May 19, 1936. J. M. DARBAKER 2,041,235

FEED DEVICE

Filed Feb. 21, 1935 2 Sheets-Sheet 1

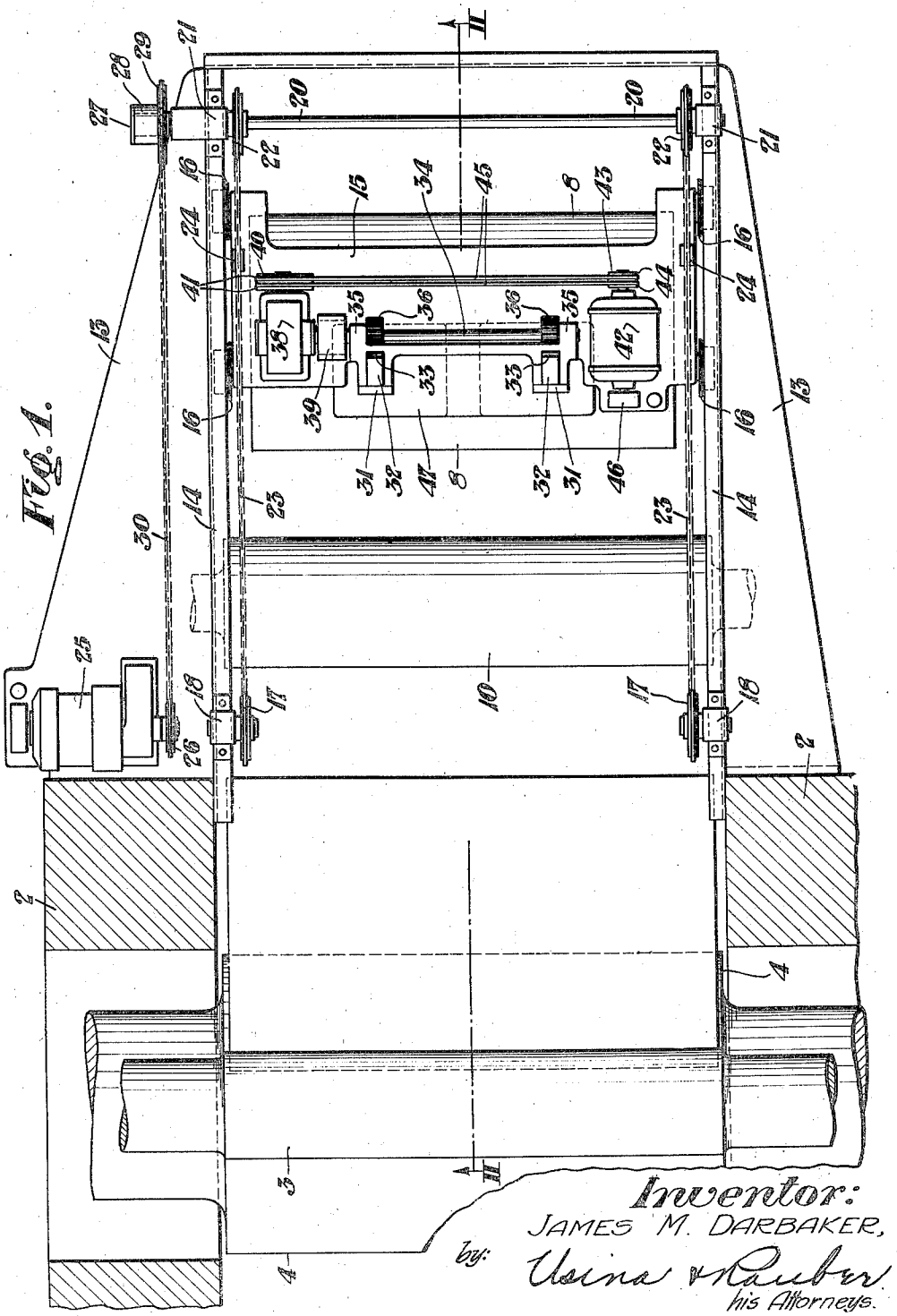


Fig. 1.

