mountings.

Background of the invention

The field of art to which the invention pertains is the provision of means for marking identifying characters or designs on the surface of an article other than a rectangular sheet by engaging the article in rolling contact between the peripheries of two oppositely rotating members to effect the marking act.

It is conventional to mark standard structural steel sections such as I-beams, channels, Z-bars, half center sills, etc., as they emerge still hot from the rolling mill, by causing them to pass between a rotary marking wheel and a back-up wheel which functions as an anvil, so as to impress the desired symbols. Prior machines for this purpose, as exemplified by U.S. Patents 2,619,030 to Doyle and 3,163,106 to Failor, issued Nov. 25, 1952 and Dec. 29, 1965 respectively, are sometimes inadequate to mark plainly all the sections which may be rolled on the different passes of the mill, because a back-up member of such prior machines cannot be adjusted independently of a marking member, nor is there a wide range of radial adjustment for either member. Such prior machines have also been unduly wasteful of operating space, which is at a premium in a steel plant, and have required excessive room both longitudinally and vertically of the machine to permit their effective operation.

Summary of the invention

The present invention enables the angular positions of the marking wheel and the back-up wheel to be adjusted separately and quickly relative to each other and to the section being marked, so as to mark plainly any size or type of section being rolled on any pass of the rolling mill. It is further exceptionally compact and economical of operating space, and is well adapted to motorized adjustments if desired.

Accordingly, it is an object of the invention to provide an apparatus for accurately marking structural steel shapes while hot and traveling at high speeds therethrough.

Another object is to provide an apparatus for impressing suitable markings upon any surface of such a shape while disposed at any angle between and including the horizontal and vertical planes.

A further object is to provide an apparatus in which the relative angular positions of a back-up element and a marking element are quickly and easily adjustable.

An additional object is to provide an apparatus which is readily movable out of the path of any rolled products which are not to be marked.

Description of the drawings

In the annexed drawings:

FIGURE 1 is a full front elevation of my marking machine;

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FIG. 2 is a partial front elevation of said machine, showing the marking wheel as raised;

FIG. 3 is a top plan view of the machine; and

FIG. 4 is an end elevation of the machine.

Referring more particularly to the drawings, the reference numeral 1 indicates a concrete foundation behind a rolling mill (not shown) and serving as a base, being provided with an elongated pit or recess 2 having horizontal I-beams 3 atop each side and rails 4 mounted on said I-beams. An air cylinder 5 is horizontally positioned at one end of the rails 4.

Wheels 6 on shafts 7 are journaled to a carriage 8 bearing an upright frame 9 formed by a pair of upright side plates 10 spaced apart by the corner cross beams 11. A shaft 12 operatively connects the air cylinder 5 to said carriage 8 to move the same on the rails 4. Angles 13 bolted to the side plates 10 and projecting beneath the I-beams 3 restrain the frame 9 from tipping over during operation of the marker.

The plates 10 of said frame 9 have a pair of aligned central orifices 14. Mounted on the outer sides of said plates and surrounding said orifices 14 are large ring gears 15 with outer teeth 16 adjacent to arcuate slots 17 and 18 in said plates 10.

Projecting toward the central orifices 14 is the marker wheel assembly 19, comprising an outer air cylinder 20 on a housing 21 enclosing a sliding beam 22 carrying the marking wheel 23. Said assembly 19 is supported between the plates 10 as shown in FIG. 3 and is traversable in opposite slots 17 (FIG. 2) within a range from horizontal to vertical by a handwheel 24 rotating a worm gear 25 meshing with a first (large) pinion 25a. A second (smaller) pinion 25b is mounted concentrically with said first pinion 25a on a common shaft 25c extending through said assembly 19 and engages the ring gear teeth 16. The worm gear 25 causes the assembly to be self-locking in itself, but the assembly may be further secured by tightening the bolt 26 of a clamp 27. A cover 28 will serve to keep dirt out of the gears.