Inventor:
JAMES M. DARBAKER,
by: Usina & Rauber
his Attorneys.

May 19, 1936. J. M. DARBAKER 2,041,235

FEED DEVICE

Filed Feb. 21, 1935 2 Sheets-Sheet 2

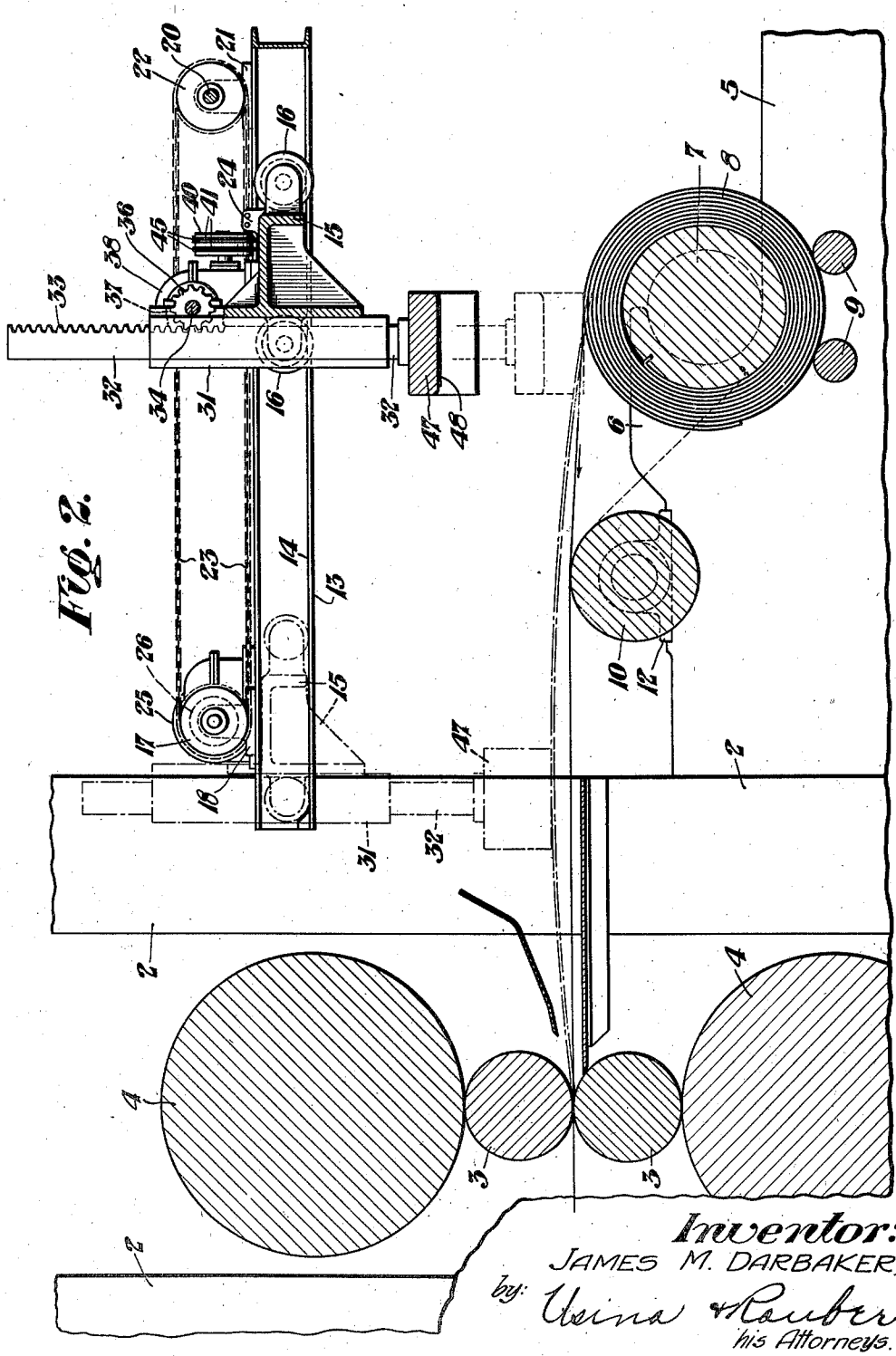


Fig. 2.

Inventor:
JAMES M. DARBAKER,
by: Usina & Rauber
his Attorneys.

Patented May 19, 1936 2,041,235

UNITED STATES PATENT OFFICE

2,041,235

FEED DEVICE

James M. Darbaker, Gary, Ind., assignor to American Sheet and Tin Plate Company, a corporation of New Jersey

Application February 21, 1935, Serial No. 7,655

1 Claim. (Cl. 80—43)

This invention relates to a feed device, and more particularly one which is adapted to assist relatively heavy coiled material into a metal processing machine, such as a 4-high cold reduction unit, although not limited thereto.

In operating metal processing machines, such as a 4-high cold reduction unit, by way of example, a great deal of difficulty is experienced in introducing the advance end of coiled material into the processing elements. It very frequently happens that the coil is composed of very wide and heavy strip which is extremely unwieldy and offers a great deal of resistance to manual manipulation. Numerous attempts have been made to devise a satisfactory guiding apparatus, but none have been met with much success, due to the fact that they are very likely to scratch the surface of the coiled material. These scratches may only be removed in a costly manner, which is particularly important in the art of cold reducing, as an extremely smooth surface condition must be maintained.

It is one of the objects of the present invention to provide a novel feed device which operates in an efficient and rapid manner to introduce the advance end of a coil to a metal processing machine in such manner as to preclude the possibility of scratching the surface of the material.

Another object is the provision of a device of the class described which may be easily and cheaply installed on existing types of metal processing machines, and one which at the same time is not readily susceptible to breaking-down.

A further object is to provide a novel feed device for metal processing machines which is so positioned with respect to the latter as not to interfere with the observation of the advance end of a coil of material at the time of introduction thereto, and one which may be subsequently removed to a relatively remote position.

These and further objects will be apparent after referring to the drawings, in which:

Figure 1 is a plan of the device of the invention as applied to a 4-high cold reduction mill.

Figure 2 is a sectional side elevation of the device.

Referring more particularly to the drawings, the numeral 2 designates the housing of a conventional 4-high mill employing the usual metal working rolls 3 and backing-up rolls 4. A bed 5 is disposed on either side of the housing 2 and carries a reel support 6. A reel 7 is carried by the reel support 6 and itself carries a coil 8 of relatively heavy and wide strip material.

In accordance with conventional practice, the coil 8 is adapted to rest upon a pair of rollers 9 which are also carried by the bed 5. An elongated roll 10 is carried by suitable bearings 12 which are disposed on the bed 5 between the reel support 6 and the rolls of the mill. This roll is adapted to assist the coil 8 into the pass of the mill in order that it may be processed, while the reel 7 is suitably rotated or frictionally restrained against rotation, depending upon whether it is taking-up or paying-off.

According to the teaching of the present invention, one side of the housing 2 of the mill is provided with a pair of frames 13, which are spaced apart substantially equal to the width of the metal working portions of the metal working and backing-up rolls 3 and 4, respectively. The pair of frames 13 are shown as being positioned above the horizontal center line of the upper backing-up roll 4, and while they are shown as being utilized only on one side of the mill housing 2 it will be readily understood by those skilled in the art that a similar pair of frames may be mounted on the other side thereof for supporting another and complete combination of the elements of the invention if the manner in which the operation of the mill is practiced should require it.

A substantially U-shaped trackway 14 is carried by each of the frames 13 in order that they may support a carriage 15 for reciprocation thereon. This carriage 15 is provided on each of its sides with a pair of wheels 16 which protrude therefrom in such manner as to substantially occupy the spaces between the flanges of the substantially U-shaped trackways 14.

A sprocket 17 is suitably journaled, as at 18, on each of the trackways 14 immediately adjacent the mill housing 2. A shaft 20 is journaled, as at 21, on the remote ends of the trackways 14 and carries a pair of sprockets 22, each of which is alined with one of the sprockets 17. A chain 23 is disposed above each of the sprockets 17 and 22, and a pair of lugs 24 mounted on the carriage 15 for engagement therewith.