Similarly adjustable in the recess 2 and projecting upwardly toward the orifices 14 is the lower back-up assembly 29. This likewise comprises an air cylinder 30 and a housing 31 enclosing a sliding beam 32 which carries a lower back-up wheel 33.

This assembly 29 is similarly traversed in the opposite slots 18 within a range of about 25° to either side of vertical by a handwheel 34 rotating a worm gear 35 meshing with a first (large) pinion 35a. A second (smaller) pinion 35b is mounted concentrically with said first pinion 35a on a common shaft 35c extending through said assembly 29 and engages the ring gear teeth 16. Said assembly 29 is secured in chosen angular position by the clamp 36. Dirt is excluded from the ring gear teeth 16 by the protective cover 37.

A supplemental or alternative horizontal back-up wheel 38 is also provided, the angular position of this assembly being fixed relative to the frame 9.

Suitably calibrated gage scales 40, 41, 42, and 43, and pointers 44, 45, 46 and 47 will facilitate the adjustment of the marking wheel assembly and lower back-up wheel assembly to any desired angular positions.

It is often necessary to resume rolling and marking a section of particular shape and size, after an interval of rolling and marking some other type of section. Accordingly, whenever it becomes necessary to return to predetermined former angles of inclination for the marking wheel 23 and/or the lower back-up wheel 33, rough angular adjustments may be set according to the pointers 44 and 46 on the long arcuate gage scales 40 and 42 numbered in degrees, and more exact final settings may be indicated by vernier pointers 45 and 47 on the short gage scales 41 and 43.

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The purpose of the individual back-up wheels 33 and 38 is to enable either one of them to be used with the single marking wheel 23, for stamping clearly on different shapes and different locations on the shapes. For example, the webs of wide flange I-beams and channels are usually horizontal, and the flanges vertical, as they emerge from the rolling mill. To mark one flange, accordingly, the marking wheel need only be traversed horizontally toward the fixed rear back-up wheel 38. If it is desired to mark the webs of beams or channels, the marker wheel 23 may then be adjusted to a vertical position and used in conjunction with the lower back-up wheel 33, without the use of the rear back-up wheel 38.

The lower back-up wheel 33 may also be used to support the underside of angular shapes such as angles and center sill halves during marking. In such cases, it is often especially advantageous to be able (as here) to make precise adjustments quickly in the angular relationship between the marker wheel and the coacting bottom back-up wheel. While manual adjustment means are shown, they may also be motorized quite simply if required.

The lower back-up wheel 33 is preferably provided with a pair of oppositely beveled faces 48 and 49, as shown, for the purpose of properly supporting the bottom surfaces of an angular workpiece.

If material leaving the rolling mill is not to be marked, the entire apparatus may be moved out of the path of such material by means of the cylinder 5, which can be actuated to move frame 9 laterally of the path of such material on wheels 6 traveling on rails 4.

I claim:

1. An apparatus for marking an elongated workpiece while said workpiece is in lengthwise motion, comprising a base, a carriage on said base, and means for horizontally traversing the carriage, wherein the improvement comprises:

- (a) an upright frame on said carriage,
- (b) an orifice through said frame constituting a passage for the longitudinal travel of the workpiece,

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(c) ring gear means on the frame surrounding said orifice,

(d) a marking wheel assembly supported on said ring gear means and adjustable in angular relation to said workpiece,

(e) an independently angular adjustable back-up wheel assembly supported on said ring gear means, and

(f) separate means mounted on each said assembly for individually adjusting the angular positions of the marking wheel assembly and the back-up wheel assembly relative to the workpiece,

(g) said separate means each comprising a worm gear, a first pinion meshing with said worm gear, and a second pinion secured to and concentric with said first pinion, said second pinion being in meshing engagement with said ring gear means, and means to rotate said worm gear.

2. In the apparatus claimed in claim 1, said independently adjustable back-up wheel having a pair of oppositely beveled faces for supporting the bottom surfaces of an angular workpiece.

3. The apparatus claimed in claim 1, in combination with an alternative back-up member, the angular position of which is fixed relative to the frame.

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