A motor 25 is mounted on one of the frames 13 and provided with a sprocket 26. The adjacent end of the shaft 20 is extended, as at 27, and carries thereon a slip coupling 28. A sprocket 29 is carried on the slip coupling 28 and a chain 30 connected thereto and to the sprocket 26 of the motor 25. It will thus be seen that the motor 25 may be suitably driven in each direction in order to reciprocate the carriage 15 through the chains 23 to which it is connected by the lugs 24. A pair of vertical guides 31 are carried by the carriage 15 and in each of which there is slidably disposed

a shaft 32 having a rack 33 on one of its sides. A shaft 34 is journaled, as at 35, on the carriage 15 in substantial parallelism with the shaft 20 on the trackways 14. This shaft 34 carries a pair of pinions 36, each of which is adapted to extend into the opening 37 in each of the guides 31 in such manner as to engage the rack 33 of the adjacent shaft 32. A speed reducer 38 is also mounted on the carriage 15 and connected to the shaft 34 through a coupling 39. This speed reducer 38 is provided with a pulley 40 having a pair of grooves 41 therein. A motor 42 is mounted on the carriage 15 adjacent the end of the shaft 35 which is remote from the speed reducer 38 and is provided with a pulley 43 having a pair of grooves 44 therein.

The pulleys 40 and 43 on the speed reducer 38 and motor 42 respectively are connected by means of a pair of V-shaped belts 45 which are disposed in the various grooves therein. A suitable brake 46 is provided for the motor 42 in order to assure the cessation of its operation at determined intervals.

A substantially rectangularly shaped magnet 47 is suitably carried by the lower ends of the shafts 32, and is provided with a slot 48 for a purpose to be later described.

In operation, the motor 25 is suitably actuated to dispose the carriage 15 at a position above the coiled material 8 on the reel 7 which is mounted on the reel support 6. In accordance with conventional practice, this coil of material is provided with a suitable strap (not shown) to prevent its becoming unwound.

After the operation of the motor 25 has been discontinued, the motor 42 is actuated to rotate the shaft 34 in such manner as to lower the substantially rectangularly shaped magnet 47. As the magnet 47 comes into contact with the coil 8 it is suitably energized, and the strap around the coil (not shown) is suitably removed through the slot 48. Due to the energization of the magnet 47, the coil will not unwind, and the reel 7 is rotated in any suitable manner to permit the advance end of the coil to come in contact with the magnet. When the advance end of the coil 8 has been drawn tightly across the face of the magnet 47, with approximately two or three feet extending toward the mill housing 2 and beyond the face of the magnet, the motor 25 is actuated to move the carriage forwardly.

The movement of the carriage 15 towards the housing 2 is continued until the advance end of the coil 8 can be satisfactorily placed in the nip of the metal working rolls 3. As the advance end of the coil progresses between the nip of the metal working rolls 3 the magnet 47 is deenergized and the motor 42 energized to raise it away from the line of pass. If it develops that the advance end of the coil 8 is not sufficiently close to the nip of the metal working rolls 3 to be seized thereby the motor 42 may be actuated to again lower the magnet 47 and the latter energized to permit it to again take hold of the material; whereupon the motor 25 may be again actuated to advance the carriage 15 until its introduction has been accomplished.

By the proper and timely manipulation of the motors 25 and 42 and energization and deenergization of the magnet 47, the advance end of the coil 8 may be introduced into the mill in a minimum of time and without the danger of marring or scratching its surface.

While I have shown and described one specific embodiment of my invention, it will be understood that I do not wish to be limited exactly thereto, since various modifications may be made without departing from the scope of my invention, as defined by the following claim.

I claim:

In combination with a machine for processing a relatively heavy coil of metallic strip, the convolutions of said coil being confined against radial displacement by a tying element, of a horizontal platform immediately adjacent said machine, a movable carriage on said platform, a magnet mounted on said carriage, said magnet being adapted to contact said coil of metallic strip and receive said tying element, means on said platform for moving said carriage, and means for moving said magnet at substantial right angles with respect to the direction of movement of said carriage.

JAMES M. DARBAKER.